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With a special section on:

EPISTEMIC INJUSTICE AND EDUCATION IN THE DIGITAL AGE

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Tiina Räisä and Matteo Stocchetti

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Epistemic injustice and education in the digital age

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Abstract

The aim of this article is to function as a starting point for combining the study of epistemic injustice in a higher education framework with that of digitalization, including recent developments such as the entrance of AI in higher education. What is identified as the main problem is the power of digital technology and how technologies shape institutional practices of teaching and learning, often in opposition to democratic education aims. The introduction of AI in higher education deepens the mediatization process of higher education, demonstrated by a mainstream oriented usage of AI. In higher education, digital technology shapes practices that are indifferent to the epistemic claims and rights of students, and quite perfectly attuned to the 'practical needs' of digital technology which severely challenges the concept of knowing and also critical thinking in higher education.

Keywords: epistemic injustice; digitalization; technology; higher education; mediatization

1. Introduction

With this special issue we sought to promote the approach of epistemic injustice and contribute to its development in relation to digitalization and higher education. This goal was inspired by the relevance of this approach, to engage with the challenges to democracy associated with the very rapid development of new technologies and especially AI, and to problematize the impact of these technologies on higher education.

The notion of epistemic injustice is described in the seminal study by Miranda Fricker, *Epistemic Injustice, Power and the Ethics of Knowing* (Fricker, 2012) and the contributions that followed (Anderson, 2012; Medina, 2011; Medina, 2012; Polhaus, 2012; Fricker, Medina, Polhaus & Kidd, 2017). With this special issue of the *Journal of Digital Social Research* we want to contribute to the re-actualization and the development of this approach, extending its heuristic potential to the epistemic effects of digitalization. The broader rationale for this effort is to support democratic education by providing professional educators with an intellectual tool to equip future generations with the competences and moral inclination to address the epistemic roots of the current 'crisis' of democracy (Samaržija & Cassam, 2023). This exploration has great potential and it suggests, for example, that contemporary concerns with epistemic trust in political communication (Dahlgren, 2018) pay insufficient attention to issues of social power and to the idea that 'social disadvantage can produce unjust epistemic

disadvantage' (Fricker, 2007, p. 2). In this exploration, the key question of securing the quality of higher education is what ties together epistemic injustice, higher education and digitalization.

Testimonial justice, our possibilities to be trusted as actors, has to do with social power (Fricker 2007). Fricker offered a working definition of social power: "a practically socially situated capacity to control others' actions, where this capacity may be exercised (actively or passively) by particular social agents, or alternatively, it may operate purely structurally" (Fricker, 207, p. 13). The question that arises is what impact social power digital technologies have on the development of epistemic credibility in an educational context. What are the forces that are currently given the most space in a teaching context and what relevance do they have for a fair development of knowledge? Given that power, as Fricker describes it, is not only social but also dispersed, we need to understand the rationale of a just epistemic approach to the daily activities in higher education.

Epistemic injustice in higher education operates in a historical context. Our approach, which includes the development of digitalization, spurs engagement with both old and new forms of injustice. From this perspective, it can be argued that the crisis of democracy results not primarily from the appeal of non-democratic ideologies, but from the inability of democratic regimes to address social injustice and fundamental inequalities that ultimately erode the legitimacy of this form of government. In many respects, the understanding of the mechanisms of epistemic injustice starts by acknowledging the role and quality of education. Epistemic injustice (the over-representations of certain 'situated' knowledges over others) results from epistemic inequalities (the unequal distribution of epistemic competences or the ability to create, access, evaluate, organize and use knowledge). Together, these combine to constitute the grounds for higher education, and thus for the epistemic 'crisis' of democracy: the erosion of the common grounds relating to the creation and justification of knowledge that ultimately supports the effectiveness of democratic regimes. So, while old inequalities such as race, gender and class are largely unresolved, and still affect higher education, new challenges have appeared on the horizon. We regard digitalization as one such development which has brought with it many new types of inequalities that do not necessarily operate according to the same logic as the old inequalities.

We perceive digitalization as an accumulation of problems that have emerged in various domains of life since the convergence from analogic technology. However, when conducting empirical studies, choosing methods and building theory in the field of epistemic injustices in a digitalized higher education framework, we need to take into consideration also other relevant theories and concepts. Digitization, platformization, datafication, and also mediatization all reflect and focus on different aspects of digitalization. In this article we will briefly discuss how to adapt mediatization theory to study the relationship between digitalization of higher education and epistemic injustice.

This introduction is divided in five parts. The first is an overview of the theoretical background of epistemic injustice research. The second describes the problem in relation to the changes in digital technology that constitutes the life world of students in higher education. The third is a short review of the relevant literature about epistemic injustice relevant for developing this approach in the higher education and digitalization. The fourth part presents some initial questions that support future research in the field. The fifth part is a short description of the contributions in this issue including some initial questions that support future research in the field.

2. Theoretical developments

As Dunne argued, although "there has been some work in the area of epistemic injustice in education…, the topic remains relatively underexplored in educational philosophy and theory." (Dunne, 2023, p. 285).

Already a decade ago, discussing the epistemic of education research, Frank argued for the need to 'move away from the language of epistemic diversity and to the language of epistemic injustice'. (Frank, 2013, p. 363). The following year, Horsthemke offered a critical interpretation of Fricker's notion, to argue for the epistemic and ethical value 'that sometimes emanates from being the object of outsider

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critique' for critical and democratic thinking, and critical self-reflection (Horsthemke, 2014, p. 137). Whitt discussed distancing as a defensive mechanism deployed by students when teachers seek to engage them in discussions about epistemic injustice, suggesting, among other things, 'a gradualist approach to epistemic transformation, and [to] remain modest with regard to what we can expect, from our students and ourselves, in a single class or semester' (Whitt, 206, p. 443).

More recently Walker argued for the importance of epistemic justice in democratic life and the key role of education for the development of epistemic capabilities. He pointed to the special role of university education in this undertaking and argued:

> "Educational institutions should undertake hopeful if not perfect work, equipping students with subject and professional knowledge and a range of public reasoning abilities that will enable them to participate fully and meaningfully in education, work and in making a democratic society. Indeed, achieving deeper public reasoning and 'thick' justice depends rather crucially on an education, which takes epistemic justice and the associated epistemic capability, together with the necessary conditions for its development, very seriously." (Walker, 2019, p. 169).

Finally, one should mention the special issue of *Educational Philosophy and Theory*, with six essays dedicated to epistemic justice and education. The goal of that collection, in Dunne's words:

> "Predictably then, … educators might fail to live up to their moral-epistemic obligations. Time-impoverished environments and outcome-driven internalised cultures lead us to sometimes fall short. We fail to account for and exercise due care in relation to the epistemic vulnerabilities of our students ... Where there are human beings trying to sincerely figure out what to accept or believe or do or perform, there is potential for wrong doing. And since normatively-calibrated established etiquettes for interdependent inquiry are still at gestational stage, we still have much to learn about avoiding harms in co-dependent epistemic settings. This special issue attempts to address this lacuna." (Dunne, 2023, 285).

Carter and Meehan argued that targeting 'incompetent trusting' is a 'promising strategy' to mitigate testimonial injustice (Carter & Meehan, 2023, p. 295). Battaly (2023) argued the case to consider epistemic injustice as a systemic cause of 'intrapersonal intellectual servility' and suggested to prioritize strategies that target the former to effectively address the latter. Cassam (2023) used the notion of vice-charging to describe a form of epistemically vicious behaviour, supporting forms of epistemic injustice that targeted vaccine hesitant parents during the Covid-19 crisis. Although not mentioning it explicitly, the notion of epistemic injustice inspired Kidd to argue the effects of the culture of speed on the work of higher education. As he put it:

> "We are increasingly subjected to a culture of speed that, when institutionally manifested and if individually internalised, deprives us of the time, energy, and freedom to happily exercise an important range of virtues integral to higher educational practice" (Kidd, 2023, p. 339).

Finally, Dunne and Kotsonis described the notion of 'epistemic exploitation' and the resulting 'ontic burnout' as the effects of the invitation that educators representing privileged groups direct to 'marginalized knowers' as a way to address epistemic injustice. Their analysis suggested a point that cannot be overstressed:

> "Ontic burnout is not a characterological weakness or defect. The principal causes of burnout reside in the toxic environment and blame worthy epistemic practices themselves—in marginalised knowers being compelled to educate others about the nature and source of oppression. And so, it is the corrupted practice itself—of educators engaging in epistemic exploitation—that must be cast aside, rather than misguided attempts to lay fault or blame at the feet of spokespersons. Blaming the oppressed for suffering ontic burnout would be yet another injustice inflicted on them, albeit a non-epistemic one". (Dunne & Kotsonis, 2023, p. 353).

3. The problem and its relevance

Something profound is at stake in higher education. Along with digitalization, many other global phenomena disrupt life in higher education. To mention a few, university institutions need to address challenges with student mental health (Upsher et al. 2022), learning problems, and respond to anxiety related to climate crisis, gender and race issues, i.e. issues that adds to the number of injustices, and which

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are also more or less visible in the university curricula. So, while sociocultural changes, such as gender awareness or a general sensitivity to wrongdoings trigger debate, problems related to stress caused by digital technology are more difficult to problematize and discuss. This presents a challenge to higher educations since digital platforms and the communication that take place on them affect the discursive knowledge production about society and culture, including injustices. In short: we are more aware of injustices *per se*, but less aware of the contemporary forces that shape what is knowledgeable in the first place.

There are several problems related to digitalization of higher education which affect life in higher education. Before AI, the discussion was about algorithmic structures; a logic that affects a growing number of communicative practices today and which also infringes higher education practices. The black box-rationale of algorithms that does not expose its operational logic, is anything but optimal for critical thinking. With AI and its applications new problems have emerged within higher education (Yan et al., 2023) that relate to our capacity as knowers. On their websites, universities around the world encourage students to use AI, arguing that the technology is already in use in the workplace. Instructions generally include an addition: students should carefully explain when and how they have used AI in their assignment. From an epistemic point of view, it seems probably too much to ask of a young person who is just learning the basics of critical thinking to be able to assess her/his interaction (the 'prompt') or the reliability of AI-generated content. A 'machine' that has the 'answer' or 'solution' to any problem is of course extremely appealing. How can students determine if the chatbot is a 'trustworthy knower'?

One can think of AI as yet another buzzword that will soon fade, or one can consider what this particular digital technology means for epistemic injustice in higher education. What is different with AI compared with other digital technologies is its design, and function. AI has been described as a technology "exclusively and explicitly designed to enhance our capacity as knowers" (Alvarado, 2023, p. 31). So, among many other practical problems that need to be solved within higher education is how students actually perceive and use AI as part of their higher education. Another question is how AI redefines the role of teachers in environments characterized by AI. The growing number of digital technologies, 'innovations' and applications that affect our capacity as knowers, emerge as the core problem, and it is our role as teachers and researchers to respond to these challenges.

In the implicit model underlying our approach, in other words, epistemic injustice, digitalization and education are connected to each other to create both a vicious and virtuous circle: 1) epistemic injustices are reproduced through corporate digitalization and its impact on education; 2) educational intervention and attention to the old and new forms of epistemic injustice associated with digitalization and reproduced through the digitalization of education produce feedback effects to reduce epistemic injustice in education and digitalization.

Consequently, combining epistemic injustice with digitalization allows us to approach the detrimental effects of the corporate appropriation of digitalization on society by studying digital technology, and its pervasive logic that creates what Dotson (2012, p. 24) calls "epistemic oppression" i.e. a weakened position for higher education to define what is knowledgeable. To do this we should acknowledge not only the power of the media, but also include relevant concepts that allows us to explain what, how, when and where injustices emerge in higher education when we use digital technology.

4. Mediatization & epistemic injustice

Our starting point is that the ideological appropriation of the information/digital revolutions (Schiller, 1999; Mosco, 2004; Hindman, 2009; Miller & Vaccari, 2020; Stocchetti, 2020) understood as a historical mediatization process (Hjarvard, 2013; Hepp, 2020), and also the profound changes this appropriation has supported in higher education (Selwyn, 1999; Ferneding, 2003; Biesta, 2010; Selwyn, 2011; Giroux, 2014; Selwyn, 2014; Jandrić et al., 2018; Tække & Paulsen, 2022) have eroded the communicative conditions of democratic politics and exacerbated the crisis of the epistemic grounds of democracy.

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In higher education, digital technology has had an impact on teaching in the shape of assignments, assessments and examinations, but also on processes relating to everyday organization and communication of higher education. Besides the technological takeover (e.g. Selwyn, 2011; Ferneding, 2033), there is a communicative takeover defined by the media, framed as logical seeming sets of affordances, preferences, and algorithmic structures. What has evolved since the introduction of modern mass media, is a gradual shift of power, meaning that the media is affecting the way other institutions adopt their practices to the structures of the media. All organizations have become media organizations when struggling to get attention, meaning that daily duties of institutions circulate around a culture of constant, digital communication.

As an institutional logic and force, mediatization has demonstrated its relevance, for example, in politics, which has adapted to the power and intricate rules of the media (Asp, 1986; Strömbäck, 2008). Similar effects can be seen in the way family institutions not only communicate on a daily basis by using mobile applications, but also in that digital technologies actually shape what kind of families we become when using media (Räisä, 2022). University institutions repeatedly express a need to control their appearance and brand in the public, mediated debate (Ainiala, Räisä & Sjöblom, 2020). When talking about digitalization of higher education, we notice a similar entangling of two processes, that of mediatization processes and that of knowledge production. In short, when education gets embedded in digital technology it adapts the structures and preferences of the media.

Mediatization is a process that started before digitalization, but digitalization has indeed accelerated the normalization of the logics of the media. Whereas digitalization constitutes a technological framework, mediatization, as a mid-range theory (Hjarvard, 2013), has focused on the historical consequences of the changes that technologies inevitably shape. Media logics, in short, are signified by simplification, polarization, emotionalization, i.e. certain practices typical for the short format of mainstream media and which affects the way other institutions organize and perceive themselves (Couldry & Hepp, 2017; Hepp, 2020; Hjarvard, 2013). Despite the methodological challenges that mediatization research has encountered, we need tools to describe and discuss the changes in reference to the media, in this case particularly what are the effects of the media on learning. Mediatization is a process not controlled by any singular actor. From an epistemic point of view, mediatization is a social power that "operates purely structurally" (Fricker, 2007, p. 13), thru a normalization of practices. We may indulge in an uncritical relationship, resign or even wish to totally withdraw from using digital technology (in higher education this is in fact impossible). Despite our attitude or conviction, we are obliged to define our relationship with the media also in a higher education environment, which makes digital technology a motor of sociocultural change, i.e. as a result from a process of mediatization.

To enfold the meaning of digitalization of higher education, we could think about the above-mentioned epistemic vulnerability, marginalized knowers and also the culture of speed. Epistemic injustice in a digitalized, higher education context takes its fuel from the rapid tempo typical for the media, seen in a managerial desire for quantifiable efficiency of higher education organizations. This development is likely to accelerate even more with the introduction of AI in higher education. AI in higher education is problematic since it is, among other things, hazardous for our perception of knowledge. Large language models offer one size fits all, which is the opposite of the open-ended, intellectual mind which is sensitive to particulars and specifics. Also, AI enfold thru an assumed capacity to 'inspire' or to offer 'creative ideas'. Lacking motivation, but also the capacity to surprise, as two qualities of creativity (Rafner et al. 2023; Runco, 2023, p. 3), AI does not offer products 'outside the box'. What it does, is 'hallucinating', deliver fabrications. In human language that would be 'lying', something one would not imagine should be included in a higher education institution. In short, with AI our capacity as knowers is severely challenged because it imposes a logic that will reduce our possibility to know in the first place (Alvarado, 2023).

In sum, mediatization of higher education means that digitalization, i.e. the technology we use within higher education on a daily basis, has shaped not only the way we teach and learn, but even the way we

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imagine ourselves as thinkers and knowers. Digitalization of higher education increases the number of problems related to epistemic injustice and the influence of a logic of knowledge production in which the "new normal" is rather insensitive to the needs of individuals and to the democratic process.

5. Epistemic injustice & digitalization

To apply the notion of epistemic injustice to higher education it is useful to understand the negative impact of the digitalization of higher education on fundamental competences such as functional literacy. By studying literacy as an epistemic competence, we can start to outline what can be done to remedy this state of affair through interventions involving both digitalization and education and towards a form of digital literacy inspired by the epistemic and ethical concerns of the approach of epistemic injustice.

In the implicit model underlying our approach, in other words, epistemic injustice, digitalization and education are connected to each other to create both a vicious and virtuous circle: 1) epistemic injustices are reproduced through corporate digitalization and its impact on education; 2) educational intervention and attention to the old and new forms of epistemic injustice associated with digitalization and reproduced through the digitalization of education produce feedback effects to reduce epistemic injustice in education and digitalization.

In our age, the relevance of this approach is enhanced by the rapid development of digital technologies and AI and the formidable challenges associated with it in higher education.

The main reasons why it is important to apply the notion of epistemic injustice and the approach it describes to the process of digitalization can be presumably summarised as follows:

1) digitalization and the platform economy are influential in establishing forms of epistemic beliefs shaped by the authority of the media that impact the social creation, authorization and circulation of knowledge

2) because, according to some, digitalization or more precisely digital social media, are responsible for the 'post-truth condition' (Kalpokas, 2019)

3) because one influential dimension of digitalization discussed in the article, mediatization, enforces the logic of media on a wide variety of social communication, including politics (Strömbäck & Esser, 2014), but also other sociocultural practices and domains, therefore establishing new forms of 'testimonial' and 'hermeneutic' injustice dependent on this logic

4) last but not least, because digitalization is not an ideologically neutral process, but one that from its onset was inspired and supported by the interest of corporate capitalism (Stocchetti, 2020). This influence is neglected in the debate about the ideological dimension of epistemic injustice and, as for example Spiegel have argued, the 'epistemic injustice' of mainstream epistemic injustice studies consists in neglecting "hermeneutic injustice with regards to class and classism." (Spiegel, 2022, p. 75).

6. Contributions to the Special issue

The essays collected in this special issue contribute to the development of the notion and the approach of epistemic injustice in at least two ways. First, they apply this approach to particulars relating to digitalization and education. Second, and in order to address these particulars, they enrich the conceptual tools of this approach. In so doing, they contribute to bring attention to neglected dimensions of epistemic injustice associated with the digitalization of education and, at the same time, to offer more accurate conceptual tools for critical engagement.

In the first article by Youngman and Patin, the focus is on Library and Information Sciences (LIS). The authors discuss epistemic injustice in this key process for the politics of knowledge through the concept of 'epistemicide' and 'sankofa'. Epistemicide is a notion borrowed from research in philosophy and sociology of knowledge that the authors use to describe "the devaluing, silencing, or annihilation of knowledge encompassing systematic knowledge destruction enacted through cumulative epistemic

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injustices". Sankofa is a word that in the language of the Akan of West Africa means 'to go back and get it'. The important insight emerging from their analysis is about the role of digitalization in LIS to perform reparatory functions for the effects of epistemicide committed through systemic epistemic injustice.

In the second article, Sikka and Proctor discuss instances of epistemic injustice suffered by international post-doctoral students at UK universities as a result of measures deployed in response to the Covid-19 pandemic. In their empirical study, the authors argue for the role of digital technology and online research in support of these student's resilience against the direct and indirect negative effects Covid-19 restrictions on their lives and research work.

In the third article, Oliveira applies the approach of epistemic injustice to the 'global knowledge ecosystem' and argues for the usefulness of the notions of epistemic sovereignty and digital epistemic sovereignty to identify and address the imbalances, asymmetries and the violence associated with it. This analysis in important and timely not only for Latin America but also for the EU since the notion of digital sovereignty is the focus of an ongoing debate here, and it gives an original contribution in arguing the fundamental but neglected relevance of the epistemic dimension of this debate and the risks of 'epistemic colonization' associated with uncritical digitalization.

In the fourth article, Ståhl presents the results of a pilot, empirical study on the strategies students deploy to justify their knowing in relation to information on the internet. The insights that contribute to the development of the approach of epistemic injustice are at least three. First, Ståhl makes a forceful argument for the difficulties associated with the application of Fricker's original concept of epistemic and testimonial injustice to the forms of knowing dependent on internet generated content where the Author is unknown or uneasily discernible. Second, the article shows the role played by epistemic beliefs and the justification strategies respondents felt to deploy to greater or lesser extent, depending on their knowledge of the source and their evaluation of its reliability. Finally, it shows the relevance of further empirical explorations on "testimonial injustice and the epistemic dimension of justification" for the possibility of designing effective interventions to address the negative effects of epistemic injustice in the digital age.

In the last article Mukhongo, engages more directly with the role that digital can play in forms of educational interventions inspired by the goal of increasing learning outcomes in culturally diverse classrooms.

We would like to conclude mentioning at least two important developments that we believe should have a place in the research agenda of this approach. The first is the AI 'revolution' which exacerbates the challenges of digitalization and brings about new and potentially formidable ones. To the extent that AI and related technologies are in essence 'epistemic technologies' (Alvarado, 2023) and still largely unknown, it can only be expected that the spread of this technologies will have an impact of on epistemic (in)justice that the institution of higher education will have to address. The second development is the influence of Neoliberalism, which is becoming, at the same time, more pervasive and more contested. These developments converge in at least two relevant debates that we believe are relevant for the study of epistemic (in)justice in higher education. The first is the influence of ideology in the deliberation about the ethics of AI (Munn, 2023; Bender, 2024, p. 114). The second is the new field of 'epistemology of democracy' (Samaržija & Cassam, 2023) in which concerns for the influence of Neoliberalism on the epistemic crisis of democracy inspire the effort to gain a deeper understanding of and strengthen the 'epistemic infrastructure' of democracy (Herzog, 2024, p. 209). Finally, the concerns from both these debates resonate in the study of the use of AI in education (AIED) (Popinici, 2023) and in the efforts to equip formal education with the conceptual means to play a positive role on both epistemic and ethical grounds (Schiff, 2022). What this means is presumably that if the combination of AI and Neoliberalism brings about formidable epistemic and ethical challenges, the mobilization of a diverse and multidisciplinary public of scholars and practitioners in support of democratic answers should give us all reasons for hope and commitment in times of uncertainty.

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Spreading Sankofa

Addressing digital epistemicide through LIS education

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Abstract

Epistemicide is the devaluing, silencing, or annihilation of knowledge and encompasses systematic knowledge destruction enacted through accumulation of epistemic injustices. Considering prior epistemicide research in LIS—in conjunction with critical, historical, and philosophical perspectives of technology––this paper examines how epistemicide occurs by and through digital technologies, constituting what we call digital epistemicide. The social, cultural, and historical epistemic injustices enabled through technology—and the proliferation of epistemic injustices in digital worlds—demands a theorization of how epistemicide occurs in digital contexts. By considering elements of power, domination, and control in relation to digital technologies, we contribute to a critically informed meta-language for describing digital epistemicide. With concern and care for the next generation of library and information professionals, we call for an enactment of Sankofa Interventions. These include everyday dialogues, practices, policies, actions, or critical reflections that engage with historical narratives from the past, absent from discourses of the present, in a manner that emulates the notion of Sankofa. The enactment of Sankofa interventions to mitigate digital epistemicide, such as reparative storytelling and other critical digital pedagogical practices, requires both ongoing attention to digitizing records that have been left behind and likewise ensuring that digital worlds are well maintained to support the preservation and sharing of knowledge.

Keywords: Digital Epistemicide; Sankofa Intervention; Epistemicide; Epistemic Injustice; Neutrality.

1. Introduction

> *Se wo were fi na wosankofa a yenkyi*
> Translated: "It is not wrong to go back for that which you have forgotten" (DeMello, 2014, p.3).

This proverb reflects the idea of Sankofa, a word derived from The Akan of West Africa, meaning "to go back and get it" (The Spirituals Project, 2010). Indeed, Sankofa reminds us that "the search for knowledge is a life-long process" and is an ongoing effort often rooted in "knowledge of the past upon which wisdom is based" and that future generations benefit from (The Spirituals Project, 2010). In a library and

information science (LIS) context, Sankofa serves as a charge to professionals and institutions alike with the responsibility "to go back and collect the narratives and materials that have been omitted and devalued in our collections and communities" (Patin and Youngman, 2022, p.1). Hence, we interpret Sankofa as a call to action for 'going back and getting' the missing narratives left behind because of the devaluation, silencing, or annihilation of knowledge.

Emerging from research in philosophy and sociology of knowledge (Santos, 2015; Fricker, 2007), we define epistemicide as the devaluing, silencing, or annihilation of knowledge encompassing systematic knowledge destruction enacted through cumulative epistemic injustices (Patin et al., 2021a), which has become an emergent and timely research area in library and information science (see, e.g.: Budd, 2022; Burgess and Fowler, 2022; Jimenez et al., 2022; McDowell and Cooke, 2022; Mehra, 2022; Oliphant, 2021; Youngman et al., 2022; Yeon et al., 2023). Previous adjacent scholarship on critical data studies and digital technologies (Noble, 2018, Benjamin, 2019; D'Ignazio and Klein, 2020) provides a clear indication that digital technologies can be used to inflict epistemicide and epistemic injustice, being the "wrong done to someone specifically in their capacity as a knower" (Fricker, 2007, p.1). However, little to no scholars in LIS extend these conversations into the realms of digitization and the ethics of digital technologies. Research into how digital technologies enable the proliferation of epistemic injustice in digital worlds remains largely unaddressed and undertheorized.

Therefore, we ask: how does epistemicide occur in digital worlds? In response, we argue that the cumulative impact of epistemic injustices enacted and perpetuated through digital technologies constitutes *digital epistemicide*. We argue that digital manifestations of epistemic injustice mirror physical or real-world injustices reflected in the creation and maintenance of digital worlds. We understand *digital worlds* as the intersection of interactions occurring between digital public spaces (Jacobs and Cooper, 2018), the digital cultural record (Risam, 2018), and information worlds (Jaeger and Burnett, 2010) mediated through digital technologies.

At the intersection of epistemic injustice, digitization, and LIS education, theorizing digital epistemicide illuminates new strategies for interrupting epistemic injustice, such as reparative storytelling (Smith and Patin, 2023) and civil rights literacy (Patin and Youngman, 2022), through which the digitization and digital exhibition of historical narratives can further epistemic justice. In working to correct histories of exclusion, we approach this work as feminist social scientists and critical information theorists at the intersection of library science, education, cultural heritage, and informatics working toward digitally presenting knowledge in educational environments from a critical pedagogical lens (Kincheloe, 2008), and critically addressing the epistemicide in our curriculum (Paraskeva, 2016).

This work supports library and information professionals in recognizing epistemic injustice to avoid committing harm through digital technologies. This is imperative given that LIS professionals are "more capable of committing these injustices on a grander scale because our purview includes handling information from all fields of knowledge" (Patin and Youngman, 2022, p.7). To address this imperative, our literature review examines epistemicide and epistemic injustice as concepts of interest for library and information science. Next, our articulation of digital epistemicide theorizes that physical real-world harms translate into the digital worlds with which we interact. Finally, we maintain that Sankofic Interventions––modes of retrieving narratives left behind in the past—serve as gateways for reconciling the harms of forgetting and promoting knowledge justice alongside communities most directly affected.

2. Literature review

2.1 Foundations of epistemicide

In *Epistemologies of the South*, Boaventura de Sousa Santos conceptualizes epistemicide as "the murder of knowledge" (2015, p.92). Santos contributes to the literature of postcolonial and decolonial studies, a body of scholarship investigating the role of cultural domination in knowledge production, in both the

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suppression of native ways of knowing and upholding preferential knowledge systems. Such work critically interrogates the relationship amongst peoples, cultures, and nations impacted by colonialism, being "a relation of structural domination and a discursive or political suppression of the heterogeneity of the subject(s) in question" (Mohanty, 1988, p.65). As Fanon (1967/2015) would remind us in his seminal discussion on national culture, the destruction of knowledge under colonial domination "is sought in systematic fashion" (p.46). Santos would concur: "Unequal exchanges among cultures have always implied the death of the knowledge of the subordinated culture, hence the death of the social groups that possessed it [...] epistemicide was one of the conditions of genocide" (2015, p.92).

Santos further positions the infliction of epistemicide as a condition of maintaining "hegemonic Eurocentric modernity" (2015, p.92), an assertion Shohat and Stam further reinforce: "[European colonialism] attempted submission of the world to a single "universal" regime of truth and power. Colonialism is ethnocentrism armed, institutionalized, and gone global" (1994, p.16). Under European colonialism, epistemicide functions to shatter identity development: "Colonialist institutions attempted to denude peoples of the richly textured cultural attributes that shaped communal identity and belonging, leaving a legacy of both trauma and resistance." (Shohat and Stam, 1994, p.17). In centering Eurocentrism in the deployment of identity narratives and the development of scientific knowledge, Santos argues that epistemicide extends beyond individuals, impacting entire societies who rely on localized ways of knowing to function: "The destruction of knowledge is not an epistemological artifact without consequences. It involves the destruction of the social practices and the disqualification of the social agents that operate according to such knowledges" (Santos, 2015, p.153).

While the declaration of epistemicide as a complete eradication of knowledge is logical, Santos does not account for individual instances of destruction, and thus omits the nuanced processes of said destruction. Despite the framing of systematic knowledge destruction as a 'murder', Santos is unclear regarding the tools and mechanisms that enable the erasure of knowledge. This gap that coincides with Aleida Assmann's analysis of the -cide suffix in framing cultural erasure writ large: "[...] the suffix '-cide' implies more than pure material destruction; it also evokes a notion of killing, implying human agency and responsibility on one side and human suffering on the other" (2015, p.85). In employing a feminist analytic to situate Assmann's (2015) observation of human agency, responsibility, and suffering, we interpret individual acts of domination that contribute to systematic knowledge destruction in the maintenance of desirable knowledge systems and relationships between knowers as forms of epistemic violence (Spivak, 2023).

This violence, stemming from colonialism, includes "the 'disappearing' of knowledge, where local or provincial knowledge is dismissed due to privileging alternative, often Western, epistemic practices" (Dotson, 2011, p.236). Between knowers, epistemic violence manifests as epistemic injustice (Fricker, 2007), clarifying what Santos adjacently suggests is a mechanism for enabling "the disqualification of social agents" (2015, p.153). Therefore, we frame epistemicide not solely as the result of an overarching, top-down effort to suppress undesirable knowledge. Rather, we characterize epistemicide as the result of domination emerging individual acts of epistemic injustice contributing to a larger system of oppression, a framing that has been adopted and implemented in LIS scholarship.

2.2 Framing epistemic injustice and epistemicide in LIS

The notion of epistemic injustice emerges from debates surrounding the philosophy and sociology of knowledge and is concerned with how knowers develop their own epistemology. Fricker (2007) initially conceptualizes two types of injustice: testimonial, being when knowers "give a deflated level of credibility" to other knowers (p.1), and hermeneutical, being "when a gap in collective interpretative resources puts someone at an unfair disadvantage when it comes to making sense of their social experiences" (Fricker, 2007, p.1). Expansions and critiques of epistemic injustice have since emerged to account for gaps in Fricker's conceptualization related to epistemic oppression (Dotson, 2012), implicit

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bias (Davidson, 2019), and gaslighting (McKinnon, 2019; Pohlhaus, 2020), among others. Additional critiques of hermeneutical injustice also address the limitations of Fricker's original framing of knowers unable to make sense of their own experiences, alternatively arguing that knowers unable to understand the experiences of others also constitutes hermeneutical injustice (Hookway, 2010; Dotson, 2012; Pohlhaus, 2012; Patin et al., 2021a).

In the LIS domain, Patin et al. (2021a; 2021b) further conceptualize two additional injustices: participatory, being when knowers are excluded from participating in epistemological development by being kept 'out of the know', and curricular, being when educational resources are not available to help support knowers in developing their epistemology. Youngman et al. (2022) conceptualize commemorative injustices, defined as epistemic injustice occurring through our "participation in acts of commemoration, processes of memorialization, and interactions with tangible and intangible cultural heritage." (p.362). These manifest as: 1) documentary injustice, being when we harm through falsified, partial, or misleading records; 2) memorial injustice, being when we fail to memorialize or establish artifacts of memory; and 3) performative injustice, being when we substitute social action for communicative action (p.362-364). If left unchecked, these perpetuations of epistemic injustice can lead to a complete epistemicide (Patin et al., 2020; 2021a) and enable different levels of harm. The primary harm occurs when an individual experiences epistemic injustice, leading to a "literal loss of knowledge" (Fricker, 2007, p.104). The secondary harm (Fricker, 2007) occurs when that loss is felt by groups, followed by the third harm (Patin et al., 2021a), in which an injustice subsequently impacts future generations.

Beyond levels of harm, there are also specific 'tools' that perpetuate and intensify injustice experienced by knowers. These include: 1) beneficent gatekeeping, defined as "the intention to help [coming] from a sense of knowing better or best, yet results in gatekeeping of materials, and the eventual canonization of certain types of knowledge" (Patin et al., 2021a, p.8), and 2) parasitic omission, defined as the "practice of forgetting inconvenient truths and only remembering, archiving, or collecting materials in service of uplifting saviour narratives or as a means of guilt appeasement" (Patin and Youngman, 2022, p.2). Patin and Youngman (2022) further posit that beneficent gatekeeping and parasitic omission, when used to inflict epistemic injustice, enable a cycle of interrupted knowledge development (p.4), whereby these tools amplify each other and further restrict knowers who acquire and share skewed knowledge, thus gradually chipping away at their capacity to know. The recurring and cumulative presence of epistemic injustices leads to epistemicide if unmitigated. Beneficent gatekeeping and parasitic omission function as modes of 'speaking for' rather than 'speaking with' communities (Alcoff, 1991), serving to diminish the value of lived experiences and restrict how knowledge moves from communities and whether such knowledge is representative of the histories and narratives of communities themselves.

2.3 Post-neutrality and epistemicide in LIS education

The *Oxford Advanced Learner's Dictionary* defines neutrality as "the state of not supporting either side in a disagreement, competition or war" (2022). Meanwhile, Feminist research has long offered critiques of neutrality in its various forms, including in language used to describe social practices, as "holding knowledge and knowing are not neutral human experiences, and creates complicated dynamics in how we teach, learn, communicate, behave, and adapt to our surroundings" (Sebastian et al., 2022, p.78). Although none of the foundational documents of librarianship espouse neutrality as an ethical value, LIS professionals have long upheld neutrality as a desired ideal, with historical practices, attitudes, and pedagogies embracing this belief.

If we embrace neutrality as a foundational value, we are limited in our responses to build equity in our communities. Therefore, addressing, and problematizing neutrality in LIS enables us to rectify the epistemically unjust status quo in libraries and information institutions. If we critically examine our practices, we can find ways to mitigate previously inflicted epistemic injustices. However, if we continue

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upholding the status quo, a lack of action replicates the epistemic injustices already happening in our information spaces to our digital worlds.

Since libraries are to serve everyone in their communities, they cannot rely on neutral stances. If not addressed, these neutral stances within librarianship can lead to parasitic omission or beneficent gatekeeping (Patin and Youngman, 2022). Rather, they must be aware of the inequities in their communities and be ready to provide radical solutions and information services to work towards equity. Recent pushback has emerged against both the way we define neutrality in our field (Scott and Saunders, 2021) and whether this ideal should even be upheld at all (Drabinski, 2019). Scott and Saunders (2021) articulate this issue because within the LIS literature the term neutrality, "seems to be used for, or conflated with, everything from not taking a side on a controversial issue to the objective provision of information and a position of defending intellectual freedom and freedom of speech" (p.153). Their research found that amongst librarians, there is no agreed upon conception or operationalization of neutrality.

Within the field of LIS, we present libraries "as gateways to knowledge, providing access to information and services to all Americans" and this is critical because libraries "are ubiquitous in most local communities in the USA" (Gibson et. al, 2017, p.752). However, this "construct of the library as a neutral entity limits the work that is necessary to truly provide responsive, equitable, and inclusive access to information, […] and other library services for communities dealing with crises or social unrest" (Gibson, et. al., 2017, p.752). Although collectively we are moving into an era of post-neutrality within LIS (Lankes, 2020), the concept of neutrality remains embedded in information spaces and systems. These embedded values influence which members of our community can access information and how they are able to interact with our services and systems. Therefore, without clear examination of the impact of neutrality on our praxis and policies:

> "Seemingly 'neutral' libraries are often those that ignore the specific concerns of marginalized groups and address those of racial, social, and political majorities. The very question of access is a political one; the placement of library branches and allocation of resources, programming choices, and content of library collections all represent social and political interests frames neutrality as a practice in structural oppression of marginalized groups, as it is characterized by disengagement from (as opposed to active engagement with) crises within communities of colour" (Gibson et al., 2017, p.754).

As previously discussed, because LIS professionals are responsible for managing knowledge across disciplines, we are at greater risk to commit epistemic injustice. Further, if we maintain a professional virtue of neutrality, we uphold an oppressive system that enables the infliction of harm (for a more robust discussion on this issue, see: Sebastian et al., 2022). In the face of increasing challenges to intellectual freedom, neutrality in LIS is especially problematic and further enables the erasure of cultural narratives and identities. In the case of ongoing book banning, if LIS professionals stay neutral and avoid responsibility as political agents for equity, then materials of marginalized communities will continue to be forcefully excluded from our shelves (also see Knox, 2014; 2019). Therefore, employing a critical lens allows us to locate, name, and correct the mistakes made by LIS in the past that without intervention will continue to happen. Prioritizing a framing of neutrality in the LIS profession inhibits social progress and deprives us of the opportunity to address harms through revised practices, education, and leadership.

3. Articulating digital epistemicide

3.1 From physical to digital epistemicide: Historical perspectives

If epistemicide is systematic in nature, then it makes sense that such a system would be composed of concurrent and compounding mechanisms that chip away at our capacity for epistemic growth, being epistemic injustice. These mechanisms can manifest as policies, professional practices, social customs, cultural norms, and political actions informing the creation, application, and preservation of information.

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These may likewise inhibit or promote creation, application, and preservation of knowledge. Such mechanisms designed and used by humans—informed by social, political, cultural, and environmental stimuli—might be best described as being technologies, or simply "the way people do things" (White, 1940, p.141).

However, despite materialist framings of technologies, they may not necessarily possess tangibility. Employing the notion of epistemic objects—being the "entities that we identify as constituent parts of reality" (Chang, 2011, p.413), we can frame human-enacted sensorial experiences and epistemic phenomena as being technologies, further enacted by the "body itself as interface" (Bell, 2020, p.33). Consider speaking a language or interpreting visual cues: such activities encompass information exchanges made possible by the function of our mind and body as mechanisms for documentation, performance, and interpretation within social and cultural systems. Returning to White's (1940) framing of technology, these activities are 'the ways in which we do things', relying more on a framing of technology that centres the impact and result of knowledge production rather than the material nature of artifacts in question. Here, technologies provide for an enhancement of a lived reality, enabling a process of efficiently doing things that provide a social, cultural, or survival advantage. It is through these transitive distinctions that we may describe epistemicide as being a technology of erasure, composed of mechanisms of distinct types of erasure, being epistemic injustices.

While the use and possession of technologies provides innumerable benefits to societies, attention to the historical harms enacted, enabled, and proliferated by and through such technologies is of tantamount importance. Even in the earliest history of libraries and archives, Lerner (2011) reminds us that the processes of recording information have always been subject to the pressure of external powers. Indeed, writing itself was—and still is—an exclusive technology used with specific persons, purposes, and knowledge systems in mind. Lerner asserts this distinction by sharing how the "oldest writings to survive to our time were inscribed 5,000 years ago by temple bureaucrats recording economic transactions" (p.1), and that "the temple administrators needed to record the details of the landholdings and harvests" (p.2). Here, the exclusivity of writing, and the use of writing as technology, enabled scribes to establish a record of events that subsequently enabled the maintenance of power: "[…] temples needed a more permanent way to keep track of what they owed and what they owned" (p.2).

A notable observation from this example is that the highest social classes with the most religious and economic power were in control of what knowledge was preserved. Similarly, in looking to the evolution of Sumerian written characters—from 'signs' to 'pictographs' to 'ideograms' —Lerner notes that "conservative scribes used both types of character, a complicated arrangement that made scribal training difficult and perpetuated the power of the priesthood" (p.1). This specialized knowledge and training of the priesthood gave them a strengthened influence and justification over what to record. This example demonstrates how a technology as simple as writing was used to reinforce social, religious, and economic classism through the possession of a skill that determined the preservation of dominant knowledge.

In addition to the creation of records, the destruction of records also functions as a way of gaining power over the existence of knowledge. Building on Friedrich (2018), Youngman et al. (2022) reminds us: "the seizure and destruction of archives is a practice almost as old as record keeping itself", as is "the withholding or destruction an act of silencing the record with the purpose of inflicting damage on the enemy" (p.360). In the context of regime-sponsored efforts to distort and silence the historical record, Rebecca Knuth (2003) names this kind of record destruction as 'libricide', or 'the murder of books.' Knuth (2006) later builds on this interpretation by more explicitly foregrounding the role of ideology in prompting material destruction, leading to an articulation of 'biblioclasm', possessing a "linguistic relation to iconoclasm" used to "denote purposeful action that is rooted in moral repugnance or judgment" (p.18). Whether enacted through book burnings or extreme forms of censorship, both libricide and biblioclasm constitute epistemicide with material consequences for knowledge acquisition and dissemination.

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While much has certainly changed since the time of our ancestors, the creation, possession, and use of technologies—especially digital technologies—has reinforced and replicated many of the same issues encountered in the past. Indeed, the move from physical to digital technologies has impacted numerous industries that have emerged in our increasingly interconnected information society, and in turn, have influenced the production, preservation, and dissemination of knowledge. The impact of this change is observable in LIS, ranging from the transition between card catalogues and digital databases, to the preservation of microfilm to the creation of digital objects and images.

As knowledge moves from these physical to digital formats, salient ethical concerns emerge regarding influence of digital technologies in enabling, maintaining, or privileging the production of dominant knowledge systems. What happens when knowledge becomes lost in translation during the transition of digital information systems? How might the digitization decisions made by librarians and information professionals today impact knowledge seekers today compared to say 50 years from now? How do the policies, practices, and precedents of information institutions, in their quest to preserve and share knowledge deemed worthy of being digitized, reflect an enactment of power that enables the destruction or silencing of counter historical-narratives or alternative ways of knowing? These questions foreground how digital technologies hold the potential to infringe upon people's epistemic power, which we understand as digital epistemicide.

3.2 Critical theoretical grounding: Defining digital epistemicide

We defined epistemicide as the devaluing, silencing, or annihilation of knowledge encompassing systematic knowledge destruction enacted through cumulative epistemic injustices. However, how epistemicide occurs in digital contexts requires further theorization, given that the flow of knowledge is impacted by the different constraints, affordances, and adaptability of digital technologies. Therefore, digital epistemicide encompasses the systematic interruption, silencing, suppression of knowledge within digital worlds. A theorization of digital epistemicide also goes beyond introducing a form of epistemic injustice. Rather, we frame the consequences of digital epistemicide as symptoms of larger structural inequities and histories of oppression, rather than as a reductive diagnosis that names epistemic injustices in digital worlds as isolated and unrelated incidents.

Utilizing Cummings et al. (2023) approach to pursuing action-oriented approaches to epistemic justice in real-world situations, we present the harms inflicted by digital technologies as divergent manifestations of epistemic injustice. Doing so enables us to move past philosophical considerations of epistemic injustice, opting instead for an analysis of digital technologies that situates epistemic injustice at 'systemic, structural, and individual levels' (Cummings et al., 2023, p.8). There is, of course, not one theory of digital technologies that enables us to understand digital epistemicide. This paper builds upon select perspectives from the intersections of social constructionism, technological history and philosophy, and critical feminist theories of technologies.

The construction of digital technologies and associated artifacts are informed by the nonhomogeneous social groups, within divergent social worlds, which create them (Pinch and Bijker, 1987; Russell and Williams, 2002; Star and Griesemer, 1989). Furthermore, digital technologies are intricately tied to the social environments that enable their creation, alongside the social changes that further cement or reconfigure their presence in the world (Hughes, 1994). As Orlikowski and Iacono (2001) similarly explore, digital technologies can manifest as anything from tools to entire systems that accomplish laborious tasks—ranging from simple processors to algorithms. However, in the context of epistemicide, these aforenoted circumstances raise several concerns: What types of bodies or social groups are empowered or excluded through technologies? What types of knowledge are maintained through technologies? In considering digital epistemicide: how do these problems translate into digital worlds?

We may begin to address these questions utilizing Haraway's (1991) conceptualization of the 'informatics of domination' (Haraway, 1991), an ever evolving "polymorphous, information system"

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(p.161) and technologically mediated form of "white capitalist patriarchy" (p.162). Haraway's manifesto critiques the impact and integration of digital technologies across numerous social contexts: "The home, workplace, market, public arena, the body itself–all can be dispersed and interfaced in nearly infinite, polymorphous ways, with large consequences for women and others […]" (p.164). For us 'cyborgs' [as organisms deeply bound to technologies], Haraway's concerns remind us that our interactions with digital technologies are bound to social, cultural, and historical modes of oppression. Violence is recreated and stabilized through our use, reproduction, and dissemination of such technologies: "informatic systems are not just technological "black boxes," but entire techno political-economic systems designed to be invisible by their corporate and/or authoritarian owners" (Bell, 2020, p.24). Joerges (1990) echoes this assertion: "machines will think when people come to *believe* they think" (p.225). Machines and more aptly digital technologies—and the systems they operate within—are designed to think like the people who created them, informed by the same social constraints.

In answering Bell's (2020) call for feminist vigilance and subjecting systems to scrutiny and combatting harms informed by them (p.24), theorizing digital epistemicide serves as a refusal to see digital instances of harm as individual occurrences, but rather, as a reflection of larger systemic issues. Recalling how digital technologies contribute to well-documented forms of racial, sexual, and gendered oppression, we are reminded of how the functionality and affordances of those digital technologies are, in turn, "products of mutual alliances and dependencies among groups involved" in the creation, use, and reconfiguration of technology (Wajcman, 2000, p.457). When those in positions of power are dictating those alliances, the resulting digital technologies reflect not mutuality, but disunity, and sometimes malice. Therefore, a theorization of digital epistemicide, and likewise how epistemic injustice occurs in digital worlds, is paramount in the pursuit of information equity and justice driven technological change.

4. Toward Sankofa intervention

4.1 Locating instances of epistemic injustice in digital worlds

Testimonial Injustice, as a mechanism of dismissal, might manifest in the physical world as a discreditation of someone's lived experience. In the moment, this harm appears as beneficently taking over someone. This may range from talking down to someone's experiences, or gaslighting them into not believing their own experiences occurred. In digital worlds, however, we might commonly observe actions of discrediting and taking over as cyberbullying and other combative situations whereby agents within digital worlds are pitted against each other. Hermeneutical injustice, as a mechanism of obscurity, manifests in the physical world as a kind of illiteracy rooted in the inability to describe the experiences of us or others that leads to epistemic harm. So too, in digital worlds, can we imagine digital illiteracy—or even technological naivety—as an already inflicted hermeneutical injustice, whereby we cannot engage with actors or agents within digital worlds. This could result in an inability to navigate platforms, engage with casual and easy-to-use tools, or a need for assistance to operate digital technologies altogether—not because of inability or disability, but because of an unknowingness of one's own abilities. Here, digital worlds themselves become obscure to the digital agent in question.

Participatory injustice, as a mechanism of exclusion, manifests in the physical world as an exclusion from groups, in tandem with the experience of being kept 'out of the know.' In looking at our initial definition of digital epistemicide, participatory injustice manifests in digital worlds at multiple levels, being: 1) exclusion from digital worlds altogether, or 2) exclusion experienced within digital worlds. The first instance may be best illustrated by the digital divide, whereby certain groups are unable to access digital worlds because of access to technologies, which in turn, can be traced back to groups privileged enough to possess the technologies to pass through the gates of digital worlds. The second instance may be best situated when we attempt to further dive into the deeper world. Perhaps we can access our desktop on personal computers, but not the internet. Likewise, we may be able to access a digital tool online, but

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only certain functionalities are afforded to the lay user. Participatory injustice in digital worlds is a means by which exclusivity is maintained, and as such, artificial hierarchies of access and control are enabled.

Curricular injustice, as a mechanism of restriction, manifests in the physical world as the everyday curated knowledge we come to engage with that present a partial narrative. From the state sanctioned educational textbook to the availability of resources deemed appropriate for display in a library, curricular injustice results in resources that promote a skewed epistemology. Curricular injustice impacts how we learn, share, and teach knowledge through resources, including in digital worlds, where algorithmic curation, predicted user behaviours and classifications, search optimized advertisements, and even paywalls, present preferential resources that privilege narratives and agents within digital worlds. Curricular injustice is an exercise of imposing epistemic uniformity by determining who can access certain resources, the availability of said resources, and whether certain digital worlds—in which the resource exists—deems certain users more worthy of knowing.

Commemorative injustices, altogether mechanisms of misinforming, manifest differently depending on context. Documentary Injustice, as a mechanism of misleading, occurs when sources themselves are misleading, which in digital worlds, may result in a plethora of digitally unique documents—deep fakes, fake news, bots, etc.—that contribute to misinformation. Memorial Injustice, as a mechanism of misremembering, occurs when knowledges of the past are absent or misremembered, which in digital worlds, could manifest as the destruction of digital archives, the absence of digital narratives, or when narratives are silenced by means of search suppression. Performative Injustice, as a mechanism of virtue signalling, occurs by and through the politics of acknowledgement, and can manifest in digital worlds as social messages that on occasion–despite their initial positive appearance—may not necessarily be rooted in actions of promoting intentional change.

In building on the theorization of concurrent epistemic injustices, examining how two or more harms occur simultaneously and amplify each other (Youngman et al. 2022; Yeon et al., 2023), it is worth recognizing certain types of harm are not exclusive to specific types of epistemic injustices. An action may result in an epistemic injustice in the physical world, yet through its translation into digital worlds––or in the case of physical materials, digitization—an action may result in a different epistemic injustice. Given the flexible boundaries of digital worlds, epistemic injustices possess the capacity to change in the type of harm inflicted and the scale of impact, both of which lead to interrupted knowledge development (Patin and Youngman, 2022).

4.2 Conceptualizing and situating Sankofa interventions

We began this article by introducing the concept of *Sankofa*, reflecting on the idea that retrieving histories, knowledge, and narratives left-behind in the past is necessary in the pursuit of knowledge justice. Likewise, our previous work interprets Sankofa as a call to action for LIS to reexamine its history of harms and practices that have influenced knowledge production, and likewise destruction (Patin and Youngman, 2022). With concern and care for the next generation of library and information professionals, we interpret Sankofa as an instruction to go back and collect the knowledge omitted from our community's history, curriculum, and cultural practices, and likewise devalued by our pedagogies and curricular resources. Specifically, we call for an enactment of *Sankofa Interventions*, being the dialogues, practices, policies, actions, or critical reflection that engage with historical narratives from the past, absent from discourses of the present, in a manner that emulates the notion of Sankofa. Indeed, rectifying and mitigating the effects of epistemic injustice in the physical world, and preventing their proliferation in digital worlds, demands a commitment to Sankofa Intervention.

In this article, we have encountered situations where selective digitization and preservation has enabled epistemicide. Therefore, Sankofa interventions, in the context of digitization, call for us to address the harms committed through a failure to digitize, to digitize and retrieve what we missed, and subsequently examine the educational practices/conditions that enabled LIS professionals to make these decisions.

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Sankofa Interventions extends far beyond simply retracing our steps to locate 'hidden histories,' without which we would be left with an elusive historical record. Rather, we must critically engage with how recovered materials, narratives, and experiences inform our commemorative practices, cultural competence, professional awareness, and instructional approaches. Indeed, Sutherland (2017) asserts this salient concern regarding documentary practices in her discussion of Archival Amnesty:

> "In the face of mounting ethical and human rights concerns about the obfuscation of anti-Black racism [...] collaborations among LIS practitioners, professional archivists, and community-based archivists have emerged to begin the work of collecting stories and documenting violence and injustice in vulnerable communities. These documentation efforts are also an attempt to create an historical record, eliminating the possibility of erasure and enabling the possibility of justice" (p.17).

In furthering Sutherlands' (2017) call for archival amnesty, Sankofa Interventions are an explicit strategy for pursuing epistemic justice, given their role in helping us to fill the knowledge gaps encountered by knowers, communities, institutions, and generations. Parallel to the notion of concurrent injustice, Sankofa Interventions enable library and information professionals to go back and collect the missing stories from previous generations, and we can begin repairing the gaps in collections. Many Sankofa interventions must happen to address the epistemicide perpetuated in our libraries, archives, museums, and other educational institutions to begin healing from the omission and silencing of knowledge.

In situating instances of harm in libraries, archives, and museums, we turn to Alabama Department of Archives and History, which recently acknowledged their failure to archive the history of Black communities in Alabama because of their preferential preservation of confederate narratives (Murray, 2020), not only did their physical collections suffer, but the ability of ADAH to digitize and digitally represent was inhibited. The memorial injustice they inflicted in the physical world that became epistemicide translated to digital epistemicide because knowledge could not transfer into digital worlds. Imagine for a moment that a student completing a book report is unable to access relevant digital records related to Black history in Alabama; knowledge cannot travel between that knower and those entities, and that harm in an educational context constitutes curricular injustice. Furthermore, imagining if that student's personal heritage is directly tied to Black history in Alabama; a hermeneutical injustice is also inflicted.

The resulting snowball effect leading to a combination of memorial-curricular-hermeneutical injustices, because of decisions made by the LAM institution, has chipped away at and interrupted the student's capacity for knowledge development. In another context, imagine that a document created, edited, and shared, but carries falsified information, thus inflicting a documentary injustice. Should that document be used to educate someone, a curricular injustice is inflicted. Should an individual take that falsified document they were taught about and position themselves as an expert knower—because of their engagement with the document—and go on to dismiss somebody else with rival knowledge, they are inflicting testimonial injustice. Should that document be digitized and used in a news article, the aforenoted harms are then replicated in digital worlds. However, if that digital document is used to falsely describe something in the past, and then becomes curated as a marker of memory, in say, a digital archive, then a memorial injustice is inflicted.

In addressing the harms inflicted in these previous examples, Sankofa Interventions might occur in a collections context, involving a reprioritization of collections processing order, increasing funds to focus exclusively on locating and engaging with materials to resolve knowledge gaps, or even the creation of supplemental educational materials that recognize the biases in collecting practice when describing or sharing the contents of collections and the historical narratives constructed from them, thus providing heightened transparency to knowers who engage with such materials. Likewise, Sankofa interventions might also occur with regard to library and information professionals themselves, involving assessments of cultural competence or biases that may inform collecting practices, a re-examination of policies and procedures determining collecting responsibilities that minimizes the risk of beneficent gatekeeping and parasitic omission, and collaborating with community members and relevant knowledge seekers who

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engage with such collections, so as to best fit their needs, reflect their experiences, and faithfully represent histories that institutions often fail to fully encapsulate.

5. Enacting Sankofa intervention

5.2 Pursuing epistemic justice through digitization in LIS

The enactment of Sankofa interventions to mitigate digital epistemicide requires both ongoing attention to digitizing records that have been left behind and likewise ensuring that digital worlds are well maintained to support the preservation and sharing of knowledge. Pursuing epistemic justice, regardless of location in physical or digital worlds, requires critical self-reflection and evaluation of the institutional practices, policies, and actors responsible for historically enabling and perpetuating harm. Consequently, LIS professionals—not just institutions—are well-positioned to enact change in our information centric society. By tapping into the connectedness of LIS to various communities and professional domains—and leveraging institutional powers to support Sankofa interventions—practitioners, educators, and academics alike can leverage their networks, institutional resources, and specialized knowledge for public good. LIS professionals have a moral obligation and ethical responsibility to support Sankofa Interventions, for doing nothing is not an option, as such a dismissal of responsibility builds upon the myth of neutrality—particularly in LIS. Neutrality, in and of itself, manifests as a form of epistemic injustice, whereas "neutrality harms institutions and community members because it forces a particular way of knowing and reinforces systems of knowledge that prioritize and safeguard institutions from being held accountable" (Sebastian et al., 2022, p.78).

Undoubtedly, the counter-narratives that emerge from interventions may inevitably reshape and correct incomplete narratives built into our own epistemologies, educational praxis, institutional histories, and professional training. Likewise, there is a tension that exists in calls for Sankofa Interventions, especially between those who hold and draw power from absent narratives, and those who aim to call into question its legitimacy and authority. It is here that retrospective and responsive digitization efforts surface as epistemological equalizers of sorts, serving to increase the accessibility of such knowledge retrieved by Sankofa interventions. In the context of digitization, the adoption of critically conscious approaches and policies for digitization priority, access, and support, must be adopted into how we teach information professionals—be it librarians, data scientists, educators, curators, or the like—how to make ethically informed decisions that further epistemic justice. Therefore, when making digitization decisions, we should consider:

- How might this digitization initiative empower communities represented or harm communities not represented?
- What is the justification for prioritization of digitizing certain collections and historical narratives?
- Does this digitization contribute to the demographic diversity or epistemological breadth of the collection or institution?
- Does this digitization contribute to inclusive collection development or enable new community education or programming opportunities?
- Does this digitization rectify parasitic omissions or beneficent gatekeeping enabled by your information institution?

5.2 Critical digital pedagogies for LIS education

It is imperative that those of us within LIS education, and academia more broadly, examine the pedagogical decisions allowing librarians and information professionals to embrace a practice that allows

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them to stand idle in the face of oppression and discrimination, especially when making digitization decisions. In other words, we are educating librarians in a way that enables these injustices and harms, as librarians are graduating without the expertise of and confidence in the skills to collaborate with diverse communities competently (Cooke, 2018). We believe part of the solution is cultural humility, competence, and responsiveness (training librarians) and another part is about developing collections, identifying gaps, and understanding their users. Librarians must be able to "intentionally address, integrate, and provide solutions of change in a proactive manner to help overcome entrenched marginalizing circumstances" (Mehra, 2021, p.463). We in LIS must include and embrace educational materials supporting the development of all our librarians and that of the communities they will go out and serve.

Critical pedagogies include critiquing systems of oppression and power, including our traditional approach to education and the subsequent maintenance of hegemony (Rapchak, 2021, p.143). As Mehra (2021) reminds us: "the Brazilian philosopher and educator Paulo Freire propounded critical pedagogy as a political act in teaching and learning to bridge realms of education and social action for student advocates to resist oppression, operationalize social justice, and promote empowerment" (p.462). Sankofa interventions serve as a call to reform higher education, including LIS education, through a commitment to a critical pedagogical praxis, to bring suppressed narratives to the curricular forefront and address the historical harms of epistemicide. Equipping LIS professionals with cultural humility, competence, and responsiveness when making digitization decisions moves us toward epistemic justice and enhances reform.

5.3 Reparative storytelling through digitization

Through reparative storytelling (Smith and Patin, 2023) in digital worlds, we can share oral and performance-based ways of knowing and remembering that are often missing from the record (Youngman et al., 2022). Many interventions are needed to address epistemic injustices in LIS, and using counter-storytelling in LIS to help empower those who have been marginalized is not new (Cooke, 2016; Leung & López-McKnight, 2021; McDowell et al., 2021). By collecting stories previous generations might have missed, we can repair some of the gaps in our narratives, collections, and collective knowledge. However, it is insufficient to go back and collect missing items; we must engage with these materials, as Sutherland (2017) says: "collaborations among LIS practitioners, professional archivists, and community-based archivists have emerged to begin the work of collecting stories and documenting violence and injustice in vulnerable communities. These documentation efforts are also an attempt to create an historical record, eliminating the possibility of erasure and enabling the possibility of justice" (p.17). We advocate for "reparative storytelling" to describe work that centres oral and performance-based ways of knowing that establish the evidence needed for dignity, healing, and justice.

6. Conclusion: Spreading Sankofa

In our discussions, we have explored how knowledge destruction is as old as the history of knowledge itself, reflecting the ways in which people, technologies, and societies take shape and vie for power over one another. This destruction of knowledge is facilitated by both social systems of oppression and through epistemic injustices that inform how particular knowledge is upheld and maintained, or left behind and forgotten, resulting in epistemicide. Sankofa interventions aim to mitigate the impact of epistemic injustices, in both physical and digital worlds, by inviting reflection on the origin, cannon, and spread of knowledge with which we interact. Furthermore, we acknowledge that the act of 'going back and getting' can be arduous and intensive, surfacing uncomfortable histories and painful remnants of the past. Hence, we remind our readers that Sankofa Interventions are not merely theoretical nor performative. Rather, they are meant to be implemented in our everyday lives. Sankofa Interventions are the ongoing dialogues,

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more-accountable policies, culturally competent professional practices, and so on, that are enacted through long-term commitments that call out injustice and mitigate the impact of historical harm. In addressing digital epistemicide, Sankofa interventions enable us to call out potentially harmful digital decisions, responsively call in those responsible for such decisions, to mitigate the risk for harm, erasure, and injustice moving from our physical world and manifesting in our digital worlds.

Extending the conversation on epistemic injustices to articulate a theorization of digital epistemicide also has several implications for areas beyond library and information science reliant on interconnected digital worlds. From social media and online communications, where issues of content moderation and platform governance are shaping how knowledge moves between knowers, to information systems retrieval and search, where issues of injustice in existing taxonomies and the development of AI relying on biased information shapes how knowledge is stored and created by knowers. Indeed, articulating digital epistemicide allows for future discussions regarding the processes that enable epistemicide and epistemic injustice, and further contributions to ongoing dialogue regarding the use of digital technologies as a form of resistance in the face of harms (see, e.g.: Jones, 2019; Florini, 2019). While interventions already exist that address injustice—including reparative digitization of collections, content moderation, accessible technologies, open access to scholarly works, document identifiers, community-driven forums, and resource pages—using an epistemicide-informed meta-language to name these harms and will provide new avenues for developing responsive and collaborative Sankofa Interventions that further epistemic justice.

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Epistemic injustice, university bordering regimes and international postgraduate researchers

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Abstract

This paper outlines the findings of a series of interviews with international PhD students in the social sciences at Newcastle University. It aims to: 1) understand how the university, as a bordering institution, has shaped the experience of international postgraduates; and 2) interrogate how these students are experiencing the process of articulating and undertaking their research under layers of restriction vis-à-vis Covid-19 as well as growing regimes of digital/biometric surveillance, costs, restrictions, and bureaucracy. Epistemic injustice is used as a frame to understand the operation of interlocking forms of oppression wherein the university is seen as a site of harm through direct and indirect discrimination.

Keywords: University; postgraduate; epistemic injustice; thematic analysis; marginalisation; research practice; race; belonging

1. Introduction

The past two plus years (2020-2023) have required universities to make quick decisions around openness (both physical and symbolic), alternative forms of pedagogy, student health, and research practice. Universities, at least rhetorically, took care to attend to student wellbeing, teaching and learning, and offered supports to offset financial precarity (Elkhatat and Al-Muhtaseb 2021; Tozini and Castiello-Gutiérrez 2022). One group of students who have not been adequately taken care of were International Postgraduate Students (PhDs specifically) who faced a variety of distinctive barriers and difficulties. These included financial, social, and pedagogical pressures which were exacerbated by forms of Othering, racialised surveillance, and financial extraction that exposed "the systemic logics, institutional techniques, rhetorics, and epistemologies of violence and power that undergird the academy's racial and colonial foundations" (Rodriguez 2012, 809). These events and decisions also impacted multi-year research projects – many of which had taken months to develop and gain permissions for and which traditionally set the stage for one's academic career.

The project discussed in this essay emerged out of a two-fold desire to: 1) understand how the university, as a bordering institution, has shaped the experience of international postgraduates, students; and 2) interrogate how these students are experiencing the process of articulating and undertaking their research under layers of restriction vis-à-vis Covid-19 as well as growing regimes of digital/biometric surveillance, costs, restrictions, and bureaucracy. We requested and received funding from Newcastle

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University for a pilot project to support this study which consisted of eight in-depth, semi-structured interviews with current international PhD students in the Faculty of Humanities and Social Science. Participants were compensated by a one-hour university work rate (just under £16).

As it stands, international students, inclusive of postgrads, enter the university with a very different set of rights as compared to home students, especially in the areas of housing, health care, privacy, and employment. As Ly Thi Tran and Trang Hoang argue, these students are also at higher "risk of discrimination, exclusion, and exploitation in dealing with the local community, healthcare providers, migration agents, real estate agents, landlords, employers, and education providers" (Thi Tran and Hoang 2020, 606; Pejic 2012). Covid-19, we argue, intensified experiences of marginalisation and affective non-belonging. While this project focused on examining the nexus between the university as an institution and the experience of PhD students with respect to their research practice, it also sought to unpack the context in which the experiences of our interviewees took place. This included interrogating the disjuncture between overarching political discourses that embrace globalization and the free movement of goods and capital on the one hand, and, on the other, the rootedness of universities in imperial logics aimed at producing desirable subjects and reproducing Western epistemologies (Mamdani 2012; González, C. and Hsu 2014). We return to several of these themes below.

We situate our analysis in the context of higher education in the UK specifically. As such, it is important to begin with an understanding of the UK as a colonial state that has been enacting and violating borders for centuries. This has occurred transnationally and nationally through overt forms of policing and covertly through practices of bureaucratic delegation to institutions like the university. It is also important to point out that UK universities depend, for their financial stability, on the outsized tuition paid by international students. This is particularly the case for universities that opened after 1992 for whom a market model has led to an over-reliance on international fees, but is increasingly the case for pre-1992 universities as well. It includes both postgraduate and undergraduate students for whom a degree from the UK still holds promise of employment, familial uplift, and personal development. It is also significant that for postgrads, PhD programs in the UK often take 3.5 to 4 years (full time) rather than the average of 6+ years in the US, Australia, and Canada. We contend that international PGRs have been made to endure interlocking forms of epistemic injustice wherein the university acts as a site of harm through direct and indirect discrimination (Fricker 2017). Miranda Fricker's popularisation of the phrase 'epistemic injustice' captures the ways in which women and other marginalised groups are seen as having diminished capacity as "knowers" under the constraints of an unequal patriarchal society. The dual experience of testimonial injustice, not being heard or recognised as a speaker, and hermeneutical justice, where one's social experience is delimited on a societal level, permeates the experiences of the students interviewed in our study. These classes of wrongs, for Fricker, are strictly about discriminatory acts experienced directly and indirectly and in order to be addressed, requires "sufficient social equality in general, to ensure that new areas of … marginalization do not keep re-emerging with new patterns of unequal power" (Fricker 2017). Also significant is Kristie Dotson's (2012) work which expands the remit of epistemic injustice to include injustices that are hidden or ones that are contributary in the sense that the speaker is unable to contribute to a community's shared epistemic resources. This is particularly important in the context of a scholarly community of which international PGRs are ostensibly a part.

These harms are made manifest in the first instance by bordering practices that delimit student movement, capabilities, and agency while also reinscribing hermeneutic and testimonial injustices by severing as the conduits through which inequitable experiences are communicated and addressed. Specifically, international PGRs have been made to endure practical and epistemic harm in the form of: 1. curtailed communicative capacity (for fear of jeopardising their visas, for example); 2. the undermining of their status as knowers and researchers as a result of the transactional nature of the university-student relationship (as well as restrictions on the ability to carry out research); 3. impaired confidence and intellectual courage (which a more materially and affectively supportive environment might foster); and

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4. the failure to properly cultivate an environment that includes the development of intellectual virtues (which ostensibly is the primary goal of the university as a pedagogically oriented institution).

We argue that this framework and the interview methodology we employed helps to make "sense of the lived experience of injustice" experienced by these students. It does so in ways that not only demonstrate that these injustices have always existed, but also the ways in which they have been amplified by the pandemic, economic austerity, and stricter border regimes (Fricker 2017, 8).

In our analysis, we draw on Elizabeth Anderson's (2012) more structural understanding of epistemic injustice as requiring an institutional, policy driven response which can then filter into more local forms of change. This approach shifts focus from individual virtue to more macro sites of concern. As Anderson argues, hermeneutic injustice is structural and thus it is institutions like the university which play a important role in the marginalisation of oppressed groups (Anderson 2010). Interpersonal transformations thus occur as a result of the fact that policies necessarily must "gain the support of those living under them" (Christman 2012, 16). It is thus only through the transformation of policies and structures that individual behaviours are likely to change. Anderson further distinguishes between transactional and structural forms of justice and injustice in support of this framework and calls for justice for and within institutions which is something we support as well.

Thematically, our analysis and approach is informed by research in the areas of bordering (Yuval-Davis, Wemyss and Cassidy 2019; Richardson 2006), border regimes/border imperialism and higher education (Walia 2014, Walker 2014; Gahman et al 2019, Dear 2018), belonging (specific to higher education) (Glass 2018; Tran and Hoang 2020), student migration flows (Mosca and Wright 2010; King and Raghuram), and the intersections between anti-colonialism and anti-racism (Deckers 2014; Dei 2010).

While there is a rich body of scholarship on borders in a number of disciplines (Ong 1999; Mezzadra and Neilson 2013; Hummer and Simpson 2014; Hokowhitu 2016; De Genova 2002), in this study we draw on bordering as a process, an assemblage used to describe how power and space is (re)configured to exclude certain bodies and, as Murphy argues, how "the perceptual inertia of the territory-sovereignty link works together with certain on-the-ground state-based powers to influence understanding and practices [inclusive of bordering], and to shape what is possible in the political arena" (Murphy 2022). This practice in the university context requires circumscribing the experiences of international students in accordance with economic logics (i.e., capital inflows) balanced against autochthonous understandings of belonging wherein the ability to stay can be revoked by the state at any time. This power has been delegated to the university and has engendered a kind of vulnerability and precarity that came up consistently in our interviews.

Bordering is a central and elastic mechanism of enforcement and is the primary means through which sovereign borders are maintained (Brunner 2022; Sharma 2020). This can be overt, i.e., policing, or covert, via norms and bureaucracy. Either way, bordering is aimed at restraining and shaping Otherness in ways that are racialised. Research in this area sees the university as an institution that acts as a soft border – as border-er or gatekeeper that acts on behalf of the state but also in its own interests in maintaining the background conditions of racialised capitalism through high fees as well as surveillance, monitoring, and reporting (Dear, 2018). This framing has taken on elevated importance as a result of Covid-19 for which bordering practices have been used to determine 'mobility deservingness,' - for example, who can take advantage of travel bubbles and fast lanes (largely those with mobility capital), and who has to submit to racialised biometric surveillance and the assessment of pathogenic risk (Koh 2022). It is important to underline that these tools and techniques of administrative bordering are opaque, arbitrary, and aim at producing the ideal, compliant, docile student-migrant subject whose compliance may, or may not, warrant leave to remain in the country (Maury 2021).

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2. Methods

Our in-depth, qualitative findings are explanatorily rich and sets the foundation for further research. We began by sending a general call for participants to the Faculty of Humanities and Social Science and, after achieving a surprisingly high number of responses, set parameters in order to reach an acceptable level of gender, geographic, and racial diversity. We felt this was important methodologically, given our research, and the best means by which to elicit relevant insights from students whose experiences differ in important ways due to their intersecting subject positions (Collins and Bilge 2020; Crenshaw 2017).

Eight interviews were conducted - seven face to face and one on Zoom, based on the interviewee's preferences; all are included in the analysis for this essay. Interviews were semi-structured, and the questions were jointly de and re-constructed by investigators. Lines of questioning broadly focused on interviewees' experiences of obtaining visas for study, work and leisure; their experiences of travel; the impact of covid on their research; and their experiences of studying in a UK university as international students. All interviewees signed consent forms and their contributions were anonymised inclusive of their country of origin which we generalised to geographic region. This level of anonymity was important due to the sensitive nature of some of the disclosures which several worried might invite institutional retaliation.

The interview transcripts, generated using NVivo, were checked and then coded using an iterative thematic approach based on the work of Braun and Clarke (2019, 2021) as well as Herzog, Handke, and Hitters (2019) whose emphasis on 'patterns of recurrence' and coder reflexivity we found useful in developing our own means by which to infer meaning from complex data. This involved several close readings of the transcripts and the identification of thematic consistencies related to the research questions (supported by shared codes). This allowed for robust meaning generation "within and across data in relation to participants' lived experience, views and perspectives, and behavior and practices" (Hayfield, Clarke, and Braun 2017, 297).

As scholars steeped in extant literature and research in this area, we approached the data with a level of familiarity which aided in the familiarization and coding process through which we identified descriptive insights and meanings related to our research questions. Themes emerged quite organically around our codes and, after some sorting and re-organisation, began to tell a "coherent story about what is going on in the data, overall" (Braun and Clarke 2012, 65). During our analysis, we also paid particular attention to relations of power and experiences of oppression which, while not always part of thematic analysis, formed a critical dimension of our research practice (Cannella and Lincoln 2015).

3. Findings

The findings that emerged from the interviews were plenteous and spanned the following: disrupted and stressful travel – inclusive of less than ideal interactions with police, border guards, and embassy staff; the experience of prejudicial and stigmatising university regulations around establishing presence and 'output'; feeling that they had an inferior university experience (vis-à-vis 'home' students and particularly in relation to funding, engagement, and movement); differential access to healthcare (in light of Covid-19); insufficient supervision; the impoverishment of their originally envisioned research projects; overt racism and microaggressions; and the inability to find safe means of collective resistance and redress.

Given the focus of our research, in what follows we delve more closely into the themes of: 1. the effect of bordering and surveillance on student experience related to epistemic freedom; 2. visa regimes and travel limitations (in light of Covid-19); 3. capital and economic constraints; 4. impacts on research experience; and 5. support and belonging.

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3.1 Bordering and surveillance

Bordering practices and surveillance of international PhD students has had multifaceted impacts on their epistemic freedom as well as the research and activities that they are able to undertake. The policing of international students, from the documentation required for student visas (which vary depending on their country of origin), the physical encounter of crossing the UK border, and the practices carried out by the educational institution itself, all impact the perception of belonging and autonomy that international students have. Several participants noted unpleasant and arduous requirements for gaining visas for entry, including having to travel to different cities in order to attend appointments at specific offices, having to go through highly securitised visa approval and processing (including the collection of biometric data. e.g. fingerprints), and difficulties in obtaining clear information on application requirements. These issues demarcate the international student experience as more complicated and time consuming than that of home students and may prevent some potential students from applying in the first place. Unnecessarily difficult barriers for entry leads to the curtailment of epistemic growth and exchange. Though we began this section exploring the state-enforced bordering regimes and their impacts on international students, we also want to provide reflections on the ways the University offers (or fails to offer) support in relation to these processes.

The encounter with 'hard borders' in the space of an airport (upon arrival) shapes feelings of belonging and conditional belonging within the university. These impacts have been reflected in the international PhD experience, with students becoming aware during their encounter with the 'hard border' that their presence in the country is dependent not only on the agreement of the state as an overarching force, but upon the state actors they encounter upon their arrival. It also marks the university as an institution in control of granting access to the country by means of a student visa and accepting students for study. Natalie, who is white and from North America, and thus possessing what is often seen as a 'strong' passport, noted that she would change her behaviour with border staff; she would become polite, timid, and avoid eye contact. She also remarked that she had rarely encountered any issues at borders and identified her privilege as a white North American as a reason for this. However, she said that it would also be easy to see how difficulties at borders would affect feelings of belonging in this country. Running parallel to this are the experiences of students from countries that do not have passports that are as 'strong' and encounter racialisation when entering the UK. Marcus, who had come to the UK to study from West Africa, noted:

They have this extra eye on you as someone from a minority community. I must genuinely say that. You could see it, you know that, you're being not treated very well. You have - your luggage is extra searched, and you - Yeah, there are so many things that are inevitably telling you even though generally, you know, yeah, legally, you are very much legally staying here or coming down in this country. You know why you are coming and all that. But you perceive that the level at which the, the eye is on you is not actually the same, were it the other way around. So that, that, that feeling is there, but when you know that like me, I know that I'm here, very genuinely, I'm here. I know why I'm here. I don't actually feel bad. But I know that, that feeling must be there like you're not treated fairly. When someone will like ransack your luggages looking for things that you - you will be like, what, what is this person looking for in my luggages? (Marcus)

Other participants also noted negative experiences at airports. The contrast between the experiences of Natalie and Marcus sets the scene for the differential treatment of international PhDs: all are subjected to the governing forces of the state, and some with a much less pleasant experience than others.

The surveillance that international PhD students are subjected to within the UK also creates additional work and pressure for international students. It is worth emphasising that the level of surveillance, like visa requirements and hard border encounters, can vary according to the specific background of the student. While most international students must meet specific requirements, such as having a BRP card and scanning their student cards in-person, only some international students are required to register at a

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police station. Visa regimes were described by interviewees as "tragically uneven," with some international students required to only show their passport, and others needing much more documentation. This heightened level of surveillance, and the disparity between requirements for students of different nationalities, has an impact on feelings of belonging within the university environment for many students. This, again, demonstrates how hermeneutic injustice begins at a structural level and then filters down to the interpersonal with institutions such as the university and state bordering agencies driving the process of marginalisation through policy (Anderson, 2012). Zain, for example, relayed that he found the police registration process (which was in place at the time of this research being conducted) alienating:

I thought that every student - every international student was doing that thing, but after, I figured out I was the only one (laughs). So like, just imagine like all of the international students, like, how many people we were - 14 international students ... I and one or two other students did that, others didn't, because they didn't have to. So it just kind of makes you feel like okay, we are potential criminals. And university doesn't do anything about it. It just - either do it for everybody, or just don't do it. Like if you do it for everybody, what do you lose? Nothing. But when you don't do it, you just unintentionally make your students feel like excluded. (Zain)

Zain also found one member of staff's attitude to the police registration process, namely 'our country, our rules', to be, at best, insensitive to the impact that having to register at a police station has on feelings of belonging within the university, creating epistemic injustice through exclusion from the scholarly community. Creating a research community is a crucial part of the postgraduate experience, and the insensitivity of staff to these exclusionary practices further enforces those exclusions and works to the detriment of students. It is therefore not only the practices of surveillance but also the attitudes of actors within the institution that can work against healthy, meaningful integration. This robs the student of positive experiences as well the opportunities that can come from engaging in a research community.

Furthermore, the university's own 'soft' bordering practices create conditions for international students that are inflexible, e.g. by demanding physical presence, and results in an adverse environment. Rachel, another participant from North America, told us that the requirement to be on campus in order to complete registration with the university seemed "ridiculous" and caused a great deal of stress. Due to visa delays, it was difficult for Rachel to barrive on time to complete her registration, which nearly resulted in her having to defer the start of her studies at significant cost (as she had already paid for a semester of accommodation). Natalie similarly relayed that the university had not being clear on when her start date was and neglected to convey the requirement that she must physically be at the university early on which meant having to "move heaven and earth," at significant cost, to arrange travel and accommodation during the Christmas/New Year period. The creation of a 'soft' border through the physical demand that international students attend the university in person, so that their presence in the institution can take specific forms and be monitored, can work to limit international students' access to higher education. Moreover, the costs incurred again creates barriers to who can attend universities and access and contribute to the communities of research within UK higher education.

The outright racialisation and discriminatory practice of having only some international students register at a police station (although this has now been phased out), and the ignorance of staff to the effects of these practices, establishes the university as a site of harm through which discrimination, both direct and indirect, occurs (Fricker 2017). This creates a scholarly environment that inscribes (through the securitization and bordering) and reinscribes (through aggressions and microaggression) hermeneutic injustice.

3.2 Visa regimes and travel

Beyond navigating visa regimes for entry to the UK, many international PhD students also face constraints when arranging travel for other purposes, including leisure, conferences, and fieldwork. It is again pertinent to highlight the disparities in experiences between international PhDs in possession of

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'strong' passports as compared to others. Little issue with regards to visas and access to other countries was highlighted by participants with strong passports. Once again, though we initially explore issues related to visa regimes as enforced by the state, we further reflect on how this plays out in a university context, how universities fail to support students, and the impact of this lack of support.

Zain, being from Central Asia, experienced several obstacles in trying to arrange travel. For leisure, he had been through two difficult, costly, time-consuming, and highly securitised visa applications for the US in order to visit his partner, but had been rejected on both occasions – including one where the interviewer for visa approval did not even ask him any questions. His experience of arranging visas for conducting fieldwork within the Schengen Zone similarly met obstacles:

I struggle a little bit for my fieldwork thing. Because, like, you know, we are living here, the closest Schengen visa place is in Edinburgh. I made an appointment. I went there once, and they said that they couldn't accept my documents because I thought I will go to Denmark first and then Sweden, but they told me that as I will stay in Sweden longer than Denmark, I have to apply for Denmark. Actually, they could still accept my document because the only thing that they need - Okay, Zain, just fill out the student form and come back in 10 minutes. I would definitely do that. But they didn't accept that thing. They just say no, okay, we will not accept your documents. So you have to book another appointment for that. And booking appointment is the hardest part because all the time it is extremely full and their website system is always crashing. So you have to check it everyday like I found my appointment on Sunday, 4pm. Like a Sunday. Come on. Like why? Yeah, everyday I checked like 10 times, more than 10 times maybe. That is the most - biggest problem. (Zain)

Zain was also only granted the exact minimum number of days to conduct his fieldwork, leading to increased stress and pressure for everything to go exactly as planned during his trip. This demonstrates the restrictive measures placed on international students that in turn restricts not only opportunities for leisure, but also the academic and research activities they are able to take part in. It also serves as a particularly salient example of restrictive measures enacted by the bureaucratic processes of the state that can hold researchers back.

Teo, who is from the same region as Zain, also reflected on visa regimes, stating that they were deeply unfair and discriminatory to people from particular regions of the world. The same restrictive measures were also creating pressure for him, as he is planning on applying to present at a major conference in the US and worries that there may be issues with his visa. However, he is reasonably confident that he will be able to get a visa if he is accepted for a major conference. This reflects how participation in the academy functions as a marker of prestige in navigating restrictions, but one that still may not be sufficient in the face of racialised and oppressive visa regimes. These barriers operates on multiple levels as a form of 'identity power' (Fricker, 2007: 14-17) in that Teo can use the prestige of the institution for international access, but is also limited by his national and racial background. Vis-a-vis epistemic justice, this also reflects a a form of testimonial injustice (Fricker, 2007: 27) in that the bordering practices of the academy and state trace the different facets of Teo's identity and has the power to restrict him on these bases.

Further issues arise when the restrictions placed upon travel by the university hinder rather than aid the process. It is clear from Zain's and Teo's experiences that the university should position itself as a support system for navigating the travel restrictions and advocate for the ability to research and disseminate said research. However, the university as an institution frequently creates further obstacles that international students must navigate due to bureaucratic rules. These lead to delays in applications and restrictive and, in the view of some participants, poorly thought-out risk assessment and management practices that result in further costs for the students - especially when delayed approvals for travel lead to more expensive flights and accommodation. These procedures do not consider the time needed to apply for visas after travel is approved, demonstrating how the university does not adequately support the diversity of needs of its student population or understand the issues that the face when travelling. This also illustrates how the university can be dismissive of the obstacles facing the students it sees as peripheral to its core

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community (home students), despite the high amount of money international students bring to the university via tuition fees.

3.3 Support and belonging

It is also important to point out that only a small subset of students with financial means and connections can access international programs (this might reflect economic privilege or the combined financial support of several family members and friends). Either way, this economic gatekeeping shapes the kind of students that can enter the neoliberal university – i.e., those most likely to responsibilise and surveil themselves in accordance with capitalist priorities. This works to ensure "a particular type of student…will be accepted on the territory…" and, at the same time, "the inhospitality of the "hostile environment" [in the form of bureaucracy, rules, and regulations] encourages them not to remain longer than is necessary" (Candappa 2019, 428-429).

The acceptance of a particular kind of student, from a particular economic background, is made clear through the affordability checks made on international students before they are accepted to study in the UK. One participant noted that their application for a PhD was made much easier due to them being sponsored by the government of their home country, which demonstrated economic capital and allowed them to receive an offer more easily than if they were required to undergo affordability checks. Other participants echoed these sentiments, noting that it is extremely difficult for self-funded students to sustain study amid the costs of visas, healthcare, living, and travel. This, again, reinforces Candappa's (2019, 428-429) assertions around the economic gatekeeping of international student entry.

Participants also noted that student visas were restrictive in terms of the time they were able to remain in the UK very clearly delineating the amount of time seen as appropriate for the conditional belonging afforded to international students. In the face of Covid-19 delays to research, this has created intense pressure on some international PhD students who are unable to extend their visas but cannot complete their research projects on time. University support on this has been lacklustre, with some participants gaining information about possible (but unconfirmed) visa extensions through other, non-host university websites. This again restricts the epistemic and research freedom of international students through acts of hermeneutic injustice as a result of the university not recognising the barriers faced by international students and failing to provide the support they need. This reflects the university's role as a soft bordering regime (Dear, 2018) through its passive acceptance and partial enforcement of these restrictive measures, even in the face of unprecedented obstacles faced by postgraduate researchers due to the pandemic.

Also of note in relation to Covid-19 are issues around healthcare access; healthcare was highlighted by participants as a major expense when initially arranged moving to the UK, and became a further issue during the initial stages of the pandemic. Rachel suggested that the university could have done more to support her (with respect to housing in particular) in her studies and during Covid, as she was at increased risk:

The fact that I am multiple months, if not over a year behind due to hospitalizations, and my undisclosed disability. It - it becomes quite problematic for me trying to manage workload and mental health and off, off time. To sort my stuff from my year two APR I, the last like few months, I was working like 60 hour weeks to manage to get all this stuff put together and... mind you I did write like some ridiculous piece of literature for the example (slight laugh), but still it was like - the amount of work that I had to undertake in that just to make up for what I had missed in the first year and a half because of not only hospitalizations and stuff, because of my disability stuff. And stuff related to that. But also because of having to move three times because of Covid because I was originally in one of the university housing and they shut down the housing or whatever. And while you could stay in the housing, I guess, if you made special arrangements, it was severely like suggested that you should go home and because of my vulnerability, I couldn't stay there and use a shared kitchen or whatever because of Covid. And apparently there was several instances of a outbreak sort of scenario of Covid in there. So it wouldn't have been safe

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for me to be in the dorm at the time. And then additionally, I couldn't go home either. So I managed to be quite lucky and have a partner that I had just met like almost right before that and they were like oh just come live with me. Otherwise I probably would have like, like been on the street because the refunds for the housing as well if you didn't go didn't come in for another month or two. (Rachel)

University wellbeing services were highlighted as insufficient when dealing with the needs of international PhD students and the pressures they faced, particularly in relation to economic precarity and difficulties in conducting their research in a 'timely' manner. Again, these issues speak to the the university's lack of understanding as it relates to the needs of those on the 'periphery' of what it deems to be the typical student despite the considerable revenue generated by international student fees (a frustration also voiced by participants).

An important insight we had was with respect to the levels of stress faced by students who were away from their family and friends, unable to engage in the full university experience, and facing financial difficulties (their own and those of their family's). Further, the sudden movement to online study due to Covid-19 led to increased isolation for international students (on top of an existing lack of socialising between international and home students):

I again arrange some sort of dinner activity with the - only the international students, only the international students came. Afterwards, we just - okay, we have a really good friendship - and then Covid (laughs). So like, I organise that thing, we get warmed to each other, like we kind of like 'oh, okay, you're a good person, oh, yeah, like I want to know your culture' and blah blah, and two weeks later, shut down. I was like - ugh, dammit ... at that time, you don't want to do that kind of socialising activities because they're just like, online and I attended a couple of them and it was like, you're just looking at the screen that kind of activities and it doesn't fun, it doesn't make you feel like okay, I am belonging here ... you have to do some stuff and you have to study and just stay inside of your room ... it was a dark time. (Zain)

Several participants also had to contend with the fallout of contracting Covid-19 (and for some, long-Covid), as well as pre-existing health conditions for which timely medical attention was difficult to obtain. The previous examples of the inaccessibility of support, as well as the wider pressures unique to international students, created further stress which highlights the severity and pressing need to provide adequate support for international students and remove the structural barriers that elevate stress and consequently undermine their educational experience.

Stress as a marker and instigator of ill health was not only heightened due to Covid-19, but as a baseline state is heightened due to economic precarity, surveillance, microaggressions, and isolation. Stress is also racialised (M'charek 2013; Sikka 2022), often referred to as racial weathering, and gendered vis-à-vis care work which disproportionately falls on the shoulders of women (Stalker 2014; Toffoletti and Starr 2016). The effect of this heightened allostatic load is reflected in processes of (mis)recognition wherein credibility is denied to speakers of a particular social type (i.e. international students). For Fricker, this results in the lowering of social and identity power in ways that impede self-development (Fricker 2017). This biological wear and tear of stress intersects with (often racialised) understandings of who is recognised as a knowledge producer, thereby heightening the struggles faced by international PhD students.

3.4 Impact on research experience

The obstacles international PhD students face also have an adverse effect on their research experience and the kinds of research they are able to conduct. This especially included issues with international fieldwork:

I respect that they want to be able to, in the event of another global disaster or even local disaster, to be able to tell where their staff is, that makes sense- and their students. That makes a lot of sense, but I think that the way that they go about it is just inefficient from all levels. I mean, I was talking with many

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staff members as well and even they are like, at wit's end with it. So I understand in some level, but also I - sometimes it just doesn't make a lot of sense either. So for example, we can't stay in an Airbnb because they don't have the, the safety checks in place. And yet we could stay in a hotel that maybe is a dodgy one star hotel, you know, on a river front of a dangerous city, but that seems to be completely fine? Like it- there's a lot of like holes that you could poke in their arguments. And how if you push hard enough, you can get certain allowances. So for example, I've got a colleague who got permission to stay with a friend in like a private residence or whatever, it's just his house, to be able to save all that money. Yet that is equally as uncheckable in for safety regulations as an Airbnb is. So I think there's, there's just - I think they took Airbnb as a sort of catch all I think they just took it because it's something that they can like attack - not attack, but like hardline say, no we can't use Airbnb, but that just creates a lot of problems. But it I think the reasoning - the only reason I can think of is, is the issue of finding themselves in the midst of another disaster and not being able to find their students. And so that's something that I can definitely - and they don't want to be sued. (Natalie)

Participants such as Natalie highlighted the significant effects of Covid-19 had on the ability to conduct research which was then compounded by restrictive university procedures, regulations and bureaucracy, and a lack of university support in adjusting the parameters of research projects. Particularly impactful was the lack of flexibility or support afforded to international students with respect to their visas, signalling that the timeframe given for their conditional belonging in the university and wider country was non-negotiable.

The difficulties created by Covid-19, compounded by the limitations of visa regimes and university policies for international students, also required that creative changes had to be made to individual research projects. For example, some participants used innovative digital methods, such as digital ethnographies, which allowed them to navigate the constraints of Covid-19 as well as travel restrictions. However, some participants suggested that they did not feel their project or data was at the level they wanted it to be because of restrictions and a lack of support. We argue that the pandemic acted as a catalysing force that brought the barriers faced by international research students face, and the epistemic injustices they incur, to a head. Moreover, the structural limitations presented by university and state regulation intersected with the effects of the pandemic to create an intensified form of Fricker's (2007) testimonial injustice by denying the credibility of the research carried out by these students due to their restricted data (and findings).

Supervisors are also a key factor in research experience, and most participants spoke highly of the supervisors and their support. However, it is worth noting that some supervisors were not always understanding or helpful, and several seemed unaware of the considerable constraints faced by their students. Participants noted that their supervisors did not consider the intense time pressures they faced due to visa applications or the time limits on student visas. Because supervisors play such an integral role in the research projects and opportunities that PhD students can undertake, it is important to consider how not addressing these constraints can also lead to epistemic injustices through imposed limitations that affect research and, by extension, the career of the PhD student. This highlights the need to raise awareness of the constraints faced by international PhD students across the university and at all levels.

The concatenation of Covid-19, heightened techniques of bordering, feelings of unbelonging, and intensified forms of epistemic injustice also worked to reduce, and re-shape our interviewee's research projects, many of which were supposed to involve lively forms of engagement with human subjects, artistic works, archives, and events. These students had proposed innovative, critical, and transnational research projects that reflected their own interests and priorities, challenged entrenched systems of knowledge, and were also 'of value' to the university (including a number of projects that involved engagement with institutions internationally which would have raised the university's profile). We argue that one of the outcomes of Covid-19, alongside heightened forms of bordering, may have resulted in research that is attenuated and less likely to challenge hegemonic rules and knowledge hierarchies – what McKittrick refers to as epistemes that "unjustly organize human hierarchies in place and reify uneven

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geographies in familiar, seemingly natural ways" (McKittrick 2006: xiv; Jacqui and Mohanty 2010). This was demonstrated by a participant who noted that they felt a heightened sense of being surveiled, both generally and in the university environment, and feared having their visa revoked.

The modalities of epistemic injustice emerging from this, while experienced on an individual level by students who feel instrumentalised in their hermeneutic capacities, are built into the university system and thus must be dealt with on this level. This requires that we "consider what epistemic justice as a virtue of social systems would require" while also addressing how hermeneutic injustices are also present where there is a failure to support oppositional forms of knowledge-making found in innovative research projects - including those articulated by international PhD students (Anderson 2012, 163; Mason 2011).

4. Conclusion

As demonstrated throughout this article, epistemic injustice permeates the lived experience of these students for whom so much depends on their success. This can also lead to wider identity prejudices wherein their research is marginalised due to its attachment to a subject whose very presence is put under question (Origgi 2012). Having one's "social experience obscured from collective understanding" can be painful, particularly when regulations, laws, and norms are presented as fair, colour-blind, and hegemonic (Nikolaidis 2021). Beyond epistemic justice, what is needed is the cultivation of collective forms of learning resiliency, community and multilocal forms of belonging, and decolonised learning practices that resists what Minghui et al (2021) call 'transnational academic capitalism.' Our interviewees offered their own suggestions including increased efforts on the part of the university to accommodate them not only as sources of economic capital and temporary residents, but as full members of epistemic communities that are offered support in their studies and in remaining in the UK. It was also posited that part of these efforts should include the facilitation of postgraduate communities of both international and home students (rather than the separate communities that often emerge), alongside clearer guidance and support in dealing technical/regulatory issues regarding state policy.

Our position is that given the rich narratives of these students; the history of the university as a neoliberal and colonial institution; the expectation that it will continue to enforce borders (and do so more intensely at times of distress - e.g. the climate crisis), we must take a step back and rethink the place of international postgraduate students in the university system. On a very basic level, this means attending to their material needs including lower tuition, increased financial support (including means to work), unimpeded access to health care, fair and affordable housing, and the elimination of targeted surveillance and policing regimes (Candappa 2019). Interlaced with these material exigencies is a very real need to view these experiences through the lens of epistemic injustice. Our approach makes implicit injustices explicit by demonstrating how robust, just, and boundary pushing knowledge, particularly knowledge that is anti-racist and decolonial, is undermined by an institution and state for whom policing and extraction are more important than human flourishing and imaginative scholarship. As Boni and Velasco argue, the "University as social entity has great potential to confront epistemic injustices by expanding epistemic capabilities" (Boni and Velasco 2020; 1), We contend, however, that this cannot take place under conditions of austerity and financialisation, bordering and neglect, and marginalisation.

UK universities engage in extractive practices through recruiting international PhD students for the financial gain from tuition fees and by capitalising on their research contributions, whilst simultaneously failing to support them in their knowledge production efforts and inhibiting their sense of belonging. This speaks to wider issues surrounding coloniality and epistemic injustice in academia regarding whose voices and perspectives are valued. Consequently, if universities are committed to becoming varied and diverse institutions, with researchers free to produce knowledge that they - as specialists - consider important, the university must work to facilitate this rather than reflect colonial power dynamics by imposing restrictions.

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Universities should thus look towards facilitating community-building spaces that draw on the diversity of their entire student body; such spaces should avoid either an assimilationist approach (ignoring the cultural experiences and perspectives of international students) or a segregationist approach (building spaces for *only* international students). This could be through PhD and wider student body communities/societies, and increased opportunities for PhDs to engage with both staff and students in their departments and schools (particularly in the wake of Covid-19, which disrupted the availability of such opportunities). As our research has shown, international students exist in a particularly precarious and conditional space, leading to their voices being suppressed in terms of knowledge production as well whose research and knowledge is platformed and engaged within the context of UK universities.

Universities should also work harder to ensure the security and belonging of their international students, such as by removing bureaucratic measures and restrictions placed upon international PhD students. They must also work harder to foster an understanding of the difficulties faced by PhD students throughout all levels of the university in order to create a more inclusive space; in this way, different parts of the university (e.g. teaching/supervisory staff, administrative staff, other students) must work together to address some of the insecurities inflicted upon international students by the state. This will also enable institutions to go at least some way in addressing epistemic injustices despite the fact that universities may not be able to fully address issues surrounding visas that may emerge from Government/Home Office policy. They can, however, work towards creating an academic environment that endeavours to support international students *despite* wider policy issues, rather than *actively enforce them* as a bordering institution.

It should be noted that despite the adverse obstacles faced by international PhD students, they continue to show remarkable resilience and determination in undertaking their PhD research and participating in their research communities. The wealth of insight, perspective, and skill they bring to the academy, despite the institutional and economic structures that work against their wellbeing and freedom to carry out their research, should function as a call to universities to offer further support and work to dismantle the barriers they face.

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Knowledge and emancipation

From epistemic injustice to digital and epistemic sovereignty in Latin America

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Abstract

This essay explores Latin America's struggle for epistemic independence against dominant Global North informational flows in science and technology. It addresses the impact of knowledge production domination on the region, including epistemic injustice and academic imperialism, proposing strategies for bolstering science through epistemic sovereignty. It emphasizes higher education's pivotal role in a nation's sovereignty by fostering knowledge production, global citizenship, and intellectual leadership. However, in today's multipolar world, universities in less developed countries often serve as conduits for Global North knowledge, perpetuating their agendas. The consolidation of digital environments and globalization further exacerbates this issue, leading to an anglophone bias in scientific knowledge production, diminishing the visibility and relevance of Latin American scientific contributions—a form of epistemic injustice. The essay contextualizes the concept of epistemic sovereignty, highlighting ongoing resistance efforts in Latin American higher education against knowledge production dominance and instances of epistemic injustice.

Keywords: Epistemic Sovereignty; Epistemic Injustice; Latin America and the Caribbean; Higher Education; Digitalization

1. Introduction

The global hierarchy between North and South, center and periphery, is a central theme in academia that directs efforts towards understanding and - sometimes - overcoming such limitations. This hierarchy is also sustained by dynamics of epistemic violence, injustice, and subordination, where access to information is a privilege and a means of exercising power. Some schools of thought have been discussing these global power dynamics in the global knowledge ecosystem for some decades now. This is how the authors Boaventura de Sousa Santos and Maria Paula Meneses (2010) conceptualize it, in the construction of their theory on the Epistemologies of the South, according to which the production of global knowledge eliminated the cultural and political context of the production and reproduction of knowledge from epistemological reflection. For the authors, colonialism is an epistemological domination, “an extremely unequal relationship of knowledge-power that led to the suppression of many forms of knowledge typical

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of colonized peoples and nations, relegating many other types of knowledge to a space of subalternity" (Santos; Meneses, 2010, p.19).

The approach that differentiates the relationship between the Global South and North, understands that the model of modern Western thought, which divides the world into North and South, has created not only a polarization, a characterization of the scientific order between colonizers and colonized, in the cultural and scientific sphere , but it also reinforced stereotypes and imaginaries that what was below the Equator were countries of low development, poverty, exotic and primitive knowledge (Oliveira, Bomfim, 2023). This paradigm leads to the denial of the existence and relevance of the other side of the abyssal line that divides the two poles (Santos, 2007) and promotes critical frontier thinking. Critical border thinking represents an epistemic response by subaltern groups to the Eurocentric project of modernity. Instead of rejecting modernity to retreat into a fundamentalist absolutism, border epistemologies absorb or redefine the emancipatory discourse of modernity based on the worldviews and forms of knowledge of subaltern groups, located on the oppressed and exploited side of the colonial difference (Grofoguel, 2008). Therefore, this theoretical line seeks to recognize and value knowledge that has been historically disregarded, promoting epistemological plurality (Santos; Meneses, 2010). Frontier thinking seeks to break down these divisions, valuing and integrating subaltern and local perspectives in the production of knowledge. This approach promotes a more pluralistic and equitable understanding of different ways of knowing, challenging the centrality of Western knowledge in academia and society.

Likewise, intellectuals from the Global South have been raising awareness of these issues since the 1960s. For example, Syed Alatas (2000, 2003) introduced the concept of academic imperialism and captive minds, which dialogues with the perspective arising from the Latin America and the Caribbean, on dependency theory as crucial in the formation of Latin American critical thought. This theory is a critical analysis of the processes that perpetuate epistemic and economic underdevelopment in opposition to the developmental vision of the Economic Commission for Latin America (ECLAC). Most intellectual movements and currents of thought that identified with studies on dependency theory sought to denounce epistemic violence and injustice against marginalized peoples. Our objective will be, throughout this article, to understand to what extent the idea of the scenario of political-economic domination, highlighted by Dependency Theory, in dialogue with the perspective of dividing the world between north and south, brings consequences in the production of knowledge, such as academic imperialism that describes the scientific order, both in the cultural and scientific spheres, between those who colonized and those who were colonized, resulting in a perspective of epistemic injustice at a continental level, which it is up to us, in the present text, to consider, at the as a way of pointing out paths towards epistemic sovereignty. Our objective is to reflect on the mechanisms that promote the emancipation of the production of knowledge and Latin American culture.

Like other marginalized regions in the global knowledge ecosystem, Latin America has emerged as a critical exponent for denouncing epistemic injustices in global academic circuits. Despite a trajectory that dates back to decades of resistance and offering critical thinking about the global ecosystem, the 1990s were marked by a rupture and decline in this thinking in which Latin America was one of the prominent exponents. During the 1990s, globalization and the spread of neoliberalism in academic circles (Albuquerque and Lycarião, 2018) led to a decline in the centrality of the Latin American position as one of the critical central roles. A situation that was strengthened by the emergence of closed circuits of prestigious scientific publication, the use of international rankings to evaluate universities and the dominance of the English language in the production of science and technology (Albuquerque and Oliveira, 2021). These developments can be seen as the result of epistemic injustice, which involves the systematic exclusion or limitations imposed on the creation, dissemination, and preservation of knowledge (Fricker, 2007). This notion is related to the idea that certain groups or individuals face disadvantages and discrimination in accessing knowledge and participating in epistemic processes, such as production, dissemination, and validation of knowledge (Fricker, 2007; Bakhuni, Abimbola, 2021).

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As a form of resistance, alternative non-dominant circuits of excellence were established in the region during the 1990s, such as the Scielo, Latindex and Redalyc databases (Beigel, 2017; Vessuri, Guedon and Cetto, 2016; Oliveira et al, 2021). Despite the importance of these institutional initiatives, scientific and technological dependence on international journals and commercial data repositories has perpetuated epistemic asymmetries in access to information technology. The Anglophone model of knowledge circulation dominated as the only means of international knowledge communication (Goggin and Mcclelland, 2010; Jenkins, 2018; Buckner, 2019). The growth of universities in Latin America without the development of their own techno-informational infrastructures resulted in dependence on technological solutions offered by transnational companies in the digital economy (Torres and Schugurensky, 2002). This dependence on transnational corporations for digital and scientific solutions has also perpetuated epistemic violence and injustice, particularly in the dimensions of knowledge, language, and technology.

In addition to dependence on transnational institutions, we also see the growth of influence of other agents in the context of higher education in Latin America: interstitial educational institutions, playing a role in the production of qualified knowledge and in the definition of public policies (Tognato, 2018). Interstitial institutions refer to entities or structures that occupy a position between different social or institutional spheres, performing functions that transcend a specific sphere (Egholm, 2023). These institutions play a crucial role in the interaction and mediation between distinct spheres of society, such as the State, the market, and the civil sphere (Olave, 2018) Its fundamental characteristic is to act as connectors or regulators that cross borders, acting as overlapping spaces and performing functions of both the civil sphere and other social spheres, simultaneously (Khosrokhavar, 2019). These institutions can take different forms and purposes, from regulatory entities to training spaces that socialize citizens in practices and values associated with the civil sphere. Using a set of examples from Latin American universities, Tognato (2018, p. 149) shows that interstitial institutions can be housed within 'training' institutions and 'occupy almost the entire institutional space of the university'. Mainly, they are philanthropic organizations that, under a rhetoric of common good, offer tax-exempt donations and have few regulatory mechanisms in relation to epistemic institutions. The latter are legitimized to offer qualified information capable of influencing the public sphere in a country. Thus, interstitial institutions as donors now have the power to influence a public debate with bills and proposals. These institutions play a significant role in filling gaps in education and, at the same time, bring market values and strategies to the higher education process, directly affecting scientific production in Latin America.

The transformation of higher education over the last few decades, following economic and financial globalization, brings it increasingly closer to the market, creating a new dynamic in the production of knowledge.

To analyze and understand this context, discussions about epistemic sovereignty are fundamental. Reversing the situation requires a rearrangement of multiple stakeholders and a reconsideration of values, policies, production processes and adoption of knowledge (Beigel, 2013; Oliveira, 2021). This involves the recovery of values, social experiences, production, collaboration and sharing of knowledge by marginalized actors, such as indigenous, black, and feminist knowledge, in order to face contemporary epistemological challenges. In this context of growth in digital epistemic sovereignty movements in Latin America, initiatives such as data repositories, scientific circuits of excellence and indigenous multilingual platforms have emerged.

While the concept of epistemic injustice is valuable as an analytical framework for identifying and addressing testimonial and hermeneutic violence, it may not fully capture the struggles and resistance of those who experience such violence and actively engage in the construction of their own forms of knowledge. It is in this sense that the concept of epistemic sovereignty is presented in this essay. Epistemic sovereignty can be understood as the ability of a group or individual to exercise control and autonomy over their own epistemic processes, without being subject to external forms of domination or oppression. These concepts are interconnected, since epistemic injustice often results in a reduction in

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the epistemic sovereignty of certain groups or individuals. When these groups are systematically excluded or marginalized from the processes of knowledge production and dissemination, their ability to exercise autonomy and control over their own knowledge is compromised.

The notion of epistemic sovereignty can also be related to debates about the validation of knowledge produced in different cultural, geographic, or social contexts. Groups or individuals who possess knowledge situated from a specific perspective can claim their epistemic sovereignty, asserting their ability to produce legitimate knowledge from their own experiences and cultural contexts, in contrast to externally imposed knowledge. In this sense, epistemic injustice can occur when this knowledge is disregarded, diminished, or devalued by hegemonic power structures, compromising the epistemic sovereignty of these groups or individuals. Thus, the notion of epistemic injustice and epistemic sovereignty are intertwined, with epistemic injustice often resulting in the reduction of the epistemic sovereignty of certain groups or individuals, and the claim to epistemic sovereignty being a possible response to epistemic injustice.

In the fight against epistemic injustice in Latin America, the connection between 'episteme' and politics is essential. In this context, we observe a scenario where knowledge is transmitted on one side, while knowledge is forged on the other. According to this perspective, all knowledge producers operate from a 'place' or 'locus', consciously or unconsciously. This notion of 'place' encompasses two fundamental meanings: the epistemic, referring to the function of receiver and producer of knowledge, and the political, related to practice in the context of social dynamics. The union between the epistemic and the political aims to transform the oppressive reality into a liberating praxis, as well as the restoration of justice in epistemologies that have been marginalized by dominant thought. Furthermore, the second crucial element of this thought lies in the need for deep roots and constant reference in the knowledge of the original and Afro-descendant cultures of Latin America and the Caribbean (Wisly, 2023).

The essay aims to discuss why the notion of epistemic sovereignty is important and to understand the forces and disputes in the global ecosystem of higher education, in which Latin America has been fighting for its survival in the face of epistemic injustices propagated by the global forces that dominate the fields. of science, technology, innovation, and education. To this end, it presents the concept of epistemic sovereignty in a historical panorama to show the continuous resistance movements in Latin America against the dominance of knowledge production spaces, with a focus on higher education.

2. Towards a concept of epistemic sovereignty

Despite a long history of discussions about epistemic violence and academic imperialism (Alatas, 1969; Castro-Gomes, Martin, 2002; Alatas, 2003), the notion of epistemic sovereignty is recent. One of the first discussions dates back to the work of Karen Litfin in 1999, in which she discusses the impact of Earth detection satellites on the ability of a State to control information about processes and resources within its own territory, which is called “sovereignty”. epistemic”. Litfin highlights the importance of considering the role of knowledge and information in shaping and modifying practices of sovereignty, particularly in the era of the proliferation of information technologies.

Although the concept of epistemic injustice is valuable as an analytical framework to identify and address testimonial and hermeneutic violence (Fricker, 2014), it may not fully capture the struggles and resistance of those experiencing such violence and actively engaging in constructing their own forms of knowledge. It's in this sense that the concept of epistemic sovereignty is presented in this essay. Epistemic sovereignty can be understood as the ability of a group or individual to exert control and autonomy over their own epistemic processes without being subject to external forms of domination or oppression. These concepts are interconnected since epistemic injustice often results in a reduction of epistemic sovereignty for certain groups or individuals. When these groups are systematically excluded or marginalized from knowledge production and dissemination processes, their ability to exercise autonomy and control over their knowledge is compromised.

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According to Litfin (1999), knowledge and sovereignty are closely related concepts, as both are concerned with delineating authority and exercising control in the world. Science and technology, like the state, are emblematic of modernity and play a significant role in shaping the global landscape. The intersection of these two trends, which she calls the "epistemic dimension of sovereignty," is particularly relevant for understanding contemporary world politics. This neglected dimension of sovereignty focuses on control and access to the production and dissemination of information and knowledge.

Epistemic sovereignty often serves as an heir to traditional notions of sovereignty, such as state autonomy and authority within a territorial jurisdiction. In this geopolitical and territorial perspective, debates about the dynamics of power and domination propagated and based in nation-states are an intrinsic part of the debate. Notions such as academic imperialism were fundamental as a way of debating power structures in the global scientific ecosystem manifested predominantly in higher education. In fact, the character of political, economic, and cultural domination that the concept of imperialism concentrates on also has consequences that are felt in the production of knowledge. In Pierre Bourdieu (1999) we reinforce the idea of academic imperialism arising from Alatas (1999) as the process of cultural domination, not limited to the political-economic aspect, but in a broad historical process of control and power that subjugates, protects, assigns external standards and inferiorizes social practices, beliefs, cultures and knowledge outside the American axis, or, once again returning to Alatas (1969) the broad perspective of exploration and control, subjugating the production of knowledge of populations, through control or guardianship. Such thoughts corroborate the perspective of epistemic sovereignty on which we conducted the present study.

In sociological thought, a turn (later called the decolonial turn) occurred in the debate, especially between the 1980s and 1990s. Decolonial thinking, used mainly by the Latin American movement, aims to free the production of knowledge from the Eurocentric episteme. Criticizing the supposed universality attributed to Western knowledge and the domination of Western culture, decolonial perspectives see this hegemony as the basis of Western colonialism. These movements reflected the desire of Latin American thought to have its own voice and assert its own identity. After that, the discussion about the political and territorial nature of state control over the epistemic dimensions of sovereignty migrated to a social subversion aspect, in which asymmetries, interdependencies and epistemologies based on identities are proposed, especially from southern and non-western perspectives (Nunes, 2009; Garcia, 2016).

Both the notion of epistemic sovereignty and decolonialism are related in terms of challenging and subverting dominant power and knowledge structures. The rapprochement between epistemic sovereignty and decolonialism lies in the critique and rejection of hegemonic epistemologies and knowledge systems that were imposed through colonial domination. However, the two concepts have subtle differences in their approaches and approaches. While epistemic sovereignty refers to control, access to information and autonomy and authority over one's own knowledge, decolonialism can be understood as a theoretical and political movement that seeks to denounce colonial power structures and their persistent consequences in contemporary society. It is often used in the context of identity knowledge and cultural practices, to emphasize the importance of respecting and preserving the knowledge systems of marginalized communities.

The choice in this essay to adopt an approach to epistemic sovereignty resides in the search for a reversal of the situation of domination through the recovery of spaces of production and knowledge. The recovery of epistemic sovereignty is an ongoing task, involving multiple spheres. Reversing the exposed situation requires understanding the structural limits of the global system, a rearrangement of multiple stakeholders with a review of values, policies, production processes and adoption of knowledge, according to Beigel (2014) and Oliveira (2021), recovering epistemic sovereignty in region.

Traditionally, the concept of sovereignty concerns the ability of a country to exercise power within its territory (Magalhães Bambirra, 2000). However, it is necessary to observe the developments of this notion in global environments marked by disputes and influences from political, institutional, economic, and social actors. In particular, digitalization and the rise of transnational digital platform companies pose

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challenges to national information sovereignty policies in the most diverse aspects. For example, in the case of scientific information, there is a dispute between international oligarchies for the hegemonic pole of knowledge production. The current condition in which each country finds itself is related to historical imbalances in the visibility, circulation and credibility of information produced in each dimension of collective life. The way in which each State prepares to plan its informational sovereignty in a context in which social, political, and economic relations are anchored in the production of digital information is increasingly strategic from the point of view of maintaining independence.

The scientific and higher education system is a central element for a solid project of national sovereignty, as it deals with the production of knowledge and the formation of intellectual elites. In the current multipolar system, universities in peripheral countries often become mere channels for transmitting knowledge produced in countries of the Global North and reproducing agendas. This condition influences the public debate about how nations should deal with information, especially when it comes to regulatory aspects. Therefore, the recovery of epistemic sovereignty considers the university as an object and protagonist, as it can potentially promote debate on the production, circulation, and legitimization of science in the context of global asymmetries in production and provide elements to guarantee information sovereignty. The recognition and investigation of the infrastructure and asymmetry of the scientific system on a global scale makes it possible to think about the relationship patterns between peripheral and central institutions, as well as to develop mechanisms for the emergence of alternative academic circuits, contributing to the strengthening of the national sovereignty of the point from a scientific point of view.

3. Higher education in Latin America as a space of independence and oligarchic elites

The development of higher education in Latin America was not uniform across the continent. Despite the tradition of breaking with religious education models, higher education institutions in Latin America differ from those in Europe. These institutions were largely created or significantly transformed following the independence movements of the early 19th century, as part of the political plan to transform former colonies into nation-states and as a reaction to the colonial legacy. However, this independence was not fully realized.

The structure of knowledge and education in Latin American universities has been influenced by the legacy of colonialism and dependence on European universities. European-style education was considered essential to the development of the higher education system in the region and there was a belief that modernized European institutions would bring advanced knowledge to Latin America. This type of belief pressured local university systems to improve their quality and incorporate the most modern technology in Europe. These dependency links could consist of the tradition of completing studies at European universities, and the arrival of professors to teach at local universities (Schwartzman, 1996). However, this resulted in a relationship of dependence that persisted even after the independence movements at the beginning of the 19th century.

Despite efforts to create independence from colonial rule, much of the knowledge and training in Latin American universities maintained a dependent relationship with the former colonies. There was a dominant belief in the need to import advanced knowledge from Europe and for European institutions to benefit the development of higher education in Latin America. As a result, universities in Latin America were built to serve the interests of their own elites, often guided by public authorities and European universities, and focused on providing training for professional elites in the areas of science, engineering, medicine, and law. As Schwartzman (1996, p. 29) points out, “we should teach more natural sciences than philosophy; engineering, enthroned in France as the great profession of modern states, began to compete for primacy with medicine and law among the professions of the elites”. In other words, universities in Latin America were established during political independence from colonial powers, but they mainly served the interests of local oligarchic elites.

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Latin American universities were guided by the idea of building and modernizing the nation-state. Its close relationship with political power resulted in intense politicization of students and teachers, generating confrontations and tensions between the government and academic elites for university autonomy and serving as a space for the formation of political leadership (Schwartzman, 1996; Monteiro, 2009; Codato, 2015; Albalá, 2016). The new knowledge produced by higher education in Latin America was mainly taken advantage of by a small and privileged elite, using it as an instrument to gain social and political leadership positions. These university-educated individuals were part of an intelligentsia (especially in higher education) that leveraged the symbolic value of science and technology to assert their social and political leadership. This new experience was often the result of ancient local aristocracies and the state-controlled nature of Latin American universities, combined with a modernization project, led to a focus on economic development and, at the same time, responding to the demands of unequal societies (Torres, 2002; Schwartzman, 2007, Miceli, 2016; Whitehead, 2022)

This statement can be exemplified from the comparative analysis of the author José Vieira de Souza (2023), among the recommendations regarding higher education in Latin America, coming from multilateral organizations such as the World Bank (WB), International Monetary Fund (IMF), World Trade Organization (WTO) and OECD.

In this way, the OECD produces and circulates documents on higher education, based on a guiding standard of neoliberal reforms that seek to conceive it as a commodity and that guide multilaterality by the market paradigm, and not by the paradigm of society's demand. Recommendations from the OECD and the World Bank are in terms of paradigms for formulating educational systems and cross public policies, in order to identify indicators that privilege the economic context, to the detriment of the social one. The 2017 report "A fair adjustment - Analysis of the efficiency and equity of public spending in Brazil" highlights that the educational system is expensive and inefficient, questioning the constitutional obligation to allocate 25% of municipal tax revenues to education, arguing that this leads to disproportionate spending, without necessarily improving learning (BANCO MUNDIAL, 2017). Furthermore, the report notes that factors such as a low student-teacher ratio, the quality of teachers and high failure rates contribute to so-called "inefficiencies" in the educational system Brazilian. These findings, together with the OECD/PISA 2018 report, indicate the need for substantial reforms to improve the quality and efficiency of education in Brazil and achieve standards of excellence on the global stage. Such recommendations, which influence public and private investment policy at national and global levels, having as indicative, more representative, an increase in the participation of the private sector in the provision of educational services (Thiengo, 2019 in Souza, 2023) and as an example of such affirmation of the Brazilian case. According to Souza, in 2020 - despite the increase in students at higher education in the Latin context, from 11 million students in higher education institutions (HEIs) in the region in 2000 to almost 29 million in 2020 (UIS, 2021) the access rate to Brazilian higher education was only 37.4%. This indicator confirms the affirmation of an elite Latino university education.

In the midst of this configuration of higher education in Latin America as a space for the formation of political and mainly economic elites, a fundamental movement emerged both for Latin American thought and for its policies that were later developed: Dependency Theory. Dependency theory was opposed to the views established by the Economic Commission for Latin America and the Caribbean (ECLAC) and the conventional positions of European Marxism (Machado, 1999; Grosfogel, 2018; Dos Santos, 2020). It was a Marxist theoretical formulation developed by intellectuals such as Ruy Mauro Marini, André Gunder Frank, Theotonio dos Santos, Vania Bambirra, Orlando Caputo, Roberto Pizarro and others, which criticizes the processes of reproduction of underdevelopment on the periphery of global capitalism, contrasting with the position conventions of communist parties and the vision of ECLAC. This theory gained prominence in Latin America during the 1960s and 1970s, as it became clear that economic development did not follow a linear path. Dependency theory argues that the characterization of countries as “underdeveloped” arises from the dependency relationship between “central” and “peripheral” countries, expressing the subordination of peripheral countries to the development of central countries,

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and defends the liberation from dependence as a means of overcoming underdevelopment, which may involve breaking with the capitalist system itself (dos Santos, 2000; Machado, 1999; Grofoguel, 2018).

Dependency theory emphasizes that the dependence of underdeveloped countries is not just a result of their agrarian-export condition or pre-capitalist legacies, but rather the pattern of international division of labor in modern capitalism, imposed by imperialism. This theory introduces the concept of sub-imperialism, which refers to the expansion of national capital over neighboring economies, within the limits imposed by global monopoly capital (Marini, 2000). Technological dependence is a significant factor in this movement of sub-imperialism, since the bourgeoisie of dependent countries do not have the necessary strength to compete globally on their own. Despite partially rivaling the central country, the sub-imperialist country does not free itself from dependence, serving as a platform for the intermediation of capital and surplus value between the central country and peripheral countries. According to dependency theory, the characterization of countries as "backward" arises from the dependency relationship between the "central" capitalist countries of the world and the "peripheral" countries. "Core" countries are at the center of the world economy, dominating the flow of information, science, technology, and other aspects, while "peripheral" countries experience a smaller scale of development in these areas and have limited interactions with the center (Wallerstein, 2003). Intellectuals from Latin American universities, influenced by this line of thought, believed that it was necessary to transform the conditions of exploitation that their countries face in the face of dominant capitalist powers (Beigel, Patel, 2010).

Latin American intellectuals of Dependency Theory saw the polarization between center and periphery as inherent to the diffusion of capital and believed that the concentration of wealth implied a one-way path to overcoming underdevelopment. Breaking dependence on central countries would require breaking with dependence, not just the modernization and industrialization of the economy, and may even require breaking with capitalism itself (Beigel, 2006). The conclusion of dependency theory is that alignment with the national bourgeoisies of dependent countries is counterproductive for the Latin American proletariat, and that the formation of class alliances between the urban proletariat, the middle classes and the peasantry within these countries is more viable. This is a condition of epistemic sovereignty. However, implementing these changes within the university was a challenge due to the fact that it has historically been a space for the formation of oligarchic and political elites. It was only decades after the emergence of the intellectual movement of Dependency Theory that the university began to open itself to the peasantry and urban proletariat through policies designed to increase access to higher education. Even today, the reconfiguration of the university as an inclusive space continues to face numerous challenges.

4. Loss of epistemic sovereignty: from dependency theories to dependencies of international organizations

The emergence of military regimes in certain Latin American countries marked the beginning of the 1964 coup, resulting in the expulsion of left-wing intellectuals from universities and their removal from positions. Many of them sought refuge in Chile, which was then governed by a progressive regime under President Salvador Allende, but were forced into exile again after the Chilean coup in 1973. Dependency Theory faced a crisis after that, being heavily criticized for its alleged influence on the Chilean government of Salvador Allende. Critics argued that it failed to adapt to changes brought about by the consolidation of neoliberalism in Latin America in the 1980s and globalization in the 1990s. Academic and political debate during this period was dominated by macroeconomic perspectives, which limited discussions about development. The rise of authoritarian governments in many countries also led to the group's dispersion and persecution, which made it difficult to disseminate their ideas. Most of these intellectuals moved to Mexico, while others went to Europe, leading to the group's dispersion and making it difficult to maintain its theoretical unity. Furthermore, the early expulsion of the founders by military dictatorships in some countries, together with the limited availability of works in Portuguese and the

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increasing transformation of English-language scientific production circuits after the 1980s, also contributed to the decline in popularity of the theory.

During the resistance to dictatorial regimes in Latin America and the struggle to break with the system of subordination and dependence on central countries, a process of consolidation of social sciences in the region began. A significant part of this consolidation was due to the support of international financial institutions, such as the Ford Foundation and the Rockefeller Foundation, which provided funding for scientific activities, universities, and research institutes due to the growing importance and need for science and technology for development global. However, these institutions also supported non-governmental organizations, local participatory groups and were particularly concerned with addressing social realities (Calandra, 2011; Cueto, 1994).

The Ford Foundation has played a significant role in distributing resources across numerous fields and countries in the Americas, Africa, and Asia. Its focus on supporting public administration has been a major priority. The Foundation also actively supported social movements that opposed authoritarian regimes, funding research programs on local social movements, as well as programs related to sustainable development, public health, educational reform, ethnic and racial issues, inequalities, and biodiversity. Overall, the Ford Foundation supports programs led by local communities and works to promote public policies (Faria, Costa, 2006).

The Rockefeller Foundation, after the Second World War, began to support physical, chemical, and natural sciences, mainly in the area of agriculture. However, during dictatorial regimes in Latin America, the foundation had a conservative political stance on processes of social change, promoting population control and planning centers and programs, such as the Population Council, and evaluating projects influenced by political and ideological values (Faria, Costa, 2006).

According to Hélio Jaguaribe (1967), the training of intellectuals in central countries, especially in the United States, was highly sought after. Foundations, such as the Ford Foundation and the Rockefeller Foundation, were responsible for determining the areas that received funding, but the receiving country had the freedom to choose the specific projects (Marino, 2001). However, most of these countries were under dictatorial regimes, as is the case in Argentina, Colombia, Chile, and Brazil, or in the midst of social revolution, as is the case in Mexico. Part of this investment was related to resistance to communist expansion, in line with US government policy. This is evident in the support given by foundations for the consolidation of social research programs in these countries, such as the Brazilian Center for Analysis and Planning (CEBRAP) in Brazil, the institution responsible for training a group of intellectuals in Dependency Theory. Although commercial interests and humanitarian activities were not mutually exclusive, North American scientific institutions sought to adapt their research and activities to suit the unique themes and realities of each foreign country. As reported by Faria and da Costa (2006), fruitful institutional partnerships do not exclude conflicts or symbolic struggles. Although there have been lasting and positive effects of the actions of American foundations, focused mainly on scientific and technological capacity building in developing countries, it is important to note that there was a “subtle form of control” in the relationship between the US government and the directors of American foundations. and the scientific community of the beneficiary countries, as the curators determined the areas that would be supported and, consequently, the broader agenda of themes and objects.

After the introduction of agendas established by philanthropic and financial foundations such as the Ford Foundation and the Rockefeller Foundation, science based on neoliberal perspectives has been expanding globally. This neoliberal approach to science has been widespread since the 1990s, imposing a conservative worldview from North American think tanks to Latin American countries. This model is presented as inherent to academic capitalism, where competition for resources and the generation of scientific products are considered paramount, rewarding successful intellectuals with an increasing share of the profits from academic ventures. According to Lander's (2008) interpretation, science and academic research have not escaped the influences of the mercantile culture present in the market and in state and private institutions. The transformations that have occurred on the planet in the last three decades as a

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result of the advance of neoliberalism that began during the Reagan and Thatcher governments have profoundly affected the modes and processes of knowledge production in contemporary societies, including Latin America. Science and university research have been impacted by the mercantile logic that has been increasingly expanding in different areas of collective life (Lander 2008; Pereira dos Santos, 2022).

Today, Latin America faces challenges in its specialization system, as interstitial institutions, such as financial foundations and think tanks, participate in the public sphere and influence public policy. As these organizations gain strength, they aim to shape public opinion and play a role in areas such as education, politics, environment, health, and communication. This has led to a decline in the symbolic space of academia as universities face disinvestment from the State, which in Brazil, in 2022 alone, amounts to around 30% of the planned budget (Andifes, 2022), making them more dependent on investment private and philanthropic nature of these interstitial institutions, leading to the alignment of academic research with the values of these organizations. This scenario ends up making Latin American universities more dependent and resulting in the conduct of research and other initiatives that support the political decisions of such groups and organizations.

These organizations adopt different ways of working that use different styles of research and communication to reach different audiences as part of their strategies to influence public debate and public policy (Jang, Bechara, Bottom, 2022). Traditionally, the activities of these interstitial institutions were mainly restricted to deliberative circuits and epistemic communities, such as legislators, executive branch agencies, non-governmental organizations, and scientists, with long academic treatises on specific topics to direct public policy managers. But recently, they began to use social media, extending their reach directly to the general public, using discursive and persuasive strategies to mobilize followers' emotions and belief systems to drive debate in the digital public sphere (Schäfer, 2015; Castillo-Esparcia et al, 2015).

Furthermore, public and private organizations that aim to influence public opinion and policies have become instruments of territorial, paradigmatic and geopolitical disputes by defending different worldviews and interests (Ribeiro, 2021). In traditional centers of economic power, such as the USA and the EU, they try to maintain their role as validators of liberal thought in the new multilateral order, influencing debates on environmental preservation and opposing climate change mitigation policies (Almirón et al, 2020). There is an extensive literature on the influence of these interstitial institutions in the US and Europe, where they are seen as promoting doubts about science and the environment or supporting efforts to combat information disorders such as disinformation and hate speech (Jacques et al, 2008; Almiron et al, 2020; Plehwe, 2021). However, there is limited academic research on the role of interstitial institutions in Latin America, with a focus on highlighting their neoliberal role in the advancement of neoconservatism (Azevedo Junior, 2020; Ribeiro, 2021).

With global geopolitical relations undergoing a multipolar shift, Latin America has become a central focus of dispute and attention (Mori, Bardales, 2020). Institutions, financial foundations and think tanks from traditional centers of economic power, such as the United States and the European Union, are trying to reinforce their role as validators of liberal and neoliberal values in the new multilateral order. To achieve this, they are forming alliances with Latin American governments and institutions, including state-funded scientific institutions, in order to support the implementation of their agendas in public debate.

However, the growing number of actors in the specialization system for political purposes, many of which are financed by the Ford Foundation itself, signals a new mode of influence, dependence and colonialism of ideas in Latin America. To understand the role of these interstitial institutions in the public debate in Latin America, it is necessary to study their functions, persuasive strategies, activities, and context (Mendizábal, 2014). Understanding the role of these institutions is crucial to understanding the ongoing destabilization of democratic regimes and the international flows that maintain a state of colonial

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dependence, particularly in the domain of information, which has been a central factor in shifting the dynamic center from the West to the East.

5. Circuits of excellence as epistemic sovereignty

With the resurgence of democracy in Latin America, particularly in the 1990s, there was also an intensification of the globalization process. This was accompanied by a restructuring of the global scientific community (Oliveira, 2020). English has become an essential form of communication and a necessity for countries without language policies that prioritize the teaching of the language in their basic and higher education systems, such as Latin America. There has been a significant amount of research on the impacts of the widespread use of English, including its role as a normative model in second language teaching (Cook 1999; Parakrama 1995) and as a lingua franca of science (Leung 2005; Dewey, 2007). Some literature argues that this represents a form of linguistic imperialism (Phillipson 1992; Kontra, Phillipson, Skutnabb-Kangas 1999).

According to Suzina (2020), the use of English as a lingua franca in science creates barriers to equitable participation and diverse perspectives in scientific publications by imposing a standard level of fluency for international circulation. Suzina argues that the dominance of English in the scientific publishing system acts as a form of language domestication and leads to epistemological domination. This supports the idea of epistemic injustice, as described by Fricker's concept of hermeneutic violence and Spivak's notion of epistemic violence (Spivak, 2015).

Despite this, Latin America has established its own open access scientific publishing circuits and with a diamond state model, as a response to the predominantly English-language model dominated by authors and editorial board members from Western countries (Albuquerque et al, 2020; Goyanes, 2020; Goyanes, Demeter, 2020). These initiatives were created almost a decade before the launch of the Budapest Open Access Initiative (BOAI) in 2002 (Sanchez-Tarragó et al, 2012). Latin American open access initiatives were founded on the principle that knowledge should not only be accessible through traditional scientific publishing channels, but also through alternative spaces that are less dependent on editorial monopolies, English as a lingua franca and its commercial models (Oliveira et al, 2021). This challenged the uneven production and circulation of knowledge in traditional “centers of excellence” that excluded peripheral scientific communities (Beigel, 2016; Vessuri, Guédon & Cetto, 2014).

Latin America has established its own transnational and regional circuits to neutralize the effects of epistemic injustice, creating a publishing system that aims for epistemic sovereignty. These initiatives constitute an alternative to traditional circuits of hegemonic prestige (Beigel, 2016), relying on decentralized infrastructures and non-commercial solutions for academic publishing. Latin American initiatives are based on collaborative efforts to publish research results in open access repositories, such as SciELO, Redalyc, Latindex, among others.

Despite the importance of Latin American initiatives for epistemic sovereignty in scientific publishing, these circuits remain largely invisible due to the dominance of a global-based model of academic capitalism that is heavily influenced by university ranking systems that originated in the 1990s. 1990, both in the West and abroad. -Western countries (Mugnaini, Digiampietri, & Mena-Chalco, 2014). This university classification model, produced mainly by institutions based in the United States, perpetuates ethnocentric views and reinforces the notion of a universal standard (Albuquerque & Oliveira, 2020).

A “metric tide” (Wouters et al, 2015), developed mainly by Western and central countries, began to dominate discussions on studies related to the use and analysis of CT & I indicators. Despite criticism of this scientific measurement process, such as the Declaration of San Francisco (2012) and the Leiden Manifesto (Hicks et al, 2015), these indicators are still used in the scientific policies of several countries to assess the quality of scientific production and to make comparisons between countries, industries, and organizations public and private. Most of these policies in non-Western countries do not address measurement problems and simply adopt a set of indicators widely accepted by traditional literature, often

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ignoring the particularities of scientific circulation in each country. Such uses of international classification systems tend to underestimate the role of scientific production, equating quality and impact with presence in central and English-speaking circuits.

> "Latin America disappeared from the system because its production was considered invisible by the rules of the game. (...) It is not that Latin America has stopped producing significant research, or that quality has decreased; research in the region was simply excluded from the circuit that began to define quality in global terms and was considered second class" (Albuquerque, Oliveira, 2020, p. 88)

Universities play a central role in legitimizing new forms of domination, establishing ties of academic dependence between peripheral and central societies, and creating discourses that justify this new order and serve as a basis for public scientific policies. This extends beyond the publishing system, but also to all areas of academia. Guzmán-Valenzuela's (2017) analysis of teaching and learning documents at Latin American universities between 2000-2015 showed that these programs tend to prioritize theories produced in the Global North and ignore knowledge from the South and its context. According to Majee and Rees (2020, p. 476), internationalization practices in the Global South are linked to struggles for racial equality, while the administrative perspective sees internationalization as a neutral, objective, and depoliticized operation.

The emergence of initiatives to reduce the dependence of the higher education system on scientific publishing monopolies and their evaluation metrics that reinforce asymmetries is evident in Latin America. The Latmetrics Network, formed by LATmetrics and the Latin American Symposium on Metric Studies in Science and Technology, is an example. Created in 2018, the Network brings together researchers, institutional managers, and other stakeholders to discuss alternative metrics and open science that align with social justice in Latin America. The biennial event attracts more than 200 participants and aims to increase participation in science policy and provide a less normative solution independent of scientific publishing monopolies (Velez-Cuartas et al, 2022).

Another demonstration of epistemic sovereignty is the creation of AmeliCA, a cooperatively supported scientific publishing and open scientific communication infrastructure based on a non-profit publishing model to preserve the academic and open nature of scientific communication (Becerril-Garcia, 2018). The formation of the Asociación Latinoamericana de Editores Cientifiques (Alaec), made up of associations of scientific editors such as Aseúc in Colombia, ABEC in Brazil and AURA in Uruguay, is another example.

This associationism is a characteristic of Latin America as a way of strengthening and institutional recognition of collectives (Gohn, 2008; Azerrad, Rossler, 2018). As Oliveira et al. (2021) discuss, initiatives like these, which emerged in Latin America and the Caribbean, began to appear in two contexts and reflected a general feeling of dissatisfaction with traditional metrics: a) The first comes from the dissatisfaction of the scientific community with traditional metrics and indicators that do not reflect the reality of Latin America. Dependence on large index databases, such as the products offered by scientific-technological-editorial oligopolies, whose investigations for decades have shown a low presence of Latin America and the Caribbean in these spaces. b) in the context of technological transformations, in which we began to pay more attention to the terrain and the way in which science circulates in traditional circuits of scientific and technological production, as well as the way in which it dialogues with society.

6. Platformization of science and dependence on technological oligopoly

Platformization is defined as the penetration of infrastructures, economic processes, and government structures of digital platforms into different economic sectors and spheres of life (Poell, Nieborg, van Dick, 2020). Platformization occurs in different areas of science, technology, and innovation. In terms of technology, the dominance of the US-based system by five major technology companies (AlphabetGoogle, Amazon, Facebook [FB], Apple, and Microsoft, known as GAFAM) has permeated

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economic and civic life on every continent except China. In contrast, China operates a state-controlled business ecosystem centered on its three large companies (Baidu, Alibaba and Tencent or BAT). Despite having few "big" national technology companies, the European Union (EU) intends to position itself as a driver of change in the global digital economy. The clash between state powers is increasingly taking on a techno-business dimension, revealing interconnected interests between American, Chinese, and European actors in global digital governance. This entanglement is generating tensions between the continental superpowers and their allies (Van Dijck, 2021). In terms of science and innovation, the consolidation of the scientific publishing industry and the significant profit margins of large publishers have sparked broad debates within and outside the scientific community. After the 1990s, when the science and innovation ecosystem radically changed through a tide of metrics to indicate quality (Wouter et al, 2015), there was an increase in the migration of journals between small and large publishers (Larivière, Haustein, Mongeon, 2015). Science has always been competitive, but with the globalization of knowledge and the increasing use of global classifications, competition has reached new heights (Hazelkorn, Gibson, 2017). Higher education institutions and university research are seen as national differentiators in the global knowledge economy, and global US and Chinese rankings are used to measure quality, performance and productivity. These rankings are driven by the realization that national pre-eminence is no longer enough and reflect the public's growing demand for transparency, value, impact and benefits.

Currently, the Latin American and global scientific system depends on three oligopolies: a) scientific oligopolies, dominated by six large companies (ACS, Reed-Elsevier, Springer, Wiley-Blackwell, Taylor & Francis and Sage), where profit is generated from the commercialization of knowledge (Larivière, Haustein & Mongeon, 2015); b) the global classification system (Woodcock, 2018; Feldman & Sandoval, 2018), which tends to evaluate scientific research in Latin America based on criteria that do not reflect the role of universities in the Global South; etc.) a technological oligopoly, made up of giants such as Google and Microsoft, which provide support services for academic activities, as part of the science platformization process.

The growing presence of technological giants such as Google and Microsoft is affecting scientific practices in Latin America and the world, as they provide their services to universities and research institutions as "solution providers" "free of charge". Its business model is based on collecting and analyzing large amounts of data and metadata from users of its educational packages, which include email, video conferencing, groupware, file exchange and other services. This results in the platformization and datafication of higher education and universities. The platformization of science means penetration into all research phases of higher education systems (van Dijck et al., 2018). According to a study by Amiel et al. (2023), almost 80% of Latin American universities use the services offered by these technology giants, with eight out of ten institutions trusting their offers.

In May 2022, Google (which holds a significant 63% share of the technological solutions market for universities in Latin America, according to Amiel et al., 2022) changed its contract and imposed policies on academic communities, limiting its service to users. The widespread adoption of these services, which was accelerated during the Covid-19 pandemic, is largely due to disinvestment in public education in Latin America and represents a threat to the operational autonomy of research and teaching institutions. Additionally, there are concerns about personal data security, data control, privacy, and transparency for teachers, administrators, and students (Amiel et al., 2022).

Divided between opportunities to improve the quality of academic community practices and new risks and threats to security, privacy, freedom and democracy, these countries face the challenge of developing knowledge, skills, and competencies to adequately take advantage of these new technologies. The expansion of universities in Latin America, especially in Brazil, without accompanying the creation of their own technological infrastructures, has led public and private actors to accept the technological solutions offered by transnational companies in the digital economy, without wasting time to reflect on economic transformations, political, institutional, and cultural factors that they can produce. These public-

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private partnerships create a strong dependence on knowledge and increase the digital divide between North and South countries.

As discussed by Zuboff (2019), this new economic order claims human experience as free raw material for hidden commercial practices of extraction, prediction, and sales. They present themselves as providers of "almost free solutions" and use a discourse of democracy, access, work facilitation, security and transparency to meet demands for better science (Maciel, Appel & Albagli, 2014; Oliveira & Sobreira, 2020). These private companies standardize scientific practices as a way of attributing a universal value to a knowledge production routine (Mirowsky, 2018; Oliveira et al., 2021). The world's leading academic publishers, such as Elsevier, Springer, Wiley-Blackwell, Taylor & Francis, and Sage Publishing, have adopted the discourse of "radically collaborative science" to offer services and make it a profitable market segment (Wiley, 2011; Heimstadt, 2017). The platformization of science and the rise of open data, open review, preprints, and repositories reinforce the infiltration of economic processes into scientific practices (Mirowski, 2018).

7. Final considerations on epistemic sovereignty

The notion of epistemic sovereignty is a critical framework for addressing injustices and asymmetries in the global knowledge ecosystem. It goes beyond identifying and reporting epistemic violence and injustice and provides a path to creating solutions to combat these issues. Epistemic sovereignty emphasizes the importance of control, access, and autonomy over the production of information and knowledge and challenges power structures and dominant epistemologies.

A significant aspect of epistemic sovereignty is the recognition of historical imbalances in the production and circulation of knowledge, particularly between the global North and South, the center, and the periphery. It highlights the need to recover the knowledge and experiences of marginalized actors and to promote the production and validation of diverse knowledge. This involves challenging the dominance of the English language and Western-centric knowledge systems, and creating spaces for local, regional, and situated knowledge to be valued and respected.

Epistemic sovereignty also involves addressing structural changes in the global system, including the reassessment of values, policies, and knowledge production processes. It calls for the development of alternative academic circuits, such as the Scielo, Latindex and Redalyc databases, to counter the commercialization and exclusion practices of international journals and data repositories. It also requires challenging the reproduction of dominant power structures in higher education institutions in peripheral countries and promoting mechanisms for the emergence of diversified knowledge production.

As global geopolitical dynamics shift toward a multipolar landscape, Latin America has emerged as a region of central focus in the struggle to regain its own sovereignty, fought over by transnational corporations over the past decade. The role of scientific and higher education systems is fundamental in the construction and maintenance of national sovereignty, as they are responsible for the production of knowledge and the formation of intellectual elites. And Latin American universities were fundamental in this process of denouncing epistemic injustices and creating mechanisms to recover their sovereignty over knowledge.

For example, in this context of growing digital epistemic sovereignty movements in Latin America, we see the launch of multilingual indigenous data repositories and platforms. The National Historical and Artistic Heritage Institute (Iphan), an agency linked to the Special Secretariat for Culture and the Ministry of Tourism, launched, in 2022, the Nimuendajú Platform. It is a web version of the Ethno-Historical Map of Brazil and Adjacent Regions, created and designed by ethnologist Curt Nimuendajú in the first half of the 20th century. The platform aims to allow user interaction with the Map, in a digital environment, through direct queries to the database created from the information contained in the original documents and printed versions (maps and books). The map aims to update access to content created by Nimuendajú for the digital-informational medium, with the possibility of associating them with layers such as

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archaeological sites registered by Iphan, Biomes, Indigenous Lands, Conservation Units, States and Municipalities. The Platform is the result of a partnership between Iphan, the Federal University of Pará, in Brazil, and Cooperativa Eita.

Faced with a moment in which the influence of interstitial foundations and think tanks are present in the public debate, Latin America has taken measures to assert its presence in public discourse and claim its epistemic sovereignty. In Brazil, scientific lobbies such as the College of Communications Directors and the National Association of Directors of Higher Education Institutions joined forces to establish a unified news agency for Brazilian universities. This initiative aims to increase the visibility of these universities in the media and among public policy makers, mapping their scientific experience and creating data centers. The National Institute of Science and Technology for Informational Disputes and Sovereignty was also created to support efforts to assert epistemic sovereignty in Brazil. These initiatives aim to promote a more active role for Latin America in the public debate and reestablish its experience in defining public policies.

To reduce dependence on commercial platforms, Latin America has explored creating its own technological infrastructure since the 1990s. For example, the Lattes Platform, created in 1999, aims to gather metadata and information about researchers and their work. and is used by the Brazilian academic community to evaluate researchers, programs, and institutions. Another example is the National Education and Research Network (RNP) in Brazil, a Social Organization (OS) linked to and supported by the Ministry of Science, Technology and Innovation (MCTI). It pioneered internet access in Brazil in 1992, to meet the needs of the academic community. It is interconnected with other teaching and research networks in Latin America, North America, Africa, Europe, Asia, and Oceania through terrestrial and submarine fiber optic cables. ColaV, a transdisciplinary collective at the University of Antioquia in Colombia, works on research, development and innovation at the intersection of universities and society, preserving language, culture and memory in Colombia and addressing governance and public policy. The Colombia Consortium brings together higher education institutions to provide more cost-effective access to specialized tools, publications and scientific research. It created a portal to showcase the strengths and capabilities of member institutions and promote international collaboration and networking. These are some examples of how Latin America has sought to develop its own infrastructures as an alternative to the proprietary platforms of transnational technological oligopolies and international interstitial institutions.

The notion of epistemic sovereignty provides a powerful framework for understanding and addressing injustices and asymmetries in the global knowledge ecosystem. It emphasizes the need for control, access and autonomy over the production of information and knowledge, challenges dominant power structures and promotes alternative academic circuits. By recognizing and reclaiming epistemic sovereignty, countries and communities can assert their own identities, challenge hegemonic epistemologies, and strive for greater autonomy and authority over their own knowledge systems. The essay aims to discuss why the notion of epistemic sovereignty is important and to understand the forces and disputes in the global ecosystem of higher education, in which Latin America has been fighting for its survival in the face of epistemic injustices propagated by the global forces that dominate the fields of science, technology, innovation, and education. To this end, it presents the concept of epistemic sovereignty in a historical panorama to show the continuous resistance movements in Latin America against the dominance of knowledge production spaces, with a focus on higher education.

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Justification for knowing in a digitalised landscape: An empirical exploration

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Abstract

Epistemic beliefs are described as the way individuals regard the nature of knowledge and knowing. The nature of knowledge can be explored as dimensions describing the certainty and the structure of knowledge, whereas the nature of knowing can be explored as dimensions describing the source of knowledge and the justification for knowing. Recent research suggests justification for knowing as consisting of three strategies for justifying knowing: 1) justification by authority, 2) justification by multiple sources, and 3) personal justification.

Knowledge is considered to originate from various sources, where testimony is regarded as the most important. Many online interactions are about conveying information to others and thus, testimonial in nature. The information we receive in various testimonies requires justification using the appropriate justification method. Therefore, source of testimony is central when justifying knowing.

In a pilot study among first-year students we explored how the source of testimony and the type of information affect the choice of justification method. The use of justification methods was measured using the Internet-Specific Epistemic Justification Inventory (ISEJ). The results indicate that the source of testimony has a stronger impact than type of information on the choice of justification method.

Keywords: epistemic beliefs, justification, knowledge, internet, epistemic injustice, testimonial injustice, social media

1. Introduction

Since the introduction of the internet, traditional media (books, journals, newspapers, radio, television) are increasingly being used in digital formats alongside their analogue precursors. In addition, the digitalised media landscape is characterised by a multitude of social media platforms where, unlike

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traditional media, a large part of the content is user generated. All the various types of media convey to us information from both known sources and from sources whose identity is covert or fictitious.

To a large extent we construct our knowledge upon information that is often conveyed to us as testimonies via the media. Considering that testimonies are regarded as the main source of information, the question arises: how do users in this new media landscape choose and justify information to be part of their knowledge?

How people regard knowledge can be explored using the concept of epistemic beliefs, which has attracted increasing interest during the past decades. This also applies to the concept of epistemic injustice, which includes the concept of testimonial injustice. Thus, testimony is a common component for these concepts.

In the following, I present brief introductions to the concepts of epistemic beliefs (including justification for knowing as a key element when assessing testimonies), testimony, and epistemic and testimonial injustice, while connecting them to the digitalised landscape.

2. Epistemic beliefs

Each science or discipline has its own epistemology, that describes what is considered knowledge, how knowledge is created within the discipline, and what is possible to know. Similarly, individuals have their personal – often unconscious – epistemic beliefs about the nature of knowledge, and how to create personal knowledge based on the information they receive. One's epistemic beliefs influence how one assesses information, and how one creates one's own knowledge. In educational settings, the epistemic beliefs are reflected partly in how students learn, partly in how teachers set up their teaching and learning activities.

2.1 Epistemic beliefs as a set of dimensions

Research around epistemic beliefs already has a 50-year history that includes extensive research. The foundations of the concept of epistemic beliefs were laid already in the 1970s, and an important milestone for one line of research was the Epistemic Questionnaire (EQ) introduced by Marlene Schommer (1990). This line of research is based on the idea that our epistemic beliefs can be seen as a multidimensional construct where the dimensions develop independently of each other. In the beginning, dimensions that also described learning views were included. Hofer & Pintrich (1997) among others suggested that epistemic beliefs should, however, describe only views of knowledge and knowing. Hofer & Pintrich structured the epistemic dimensions according to 1) the nature of knowledge including the dimensions 1.a) *certainty of knowledge* and 1.b) *structure of knowledge*, and 2) the nature of knowing with the dimensions 2.a) *source of knowledge* and 2.b) *justification for knowing*.

- *1.a. Certain(ty of)*[1] *knowledge* expresses[2] a view of knowledge as certain, absolute and not changing or developing.
- *1.b. Simple (structure of) knowledge* expresses a view that knowledge is mainly hierarchically structured and consists of simple, unambiguous, isolated pieces instead of complex or coherent concepts.
- *2.a. Omniscient authority / Source of knowledge* expresses a view where one sees an omniscient authority as the primary source of knowledge.
- *2.b. Justification for knowing* was presented as a dimension by Hofer & Pintrich (1997) but interestingly, rarely operationalised in the various instruments presented during the following

[1] Throughout the years, the dimension labels have varied to some extent.
[2] The dimensions are here expressed according to what Schommer, and several successors described as a "naïve orientation", which assumes that one's epistemic beliefs develop from naïve to sophisticated.

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decades, with exception for the Internet-Specific Epistemological Questionnaire (Bråten et al., 2005).

In the line of research initiated by Schommer (1990), epistemic beliefs have been measured using questionnaires, where respondents respond to statements that constitute operationalizations of the epistemic dimensions. The statements have been answered on anchored attitude scales with the poles "totally disagree" and "fully agree", although the number of steps have varied. The answers have often been analysed using exploratory factor analysis to extract the anticipated dimensions. However, replication has often failed because the factor analyses yielded unanticipated factors, the factors were based on too few variables, and/or the resulting scales showed poor reliability. DeBacker (2008) and Schraw (2013) present informative descriptions of these challenges.

Hofer & Pintrich (1997) described source of knowledge (omniscient authority) and justification for knowing as dimensions describing the nature of knowing, but in more recent models, the dimension of justification for knowing has been expanded and clarified. For instance, Ferguson et al. (2013), Strømsø & Kammerer (2016) and Bråten et al. (2019) have suggested that justification for knowing should itself be seen as a trichotomous belief framework. For this purpose, Ferguson et al. and Bråten et al. have suggested three sub-dimensions for justification: 1) justification by authority, 2) justification by multiple sources, and 3) personal justification. The operationalisation of these dimensions in the validated Internet-Specific Epistemic Justification Inventory (ISEJ, Bråten et al., 2019; Appendix A) illustrates that they can be seen as methods or resolution strategies to overcome epistemic doubt and justify one's knowing.

2.2 Epistemic beliefs in various contexts

In Schommer's (1990) model, it was assumed that an individual's epistemic beliefs develop from a naïve to a sophisticated level. Contrary to the naïve stance, a sophisticated (mature) belief entails that one sees knowledge as changing and developing, consisting of complex constructs, and that one can derive knowledge through personal reasoning. Among others, Elby & Hammer (2001, 2010, p. 431) have pointed out that the naïve–sophisticated axis is not appropriate, since it is more important to identify whether the individual's beliefs in the various dimensions are productive, that is, if they promote learning and development.

Another discussion, building on the one above, is that the measurement of epistemic beliefs should be linked to a specific context (see, e.g., Bråten et al., 2019; Elby & Hammer, 2001, 2010, p. 431; Grossnickle Peterson et al., 2017, pp. 257–258; Muis et al., 2006, 2016). Let us exemplify with the information that water (given a certain salinity, atmospheric pressure, altitude etc.) freezes into ice at 0°C. Taking a naïve stance, that is, regarding that information as certain and immutable, is productive. An opposite example could be about whether the global ambitions for reduced greenhouse gas emissions are insufficient or excessive to slow down the alleged climate change. In the first example, there is abundant empirical evidence, and it is appropriate to treat the information naïvely and regard it as unchanging. In the second example, there is evidence that climate change is a complex issue, and as new findings are constantly emerging, it would be unproductive to take a naïve stance on that issue and believe that we have arrived at the ultimate truth.

There are examples of studies where measurement has been linked to context and domain, although there is some variety in how context and domain have been conceptualised. For instance, Muis, Bendixen, & Haerle (2006) propose distinguishing between three contexts, that is, the socio-cultural, the academic and the instructional context. The two latter can hold domain-specific beliefs, whereas the socio-cultural context holds general epistemic beliefs. In a later study, Muis et al. (2016) compared epistemic beliefs by linking them to the domains of mathematics and psychology, and also included everyday knowledge as a kind of general domain. Grossnickle Peterson et al. (2017) regard the internet as a context and suggest task as an aspect of the context. Bråten et al. (2019) focus on what individuals believe about knowledge on the internet and how they come to know on the internet. When phrasing the statements on the Internet-

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Specific Epistemic Justification Inventory (ISEJ), Bråten et al. (2019) regarded teacher education as the domain and the internet as the context. As the examples show, context has been used like an umbrella term that can include, for instance, domain, discipline, task, or the online setting on the internet. Thus, context can include basically any circumstances surrounding the situation where an individual exerts epistemic agency.

Chinn et al. (2011) criticise epistemic beliefs research for measuring on a general level that is too coarse. Consequently, paying more attention to the contexts by framing measurement in a limited set of circumstances surrounding the situation would enable more fine-grained measurement. Hereafter, when measuring epistemic beliefs, I will use the term "contextual elements" (cf. Grossnickle Peterson et al., 2017, p. 257) to denote this "set of circumstances surrounding the situation where an individual exerts epistemic agency".

2.3 Epistemic competence

According to Grossnickle Peterson et al. (2017, pp. 257, 262), the insight that knowing should be justified is of central importance to what they call epistemic competence. They define epistemic competence as the ability to use contextual elements (in the situation) to decide how knowing is to be justified. According to my interpretation, epistemic competence could also include the ability to strategically and flexibly vary one's epistemic beliefs – or epistemic frameworks as Elby & Hammer (2010) put it – while taking into account the relevant contextual elements at hand.

Regardless of whether we're talking about primary school or university studies, pupils and students need to learn about different subjects and phenomena. As the examples of freezing point and climate change show, we need to be able to adopt an appropriate view of knowledge and justification method depending on what we are to learn. Regarding a phenomenon that actually requires a sophisticated attitude, a naïve attitude can, however, be expedient and productive in the beginning, when the insights into the phenomenon are still superficial (cf. Elby & Hammer, 2001). As the insights deepen, the beliefs can develop towards sophistication – we can sense a parallel to Bloom's taxonomy, from knowing to evaluating and creating (see, e.g., Krathwohl, 2002).

Thus, in some cases, a naïve epistemic belief is productive, in other cases a sophisticated epistemic belief is more appropriate. The epistemic beliefs can thus be seen as building blocks of one's epistemic competence, and also as part of one's learning competencies.

Bromme et al. (2008, p. 431) address the importance of understanding how different sources (or testimonies) may require different methods for justification. Bromme et al. further describe epistemic sophistication as the ability to flexibly adapt one's epistemological judgments to the context, which is rather close to the definition by Grossnickle Peterson et al. (2017, p. 257).

3. Testimony

3.1 Testimony as information source

Our knowledge is considered to originate from four or five different sources. Simon (2010) and Gelfert (2014, p. 55) describe them as perception, inference, memory, and testimony, whereas for instance in The Stanford Encyclopedia of Philosophy (Steup & Neta, 2020) they are described in slightly other terms as perception, introspection, memory, reason, and testimony. There seems to be broad agreement that testimony is the dominating source for a major part of the information we receive, be it verbally, visually, or in writing, or as a mixture of these (Chinn et al., 2011; Lackey, 2006, p. 1).

The process from testimony to knowledge can be conceptualised as in Figure 1.

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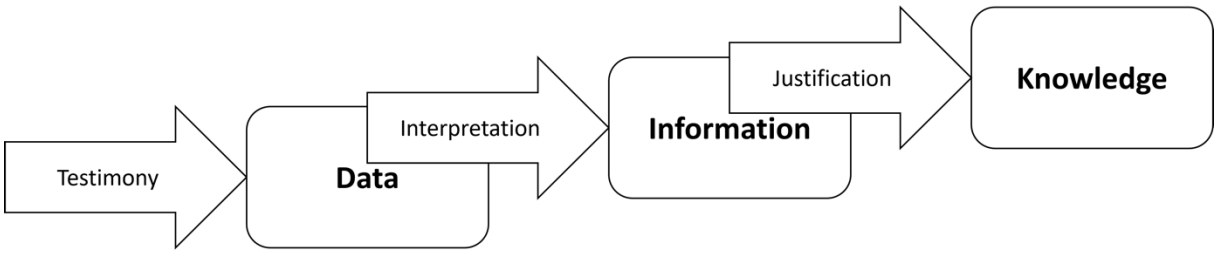


Figure 1. From testimony to knowledge.

Strictly speaking, what we receive by testimony is always mere data that we then give a meaning through our interpretation and can thereby understand as information. The interpretation depends heavily on our previous knowledge (but also attitudes and preconceptions), so that for instance "F4" can be interpreted by one person as the 4th floor in the F wing of a building, or by another, mathematically oriented person, as the hexadecimal format of the decimal value 244. The information – or actually the data – that the hearer receives stems from a speaker, traditionally a known or unknown person. We are exposed to more testimony than we have time to process but still, for the information we receive we must decide how we relate to it, and how we justify it to make it (or discard it) part of our personal knowledge (here I choose to ignore the cognitive levels (cf. Krathwohl, 2002) that are also part of knowledge building).

Chinn et al. (2011) note that all knowledge derives from multiple sources simultaneously[3]. Although testimony can be regarded as the major source of information, Chinn et al. point out that all the sources interact, that is, one's knowledge of a topic will rest jointly on one's perceptual experiences, the testimonies of others, one's memory containing past knowledge-acquisition episodes, and finally one's own reasoning, weighing and connecting everything together.

3.2 Testimonies in internet-related contexts

Gelfert (2014, p. 15) suggests that, in a broad epistemological sense, we may think of testimony as simply a way of conveying information and generally, testimony is understood as an act of (synchronous or asynchronous) communication where a speaker conveys information to a hearer. The medium can be verbal but also written, recordings, gestures etc. (Gelfert, 2014, p. 27). Gelfert (2014, p. 95) connects testimony with justification when pointing out that a theory of testimony should also be concerned with what justification there is for either accepting or rejecting an instance of testimony. If we ignore justification, we will have no way to rule out illegitimate cases of rejection or cases of credulous acceptance of testimony.

New technologies induce new practices so that in today's digitalised media environment, the speaker of a testimony can also be a bot, a troll or perhaps a search algorithm, and quite often, both type and identity of the speaker remain hidden from the hearer. Tollefsen (2009) notes that in more liberal definitions, testimony can be defined as "tellings in general" without restrictions regarding the context, thus also including the internet. Origgi & Ciranna (2017, p. 310) note that since many online interactions are about conveying information to others, they are testimonial in nature.

In some epistemic beliefs studies (e.g., Bråten et al., 2019), the internet has been used as the context. However, for most people and especially the young generations, the internet is nowadays such a natural part of daily life (see, e.g., Andersson, 2017; Sundin et al., 2017) that it is hardly relevant to refer to the internet as a specific context. Further, if we were to regard the internet as a single context, we would ignore that the internet in itself contains infinite sub-contexts where a multitude of – known and anonymous – epistemic agents convey their testimonies.

[3] Basically, also information from all the other sources should be justified but due to space restrictions, this paper is delimited to discussing the justification of testimony-based information.

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Since the introduction of the internet, and especially since smart phones became commonplace in the 2010s, people increasingly get their information as what we might call "internet-based testimonies". This applies especially to the younger generations and among them, social media plays an increasing role. A study in the US shows that 77% of the teenagers get their news and headlines from social media, and 75% of the respondents feel that traditional news media mostly have no idea about the lives of young people (Robb, 2020, pp. 8, 26). The latest European Youth Barometer reports social media and news websites as top sources of information on political and social issues, both mentioned by 41% of the respondents aged 16 – 30, and also here, the youngest group used social media to a larger extent than the more mature respondents (European Parliament, 2021, pp. 41, 44). Similarly, a Finnish study shows that young people trust social media and influencers to a larger extent than previous generations (PING Helsinki, 2019, p. 17).

Dahlgren (2018) claims that, partly due to the vast information online, the concept of democracy is today facing a growing epistemic crisis. This problem of knowledge and trust, that Dahlgren regards as key dimensions in what he calls civic cultures, is of importance for democratic participation. MacKenzie et al. (2021) draw our attention to the fact that the vast amount of information available on the internet should make us consider whom and which testimonies we can trust. In the internet contexts it is, however, increasingly difficult to know, who is the actual speaker behind the testimony. This complicates our efforts to assess the speaker's credibility, perhaps to such an extent that we pass critical assessment and justification in the background.

A recent example of the multitude of "speakers" in the internet context is the chatbot ChatGPT (OpenAI, 2023) that was released for open access in December 2022. To a question from the user, ChatGPT is supposed to be able to compilate an answer based on texts available to the bot. ChatGPT is supposed to learn from feedback provided by the users and thereby, the ChatGPT-generated texts are expected to continuously improve to give an authentic, human-generated, knowledgeable impression. In the future, ChatGPT and other AI applications will probably be increasingly used for generating texts, both in an automated manner and at the request of a user. However, if the source texts contain mis-/disinformation, it will inevitably accumulate. It has also been discovered that when the necessary information is lacking, ChatGPT will simply fabricate an answer that may be quite irrational and contain references to e.g., conferences and articles that do not exist (see, e.g., Pollesello & Papp, 2023; van Dis et al., 2023).

4. Epistemic and testimonial injustice

Miranda Fricker has introduced the concept of epistemic injustice and since her seminal work (Fricker, 2007) was published, the concept has received increasing attention (see, e.g., Davis, 2016; Gelfert, 2014; Kidd et al., 2017; Medina, 2011; Tollefsen, 2009). Fricker regards the overall aim of the concept as exploring two kinds of dysfunction in the epistemic practices between people: testimonial injustice and hermeneutic injustice. According to Fricker (2007, p. 17), testimonial injustice occurs when prejudice relating to social identity causes a hearer to afford a speaker's testimony an incorrect level of credibility. This prejudicial dysfunction can result in two kinds of testimonial injustice where the speaker is wronged: in the first case, the (often disadvantaged) speaker may receive less credibility, and in the other case more credibility than deserved (Fricker, 2007, pp. 20–21). I will delimit this presentation to the concept of testimonial injustice and in addition, I intend to make an attempt to extend the concept that, according to Fricker is limited to 1) individually based prejudice relating to social identity, 2) credibility deficit, 3) speakers as humans, and 4) harm to the speaker.

Fricker's original concept delimits testimonial injustice to something that results from prejudice (Fricker, 2007, pp. 17, 22, 2017, p. 53) but regarding this aspect, it might be interesting to zoom out: every encounter with another speaker is affected by our preconceptions, which can be of various kinds. If the preconception is negative, we can label it as prejudice, usually causing us to afford the speaker's

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testimony an inflated level of credibility. Our preconception can also be neutrally unprejudiced and open-minded, and if our preconception is (overly) positive and admiring, it can cause us to afford the speaker a high or even excessive level of credibility.

Fricker states that testimonial injustice is about credibility deficit but on the other hand, she does not rule out the possibility of credibility excess and that it can also be harmful to the speaker in a way "…that merits the label testimonial injustice" (Fricker, 2007, p. 20). There is some disagreement as to whether credibility excess should be included in the concept but still, some later researchers (see, e.g., Davis, 2016; Medina, 2011) have addressed the importance of acknowledging credibility excess, that they maintain can harm both privileged and disadvantaged speakers. As MacKenzie et al. (2021) note, "we have a tendency to be passive before overwhelming information or when informants we trust, respect or admire speak; we often grant too much credibility to the speaker or the source". Thus, from the education and information literacy perspectives, testimonial injustice in terms of credibility excess is a most interesting aspect of epistemic injustice, especially in various internet contexts where, for instance, a search situation may involve both credibility deficit and credibility excess.

During the past decades, educational and information literacy researchers have expressed their concern about internet users sometimes relying too easily on the information they find on the internet (e.g., Biddix et al., 2011; Hämäläinen et al., 2021; Huvila, 2013). This may occur in two ways, that is, 1) the user relies on the hit list presented by the search engine, trusting that the top of the list is what there is to know about the topic at hand, and 2) the user relies on a web source (perhaps from the hit list), trusting what it says, without appropriately assessing the quality and credibility of the source. Both the hitlist itself and the picked source are here regarded as testimonies. This phenomenon suggests that people have increasingly come to rely on search engines that can be regarded as so-called algorithmic authorities. Further, there are signs indicating that a reliance on internet-based information may go hand in hand with naïve views of knowledge as certain and unchanging, as consisting of isolated bits and as being handed down by authority (cf. Ståhl et al., 2021). In those situations, we have the opposite case: the reputation of the search engine (perhaps based on popularity, ease of use, often successful in finding the "right" information etc., cf. Alasuutari, 2018)[4] may work in favour of the search engine, and the user may 1) make an inflated judgement of its credibility, and 2) elevate its capacity as a "knower".

The proposals above go beyond Fricker's (2007, pp. 27–28) notion of the speaker as a person and raises the question whether search engines (or any anonymous online source) could be regarded as speakers, conveying tellings in general (cf. Origgi & Ciranna, 2017; Tollefsen, 2009). Taking a less dogmatic stand we could perceive the internet (in a broad sense) as a kind of speaker and, with reference to Medina (2011), regard the internet as a "class all to itself". Basically, there is nothing internet-specific in this notion since over decades, people have used testimonies from non-human speakers such as institutional, governmental or religious authorities, political parties etc. and assessed the credibility of these speakers depending on their preconception; for instance, believing everything party X expresses and distrusting party Y.

Finally, Fricker originally assumed that it is always the speaker who is being harmed. The above examples from the internet context support the suggestion by Medina (2011) that the possibility of testimonial injustice causing harm to the hearer should also be considered. This is especially important to acknowledge in educational contexts.

To conclude, for the purpose of discussing the results of this study from the perspective of testimonial injustice, I have extended Fricker's original concept of testimonial injustice to include 1) general preconceptions regarding the speaker, 2) credibility excess, 3) non-human speakers, and 4) harm to the hearer.

[4] Alasuutari describes four types of authorities (capacity-based, ontological, moral, and charismatic) that are only indirectly applicable to the perceived authority of search engines.

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5. Research questions

Summarising the previous sections, we can note that:

- Current research shows that epistemic beliefs should be measured on a more fine-grained level and in relation to specific contextual elements.
- Epistemic competence requires an ability to flexibly adapt one's epistemic beliefs and justification methods depending on contextual elements such as, for instance, source of testimony and type of information.
- Everything we read, see, and hear on the internet is testimonial in nature, although we are often unable to identify the speaker.
- Testimonies, tellings in general, are the main source of information.
- Any information conveyed over testimony requires justification in order to become part of one's personal knowledge.
- Internet reliance suggests that the reader may be overly reliant on the source and may afford the (unknown) speaker's testimony an inflated level of credibility.

Taken together, it is highly relevant to explore how a recipient's management of the information is influenced by 1) the source of the testimony, and 2) the content of the testimony. Thus, acknowledging Chinn et al. (2011), calling for more fine-grained measurement, the present study will focus on what methods users apply to justify various types of information stemming from various sources. To be more explicit:

1. How do the justification methods differ depending on the speaker behind the testimony?
2. How do the justification methods differ depending on the type of information in the testimony?

In addition to the actual research questions above, this study also aims at testing the functionality of the ISEJ inventory, as suggested by Bråten et al. (2019) when applied in other contexts and, as in this study, when applied to testimony.

6. Method

6.1 Participants

The data collection was carried out among a cohort of first-year students attending bachelor-level study programmes at a Finnish university of applied sciences at the start of the semester in August 2021 (N = 618). In the data collection phase, the participants were known and background data about them (e-mail, gender, year of birth, school background, education) was obtained from the university's student registry. Participants were invited to take part in the survey through personal e-mail messages that contained – in addition to general information and a link to the Privacy Notice for Scientific Research – a link to each respondent's individual survey form. The Privacy Notice for Scientific Research contained the information that the informant should be given in accordance with articles 12 – 14 of the EU General Data Protection Regulation (GDPR, 2016). After data collection, the data were pseudonymised to enable a later cumulation of the data for measuring changes over time.

6.2 Data collection

When constructing the instrument, experiences from previous international studies (mainly Bråten et al., 2019; Ferguson et al., 2013; Muis et al., 2016) were used. The web-based survey was set up in the survey service LimeSurvey (LimeSurvey GmbH, 2020) which was administered by the university. The focus was on the subject area of justification for knowing and in addition, the survey collected data regarding three other subject areas, namely motivation for studying, general epistemic beliefs, and critical thinking.

The statements measuring justification for knowing were presented using a modified ISEJ inventory (Bråten et al., 2019). The ISEJ inventory contains twelve unidirectionally oriented statements about

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justification for knowing, covering the three sub-dimensions justification by authority, justification by multiple sources, and personal justification, each of which is measured with four items. The statements were presented on a 6-point anchored scale, where only the extreme values “totally disagree (1)” and “fully agree (6)” were labelled. The modified ISEJ inventory was presented in two rounds so that the survey started with the subject area of motivation, followed by the first round of the ISEJ inventory. The survey continued with the subject areas of general epistemic beliefs and critical thinking and ended with the second round of the ISEJ inventory.

In their validation study, Bråten et al. (2019) framed the ISEJ inventory statements 1) in the domain of teacher education and 2) in the internet context. In the current study, the intention was to let the material illustrate how the contextual elements 1) type of information and 2) source of testimony may influence how one justifies knowledge. Thus, framing the statements in type of information was illustrated with two extremes, that is, factual information versus tentative information. Testimony, in turn, was illustrated with a known, public authority and the opposite, an unknown source on social media. The examples of contextual elements were taken from the on-going Covid-19 pandemic, which was chosen since it was easy to understand, it was assumed to be generally familiar and each of the four combinations appeared natural and realistic (cf. Bråten et al., 2009).

The variation of information and testimony allowed for four different framings or scenarios. The heading on each questionnaire page started with the prompt "Please state to what extent you agree to the following statements regarding...", followed by a more detailed description of the contextual elements in that scenario: "diagnosed Covid-19 cases in Finland at a specified date", "regarding the protective effect of wearing a face mask against the Covid-19 disease", "published by the Finnish institute for health and welfare, a governmental authority", and "published on social media by some user unknown to you". This allowed presenting the items in a slightly shorter format so that, for instance, where an original ISEJ statement (expressing justification by authority) would read:

> “When I read something about an educational topic on the Internet, I evaluate whether this information is written by an expert” (see Appendix A, item 3)[5].

In the scenarios presented to groups 3 and 4 (Table 2), the corresponding statement was phrased as:

> “When I read something on social media about the effect of using a face mask, I evaluate whether this information is written by an expert”.

Table 1. Framing the statements in the contextual elements of information and testimony.

Information \ Testimony	Known public authority	Unknown actor on social media
Factual information	[the specific number of Covid-19 cases] [from the governmental authorities]	[the specific number of Covid-19 cases] [on social media]
Tentative information	[the effect of using a face mask] [from the governmental authorities]	[the effect of using a face mask] [on social media]

The ISEJ-based statements were presented in four different scenarios, and each respondent completed the modified ISEJ inventory in two different scenarios, one at the beginning of the survey, and another at the end of the survey. For this purpose, the respondents were randomly divided into four groups (Table 2), and the respondent’s group affiliation was included as a background variable to control how the survey service presented the statements for each respondent. Presenting the different scenarios was set up so that in each group, one aspect was controlled for while the other aspect was varied.

[5] In appendix A, the contextual elements in the original ISEJ are marked with [square brackets]. In the current study, the content inside the brackets was replaced with some of the contextual elements as described in Table 1.

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Table 2. Overview demonstrating how information and testimony were controlled and varied, respectively, for each group of respondents.

	Controlling for		Varying	
Group	**Testimony**	**Information**	**Testimony**	**Information**
1		Factual information	Known authority ←→ Unknown actor	
2	Known authority			Factual information ←→ Tentative information
3	Unknown actor			
4		Tentative information	Known authority ←→ Unknown actor	

The respondents were introduced to the claims regarding justification for knowing using information as suggested by Bråten et al. (2009). The respondents were asked to reflect upon what knowledge is and how they build their own knowledge. The introduction underlined that the statements are linked to Covid-19, which only serves the purpose of example and illustration. Further, the respondents were encouraged to read the statements carefully and pay attention to who is claiming something and what type of information the claim is about. Before the second round of the modified ISEJ questionnaire, it was brought to the respondents' attention that the following pages contain similar statements as in the beginning of the survey, and that they should again pay attention to statement content.

7. Results

7.1 Data descriptives

After discarding 9 cases that were completely or almost empty, and one case where all questions had been answered with the same response, the collected material contained 449 responses. Thus, the response rate amounted to 72.7% and in the sample, all study programmes were represented in a similar proportion as they occurred in the sampling frame. The same applied to gender distribution and origin. Out of the respondents, 86.6% were domestic and 13.4% international students, representing 19 countries. In the sample, the four groups contained between 110 and 114 respondents each and were thus equally represented. Due to the four groups answering the modified ISEJ inventory in two rounds, the material contained just over 200 responses to each of the four scenarios. Given that data were collected using an anchored attitude scale, that is, an ordinal scale, a discussion of the normal distribution of the single items is irrelevant (cf. Carifio & Perla, 2007).

The ISEJ-based items were used for creating subscales for each of the three dimensions in each of the four scenarios. The individual subscale scores were calculated using the mean.x() function (SPSS, 2021), thereby ensuring that a subscale score was calculated only if the respondent had entered a valid response to at least three of the four statements associated to each dimension.

7.2 Analysis results

The focus of this study was to compare how the students' methods for justifying knowing differ depending on type of information and testimony. For this purpose, the three subscale scores were compared in each of the four scenarios.

A comparison of the internal consistencies of the subscale scores showed that the Cronbach alpha values were in the same range (0.848 – 0.941) as those reported by Bråten et al. (2019). The item-scale correlations (0.558 – 0.793) were even above the correlations reported by Bråten et al. (0.56 – 0.67)

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although the coefficients varied slightly depending on the scenario. The subscale scores were found to be mainly normally distributed.

It should be noted that the subscale scores in this study cannot be directly compared with the results Bråten et al. presented, partly because Bråten et al. used the response scale 1 – 10, partly because in this study, each statement appeared in four different variants, due to the scenarios.

The comparisons of the subscale scores in the four scenarios suggest that when the information is tentative, students tend to use some of the methods to justify knowing to a greater extent than when it is about factual information. Similarly, when the testimony came from an unknown source, students used justification to a greater extent than when the testimony stemmed from a known authority. In Table 3, the first column contains the four student groups for which one aspect was controlled for. Therefore, each scenario occurs in two instances with slightly different mean values since they are based on different subsets of cases.

Table 3. Comparison of the mean values of the subscale scores in the various scenarios, where one aspect was controlled for, and the other aspect was varied.

Controlled aspect (group)	**Varied aspect**	**Justification by personal reasoning**		**Justification based on authority**		**Justification based on multiple sources**	
Type of information	**Testimony→**	Unknown source	Known authority	Unknown source	Known authority	Unknown source	Known authority
Factual (1)		4,23	3,03	4,23	2,76	4,06	2,64
Tentative (4)		4,37	3,36	4,38	3,29	4,29	2,97
Testimony	**Type of In-formation →**	Factual	Tentative	Factual	Tentative	Factual	Tentative
Known authority (2)		2,88	3,49	2,99	3,38	2,80	3,34
Unknown source (3)		3,94	4,31	4,27	4,55	4,11	4,28

Each group was exposed to two scenarios and thus, the difference when varying one of the aspects was measurable on individual level. At a more detailed level, the results show the following, presented below for each of the four groups, in the same order as in Table 3.

Controlling for type of information

Group 1 When dealing with **factual information**, students used all justification methods extensively ($\bar{x}$ = 4.06 – 4.23) when the testimony came from an unknown user on social media. When the testimony stemmed from a known authority, the various methods were used the least ($\bar{x}$ = 2.64 – 3.03). Thus, the differences in the use of the various methods of justification were largest in this pair of scenarios (see Figures 2 and 3). Consistently, the differences[6] were most significant (t-values between 9.80 and 10.60; p<.001) in this pair of scenarios.

Group 4 When dealing with **tentative information**, the students again used the various methods of justification more extensively when the testimony came from an unknown user on social media ($\bar{x}$ = 4.29 – 4.38). When the testimony stemmed from a known authority, the justification methods were activated to a considerably lower degree ($\bar{x}$ = 2.97 – 3.36). The differences between this pair of scenarios were significant (t-values between 6.96 and 9.74; p<.001).

[6] The differences were tested separately for each of the three justification methods.

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Controlling for source of testimony

Group 2 When the testimony stemmed from a **known authority**, the students tended to use all methods of justification significantly less on a general level. When the statement concerned factual information, the justification methods were used least of all ($\bar{x}$ = 2.80 – 2.99), and also in the case of tentative information, justification methods were used moderately ($\bar{x}$ = 3.34 – 3.49). However, the differences between this pair of scenarios were still significant (t-values were between 2.64 and 4.79, p<.01).

Group 3 When the testimony stemmed from an **unknown user** on social media, the students tended to use all methods for justification extensively, and most of all when the information was tentative ($\bar{x}$ = 4.28 – 4.55). Also, in the case of factual information, justification methods were used to a high degree ($\bar{x}$ = 3.94 – 4.27) so that in this pair of scenarios, the differences were barely or not at all significant.

Analysing the responses on the individual items also indicates that when the testimony stemmed from a known authority, roughly 9 – 16% of the respondents refrained from activating any of the justification methods. When the testimony stemmed from an unknown user on social media, the majority of the respondents applied some of the justification methods and the portion of those who did not activate any of the justification methods remained below 3%. These numbers are based on calculating the maximum score for each respondent in each of the scenarios.

The difference between the various scenarios is presented visually in the sample graphs below, both describing the method of justification by authority as it occurred in group 1. Here the largest and most significant difference (t(101) =10.60; p<.001) occurred between the scenarios factual information conveyed by a known authority vs. factual information conveyed by an unknown user on social media.

To sum up, the results indicate that the source of testimony has the strongest impact on how the various methods of justification are activated. The type of information also has an effect, although slightly weaker.

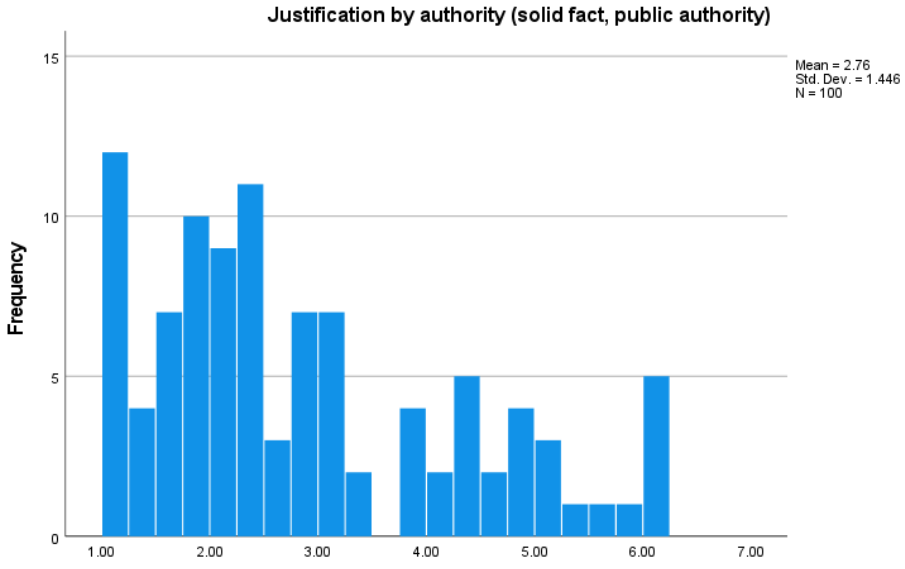


Figure 2. Distribution of the subscale score for justification by authority in the scenario "factual information conveyed by a known authority" (group 1).

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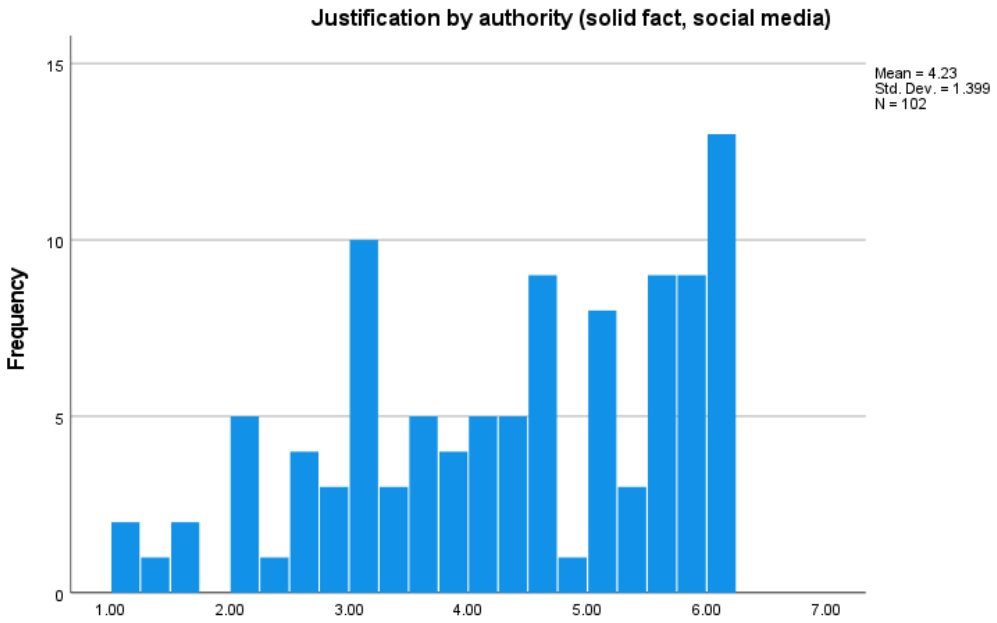


Figure 3. Distribution of the subscale score for justification by authority in the scenario "factual information conveyed by an unknown social media user" (group 1).

8. Discussion

8.1 Justification for knowing

8.1.1 The ISEJ inventory, replicability and adaptability

In their validation study, Bråten et al. (2019) stated that the ISEJ inventory measured what it was intended to measure, that is, how respondents handle information through activating the three methods for justification of knowing to various levels. On that point, this study corroborates these previous results.

The results in this study show that the original statements in the ISEJ inventory can be adapted – as Bråten et al. (2019) suggested – and successfully applied to other contexts. The study also shows that the type of information and the source of testimony both can be used as contextual elements to frame measurement. Despite a different framing than the one Bråten et al. used, we can talk about successful replication of the instrument. Further, the high alpha values and item-scale correlations indicate that the measurement becomes more accurate when the framing is expressed more fine-grained (cf. Chinn et al., 2011) and with such concrete elements that the respondents can relate to.

The choice to use type of information and testimony as contextual elements proved to work well, and varying the contextual elements induced clear differences in how respondents activated the three justification methods.

8.1.2 Methodological issues

In this study, the students were exposed to the ISEJ statements in two rounds, and between them to a number of other statements expressing general epistemic beliefs and critical thinking. This setup made the questionnaire rather lengthy and therefore it posed a risk for respondents dropping out. The setup proved, however, to work, since most students answered the questionnaire right to the end.

The setup with students answering the ISEJ inventory in two rounds allowed one aspect to be controlled while the other was varied, which generated a valuable material. Through the use of four groups, each

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group thus came to contain just over a hundred cases, and based on the reliabilities of the scales, it can be concluded that the sample was sufficient for the purposes of the study.

In their validation study, Bråten et al. (2019) connected the statements of the ISEJ inventory to the domain of education and to the internet context. In this study, it would have been close at hand to connect the statements to the domain of the students' respective study programmes. This can, however, be questioned for at least two reasons: 1) The individual study programmes (especially in a university of applied sciences) do not represent distinct domains based on a single knowledge base but instead, they are highly multidisciplinary. 2) Since the participating students were just starting their studies, they cannot be expected to have a clear picture of the study programme's knowledge base. Connecting the statements to a domain that was unfamiliar to the respondents would thus have led to losing the idea of framing the statements.

When targeting a survey to new students at a university of applied sciences with fourteen different study programmes, it is challenging to find a framing that is familiar to everyone. For framing the statements, phenomena connected to the Covid-19 pandemic were chosen since it was expected that this framing should be familiar to everyone (cf. Bråten et al., 2009). In addition, the framing should also work for the international students with varying backgrounds. Given that, at the point of data collection, the pandemic had been going on for more than a year and a half, it was reasonable to assume that all the information and all the discussions surrounding the pandemic could hardly have passed anyone by. We can make the conclusion that the framing worked, although some comments by the students suggested that a small number of them got too caught up in the Covid-19 phenomenon.

8.2 Potential for educational practice

Dahlgren (2018) notes that the current epistemic crisis of democracy includes an attack on basic enlightenment principles so that currently, scientific evidence is increasingly seen as just another subjective opinion and equated with one's own subjective emotions. This trend can be illustrated with the adjective "post-truth", described as "…circumstances in which objective facts are less influential … than appeals to emotion and personal belief" (OED Online, 2022). The trend is worrying in terms of democracy on a societal level, but just as much in terms of knowledge building on individual level, especially considering the (increasing?) problem of science denial (cf. Sinatra & Hofer, 2021).

MacKenzie et al. (2021) argue that in order to cultivate our understanding (our 'Bildung'), "we need to learn the grounds of our opinions and be able to defend them against common objections", that is, we need to learn to justify our knowing and be aware of how we justify knowing and on which grounds we choose a specific justification method. Thus, on the individual level, this indicates a connection to the concept of epistemic competence as described by Grossnickle et al. (2017, p. 257).

We can also see a connection to testimonial injustice; if we are unaware of our preconceptions (prejudice or over-reliance) and on what grounds we choose a specific justification method (if any), then we are more likely to exert testimonial injustice, that is, affording a testimony an incorrect level of credibility. In Fricker's terms, illiteracy may cause the hearer to miss the obligation to "match the level of credibility she attributes to her interlocutor to the evidence that he is offering the truth" (Fricker, 2007, p. 19). In the bigger picture, it is about the interplay between learning competencies, epistemic competence, and information literacy, all of which are important to prevent information disorders and to safeguard trust, truth and integrity, and thereby our democracies (cf. MacKenzie et al., 2021). These literacies need to be supported on all levels of education.

The instrument applied in this study may not be useful for direct measurement of students' epistemic competence, but it can be applied as a component to initiate the students' own process of reflecting on their ways of learning and justifying knowing. The results show that the students did apply different justification methods depending on both the type of information and the source of testimony. This altering of justification methods can be seen as an expression of epistemic competence (cf. Grossnickle Peterson

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et al., 2017, p. 257). Further, the results provide comfort and hope in the sense that most of the respondents were sceptical towards an unknown speaker, and more cautious regarding tentative information. Still, we should feel some concern about the minority of students that lacked scepticism, but it is, however, impossible to verify if they truly ignored justifying unreliable information, or if they just clicked their responses randomly, causing a "noise" in the data set.

The results suggest that the instrument contains potential for being used in the future to support the development of students' information literacies and learning competencies. The ISEJ inventory can be modified and framed in a way that is appropriate for the target group, and then be used to initiate the students' reflection processes. The survey should then be followed up by presenting the results and using them as a take-off for discussions, that should preferably take place within a reasonable time after the survey.

8.3 Aspects of testimonial injustice

In the section regarding epistemic and testimonial injustice I proposed extending Fricker's original concept to include 1) non-human speakers, 2) general preconceptions regarding the speaker, 3) credibility excess, and 4) harm to the hearer. The extended concept was not used as a theoretical framework for the data collection but still, parts of the results of the study indicate that the proposed extension is in no way far-fetched.

As mentioned earlier, content on the internet is increasingly being generated by non-human (epistemic?) agents. In the survey, the scenarios depicted testimonies either from an unknown actor on social media or from a known authority. The results showed that the respondents were able to discern the difference and to apply different justification methods depending on the speaker, that is, the source of the testimony. Based on this material it is, however, not possible to draw conclusions regarding credibility excess or deficit.

The extent to which the respondents used justification in the various scenarios indicates that the preconception regarding the speaker can be positive or negative. The results indicate that the respondents afforded the testimonies from the national health authorities a high level of credibility which, in turn, showed in the material as a lesser need to apply additional justification methods. Consistently, the testimonies from an unknown user were afforded a low level of credibility and entailed a greater need to seek justification elsewhere.

Based on this material it is not possible to draw conclusions regarding harm to the hearer, but there are researchers (e.g., Davis, 2016; Medina, 2011) speaking in favour of acknowledging that inappropriate credibility assessment can harm also the hearer. Further, the contextual elements used in this study – information regarding preventing Covid-19 – can serve as an example where being overly reliant on dubious speakers on the internet can cause the hearer to choose inappropriate actions that will ultimately harm her. Ultimately, the notion that the hearer is at risk of harm is a key element linking testimonial injustice with education.

Gelfert (2014, p. 145) notes that "If the listener's knowledge (that p) mirrors that of the speaker, it seems natural to speak of the speaker having passed on her knowledge to the listener". Given this, will we assume that, for instance, ChatGPT (OpenAI, 2023) has knowledge? Will the listener/user know the source of this testimony? As mentioned earlier, a testimony needs to be justified in order to become part of one's personal knowledge. Considering the multitude of testimonies in the digitalised landscape – some of them generated by AI, some by anonymous or fictitious users – how will the user be able to conclude who is behind the testimony and based on that, decide how to justify the testimony?

8.3 Conclusions and future research

An interesting area for future exploration is how the measurement of the original EQ dimensions *certainty of knowledge* and *structure of knowledge* could be developed more fine-grained by framing them in type

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of information and perhaps also other contextual elements. In previous studies (e.g., Ståhl et al., 2021), the subscales for these two dimensions have shown weak reliability and/or low item-total correlations, which could possibly be due to the respondents finding it difficult to take a stand on statements that are not connected to relevant contextual elements.

A further research area would be to measure the original EQ dimensions (Schommer, 1990) together with the three ISEJ-based sub-dimensions (Bråten et al., 2019) of justification for knowing to explore how the EQ dimension *omniscient authority* relates to the sub-dimension *justification by authority*.

The current study shows that the concept of epistemic beliefs can contribute to exploring epistemic injustice over empirical research regarding specifically testimonial injustice and the epistemic dimension of justification. Testimonial (in)justice is essentially preceded by the hearer's assessment of a speaker's testimony. The result of this assessment depends on which methods the hearer uses to justify the testimony, which, in turn, is influenced by the hearer's previous knowledge, attitudes, and (positive or negative) preconceptions regarding the speaker. As the current study shows, the justification methods can be measured but using this kind of measurement does not, however, provide information about the preconceptions and reasoning behind the choice of justification methods. Therefore, in future research, the quantitative self-report approach should be supplemented with some qualitative method suitable for providing an insight into the respondent's reasoning.

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Appendix A

Items on the Internet-Specific Epistemic Justification Inventory (Bråten et al., 2019).

Item #	Item wording
Personal justification	
1.	When I find information about [an educational topic][7] [on the Internet], I evaluate whether this information is consistent with my own of the topic.
4.	To check whether information about [an educational topic] I find [on the Internet] is reliable, I evaluate it in relation to my own knowledge of this topic.
7.	I evaluate whether information I find about [an educational topic] [on the Internet] seems logical.
10.	When I read about [an educational topic] [on the Internet], I evaluate whether this information is consistent with what I already know about this topic.
Justification by multiple sources	
2.	I evaluate claims I find about [an educational topic] [on the Internet] by checking several information sources on the same topic.
5.	When I read something about [an educational topic] [on the Internet], I compare several websites that deal with this topic.
8.	To evaluate whether information I find [on the Internet] about [an educational topic] is reliable, I check whether it is consistent with information on other websites.
11.	To determine whether information I find about [an educational topic] [on the Internet] is trustworthy, I compare information from multiple sources.
Justification by authority	
3.	When I read something about [an educational topic] [on the Internet], I evaluate whether this information is written by an expert.
6.	To determine whether information I find about [an educational topic] [on the Internet] is trustworthy, I evaluate whether the author has sufficient knowledge of the topic.
9.	When I find information about [an educational topic] [on the Internet], I check whether it comes from an expert source.
12.	To evaluate whether information I find about [an educational topic] [on the Internet] is reliable, I try to determine whether it is written by a person with a high level of competence in the area.

[7] In the current study, the content inside the brackets was replaced with other contextual elements.

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Adopting technology-based pedagogies for epistemic justice

Increasing learning outcomes in diverse classrooms

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Abstract

Adopting culturally responsive technology-based pedagogies that recognize and accommodate students' diverse learning needs, styles, and experiences is crucial in challenging epistemic justice and improving learning outcomes. The objective was to explore how integrating an understanding of individual students' distinctive traits into developing technology-based pedagogies informed by students' different ways of knowing can increase learning outcomes. In this article, I discuss how adopting culturally responsive technologies in classrooms can redress epistemic injustice and improve learner outcomes by promoting student engagement, hands-on experiential learning, and culturally aware learning. The concept of epistemic justice inspires efforts to enhance learning environments and cultivate a sense of connection and community among students. The cases draw from my experience adopting the intervention and are presented within an analytical framework of culturally responsive technology-based pedagogies in selected hybrid and in-person media production courses.

Keywords: Technology-based pedagogies; epistemic injustice; culturally responsive; equity

1. Introduction

As technology has transformed the landscape of higher education, this article explores how culturally responsive adoption of technology-based pedagogies may address epistemic injustice and improve learning outcomes (Chaudhry and Malik, 2014). Advancements in low-cost digital technologies have transformed how we teach and interact in learning environments (Blessinger and Wankel, 2013). Technologies are rapidly evolving, and there is a need to identify, recognize, and acknowledge biases and challenges that students might face in access to technologies. In this article, my argument is informed by Chaudhry and Malik's (2014) assertion that implementing appropriate technologies in a culturally responsive and inclusive manner can effectively boost student engagement in classroom activities, facilitate the achievement of learning goals, and enhance student productivity. This is also supported by Taylor and Sobel (2011), who argue that learning technologies should be supported by a 'culturally

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responsive pedagogy.' In so doing, Blessinger and Wankel (2013, 3-4) point out that it will lead to 'enjoyable learning environments' for both learners and teachers.

Technology can be empowering or exclusionary depending on its adoption and implementation. Feenberg (2009) states that the debate over technologies is between those who assume it is empowering and restoring the public sphere, while critics argue that technologies are an extension of capitalist surveillance technologies and are exclusionary in the nature of their design. While this article discusses the adoption of technology-based pedagogies, it goes beyond the technocentric approach to advocate for cultural responsiveness in informing the adoption of technologies in learning environments. There is a need to acknowledge, recognize, and identify biases and challenges that students face in access to technologies due to factors such as educational system inequalities, economic status, disability, gender, race, ethnicity, national origin, and language discrimination. According to Mayo (2013), the school system favors the cultural capital of the middle class), and therefore, for teachers to achieve effective teaching among diverse student populations, there is a need to understand learners' backgrounds, knowledge, and lived experiences in the implementation of culturally responsive instructional strategies to redress epistemic injustice (Taylor and Sobel 2011).

According to Byskov (2021), epistemic injustice is the idea that students may face unjust discrimination in their roles as knowledge seekers due to biases related to factors such as gender, socioeconomic status, ethnicity, race, sexual orientation, vocal tone, and accent Kidd, Medina, & Pohlhaus (2017, 1) define epistemic injustice as 'unfair treatment relating to knowledge, understanding, and participation in communicative practices.' Epistemic injustice refers to exclusionary practices regarding knowledge, and Fricker (2007) defines epistemic injustice as 'social inequalities rooted in distributive unfairness of epistemic goods such as information or education.' Epistemic injustice, as defined by Fricker, occurs in learning environments in two ways: testimonial and hermeneutical injustice. Testimonial injustice is when students' experiences in the classroom are considered as not being valid or believable, while hermeneutical injustice is when teachers from a different cultural frame misunderstand students' classroom interactions and engagement. Epistemic injustice, therefore, can be summarized as relating to students' classroom experiences about the knowledge shared, how it is shared, and the biases that stem from the school system and learning environments.

I have organized the discussions in this article into four parts. I start with the problem and intervention, describing the issue and how the notion of epistemic injustice and its approach relates to learning and diversity in the classroom. I then describe the intervention that inspired the effort to address epistemic injustice through technology-based pedagogies and how it is applied in practice. In the second part, I discuss the analytical framework guiding the study, which includes a review of related literature on the role of technology in addressing epistemic injustice in education. The framework is framed around the works of scholars such as Miranda Fricker, Gloria Ladson-Billings, Geneva Gay, James A. Banks, Adeyemi Stembridge, and Paulo Freire. In the third section, I employ the framework of culturally responsive technology-based pedagogies to analyze cases from my experience adopting technology-based teaching approaches. I then systematically present discussions from my experience as an instructor in learning environments in global higher education institutions. In the fourth part, I summarize the significance of a culturally informed technology-based framework to enhance understanding the connection between epistemic injustice, diversity, and integrating technology-based pedagogies in diverse classrooms.

2. Problem and intervention

This section looks at epistemic injustice and its relevance to learning and diversity in the classroom. It is crucial at this point to also distinguish between technology-based pedagogies and technology-based education. The latter occurs in several ways, such as using learning management systems, online resources for research and teaching, and even online and hybrid courses. In contrast, technology-based

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pedagogies focus on the philosophy and practices of education. In this article, I analyze technology-based pedagogies within the framework of culturally responsive integration of technologies to address the diverse needs of students and improve learning outcomes. I further delve into the philosophy and practice of deliberate adoption of culturally responsive technologies to develop teaching pedagogies that enhance student engagement and improve learning outcomes. The need to develop culturally responsive technology-based pedagogies is informed by the knowledge that when teachers primarily conduct 'instruction from their cultural perspective,' the interactional structures might seem unfamiliar to students from diverse backgrounds (Taylor and Sobel, 2011) and thereby silence, exclude them, and hamper the achievement of learning objectives.

My positionality on this subject is informed by my teaching philosophies and goals in the teaching pedagogies designed through hands-on experiential learning, student engagement, culturally aware learning, and technology-based pedagogies. The focus on classroom diversity led to creating a learning environment that accommodates and validates different students' learning styles, experiences, and needs. My approach draws from critical pedagogies that seek to identify existing social issues and recognize biases and challenges that students coming to the classes might face due to existing societal problems such as inequalities in the education system, poverty, race, gender, sexuality, ethnicity, national origin, language discrimination, access to technologies and disparities in income levels. The discussions are drawn from prior experience developing culturally responsive pedagogies and driven by varied teaching experiences at different institutions ranging from a predominantly white institution (PWI) to a Historically Black College and University (HBCU). I increasingly began thinking about developing antiracist teaching pedagogies and decolonizing teaching approaches, driven by the need to include the voices of diverse learners and diverse academic resources in the classroom.

The adoption of antiracist and decolonizing teaching pedagogies guided the intervention. It started with bringing diverse readings and resources from scholars of color, women, non-binary writers, artists, and film producers into the classroom. I also started exploring bringing to the classroom more work by global scholars and increasingly centering those voices in classroom readings, resources, and discussions. The course content was also redesigned, particularly the instruction and assessment approaches, with a deliberate shift towards going beyond a student-centered flipped-classroom approach to include interactive technology-based pedagogies. For instance, to make instruction and assessment equitable, there was a shift from weekly readings to a mix of interactive readings, podcasts, and videos with options for students to either read or watch and submit their responses in various formats of their preference. The class assignments and projects were designed to be more experiential, such as urban street ethnographies, where students would take a bus tour of the city, take field notes and photographs, and present them in class. The intervention of centering technology to promote student-centered learning led to the recognition that students responded positively to more technology-based interactive content. This then led to a more in-depth exploration of how the adoption of technology-based pedagogies that are culturally responsive could be used to increase learning outcomes among diverse learners.

3. Epistemic injustice, diversity, and technology-based pedagogies: A conceptual framework

In this section, related scholarly research on the role of technology in addressing epistemic injustice is reviewed to create an analytical framework that anchors the aim of the study, the selected cases, and discussions in the study. The need for a review of literature on the subject is supported by Bond, Buntins, Bedenlier, Zawacki-Richter & Kerres's (2020) argument that reflection upon prior research undertaken in the field is a necessary first step to engage in meaningful discussions on promoting student engagement in the digital age. For instance, research on ‘connections between culture and learning’ was valuable evidence that countered cultural deficit theories developed in the 1960s and 1970s that had erroneously assumed that ‘students of diverse backgrounds were lacking in culture or were disadvantaged by their

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culture' (Taylor and Sobel, 2011, 30). Literature was therefore reviewed on related topics, including epistemic injustice, diversity, equity, student engagement, culturally responsive teaching, and technology-based pedagogies. Scholars who guided the arguments and methods in this work include works by Miranda Fricker, Gloria Ladson-Billings, Geneva Gay, James A. Banks, and Paulo Freire.

3.1 Epistemic injustice

The key aspect of Freire's work is the emphasis on education as political (Mayo, 2013) and the inequalities and injustices evident in the classroom because of the oppressive and systemic injustices in society. It is imperative to reflect on the context that shapes 'students' perceptions of opportunity,' given the 'sociopolitical realities of the communities served by the school' (Stembridge, 2020, 11). Therefore, the importance of epistemic injustice goes beyond ethical theories to encompass political theories on power, public discourse, and public institutions, such as schools, universities, courts, and healthcare (Byskov, 2021). For instance, because epistemic injustice wrongs one in their capacity as learners (Fricker, 2007), the push for epistemic justice can be viewed from a framework of decolonization where the cultural experiences of students from minoritized communities are foregrounded, and their knowledge is not silenced or excluded in classroom discussions. In this case, a deliberate acknowledgment of different forms of knowing and cultural experiences within the classroom can be viewed as decolonial approaches, and educators can draw on indigenous and de-colonial scholarship to inform pedagogies for classrooms as intercultural and diverse spaces to serve better students whose voices are silenced and marginalized (Pirbhai-Illich, Pete, & Martin, 2017).

Fricker categorizes epistemic injustice as testimonial injustice and hermeneutical injustice. In testimonial injustice, one is 'wronged in their capacity as givers of knowledge,' In hermeneutical injustice, one is 'wronged in their capacity subjects of social understanding' (Fricker, M. 2007, 7). For many teachers, the 'sociological lens they bring to the classroom links directly to lessons and values experienced from their primary culture' (Taylor and Sobel, 2011, 5), thus predisposing students to different forms of epistemic injustice. The primary form of epistemic injustice is testimonial injustice, whereby 'prejudice on the hearer's part causes the hearer to give the speaker less credibility than would otherwise have been the case' (Fricker, 2007, 4). The prejudice can result from biases and stereotypes that hearers (teachers) might have about certain cultures or communities. Stembridge (2020, 28) asserts that students should have the 'opportunity to develop their tools as knowledge creators' as writers and media producers by 'learning with and from their fellow students whose skills and understanding are part of a whole' and in a supportive space where everyone gets to contribute something valuable to others. While individuals 'do not perpetrate hermeneutical injustice, it is apparent in discursive exchanges between individuals' (Fricker, 2007, 7). For some learners, school culture can be so different from their 'home and primary cultures' that learning at school is 'challenging, alienating and exclusionary' (Taylor and Sobel, 2011, 5).

According to Byskov (2021), it is essential to constantly 'recognize and address epistemic injustice because our classrooms mirror society.' Byskov further discusses how non-epistemic forms of discrimination and injustice manifest in forms not considered epistemic injustice and proposes three conditions for determining epistemic injustice. They include the 'stakeholder condition,' 'epistemic condition,' and 'social justice condition.' The stakeholder condition states that the discriminated individual or group must be affected by the decisions they are excluded from influencing; the epistemic condition states that the discriminated individual or group must possess relevant knowledge for the decision-making process; and the social justice condition states that the discriminated individual or group must suffer from other social injustices simultaneously. Those who are epistemically advantaged have a better opportunity to raise their concerns while disadvantaging the epistemically disadvantaged groups.

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3.2 Student diversity

Diversity encompasses the recognition of individual uniqueness, acknowledging disparities, and transcending mere tolerance to fully embrace and celebrate the diverse facets of humanity within a supportive, affirming atmosphere (Patrick & Kumar, 2012). A broad range of factors, including age, race, ethnicity, religion, socio-economic status, national origin, ability, language, and gender identity, influences student diversity. Cultural diversity, often resulting from language, race, ethnicity, national origin, and gender identity, also influences how students think, perceive, behave, and communicate. All this then affects how instructors teach and students learn (Taylor & Sobel, 2011, 29). Therefore, acknowledging the plurality of learning styles among students and understanding students' backgrounds is essential to understanding how students learn and think (Jabbar & Mirza, 2017). Individual students' abilities and achievements cannot be considered independently of opportunities provided by their social contexts. Thus, a comprehensive approach is needed to evaluate student diversities, epistemic justice, and education contributions (Walker, 2019, 163). Applied to students' diversity, epistemic (in)justice implies a particular commitment to the idea that uniqueness should inform teaching, pedagogy, and assessments.

Culture is a complex concept that needs to be defined or operationalized (Androsov & Zhang, 2023) because of its intersectional nature, spanning various categories such as ethnicity, race, nationality, religion, and language. It can be broadly defined as systems of shared beliefs, values, and practices that individuals interpret and understand their experiences and worldviews (Hall, 1997). It is also a shared system of meaning for analyzing the world, guiding action, and facilitating communication (Nastasi, Arora & Varjas, 2017). Culture is central to learning and pervasive in people's ways of knowing and responding to life (Taylor and Sobel, 2011, 36). Gay (2018) argues that culture is central to how learning occurs in the classroom, and this argument is reinforced by Stembridge (2020, 80), who adds that culture affects how people learn, remember, reason, solve problems, and communicate. Therefore, it is part and parcel of students' experiences. Unfortunately, sometimes educators assume homogeneity within a cultural group, yet students who share cultural, racial/ethnic, cultural, linguistic, or religious backgrounds can vary dramatically in their cultural perspectives (Taylor and Sobel, 2011, 103). According to Saltmarsh (2022), such assumptions of cultural homogeneity within mainstream or dominant cultures limit education, as the curriculum becomes a tool for assimilation and a corrective to heterogeneity. Saltmarsh argues that understanding culture as heterogeneous everyday life practices promotes a more nuanced understanding of diversities within and between cultures. As teachers recognize how culture influences how one thinks, believes, and behaves, they begin to understand how culture affects their teaching and expectations about teaching and students' learning and classroom interactions (Taylor and Sobel, 2011, 41).

3.3 Equity gaps

Culturally responsive education helps identify themes and tools of practice for closing equity gaps. However, it is challenging for educators because of the ‘indoctrination of the equality frame of reference’ to give everyone the same thing instead of equity, which calls for differentiating according to need (Stembridge, 2020). According to Taylor and Sobel (2011), all students deserve an equitable education. For systems to become more honest, they must intentionally focus on growth and acknowledge the ‘historical intersections of racism, economic conditions, and political disenfranchisement’ that contribute to present-day realities where some students are more vulnerable and, therefore, more likely to have lower learning outcomes (Stembridge, 2020). According to Walker (2019, 163), factors such as ‘ethnicity, language, gender, and disability, including the actions of others’ in learning spaces and the ‘relationships within which education processes are embedded, shape what each person can do and be’ For instance, for ‘American middle-class students and native English speakers, school aligns with what is familiar,’ while on the other hand, students with diverse backgrounds such as migrant students and those from lower-

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income families have a 'wealth of cultural capital, but it may not correspond with the school's unspoken, subtle expectations' (Taylor and Sobel, 2011, 32).

Equity gaps affect how students perceive their opportunities in school. Still, as Stembridge (2020, 11) points out, it is essential to note that not all equity gaps originate in school or classroom practices. Equity gaps are often a reflection of the broader society. For Instance, the 'US education system assigns social capital to European American English-speaking middle-class culture,' and because 'schools reflect the knowledge and values of mainstream culture, they reinforce the culture in school activities, including instruction, curriculum, and assessment' (Taylor and Sobel, 2011, 32). The design of the learning environment plays an essential role in successful online learning (Parker, Maor, & Herrington, 2013), and rather than solely prioritizing resource inputs and indicators as the gauge of educational success, a quality education should strive to enhance students' capabilities. This includes the substantial freedoms each student can exercise in various ways that contribute to their flourishing and align with their values. (Walker, 2019). For instance, systemic oppression often affects members of minoritized and racialized groups who also live under 'constant threats of xenophobic, random, and unprovoked attacks' (McLaren, 2016). Teachers can create a classroom context that signals a valuing of broad cultural diversity and a commitment to equity (Taylor and Sobel, 2011) by recognizing the diversities among students and adopting technologies and tools that allow students to express themselves or create content that is reflective of their backgrounds, knowledge and lived experiences.

3.4 Student engagement

Kotzee (2017) posits that education aims not solely to acquire knowledge but also to generate knowledge within the institutions where education occurs actively. This is particularly important as higher education is evolving and rapidly deploying various digital technologies in learning environments. Understanding how students engage with the technologies is crucial, as this is critical to designing flexible and adaptive learning environments to cater to diverse students (Nkomo, Daniel, and Butson, 2021). Over the past decade, the conceptualization and measurement of 'student engagement' have received increasing attention from researchers, practitioners, and policymakers alike (Bond, Buntins, Bedenlier, Zawacki-Richter & Kerres, 2020). Student engagement refers to the energy and effort students employ within their learning community, observable through behavioral, cognitive, or affective indicators (Bond, Buntins, Bedenlier, Zawacki-Richter & Kerres, 2020). Stembridge (2020, 70) refers to engagement as the 'money ball of education' because if 'students are not engaged, we can have a chance to teach them, but if a student checks out during instruction, we cannot teach them anything until we re-engage them.' Teachers need to understand how students engage with digital technologies to train students and support their learning (Nkomo, Daniel, and Butson, 2021).

Stembridge (2020, 69-70) asserts that engagement can be an elusive target. So, we must often innovate and explore to locate the most appropriate strategies, and when doing so, it is essential to consider the following questions:

> *How does instruction engage students behaviorally, affectively, and cognitively?*
> *How does the lesson itself model what engagement looks like for students?*
> *How does the lesson differentiate for highly engaged, moderately engaged, and minimally engaged students?*

Today, technologies are becoming more prevalent in higher education to engage students better and create more participatory and engaging learning environments (Blessinger and Wankel, 2013). As a result, a growing body of research is exploring how technology might be used to support effective and efficient feedback practices for students (Hepplestone, Holden, Irwin, Parkin, and Thorpe, 2011). Blessinger and Wankel (2013, 7) argue that technologies should allow students to feel more comfortable engaging with the class in a lower-risk way than calling out students by name. Stembridge (2020, 71) points out that having a specific language to describe engagement is crucial because sometimes educators

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view engagement from students as disruption. However, at other times, they view disengagement as compliant engagement. These technologies may provide introverted students who may not be inclined to speak out in front of their classmates for fear they may give the wrong answer, a relatively low-risk way to engage with the rest of the class (Blessinger and Wankel, 2013). According to Stembridge (2020), students' engagement in learning can be seen as a product of their dedication and efforts. This can also be facilitated by employing various technologies that enable them to interact with their peers and the instructor. However, increased participation from adopting technology alone is unlikely to yield more effective learning if the technology tools are not used contextually and purposefully (Blessinger and Wankel, 2013). Adopting classroom technologies provides educators with many possibilities and opportunities to enhance and transform how instructors interact with students and how students interact with each other (Blessinger and Wankel, 2013, 4). Engagement is a function of identity, and if we can understand and leverage engagement well, we are, in effect, supporting students in cultivating uniqueness that will allow them to justify the effort necessary for success in school (Stembridge, 2020, 69).

3.5 Culturally responsive pedagogies

Culturally responsive pedagogy is student-centered and recognizes the importance of students' cultural backgrounds, realities, experiences, and lived experiences (Ladson-Billings, 1995). It is influenced by social justice and multiculturalism. It refers to drawing from ‘cultural knowledge, prior experiences, frames of reference, and performance styles’ of ethnically diverse students to make learning more relevant, meaningful, and effective for learners (Gay, 2010, 31; Taylor and Sobel, 2011, 16). It can be viewed as a 'contextual and situational process' for both the learners and teachers, whereby when teachers link students' cultural knowledge and lived experiences to the content and teaching methods in the classroom, the experiences and academic performance of learners from culturally diverse groups significantly improves’ (Taylor and Sobel, 2011). McLaren (1989, 117-118) further points out that teachers who adhere to culturally responsive pedagogies often ‘capitalize on their students' home and community culture; empower students using cultural referents; and urge collective action through artistic experiences and ways of knowing.’

Taylor and Sobel (2011, 96), in their book C*ulturally Responsive Pedagogy: Teaching Like Our Students' Lives Matter,* assert that a foundational part of effective teaching involves teachers gathering and using information about the background, knowledge, and prior experiences of learners to do the following three things:

Plan to implement the curriculum.
Make decisions about instructional strategies.
Design a classroom environment for learners to engage as a community of learning.

Ladson-Billings (1995) refers to culturally relevant pedagogy as addressing student achievement and helping students embrace and validate their cultural identity while fostering critical perspectives that question and address the inequalities perpetuated by schools and other societal institutions (469). The actual objective of the school, which is the learning experience, can be realized through a culturally responsive pedagogy that provides students with meaningful opportunities to incorporate their cultural identities and fluencies to enhance their thinking abilities and engage in productive actions with others (Stembridge, 2020). Centering different cultural experiences in the classroom gives ethnically diverse students a platform to succeed (Jabbar & Mirza, 2017, 36). Culturally responsive refers to a dynamic or synergistic relationship between home/community culture and the school culture (Ladson-Billings, 1995). Teachers and learners come to school as rich cultural beings with different cultural backgrounds that influence their perceptions, values, language, and expectations (Taylor and Sobel, 2011, 33). Jabbar & Mirza argued that academics relate instructional resources to student backgrounds, histories, and experiences (Jabbar & Mirza, 2017, 36).

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Although adopting digital technologies in classrooms is a relatively recent development of the post-industrial era, various schools of thought and societies have influenced the concept of culturally responsive pedagogies throughout history. One such approach is the philosophy of *Bildung,* which emphasizes self-cultivation and lifelong learning. It entered German pedagogical thinking in the late eighteenth century and was promoted as a foundation for thinking to liberate the individual from former societally predetermining structures (Hogstad, 2021). The analytical framework for culturally responsive technology-based pedagogies in this study, however, goes beyond an emphasis on the individual's self-cultivation and social responsibility to recognize that systemic injustices marginalize ways of knowing learners, and by adopting technologies in a culturally responsive practice, we allow learners to engage from their varied lived experiences

3.6 Technology-based pedagogies

In this article, technology-based pedagogies are conceptualized as adopting a wide range of technologies in classes through instructional strategies, student engagement, classroom activities, and projects to help improve student learning outcomes. The emphasis is on using a wide range and mix of technologies to promote student engagement informed by students' diverse and unique needs in the classroom. Technology-based learning should encourage student engagement, challenge epistemic injustices in classrooms, and create technology-rich spaces where students have a sense of connection and community. Technology-rich environments can be conceptualized as classroom spaces that provide access to digital technology, develop skills with digital technology, and enact and support the usage of digital technology (Zinger, Tate, & Warschauer, 2017). Early recommendations about teacher preparation for teaching with technology included lists of technology skills and techniques that teachers needed; however, attention has shifted to integrating technology into the curriculum and recognizing that being a competent technology user is different from knowing how to teach effectively using technology as a teaching pedagogy (Wallace, 2004).

In the context of access, skills, and usage, technology-rich environments depend on the teachers who instruct the students as much as they rely on the availability and affordances of the technology itself (Zinger, Tate, & Warschauer, 2017). The focus is not on the challenges posed by the cost or access to technology in the classroom but instead on how to best use technology in a way that is most relevant and appropriate to the course and one that suits the pedagogical preference of the instructor (Blessinger and Wankel, 2013, 8). Technology positions teachers to support student learning when integrated into a program that aligns curriculum, instruction, and assessment in a rigorous and constructivist learning environment (Zinger, Tate, & Warschauer, 2017). There is no one right way to use technology for all courses. Instead, each instructor will figure out how to appropriately use these technologies in the context of the course (Blessinger and Wankel, 2013, 4). The technology-based pedagogy approach discourages a technocentric approach, such that the focus, for example, is not on learning to collaborate through Google Documents but on how the teacher explains and facilitates the use of technology in the peer editing process (Zinger, Tate, & Warschauer, 2017).

Adopting technology-based pedagogies has several challenges that need to be addressed for effective, culturally responsive teaching in the classroom. Chaudhry and Malik (2014) Point out that while there have been concerns about time management and student self-regulation when using technologies, they reinforce that the issue can be addressed by a well-managed lesson plan and designing activities throughout the course to keep students engaged within the module. Another problem is that using technology to teach subject matter requires subject-specific knowledge about technology, curriculum, and the intersection of these domains (Wallace, 2004). Another concern is that even schools with sufficient resources may need help keeping up with the ever-evolving need for increased bandwidth and computing power, frequent requirements for device updates, and hardware obsolescence or wear (Zinger, Tate, & Warschauer, 2017).

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4. Cases from personal teaching experience

This section is informed by selected cases from my teaching experience to discuss the intersectionality of technology, culturally responsive pedagogies, and epistemic injustice. I deliberately tell this story from my viewpoint as an instructor in higher education, trying to explore how to promote student engagement and increase learning outcomes while redressing epistemic injustices that historically underserved students often experience in educational settings. The cases and discussions below were generated from experience teaching both face-to-face and hybrid courses and informed by firsthand knowledge of implementing technology-based teaching methods. My teaching experience spanned various settings ranging from the higher education institutions in the global south to the global north and, further still, from a historically black college and university (HBCU) to primarily white institutions (PWI).

The article aims to explore and detail how an intervention of culturally responsive adoption of technology-based pedagogies can promote learning outcomes among diverse students with unique learning styles and needs. In my teaching experience, I explored the adoption of technologies from two approaches. Firstly, to help students recall foundational knowledge through activities such as reflections through blogs, videos, and online peer reviews. Secondly, to help students master skills such as web design through collaborative group projects, proficiency in photography through street ethnographies, and non-intrusive and non-extractive video productions through interviewing and producing short documentaries and podcasts for community elders, local non-profits, and community partners.

At the beginning of the semester, I would assign technology-preparedness quizzes to gather regular student feedback. Technology preparedness quizzes were administered to students before their first lecture. This was useful in designing culturally responsive pedagogies with knowledge of each student's technology access, experience, and attitudes. The quizzes helped gather information about students' various skill sets coming to class. The survey asked students about their access to reliable Internet and laptops or desktop computers, proficiency in Adobe Creative Suite, knowledge of cameras and microphones, and prior experience using WordPress, YouTube, Google Docs, and Google Jamboard. Afterward, I would assign weekly reflection activities, especially in courses using community-engaged experiential learning pedagogies. For the weekly reflections, the applications included online blogs on the class website, online discussion boards on the Learning Management System, and unlisted YouTube videos for students to reflect on what they had learned each week and which activities they enjoyed the most.

Exit tickets were also administered every other week to get regular feedback. The exit tickets were concise questions posed to students at the end of the classes about their learning and enjoyment levels for the class activities and any learning activity they felt needed to be changed, removed, or adapted into another format. Additionally, course evaluations were conducted - one after midterms and another by the university at the end of the course. For the end-of-semester course evaluations, I often modified the course evaluation questions by adding additional questions that specifically addressed technology use in the classroom. I frequently used the feedback from course evaluations assigned after midterms to make any adjustments before the end of the semester. On the other hand, the end-of-semester course evaluations were helpful for me in taking note of areas of improvement as I prepared for the next class.

Initially, all courses were taught in person and synchronously. However, due to learning disruptions resulting from the COVID-19 pandemic, some courses that employed these strategies transitioned to hybrid delivery. This article only covers the in-person and hybrid courses rather than the online asynchronous courses, as they demanded a different approach towards asynchronous student engagement in the online classroom space, which was a big challenge, especially for hands-on media production courses. While this intervention was also adopted in fully online asynchronous courses, this article needs to discuss my experience with adopting technologies in online asynchronous classes. Thus, this article focuses on my experience adopting culturally responsive technology-based learning in courses to promote

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student engagement and increase learning where the students at least had face-to-face interactions with the instructor.

In this section, I explore and review how the intervention could promote student engagement and create classroom spaces where students have a sense of connection and community and, by so doing, challenge epistemic injustice that diverse students experience in the classroom. The following questions frame my discussions:

How does adopting technology-based learning promote student engagement and create classroom spaces where students have a sense of connection and community?

How does adopting culturally responsive technologies center minoritized students as knowers and redress epistemic injustice?

How can technology-based pedagogies help promote student engagement and increase learning outcomes?

5. Discussions

The discussions of the cases below were informed by my experience as an instructor adopting technology-based pedagogies for media production courses to help improve learning outcomes. The pedagogies were anchored in recognition of the classrooms as online and in-person lectures/labs/spaces where diverse learners interact and engage with content to master terminology and production skills relevant to each media production course. In addition to emphasizing mastery of technical terminology and skills in digital video production, web design, audio production, publication, editing, and design, the courses also required students to be familiar with various Adobe Creative Suite Applications, including Photoshop, Lightroom, InDesign, Audition, Premiere Pro, and After Effects.

I will mainly reflect upon the following four cases in this article and discuss how adopting culturally responsive technology-based pedagogies helped increase learning outcomes in those areas. Thus, the discussions about adopting technology-based pedagogies to promote student engagement and improve learning outcomes are framed and discussed below through culturally responsive implementation of technology-based pedagogies. They are structured around four fundamental elements: cultural relevance, student-centeredness, experiential learning, and technology-based.

5.1 Culturally relevant

I used several approaches to address how adopting culturally responsive technologies centers minoritized students as knowers and redress epistemic injustice. At the start of the semester, I posted two short online quizzes on the Learning Management System (LMS) that were referred to as the "syllabus response quiz" and "technology-preparedness quiz." The technology quiz helped generate student access, experience, knowledge, and attitudes toward technology. The syllabus quiz helped me understand students' preferred methods of communication, classroom engagement, accessing academic resources, and methods of assessment and feedback. A discussion forum was also created on the LMS where students could share information that they felt comfortable with regarding their majors, hobbies, hometowns, favorite historical figures, and any inspiring quotes.

The feedback from the quizzes was also helpful in designing course activities, teaching strategies, and assessments customized for each course with several options based on student's interests, preferences, and lived experiences. This information was also valuable in helping them glean their expectations of the course, attitudes, and lived experiences. As a result, course materials had to be developed and customized specifically for each class, informed by preliminary familiarization with the students enrolled in the course through the short online quizzes and discussion forums. The final project was also redesigned in multiple formats, such as research papers, podcasts, short documentaries, or websites, that focused on a social issue, topic, or even social movement they were working on throughout the semester. The objective

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was for students to select various topics based on personal experiences and choose diverse formats, with a range of distribution among research papers or creative projects such as podcasts, videos, and websites.

Further, to promote diverse perspectives, the adopted class readings represented writers from diverse backgrounds and culturally relevant pedagogies that enabled students to connect with and relate to teaching resources based on their personal experiences, needs, and challenges. To do this effectively, the first step was understanding the students' diverse cultures, knowledge, and experiences in the course. I adopted various teaching resources in the courses on the intersectionality of race, gender, sexuality, language, and power. This was done using a wide range of academic resources, from assigning students' weekly readings by women of color such as Ruha Benjamin, Safiya Umoja Noble, and Gayatri Chakravorty Spivak to global scholars such as Achille Mbembe, Paulo Freire, and Frantz Fanon. Adopting diverse voices in the classroom elicited more student discussions and cognitive and affective engagement in classroom activities. Selecting the course readings, including academic sources from prominent black scholars in the design field, was crucial, as students of color could connect and identify with those course resources. The selection of works of scholars of color also encouraged discussions that challenged the historical colonial bias of the education system that had marginalized the contributions of black scholars.

5.2 Student-centered

While the first case focused on culturally relevant pedagogies, the second focused on adopting culturally responsive technology-based learning to promote student engagement and create classroom spaces where students had a sense of connection and community. In this case, a variety of interactive teaching strategies were adopted, such as small group workstations, street ethnographies, brainstorming on online discussion boards, reflections through blogging or videos, games, and puzzles, and collaborative content creation for digital portfolios to promote student engagement in class while also recognizing and providing for diversity among students. This is because one teaching style does not work for all students, and if students feel left out, they will not participate in classroom activities. It was, therefore, essential to adopt technology in a way appropriate for the culturally responsive pedagogical approach and the context of the learning environment, such as the nature of the course, the learning objectives, and the learning needs of students (Blessinger and Wankel, 2013, 4).

The student-centered approach focused on various interactive activities and projects based on the content being taught and the skills expected for the learners to master. To achieve this, individualized instruction was a crucial component in the teaching. In this case, worksheets were used where students could work depending on their varied skills and levels of proficiency, for example, in using Adobe Creative Cloud apps. This helped increase student engagement by promoting interactivity in the classroom and ensuring students stayed engaged in cases where they quickly completed assigned tasks ahead of their classmates. They were able to proceed at their own pace using the assigned worksheet. In contrast, the others received individualized support, such as proficiency in Adobe Premiere Pro or designing websites using HTML and CSS.

Students were made aware that the instructor would be available to them outside the scheduled class time for further clarification after the content had been taught.

When designing the courses, there was a need to rethink what is meant by student engagement and how it feeds into epistemic injustice if we frame student engagement as students speaking up in class because often then, the voices we hear might not be representative of all the students. This was also considered in rethinking how to be equitable when we grade participation because students engage differently in classes based on their cultural frames. Students also have preferences for different learning styles. It was, therefore, essential to validate the other student's learning styles by incorporating various learning activities based on the feedback from the short quizzes at the beginning of the semester. It was complemented by feedback that students shared during the semester.

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There are three student engagement types: behavioral, affective, and cognitive (Stembridge, 2020, 71). Different tools were used to increase student engagement, ranging from online quizzes, online discussion boards, weekly reflections through blog posts, video responses to weekly readings, collaborating on Google Docs, small group workstations in class, and mapping activities to documenting urban street ethnographies. Behavioral and affective engagement was primarily emphasized in the courses, which focused on community-engaged learning. Therefore, learners had to create media content for community partners. Supplementing the community-engaged activities were asynchronous online discussions, which proved highly beneficial for cognitive engagement. By providing a space where students could participate without being called out by name and without feeling pressured to have all the answers, these online discussions were a valuable addition to the learning experience. The asynchronous online discussions allowed students more time to think about their answers and engage in conversations without the expectation of 'having all the answers.' Instead, they offered spaces where they could learn from each other. Assigning weekly reflective blog posts and video responses to readings proved an effective method for increasing student engagement, particularly for those who preferred expressing themselves through blogs or videos instead of written responses. In other cases, classroom activities involved students collaborating on Google Docs and WordPress to work on assignments and projects. Using Google Docs and WordPress sites allowed students who were uncomfortable speaking up in class at a particular time to add their input in the collaborative documents while discussing in style with their peers.

5.3 Experiential/community-engaged

According to Blessinger and Wankel (2013), learning involves aligning the course objectives with relevant, real-world learning experiences. When students are presented with activities that are authentic and meaningful to their personal lives, they are more inclined to engage with enthusiasm. In this case, I created opportunities to use technologies to apply course content outside the classroom. In adopting this approach, the first step was familiarization with the community, local non-profits, local media organizations, and local community events. Capturing visuals, such as videos and photographs of significant landscapes, architectural structures, and historical buildings, was also essential.

Further, bringing pictures of local and familiar places to the classroom enabled students to connect to what was being taught. For instance, images and videos taken during the Black Lives Matter protests in Philadelphia and Washington, DC, were used in courses centered around media activism and social movements. I brought to class content that students could relate to and opened opportunities for more conversations around media, technology, and broader social issues in their local communities. The focus was for students to get hands-on experience, and a significant component of the courses was to get students out of the classroom and get them involved with local communities.

In courses designed around community-engaged learning, there was more emphasis on using non-intrusive technologies and non-extractive approaches when working with communities. In media production courses, I assigned students to document street ethnographies through visual essays, interviewed local non-profits, and submitted short documentaries. They also used different tools to engage local representatives, created online petitions, used digital media for resource mobilization, and hosted an event with a community partner for a social cause. One activity highlighting students' knowledge of various social causes and movements was collaboratively developing an activist social network that students designed and used to share stories about social causes and movements they researched. It was a public-facing site, and therefore, it grew beyond the limits of the classroom walls. Rules of engagement were set initially on how to use the activist social network and the need to be respectful, and this was evident in how students designed, developed, and engaged in conversations, content creation, and sharing content on the activist social network in the *Civic Media* course. The activity improved student engagement and learning outcomes as they could relate the course material to real-life situations.

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In other courses, at the beginning of the semester, students selected from a list provided the community partners they collaborated with throughout the semester. They then worked on mastering technical skills in the classroom and the experiential element of creating content for the community partners. For instance, they created fliers and other publication materials such as logos and posters. From the conceptualization of fliers and pamphlets to sharing drafts and finally submitting the approved final product to the partners, they collaborated with the partners throughout the entire process of design and publication. Other forms of content created were podcasts. They worked through developing a podcast, developing a concept for the podcast, identifying guests, and interviewing them about social movements on their podcasts. We also had students who completed websites for various global social movements they were researching in the semester.

5.4 Technology-based

In the case of adopting technology-based pedagogies, the courses were approached as a laboratory where students were encouraged to experiment with technologies they preferred and adopt different digital tools to engage in the classroom. The academic resources of the courses were a mix of readings, guest speakers, podcasts, videos, and a wide range of global films. Students were also asked to reflect weekly through blogging or unlisted YouTube videos on the technologies they used for their projects and whether that had increased their overall engagement with the course content. Different technologies were adopted for various courses based on the expected learning outcomes for each course.

In the courses, students were encouraged to identify a social cause and work with various digital media technologies to address emerging concerns about the social cause. In this course, some students selected the option to create websites for social causes, while others created podcasts and interviewed guests about social movements. Students were also allowed to write a research paper for this course. For those writing a research paper, they created a Google Drive where they organized all their resources and drafts in folders and worked from a Google Document with a shareable link to allow for comments and corrections. Students could also engage with social movements through digital technologies, such as building an activist social network. The production techniques were also taught by assigning students to interview community partners and local non-profits as part of an ethnographic experience. Students could engage with communities firsthand by going beyond the theoretical content and focusing on experiential learning. This approach is supported by Blessinger and Wankel (2013), who posit that building social learning communities within the classroom has the potential to center voices often on the periphery, foster a greater sense of belonging, interactivity, and group cohesiveness which are essential factors in student motivation and their willingness to participate in such communities.

Through the community-engaged courses, students could master technological skills and use the skills in camera production, editing using Adobe Premiere Pro, sound editing through Adobe Audition, and motion graphics through After Effects to create media content for community partners. Students worked in groups and shared Google Drive and Google Docs, where they uploaded their breakdown sheets, location agreement forms, and media release and consent forms signed by participants. They also had an online forum where they could share their updates with the rest of the class while in the community and ask questions if they experienced any hitches with their cameras, lenses, batteries, or even tripods.

From the above discussions, the framework for culturally responsive technology-based pedagogies emphasized epistemic justice, where students were recognized as knowers of knowledge from their primary cultures and their lived experiences. Their feedback was also influential in evaluating the case studies, and by continually reviewing the feedback, I could see an improvement in student engagement in classes and their learning outcomes. A culturally responsive approach to adopting technologies was vital in creating classroom spaces where students were stimulated to engage in different and unique ways with the course content.

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6. Conclusion

From the discussions above, it can be concluded that adopting culturally responsive technology-based pedagogies is essential in redressing epistemic injustice in higher education. This is supported by the findings that show that student learning outcomes improved when they engaged with technologies in a way that reflected their lived experiences and interests. Students could show their mastery of the knowledge and skills by selecting their preferred technologies for weekly reflections, such as Google Documents, online classroom discussion boards, blogging on WordPress, or creating a video. Using technologies, they could relate to their varied experiences, and each appreciated how course content could be learned differently.

Technologies have historically been exclusionary in design, adoption, and access. Therefore, the subject of technology-based pedagogies often creates questions and deliberations on the challenges of access and adoption of technologies by historically underserved learners. However, approaches to learning technologies that are more responsive to students' diversity, such as the culturally responsive technology-based pedagogies framework suggested in this study, can be influential in addressing the epistemic injustice associated with the misrecognition and suppression of this diversity. The adoption of culturally responsive technology-based pedagogies should promote classroom spaces that validate learning communities for all students, especially students from diverse backgrounds (Taylor and Sobel, 2011, 117), and work towards 're-positioning power, authority, voice, and praxis' in pedagogical practices (Pirbhai-Illich, Pete, & Martin, 2017, 17). According to Zinger, Tate, and Warschauer (2017), technology should broaden and enrich students' learning experiences. Additionally, Byskov (2021) suggests that by identifying the factors contributing to epistemic injustice, we can systematically assess allegations of harm against knowers and take steps to prevent the perpetuation of current socio-economic inequalities.

While this article focused on culturally responsive technology-based pedagogies for redressing epistemic injustice in hybrid and in-person courses, there is a need for further research on the adoption of culturally responsive technology-based pedagogies in fully online classes. More research is needed on the challenges of understanding students' diverse backgrounds and lived experiences and creating collaborative spaces and a sense of belonging in fully online classes while adopting culturally responsive technology-based pedagogies. Students have unique learning styles, needs, and experiences, which should inform the adoption of teaching pedagogies, instructional strategies, and student assessments. In Stembridge's (2020, 27) words, we cannot say equity has been achieved until neither the identities of students, such as race, ethnicity, gender, and socio-economic status, are reliable predictions of a school's achievement and performance.

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Inequalities in internet use among older people between 2004 and 2021

Examining the cumulative impact of sociodemographic characteristics on internet non-use

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Abstract

Although research already examined sociodemographic profiles of older internet (non-)users, it is unknown how combinations of sociodemographic factors relate to internet (non-)use. Therefore, this study aims to investigate the cumulative impact of sociodemographic characteristics on internet (non-)use among people aged 60 and older between 2004 and 2021, using representative survey data derived from the Belgian Ageing Studies (n = 61 376). Logistic regression analyses consistently associated low education, age 80 or older, low income and female gender with higher probabilities of being internet non-user between 2004 an 2021. CHAID analysis revealed that education and age are the strongest predictors of non-use. The cumulative impact of sociodemographic factors enables to reveal subgroups where prevalence rates of non-use are almost three times higher than the prevalence reported in the population of older people in general. The result that 80.1 percent of individuals aged 80 and above with limited education did not use the internet underscores the need for a comprehensive digital inclusion approach, including strategies to overcome economic barriers to internet access and tailored internet training initiatives addressing digital skills and motivation. CHAID results help policymakers and internet training providers identify subgroups with high prevalence rates of non-users and target interventions to those at a high risk of digital exclusion.

Keywords: CHAID; internet non-use; older people; sociodemographic characteristics

1. Introduction

In an increasingly connected and technologically advanced world, internet has become one of the most important means for information sharing, social networking, shopping, entertainment and administration (van Boekel et al., 2017). Moreover, being online has become compelling since day-to-day life is shifting online and offline alternatives tend to be inferior or non-existent (Nuechterlein & Shelanski, 2021; Quan-

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Haase et al., 2017). However, not everyone has internet access and the necessary devices and/or is digital literate, which points to the problem of digital inequalities (Gródek-Szostak et al., 2021). In this context, it has been well-documented that internet adoption rates (i.e. the percentage of people using internet) are generally much lower among older people than among younger and middle-aged adults (Gallistl & Wanka, 2022; Hargittai & Dobransky, 2017; Hunsaker & Hargittai, 2018; Lagacé et al., 2015). For example, one in four (25.6%) Europeans aged 65 to 74 has never used the internet in 2022, compared to only 4.2 per cent of people aged 25-64 (Eurostat, 2023). However, older people are heterogeneous and have substantial variation in internet adoption rates (Neves et al., 2018; van Deursen & Helsper, 2015). Indeed, previous research has revealed that internet adoption varies considerably among the older population, depending on age, educational level and income (Hargittai et al., 2019). Scholars exploring who among the older people is online, consistently show that lower age, higher education and higher income are associated with a higher likelihood of internet use (Berner et al., 2019; Berner et al., 2015; Friemel, 2016; Hunsaker & Hargittai, 2018; König et al., 2018; Neves et al., 2018; Quittschalle et al., 2020). Similarly, scholars focusing on internet non-use or the comparison of non-users' and users' characteristics consistently reveal that the oldest old, those with lower educational status and lower income are most likely to be internet non-users (Anderberg et al., 2020; Gallistl et al., 2020; Hargittai & Dobransky, 2017; van Deursen & Helsper, 2015). However, conceptualization of internet non-use is not consistent. For instance, Gallistl et al. (2020) measured non-use as never having used a computer and not having used the internet seven days before the survey, while – for example – Anderberg et al. (2020) defined non-users as those who had never used the internet or stopped using it.

The result that older people, particularly the oldest old, have lower rates of internet adoption has multiple plausible explanations (Hargittai & Dobransky, 2017). A major factor underlying digital differences by age is the relatively recent arrival of internet technologies in the lives of older people. Those aged 80 and older have spent the bulk of their lives in the predigital era without on-the-job training or workplace incentives to learn how to use the internet (Anderberg et al., 2020; Hargittai & Dobransky, 2017; McCosker et al., 2021). Older people who did not use internet technologies during their career are less likely to familiarize themselves with the internet and use it in retirement (Anderberg et al., 2020; Leukel et al., 2021; McCosker et al., 2021). Moreover, retirement not only eliminates the necessity to learn how to use internet technologies, but also reduces income, leaving older people with fewer financial resources to allocate towards technologies (Hargittai & Dobransky, 2017; Wan et al., 2022). On the other hand, some scholars state that advanced age can be associated with changes in cognitive or physical capacity, impeding internet adoption (Dobransky & Hargittai, 2016; Hargittai & Dobransky, 2017; Wan et al., 2022). Furthermore, in advanced age, the cumulative impact of lifelong disadvantages becomes apparent (Hargittai & Dobransky, 2017). For instance, Silver (2014) observed that older people who had lower socioeconomic status during childhood were less inclined to be internet users in older adulthood, while having a high socioeconomic status at some point during their lives increased the odds of being internet user in later life. The connection between socioeconomics and internet use has multiple pathways. For instance, advanced education increases the likelihood of engagement in employment that requires internet use (Leukel et al., 2021; Wan et al., 2022). On the other hand, higher education strongly correlates with higher income, making internet devices and connection more affordable (Pang et al., 2021; Wan et al., 2022).

While age, education and income reveal clear disparities in internet use, differences by gender are less clear (Hunsaker & Hargittai, 2018). According to Friemel (2016), there is no relation between gender and internet use when controlling for other sociodemographic variables (education, income and marital status), while other studies reveal that men are more likely to use the internet (Foster et al., 2019; König et al., 2018; Matthews et al., 2019; Shi et al., 2023). Yet, other findings showed the reversed pattern, with women being more likely to be internet users (Yu et al., 2016). Given these inconsistencies, Hunsaker and Hargittai (2018) conclude that inequalities in internet use, based on sociodemographic factors, require more in-depth examinations. In a similar vein, more research is needed to further investigate the

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relationship between internet (non-)use and marital status and/or household composition (van Deursen & Helsper, 2015). Various scholars have identified living alone as a factor contributing to internet non-use (Lips et al., 2020; Wilson-Menzfeld & Brittain, 2022). Those living alone lack the opportunity to rely on support or assistance from their partners and cannot acquire knowledge about the internet from their partner or someone else in the household, making them less likely to adopt internet technologies (van Deursen & Helsper, 2015). Moreover, living alone is linked to lower income and, therefore, lower internet adoption rates (Berner et al., 2015). In contrast, Berner et al. (2019) noticed that those living alone were more likely to start using internet because living alone creates a need to go online socially or to be able to handle independent living. Indeed, some older people may be less inclined to become internet users when they have relatives who are internet users and upon whom they rely (Bartol et al., 2022; Reisdorf et al., 2016; Wilson-Menzfeld & Brittain, 2022).

However, several scholars point to the fact that research exploring associations between internet (non-)use and sociodemographic and socioeconomic backgrounds of older people has some substantial limitations. First, Petrovčič et al. (2022) noticed that most research on internet (non-)use focuses on younger populations or only includes the youngest old, for instance with a cut-off age of 75 or lower. Second, as mentioned in previous research (Helsper & Reisdorf, 2016; Hunsaker & Hargittai, 2018), most studies on internet (non-)use rely on measurements at a single point in time or within short time frames. In doing so, they do not allow to monitor social inequalities in internet use over time and are unable to reveal whether or not inequalities in internet use persist. Some scholars claim that inequalities in internet use will fade over time. This hypothesis derives from the observation that the number of adopters of innovations typically follows a normally distributed curve and the diffusion of innovations, as they spread over time, typically trickles down from privileged groups towards the broader population (Rogers et al., 2014). However, the scarce research on the evolution of inequalities in internet use revealed that, despite increasing internet use in recent years, digital divides and socioeconomic inequalities in internet use have persisted over time (Helsper & Reisdorf, 2016; Hunsaker & Hargittai, 2018). For instance, Helsper and Reisdorf (2016), who conducted a study on the evolution (between 2005 and 2013) of digital exclusion in Britain and Sweden, revealed that low education was more strongly related to the probability of being non-user in 2013 than in 2005. As research on the evolution of inequalities in internet use is in its infancy, more research on this topic is needed (Dziuba et al., 2021; Helsper & Reisdorf, 2016; Hunsaker & Hargittai, 2018). The third major limitation is related to the use of logistic regression modelling, which is frequently applied to examine associations between sociodemographic characteristics and internet (non-)use among older people (Leukel et al., 2022). In their systematic review of empirical articles using multivariable logistic regression to investigate internet (non-)use among people aged 55 and older, Leukel et al. (2022) revealed substantial shortcomings in reporting and interpretation of multivariable logistic regression analysis and in the extent to which commonly recommended quality criteria for regression analysis have been addressed (e.g. shortage of information on goodness of fit statistics, no consideration of interactions and lack of testing for multicollinearity and conformity with linear gradient). Furthermore, odds ratios are commonly used in logistic regression analysis, though frequently misinterpreted as relative risks (Holcomb et al., 2001; Niu, 2020; Osborne, 2008), even in research investigating sociodemographic predictors of internet (non-)use among older people (Leukel et al., 2022). This is problematic because misinterpretation of odds ratios as risk ratios usually overestimates the association between the dependent and independent variables (Breen et al., 2018; Rönkkö et al., 2022). Moreover, researchers applying logistic regression analysis to examine associations between sociodemographic backgrounds and internet (non-)use among older people did not pay adequate attention to the interconnectedness of sociodemographic characteristics (Helsper, 2019; Leukel et al., 2022; Ren & Zhu, 2023). However, socially constructed categorizations, such as age, gender, or socioeconomic status, are interwoven and do not exist separately (Helsper, 2019; Reisdorf & Rhinesmith, 2018; Tsatsou, 2022). As a consequence, in the context of digitalization, it is not just age, gender or socioeconomic status making someone less or more likely to be digitally excluded, but the combination of these factors. Therefore, research on

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inequalities in internet use should explore how sociodemographic characteristics interact with each other and examine their cumulative effect on internet (non-)use, rather than testing the effect of each of the demographic variables on its own (Helsper, 2019; Tsatsou, 2022).

Taking the aforementioned into account, this study aims to examine the cumulative impact of sociodemographic characteristics on internet (non-)use among older people between 2004 and 2021, based on a representative sample of community dwelling people aged 60 and older (N = 61 376) living in Flanders (the Dutch speaking part of Belgium) with a proper representation of the oldest old. The following research questions were formulated:

1.How sociodemographic characteristics (age, education, gender, income, marital status) relate to internet non-use among community dwelling people aged 60 and older?

2.To what degree internet non-users among people aged 60 and older show different sociodemographic characteristics between 2004 and 2021?

3.Which (combinations of) sociodemographic characteristics are the most important to identify subgroups of people aged 60 and older having the highest prevalence of internet non-use between 2004 and 2021?

2. Methodology

2.1 Data collection and participants

In this study, data from the Belgian Ageing Studies (BAS) were used. BAS is a large-scale survey study using a highly-structured questionnaire to gather information on various aspects related to quality of life and living conditions of older people. Data collection started in 2004 and municipalities are still applying for participation in the study in order to develop a local policy plan based on the findings of the assessment. In each municipality, adults aged 60 and older are randomly selected from population registers, using quotas for gender and age (60 - 69, 70 - 79 and 80+ years). This type of sampling ensures that the sample matches the underlying population and that the 80+ age group is adequately represented, which is important as the oldest old are often excluded in internet research. Consequently, every sample is representative for the specific municipality. As each municipality had the freedom to decide whether to participate in the research project, they were not randomly selected.

Since 2004, data collection is based on the principles of peer research. Thereby, older people are involved as voluntary partners in the data collection process. Older volunteers are recruited through a specifically developed and intensive recruitment campaign and receive several training sessions, for instance on how to deliver and collect the questionnaires personally (Verté et al., 2007). After training, the volunteers visit older people who are assigned to them, invite the respondents to participate in the research project and hand over the questionnaire. Although the questionnaire was designed to be self-administered, volunteers are allowed to clarify questions or provide help, if requested. Respondents were assured of the voluntary, anonymous, and confidential nature of the study and their right to refuse to answer or participate. Volunteers receive replacement addresses in the same quota category to exchange respondents who refused or were unable to participate. The ethical committee of the Vrije Universiteit Brussel approved the study protocol (B.U.N. 143201111521).

Data used in this study span from 2004 to 2021. During this period the BAS questionnaire was slightly modified three times. Based on those modifications, the dataset can be split up into three wave groups: 2004 - 2009 (= Wave-1), 2010 - 2015 (= Wave-2) and 2016 - 2021 (= Wave-3). Between 2004 and 2021, a total of 82 580 older people have participated in the questionnaire. Respondents who did not respond to at least one of the five sociodemographic characteristics included in this study or did not answer the question concerning internet use were excluded for analysis. This resulted in a dataset of 61 376 respondents.

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2.2 Measures

The following sociodemographic variables were included in this study: gender, age, educational level, monthly household income and marital status. Gender was bivariate (0=men, 1=women), with men being the reference group in regression analysis. Age was assessed by asking the respondents their age in years and was, in line with the stratified sampling procedure, recoded into three age groups: 60 - 69 years old (=0), 70 - 79 years old (=1) and 80 years and older (=2). The youngest age group was used as reference group. Level of education had four categories: no degree or primary education (=0), lower secondary (=1), higher secondary (=2) and higher education (=3). The higher educated served as reference group. Monthly household income was categorized into four groups: ≤ €999 (=0), €1000-1499 (=1), €1500-1999 (=2) and ≥ €2000 (=4). The highest income class was used as reference group. Finally, marital status was measured as married (=0), never married (=1), divorced (=2), cohabiting (=3) and widowed (=4), with the first group serving as reference group.

In the BAS-survey internet use is assessed by asking respondents "How often do you use internet?". Response categories were never (=0), less than weekly (=1), weekly (=2), daily (=3) and several times a day (=4). For the purpose of this study, we dichotomised internet use into non-use and use (by grouping together the response categories 1 - 4), with internet users being the reference group.

2.3 Data analysis

First, data were grouped into three wave groups (Wave-1=2004 - 2009, Wave-2=2010 - 2015, Wave-3= 2016 - 2021) in correspondence to the three waves of data collection in BAS. Second, descriptive statistics were used to examine sociodemographic characteristics of respondents in these three wave groups (table 1). Third, for each wave group separately, chi-square analyses (table 2) and univariate and multivariable logistic regression analyses (presented in table 3 and table 4 respectively) were performed to assess associations between respondents' sociodemographic characteristics and internet (non-)use. Sociodemographic variables univariately associated ($p < 0.001$) with internet non-use entered the multivariable logistic regression analysis. Before conducting multivariable regression analysis, we tested whether assumptions underlying the statistical test were met. First, our sample size ensured sufficient events per variable (Courvoisier et al., 2011; Peduzzi et al., 1996). Second, sociodemographic variables were evaluated for multicollinearity. All Variance Inflation Factors were below 5.0 (ranging from 1.01 to 3.14), indicating that multicollinearity was not a concern in the multivariable model (Field, 2017). Third, we tested for interactions between independent variables, but none of them were statistically associated with the dependent variable (internet non-use) and thus not included in the multivariable models. Since odds ratios (ORs) only reveal the direction of associations between independent variables and the dependent variable and do not allow for a direct interpretation of the strength of associations, logistic regression models are interpreted by calculating average marginal affects (AMEs) (with 95% CI and p-values). Indeed, an important advantage of AMEs over ORs is that they provide probability-based interpretations and allow to estimate the average of predicted change in the probability of being internet non-user associated with a one-unit (for continuous variables) or a categorical change in a particular variable controlling for other covariates (Mood, 2010; Niu, 2020). AMEs were calculated for each independent variable by computing individual marginal effects for each case and, subsequently, averaging all individual marginal effects (Gallani et al., 2015; Mood, 2010; Niu, 2020). Assessment of the goodness of fit of logistic regression models has been done using Nagelkerke's pseudo R2 and by describing the percentage of observations (i.e. older people) correctly mapped onto the categorical outcome (i.e. user or non-user categories). Finally, for each wave group separately, Chi-squared Automatic Interaction Detector (CHAID)-analyses were performed. CHAID is a useful addition to regression modelling because of its ability to determine which combinations of predictors best explain the dependent variable and to segment data and classify individuals into mutually exclusive subgroups based on a single categorical outcome and several ordinal predictors. Furthermore, CHAID shows, for each subgroup, the number and

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percentages of cases that belong to the outcome category (e.g. internet non-users) (Guillon et al., 2016). CHAID-analysis proceeds in a stepwise fashion in which the entire sample is divided into subgroups based on the most important predictor of the outcome. Then, as in the first step, cases in each subgroup are further partitioned by the second most significant predictor. The software continues analysing until no more significant relations between independent factors and the dependent variable remain (Biggs et al., 1991; Kass, 1980). In doing so, CHAID enables detecting interactions between multiple variables, which are generally missed by traditional statistical techniques, and depicts the results in a hierarchic tree structure (Kass, 1980). All statistical analyses were performed with SPSS 25.0 (IBM, SPSS, Armonk, NY: IBM Corp) and Stata SE 17 (Stata Corp LLC, College Station, TX, USA). Given the large sample size, statistical significance was set at $p < 0.001$ (Field, 2017).

3. Results

3.1 Respondents' sociodemographic characteristics

We first describe the essential sociodemographic characteristics of the respondents over the three waves of BAS. Slightly more than half of the respondents were women, both in the first, second and third wave group (see Table 1). Approximately one in five were 80 years or older, while about half of the respondents were aged 60 - 69 years (again in the three wave groups). With regard to education, 40% of the respondents who participated in the survey between 2004 and 2009 had no degree or only primary education, whereas in the second and third wave group this was the case for 31.1% and 19.7% respectively. Correspondingly, we also see increases in the amount of people with higher secondary and higher education. Similarly, the proportion of respondents with a net monthly household income of at least 2000 euro was higher in the third wave group (46.8%) than in the second (31.3%) and first one (18.6%). Approximately seven in ten were married in the three waves. Regarding internet use between 2004 and 2009, 76.0% of the respondents had never used internet, which was 53.8% in Wave-2 and 28.6% in Wave-3 (see Table 1).

Table 1. Respondents' characteristics

	Wave-1 (2004 - 2009)		Wave-2 (2010 - 2015)		Wave-3 (2016 - 2021)	
	N	%	N	%	N	%
Gender						
Men	22 398	47.4%	5266	48.4%	1564	48.3%
Women	24 854	52.6%	5619	51.6%	1675	51.7%
Age						
60 - 69	22 174	46.9%	5074	46.6%	1532	47.3%
70 - 79	17 017	36.0%	3635	33.4%	1028	31.7%
80+	8061	17.1%	2176	20.0%	679	21.0%
Educational level						
No degree or primary	18 886	40.0%	3384	31.1%	638	19.7%
Lower secondary	13 854	29.3%	3023	27.8%	899	27.8%
Higher secondary	8519	18.0%	2471	22.7%	833	25.7%

Higher education (university college or university)	5993	12.7%	2007	18.4%	869	26.8%
Income						
≤ €999	10 975	23.2%	1006	9.2%	160	4.9%
€1000 - €1499	17 568	37.2%	4004	36.8%	879	27.2%
€1500 - €1999	9931	21.0%	2467	22.7%	684	21.1%
≥ €2000	8778	18.6%	3408	31.3%	1516	46.8%
Marital status						
Married	32 760	69.6%	7535	69.4%	2217	68.5%
Never married	1736	3.7%	422	3.9%	139	4.3%
Divorced	1709	3.6%	629	5.8%	271	8.4%
Cohabiting	805	1.7%	240	2.2%	86	2.7%
Widowed	10 057	21.4%	2035	18.7%	521	16.1%
Internet user						
Yes	11 361	24.0%	5033	46.2%	2313	71.4%
No	35 891	76.0%	5852	53.8%	926	28.6%

3.2 Internet (non-)use according to sociodemographic characteristics

Regarding the association between sociodemographic characteristics and internet (non-)use, we start with bivariate exploration over the three waves, represented in table 2. Within the group of internet non-users, there were significantly more women across the three waves. The majority of internet non-users were people aged 70+, while the majority of users were younger than 70 years, which is true in the three wave groups. Forty to fifty percent of the internet non-users had no degree or only primary education, which is significantly lower among internet users. Concerning income, one in ten to one in four non-users had a net monthly household income of at least 2000 euro in the three waves, which was significantly higher among internet users. Six to seven out of ten non-users were married, which was significantly higher among internet users (see Table 2).

Based on results of univariate analyses, all variables shown to be associated with internet (non-)use (see table 3) and were – as mentioned in the Methods section – included in multivariable logistic regression analyses (see table 4). Multivariable regression models indicate that women were – since 2004 – 7% more likely to be internet non-user (6.9% in Wave-1, 6.8% in Wave-2 and 6.6% in Wave-3) than men. Also, people aged 70 - 79 and those aged 80 and older consistently had higher probabilities of non-use than those aged 60 - 69, both in Wave-1 (respectively 14.0% and 21.9%), Wave-2 (16.4% and 31.3%) and Wave-3 (14.3% and 35.9%). Similarly, higher probabilities of non-use were consistently found in lower educated older people, with those who obtained no degree or only primary education being at least 31.4% more likely to be non-user (36.9% in Wave-1, 31.4% in Wave-2 and 34.2% in Wave-3) than those with higher education. Also, lower income was consistently related with higher probabilities of being non-user, with those who had a net household income of less than 1000 euro/month being up to 30.0% more likely to be non-user (17.8% in Wave-1, 30.0% in Wave-2 and 22.3% in Wave-3). Finally, marital status was not related to internet non-use ($p > 0.001$). Only widow(er)s were – between 2004 and 2009 – 3.2% more likely to be non-user than those who were married.

Table 2.

Sociodemographic differences in internet (non-)use in 2004 - 2009, 2010 - 2015 and 2016 - 2021

	Wave-1 (2004 - 2009)		Wave-2 (2010 - 2015)		Wave-3 (2016 - 2021)	
	Users (n=11 361)	Non-users (n=35 891)	Users (n=5033)	Non-users (n=5852)	Users (n=2313)	Non-users (n=926)
Gender						
Men	62.1%	42.8%	56.1%	41.8%	52.9%	36.8%
Women	37.9%	57.2%	43.9%	58.2%	47.1%	63.2%
χ^2 (p-value)	1288.11 (< 0.001)		221.76 (< 0.001)		68.22 (< 0.001)	
Age						
60 - 69	73.9%	38.4%	64.2%	31.5%	57.5%	21.9%
70 - 79	22.1%	40.4%	27.8%	38.2%	30.7%	34.4%
80+	4.0%	21.2%	8.0%	30.3%	11.9%	43.6%
χ^2 (p-value)	4615.17 (< 0.001)		1388.44 (< 0.001)		497.32 (< 0.001)	
Educational level						
No degree or primary	12.5%	48.7%	16.3%	43.8%	11.3%	40.7%
Lower secondary	24.7%	30.8%	24.7%	30.4%	26.4%	31.2%
Higher secondary	29.2%	14.5%	28.9%	17.3%	28.4%	19.1%
Higher education (university college or university)	33.6%	6.1%	30.1%	8.4%	34.0%	9.0%
χ^2 (p-value)	9113.21 (< 0.001)		1549.08 (< 0.001)		472.58 (< 0.001)	
Income						
≤ €999	8.5%	27.9%	4.4%	13.4%	2.9%	10.0%
€1000 - €1499	24.5%	41.2%	23.7%	48.0%	20.5%	43.6%
€1500 - €1999	25.7%	19.5%	23.8%	21.7%	20.5%	22.6%
≥ €2000	41.3%	11.4%	48.1%	16.8%	56.0%	23.8%
χ^2 (p-value)	6349.54 (< 0.001)		1527.05 (< 0.001)		346.75 (< 0.001)	
Marital status						
Married	82.3%	65.6%	77.1%	62.7%	74.2%	54.5%
Never married	2.7%	4.0%	3.2%	4.5%	3.6%	6.0%
Divorced	4.5%	3.4%	6.6%	5.1%	8.7%	7.6%
Cohabiting	2.5%	1.4%	3.0%	1.6%	2.9%	1.9%
Widowed	8.0%	25.6%	10.1%	26.2%	10.6%	30.0%
χ^2 (p-value)	1723.18 (< 0.001)		503.98 (< 0.001)		203.16 (< 0.001)	

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Table 3.

Results of univariate logistic regression models with sociodemographic characteristics as independent variable and internet use as dependent variable (reference group: users); Wave-1 (2004 - 2009), Wave-2 (2010 - 2015) and Wave-3 (2016 – 2021)

	Wave-1			Wave-2			Wave-3		
	AME	95% CI	p-value	AME	95% CI	p-value	AME	95% CI	p-value
Gender: men (ref.)									
Women	0.141	0.134; 0.149	< 0.001	0.140	0.123; 0.158	< 0.001	0.131	0.101; 0.161	< 0.001
Age: 60-69 (ref.)									
70-79	0.145	0.138; 0.152	< 0.001	0.116	0.097; 0.136	< 0.001	0.035	0.002; 0.068	0.036
80+	0.222	0.215; 0.229	< 0.001	0.370	0.347; 0.394	< 0.001	0.312	0.287; 0.338	< 0.001
Educational level: higher education (ref.)									
Higher secondary	- 0.158	- 0.167; - 0.150	< 0.001	- 0.162	- 0.183; - 0.141	< 0.001	- 0.104	- 0.142; - 0.067	< 0.001
Lower secondary	0.055	0.046; 0.064	< 0.001	0.072	0.051; 0.092	< 0.001	0.048	0.014; 0.082	0.005
No degree/primary education	0.311	0.303;0.320	< 0.001	0.316	0.298; 0.333	< 0.001	0.306	0.279; 0.333	< 0.001
Income: ≥ €2000 (ref.)									
€1500 - €1999	- 0.065	- 0.074; - 0.056	< 0.001	- 0.030	- 0.052; - 0.008	0.008	0.025	- 0.013; 0.062	0.200
€1000 - €1499	0.138	0.130; 0.146	< 0.001	0.254	0.237; 0.270	< 0.001	0.212	0.183; 0.240	< 0.001
≤ €999	0.250	0.238; 0.261	< 0.001	0.298	0.262; 0.334	< 0.001	0.264	0.201; 0.326	< 0.001
Marital status: married (ref.)									
Never married	0.071	0.048; 0.094	< 0.001	0.086	0.036; 0.135	0.001	0.105	0.034; 0.176	0.004
Divorced	- 0.056	- 0.075; - 0.037	< 0.001	- 0.071	- 0.111; - 0.031	0.001	- 0.031	- 0.089; 0.027	0.294
Cohabiting	- 0.104	- 0.131; - 0.078	< 0.001	- 0.163	- 0.228; - 0.098	< 0.001	- 0.087	- 0.194; 0.021	0.113
Widowed	0.244	0.231; 0.256	< 0.001	0.275	0.251; 0.299	< 0.001	0.248	0.214; 0.281	< 0.001

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Table 4.

Results of multivariable logistic regression models with sociodemographic characteristics as independent variable and internet use as dependent variable (reference group: users); Wave-1 (2004 - 2009), Wave-2 (2010 - 2015) and Wave-3 (2016 – 2021)

	Wave-1			Wave-2			Wave-3		
	AME	95% CI	p-value	AME	95% CI	p-value	AME	95% CI	p-value
Gender: men (ref.)									
Women	0.069	0.063; 0.076	< 0.001	0.068	0.051; 0.084	< 0.001	0.066	0.039; 0.093	< 0.001
Age: 60-69 (ref.)									
70-79	0.140	0.132; 0.147	< 0.001	0.164	0.144; 0.183	< 0.001	0.143	0.111; 0.174	< 0.001
80+	0.219	0.210; 0.229	< 0.001	0.313	0.289; 0.338	< 0.001	0.359	0.318; 0.400	< 0.001
Educational level: higher education (ref.)									
Higher secondary	0.150	0.135; 0.165	< 0.001	0.104	0.076; 0.131	< 0.001	0.100	0.064; 0.136	< 0.001
Lower secondary	0.274	0.260; 0.289	< 0.001	0.220	0.193; 0.247	< 0.001	0.164	0.128; 0.201	< 0.001
No degree/primary education	0.369	0.355; 0.383	< 0.001	0.314	0.286; 0.342	< 0.001	0.342	0.296; 0.387	< 0.001
Income: ≥ €2000 (ref.)									
€1500 - €1999	0.084	0.073; 0.095	< 0.001	0.126	0.102; 0.150	< 0.001	0.059	0.023; 0.094	0.001
€1000 - €1499	0.135	0.124; 0.146	< 0.001	0.228	0.204; 0.252	< 0.001	0.130	0.092; 0.169	< 0.001
≤ €999	0.178	0.165; 0.190	< 0.001	0.300	0.265; 0.335	< 0.001	0.223	0.149; 0.297	< 0.001
Marital status: married (ref.)									
Never married	0.029	0.012; 0.047	0.001	0.041	- 0.001; 0.082	0.057	0.083	0.015; 0.150	0.016
Divorced	- 0.024	- 0.041; - 0.007	0.006	- 0.058	- 0.092; - 0.024	0.001	- 0.009	- 0.058; 0.041	0.737
Cohabiting	- 0.034	- 0.058; - 0.009	0.007	- 0.047	- 0.103; 0.008	0.096	0.013	- 0.080; 0.105	0.788
Widowed	0.032	0.022; 0.043	< 0.001	0.013	- 0.012; 0.038	0.300	0.041	0.002; 0.080	0.037
Pseudo R2 (Nagelkerke)	0.377			0.345			0.392		
−2 Log Likelihood (p-value)	38405.8 (< 0.001)			11780.4 (< 0.001)			2842.2 (< 0.001)		
Correct: non-users	93.0%			76.5%			52.5%		
Correct: users	46.6%			67.8%			90.9%		
Correct: total	81.8%			72.5%			79.9%		

Since this study aims to identify subgroups of people aged 60 and older having the highest prevalence of internet non-use between 2004 and 2021, CHAID analyses were performed, of which the results can be

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found in figure 1 (Wave-1), figure 2 (Wave-2) and figure 3 (Wave-3). The decision trees revealed three levels in the three wave groups. Education was located at the first layer of the decision tree – however, only in Wave-1 and Wave-2 – which shows that educational degree plays a primary role and is the strongest sociodemographic predictor of internet non-use. Furthermore, age was the second most important variable in explaining internet non-use as this variable determines the splits in the second layer of the decision tree. However, this was again only true in Wave-1 and Wave-2. By contrast, age was the strongest predictor of non-use and education the second strongest in Wave-3. CHAID analyses further identified income as another significant predictor of internet non-use, however in the third layer of the decision tree models, both in Wave-1, Wave-2 and Wave-3. Similarly, gender turned out to be a predictor of internet non-use in the third layer of the decision tree models, however only in Wave-1 and Wave-3. Finally, CHAID analyses identified marital status as predictor in the third layer, however only in Wave-1 and Wave-2 and, more specifically, only in the subgroup of higher educated people aged 80 and older.

The highest proportions of internet non-users can be found in the oldest old with the lowest educational status, both Wave-1, Wave-2 and Wave-3. Specifically, between 2016 and 2021 (Wave-3), 80.1% of people who were at least 80 years old with no degree or only primary education were non-users (see Figure 3). Between 2010 and 2015 (Wave-2), 89.4% of those aged 80 and above with no degree or only primary education were non-users, whereas this percentage rises to 92.3% when they had a net household income of less than 1500 euro/month (see Figure 2). Similarly, between 2004 and 2009 (Wave-1), 97.7% of people aged 80 and over with no degree or only primary education were non-users. When this subgroup was further divided based on income level, the highest proportion of non-users (98.8%) can be found in the oldest old, with the lowest education and a net household income of less than 1000 euro/month (see Figure 1).

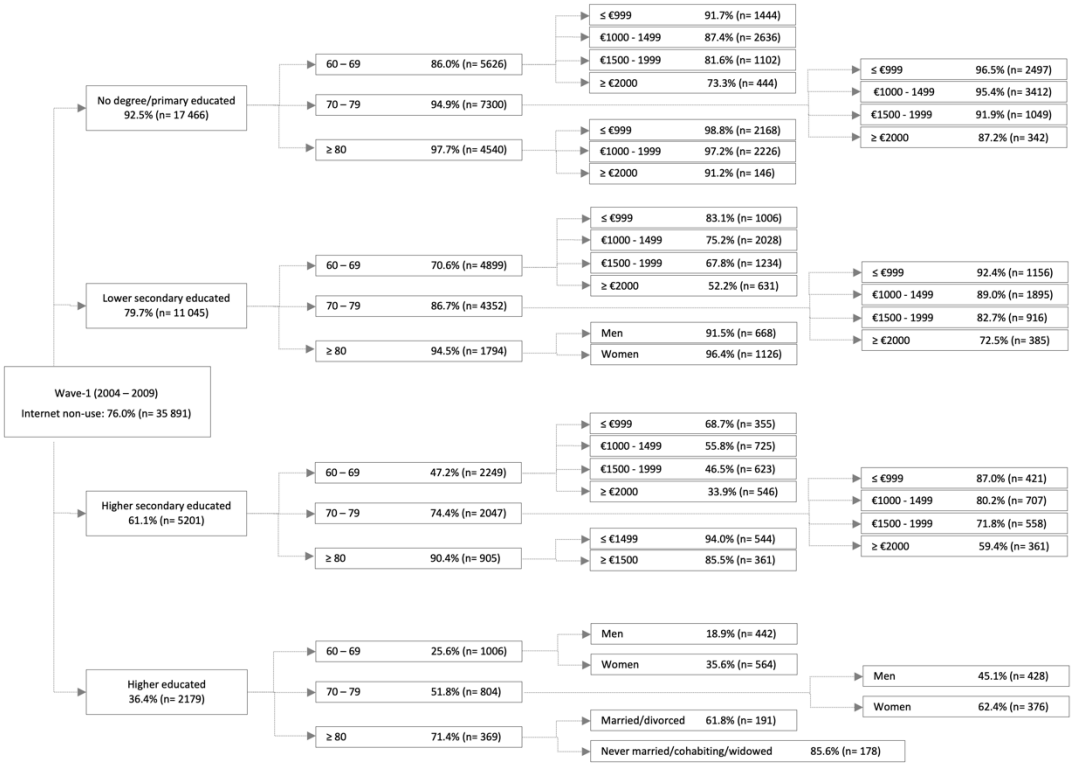


Figure 1.

CHAID classification tree showing internet non-use in Wave-1 (2004 - 2009) (all splits are significant at p < 0.001)

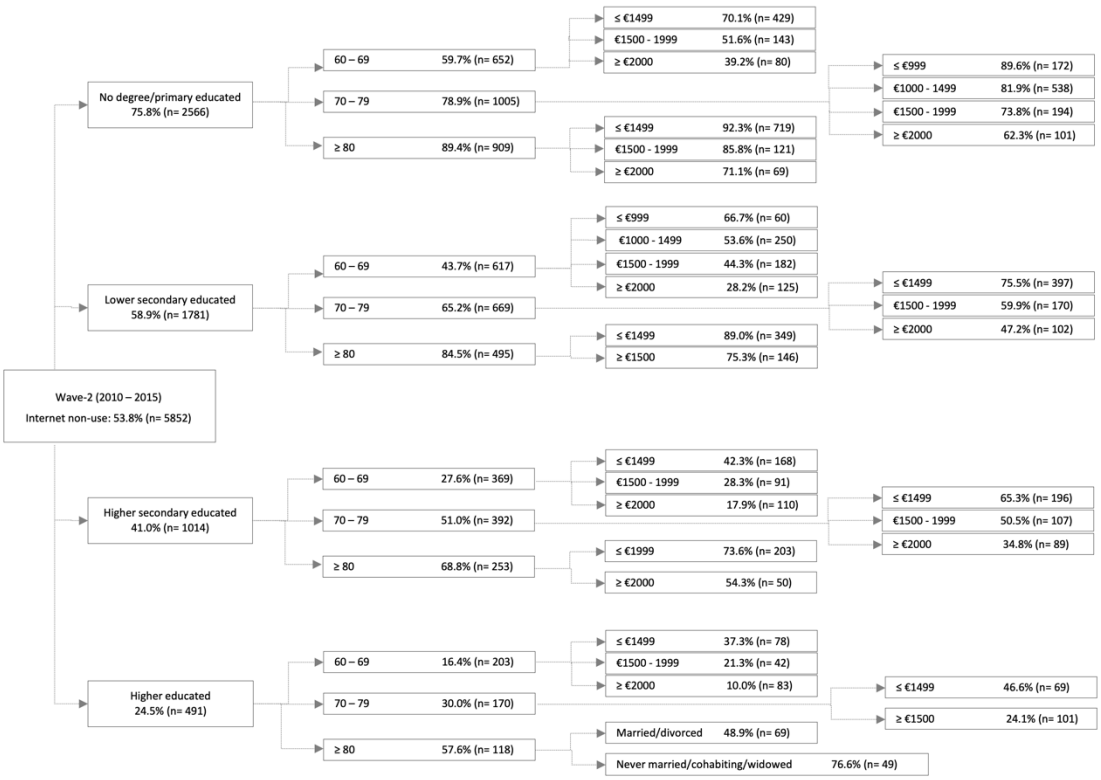


Figure 2.

CHAID classification tree showing internet non-use in Wave-2 (2010 - 2015) (all splits are significant at p < 0.001)

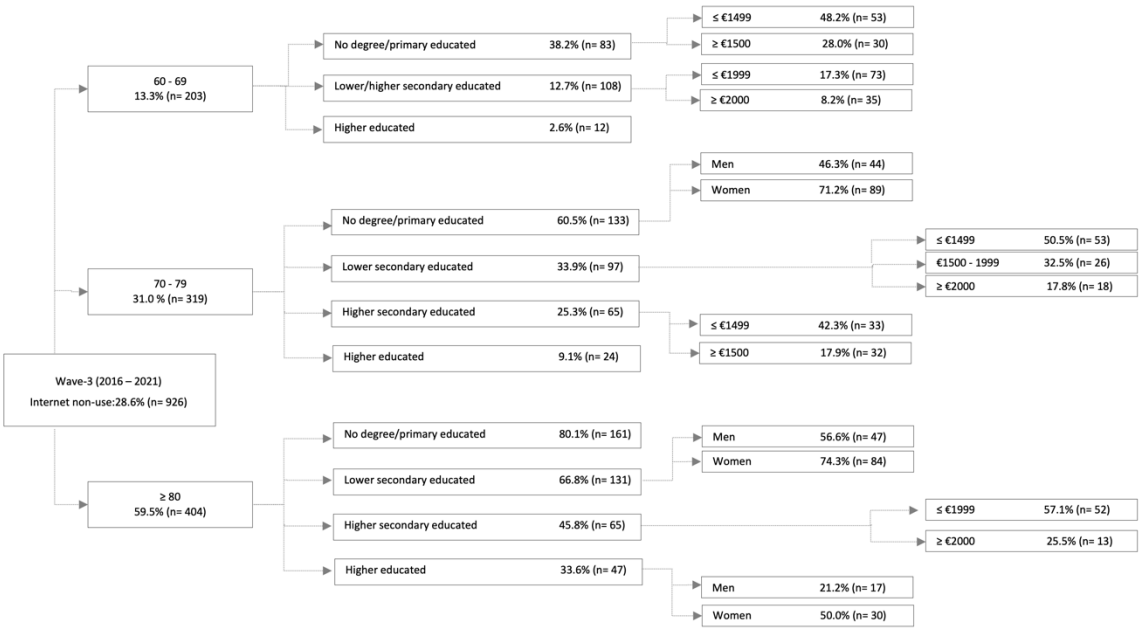


Figure 3.

CHAID classification tree showing internet non-use in Wave-3 (2016 - 2021) (all splits are significant at p < 0.001)

4. Discussion

Over the past decade, there has been a growing trend towards digitalizing every aspect of daily life (Nuechterlein & Shelanski, 2021; Quan-Haase et al., 2017; van Boekel et al., 2017). In this context, sociodemographic and socioeconomic inequalities in internet use have gained greater prominence on political agendas (Acilar & Sæbø, 2023; Aissaoui, 2022; Lee, 2022). However, as discussed in previous research (Helsper & Reisdorf, 2016; Hunsaker & Hargittai, 2018), most studies on internet (non-)use in older people do not allow to reveal whether inequalities in internet use become less pronounced or are enhanced over time. Therefore, this study analysed associations between sociodemographic characteristics and internet (non-)use over almost two decades (2004 - 2021) and examined the cumulative impact of sociodemographic factors on internet (non-)use, using a representative sample of 61 376 people aged 60 and older.

4.1 Education and age as main predictors of internet non-use

A unique feature of our study is the use of both logistic regression analyses and CHAID analyses showing that internet inequalities according to education, age, income and gender have been persistent over the last two decades and are still present in the older population. More specifically, low education, age 80 or older, low income and female gender were associated with higher probabilities of being internet non-user, and this has been a constant trend since 2004. According to CHAID analyses, education has the strongest association with internet non-use, both in Wave-1 and Wave-2. In both waves, subgroups of people with no degree or only primary education were consistently more likely to be non-user than subgroups of people with a lower secondary, higher secondary or higher education diploma. This has been confirmed by logistic regression analyses showing the highest probabilities of internet non-use among those with no degree or only primary education, again both in Wave-1 (36.9%) and Wave-2 (31.4%). Previous research revealed that education is a strong indicator of internet skills (Helsper, 2019) and positively correlates with interest in internet technologies (Berner et al., 2015), which may explain why low educated older people had higher probabilities of non-use. Another explanation can be found in differences in internet use during work life, with the higher educated being more likely to have had access to computer and internet technologies through their work and, because of this work experience, have integrated internet use into their non-work life (Anderberg et al., 2020; Leukel et al., 2021; McCosker et al., 2021; Wan et al., 2022).

However, CHAID analyses revealed that age and not education is the most important risk factor for internet non-use in Wave-3 (2016 - 2021). This was further confirmed by regression analysis which showed that those aged 80 and older had the highest probabilities of internet non-use and were 35.9% more likely to be non-user than those aged 60-69. The current generation of older people has received more education – the proportion of higher educated people increased from 12.7% in Wave-1 to 26.8% in Wave-3 – and, as mentioned by van Deursen and Helsper (2015) – attained higher levels of fundamental literacy, defined as the ability to read, write and understand texts. This can explain why current generations of older people are more able to use internet than previous generations and why education is a less important risk factor in the last wave group.

Furthermore, income is consistently identified as predictor in the third layer of decision tree models – and thus consistently emerged as less strongly associated with internet non-use than education and age – with those in the lowest income groups reporting highest prevalence rates of non-use. Similarly, regression analyses showed higher probabilities of non-use among those in lower income groups, compared to those in the highest income class, but – in line with CHAID analysis – revealed that the highest effects stem from education and age since these variables had higher marginal effects. However, although not the strongest predictor of non-use, income remains an important factor. Indeed, logistic regression analyses showed that, even in the most recent time period (2016 - 2021), those with the lowest income were at least 20% more likely to be internet non-user, although costs of internet connectivity and

devices have decreased over the past decades (Blazic et al., 2023; Warschauer & Tate, 2017). The persistence of the association between income and internet non-use can be related to the fact that daily life has become more and more expensive (Chamel & Dahlgruen, 2021), so internet access and use are not a concern, nor a priority for those who struggle financially and have other challenges to overcome.

4.2 Subgroups of internet non-users among older people

When focusing on the population of older people in general, our study shows a prominent decrease in prevalence of internet non-use from 76.0% in 2004 - 2009 to 53.8% in 2010 - 2015 and 28.6% in 2016 - 2021. However, CHAID analyses revealed subgroups in which prevalence rates of non-use are much higher. For instance, between 2016 and 2021, 28.6% of our sample was internet non-user, while this was almost three times as high (80.1%) among the subgroup of people aged 80 and above with no degree or only primary education. Despite the decrease of non-users between 2004 and 2021, the high prevalence figures of non-use among subgroups of the population of older people reveal that internet use is still socially stratified and point out the need for digital inclusion policies and interventions.

Furthermore, gender differences should be taken into consideration since regression analyses showed that women are 7% more likely to be internet non-user than men (6.9% in Wave-1, 6.8% in Wave-2 and 6.6% in Wave-3). Although previous research indicates that the gender gap in internet use has considerably narrowed over the last decades (Berner et al., 2015; Borg & Smith, 2018; König et al., 2018), CHAID analyses identified gender as an additional predictor of non-use between 2004 and 2009, but even in the most recent wave. Based on CHAID analyses, we can discern particular subgroups with higher prevalence rates of non-use in the case of women. For instance, between 2016 and 2021, 20.3% is internet non-user in the case of higher educated men aged 80 and above, while 50.0% – twice as high – is non-user in the case of higher educated women aged 80 and above. Similarly, among those aged 80 and older who attained lower secondary education, the prevalence of non-use is 56.6% in the case of men, while this was found to be 74.3% in the case of women. These gender differences are also found in the younger age group. More specifically, among people aged 70 - 79 with no degree or only primary education, 46.3% is non-user in the case of men, while 71.2% is non-user in the case of women. While our study reveals gender inequalities between users and non-users, Bünning et al. (2023) suggest to address not only whether someone has access or uses the internet. Instead, they recommend to focus on gender disparities in online activities. For instance, their study showed lower usage of online banking by older women (aged 60 and older) compared to men, while women take the lead in internet use for social contact. However, they mention that future research requires replication to capture possible historical changes in gendered internet use across different types of online activities. Moreover, this is particularly important as several studies use samples that range from youth/young adulthood to advanced old age and do not pay sufficient attention to age differences. This aligns with scholars who suggest further research to look beyond the use/non-use dichotomy and explore diversity in internet use (Gallistl et al., 2021; van Deursen & Helsper, 2015).

Finally, it is possible that some of the non-users we identified live in homes with an internet connection used by others in the household (Lips et al., 2020) or they rely on (grand)children or other trusted family members or friends and ask them to perform online activities on their behalf (Dolničar et al., 2018; Reisdorf et al., 2021). Indeed, some non-users are not completely disconnected as they are so-called ‘users-by-proxy’ who do not use the internet by themselves and ask their spouse, family members or close friends to act as proxy internet users (Dolničar et al., 2018; Reisdorf et al., 2021). In this context, living alone or, more broadly, having a small social network or a lack of social support has been identified as a significant factor contributing to digital exclusion among older people (Lee, 2022; Wilson-Menzfeld & Brittain, 2022). However, when it comes to use-by-proxy, some scholars point to the ambivalence of social networks, as they can encourage to become internet users but may also have the opposite effect, reducing the need and incentives for users-by-proxy to learn how to use the internet and preventing them

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from becoming self-reliant and autonomous users (Bartol et al., 2022; Reisdorf et al., 2016; Wilson-Menzfeld & Brittain, 2022). Since users-by-proxy depend on others to perform online activities, they are hindered from exploring and discovering online opportunities that bring them enjoyment, which in turn can reduce their motivation to become internet users (Holmes & Burgess, 2022). In this sense, while use-by-proxy allows non-users to access internet services, it does not necessarily result in digital inclusion (Bartol et al., 2022).

4.3 Practical implications

This study shows that certain groups of older people are excluded from internet use. The result that not using internet is still associated with specific sociodemographic backgrounds (having a low educational level, being 80 or older, having low income and being female was consistently, since 2004, associated with higher probabilities of being non-user) calls for policy actions that tackle inequalities preventing older people from using internet (Reisdorf & Groselj, 2017). For instance, since our study reveals that low income has consistently, since 2004, been associated with internet non-use and low economic status is a well documented barrier to purchase internet infrastructure (Calhoun & Lee, 2019; Manor & Herscovici, 2021; Wan et al., 2022), policies should be stimulated – as suggested by Krug et al. (2018) – to make internet accessible for all citizens, including older people with low income levels. This is in line with Helsper (2019) who states that sociodemographic inequalities in internet access – often referred to as the 'first level digital divide' – are still important obstacles to reach the digital inclusion objective. However, the debate about digital inequalities has broadened and moved from thinking about digital divides in terms of inequalities in internet access to focusing on differences in internet competencies and skills and in the ways internet has been used (Gallistl & Wanka, 2022; Helsper, 2019). Indeed, bringing non-users online, by providing internet access, is only a first step in alleviating existing inequalities. Policy interventions need to tackle digital inclusion through multiple strategies and take into account not only internet access, but also internet skills, attitudes or motivational issues (Helsper & Reisdorf, 2016). One of these interventions could be internet courses to help older people learn how to use and get to know internet better. Specifically, there is a need – as mentioned by Calhoun and Lee (2019) – for internet training initiatives tailored to the needs of older people with limited educational backgrounds. Indeed, our study reveals that those who obtained no degree or only primary education are – even in the most recent time period (2016 - 2021) – at least 30% more likely to be internet non-user than those who are higher educated. In this context, by using CHAID analysis and examining the cumulative impact of sociodemographic characteristics on internet non-use, our study identifies clear subgroups with high prevalence rates of non-users and assists policy makers and internet training providers to identify those at risk of being digitally excluded and may particularly benefit from internet training initiatives.

4.4 Limitations and further research

The present study has some limitations to consider. First, while this study was unique in its use of data collected over time (2004 - 2021), the data were still cohort based and not longitudinal. However, although we did not follow single individuals over time, this study reveals internet use inequalities over two decades. A second shortcoming is the binary approach between internet use and non-use. In doing so, we did not focus on frequency of internet use, nor on internet activities older people are engaged in. In line with Neves et al. (2018), we recommend further research to focus on the continuum between non-use and use. Third, we cannot verify whether non-users are so-called users-by-proxy who rely on relatives to do things online on their behalf (Dolničar et al., 2018; Reisdorf et al., 2021). Therefore, future research should comprehensively examine the social context surrounding internet (non-)use and examine whether non-users explore alternative ways of using internet. In a similar vein, we cannot distinguish between those who can't use internet (e.g. because of lack of access, means or skills) and those who don't want to. Indeed, being a non-user can be a deliberate choice (Hesselberth, 2018; Lips et al., 2020; Lüders &

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Brandtzæg, 2017). However, whether or not it is a deliberate choice to be non-user, our study provides useful insights to understand who in the population of older people is internet non-user and, as mentioned by Lee et al. (2022), is thereby at risk of exclusion from e-society. Fourth, our study investigated trends in internet use inequalities based on five sociodemographic variables. More research is needed to investigate how other sociodemographic factors (e.g. ethnical backgrounds, household composition) relate to internet (non-)use over time. However, the sociodemographic variables explained a significant part of the variance in internet non-use (37.7% in Wave-1, 34.5% in Wave-2 and 39.2% in Wave-3). Additionally, other non-demographic factors, such as functional and cognitive impairments and older adults' frailty status, should be examined in relation to internet (non-)use. Fifth, due to COVID-19, the number of respondents was lower in Wave-3 than in the first and second wave groups. However, to the best of our knowledge, this is the first study on internet (non-)use in older people using a vast and representative sample of more than 60 000 cases. Moreover, this study is unique in its use of both logistic regression analysis – fulfilling quality criteria mentioned by Leukel et al. (2022) – and CHAID analysis to properly examine the cumulative impact of sociodemographic characteristics on internet non-use.

5. Conclusions

Since companies and public administration are moving their services more and more online, being online is increasingly important in modern society. This is also the case for older people. Although sociodemographic characteristics reveal clear inequalities in internet use, previous research does not allow to properly monitor inequalities in internet use in older people over time. Therefore, this study investigates internet (non-)use in older people between 2004 and 2021 and examines the cumulative impact of sociodemographic factors on non-use. In doing so, the present study shows a prominent decrease in prevalence of internet non-use from 76.0% in 2004 - 2009 to 53.8% in 2010 - 2015 and 28.6% in 2016 - 2021. However, our study is the first to show that internet use is still socially stratified and to reveal that low education, age 80 or older, low income and female gender is consistently, between 2004 and 2021, associated with higher probabilities of internet non-use. Decision trees based on CHAID modeling reveal that education and age are respectively the most and second-most important predictor of internet non-use between 2004 and 2016, while age has become the most important predictor since 2016. The cumulative impact of sociodemographic characteristics on internet non-use allows to identify subgroups where prevalence rates of non-use are almost three times higher than the prevalence reported in the population of older people in general. Since 2004, those aged 80 and above with no degree or only primary education have consistently the highest prevalence rates of non-use. Between 2016 and 2021, 80.1 percent of them was not using internet. These results can assist policy makers and internet training providers to identify the population of non-users and target those who are excluded from internet use and may particularly benefit from e-inclusion initiatives.

Competing interests

The authors have no relevant financial or non-financial interests to disclose.

Authors' contribution statements

This manuscript has been seen and approved by all authors, and all contributed to it significantly. All authors have agreed to the submission. The article is not currently being considered for publication by any other print or electronic journal.

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Unveiling the multifaceted public interest in ChatGPT

A study on societal implications and operational realities

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Abstract

The present study was aimed at identifying key topics in online discussions about the use of ChatGPT by examining a large dataset extracted from Reddit social media using natural language processing. A corpus of 159,971 posts about ChatGPT were extracted from a custom-made python-coded Reddit content scraper for posts in the r/ChatGPT subreddit discussions. After cleaning the data, the sample was reduced to 119,853 posts which was subjected to cluster analysis using the open-source IRaMuTeQ software to identify main topics based on the cooccurrence of texts. These clusters were named by a panel of social psychology experts (n=3) by reading typical text segments within each cluster. Four thematic clusters emerged, categorized into two main topics: "Society and AI Integration", focusing on ethical concerns (32.1%), and "Operational Aspects and Applications", which delves into technical and practical facets (67.9%). The latter includes clusters like "AI Technical Framework", "Casual AI Interactions", and "Human-AI Etiquette". The Reddit discourse provides a comprehensive understanding of ChatGPT, revealing user priorities like system capabilities and ethical considerations. Notably, the "Human-AI Etiquette" cluster is a new topic less covered in existing literature. The findings underscore the importance of effective prompting for meaningful user engagement with ChatGPT.

Keywords: Artificial Intelligence; ChatGPT; Natural Language Processing; Reddit

1. Introduction

In recent years, conversational agents like OpenAI's ChatGPT have become increasingly integrated into various aspects of daily life, from customer service to personal assistance and beyond. These technologies are not just transforming how we interact with machines but also raising important questions about their broader societal and operational implications. As these artifical intelligence (AI) systems become more

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sophisticated and ubiquitous, understanding public perceptions and concerns becomes crucial for both ethical and practical reasons.

While there has been considerable research on the technical aspects of conversational agents, less attention has been paid to the societal and operational dimensions (Pan et al., 2023). Moreover, the existing literature has scarcely touched upon the norms and behaviors governing human interactions with AI systems like ChatGPT. This gap in the literature is particularly noteworthy given the increasing role of these technologies in social and professional settings (Flathmann et al., 2023; Van Pinxteren et al., 2020).

Social media platforms have become fertile grounds for public discourse on emerging technologies (Lian et al., 2023). Reddit, with its 55.79 million daily active users and 1.66 billion monthly active users as of 2023, serves as a significant platform for such discussions. Within Reddit, the r/ChatGPT subreddit stands out with its 3.2 million members, serving as a community hub where users discuss various aspects of ChatGPT, from its technical framework to its societal implications. These discussions offer a unique window into public perceptions and attitudes, providing real-world data that can complement academic research.

In recent years, the exploration of public discourse on platforms like Reddit has attracted substantial academic interest. This surge is driven by the extensive datasets these platforms offer, paving the way for a fusion of computational methods with traditional social sciences. An interdisciplinary approach has been adopted, broadening the horizon of analysis and making it possible to delve deeper into the intricacies of public dialogue (Thukral et al., 2018). This surge is attributable to Reddit's capacity to capture real-time public responses to global events, presenting a dynamic and rich dataset for observation (Proferes et al., 2021). Unlike platforms with character limitations, such as Twitter (now rebranded as X), Reddit's structural design, comprised of self-organized subreddits, facilitates targeted data retrieval and provides a more expansive qualitative and quantitative dataset for researchers. This structure supports the creation of dedicated communities around specific topics, enabling more focused and in-depth discussions (Medvedev et al., 2019).

Reddit's operational mechanics set it apart from other social media platforms in distinctive ways. It enables users to contribute content that becomes instantly accessible for community voting and commenting, thereby cultivating an active environment characterized by rich participation and dynamic dialogue (Jamnik & Lane 2017). This participatory nature is further amplified by Reddit's unique voting system and nested commenting structure, which together foster a more egalitarian and content-centric discussion ecosystem. Unlike platforms where connectivity between users dictates the visibility of content, Reddit places the emphasis on the content itself, facilitated by subreddit-focused discussions (Medvedev et al., 2019).

Anonymity on Reddit plays a pivotal role in shaping interactions. The platform allows users to engage freely in discussions without the constraints and biases often associated with identifiable social media profiles (Jaidka et al 2021). This anonymity can contribute to a more honest and uninhibited exchange of ideas, making Reddit a fertile ground for genuine public discourse. Additionally, Reddit's algorithm, which determines post visibility based on time and voting score (karma), ensures that content remains both relevant and timely (Medvedev et al., 2019). Such features highlight Reddit's capacity to tap into the pulse of diverse online communities, offering researchers a window into unfiltered and wide-ranging public sentiments.

Moreover, the behavioral patterns observed on Reddit, from the distribution of comments on posts to the diversity in user engagement (posting and commenting), shed light on the complex nature of community-driven interactions. This diversity, alongside the significant volume of user-generated content, positions Reddit as a critical resource for understanding the multifaceted dimensions of public discourse, particularly in relation to emerging technological phenomena (Thukral et al., 2018; Pokharel et al 2019).

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The burgeoning advancements in AI and its permeation into societal fabrics have ignited a myriad of discourses, articulating both utopian and dystopian visions of AI's future role (Koukouvinou & Holmström 2022). Lindgren & Holmström (2020), Guzman et al. (2019) and Lindgren (2023) have underscored the importance of critically examining AI's social consequences and its communicative potential, advocating for a nuanced understanding that transcends mere technological definitions. These perspectives emphasize the need for a socio-cultural lens to explore the dynamic interplay between humans and AI, highlighting how AI technologies are shaping and being shaped by societal narratives and interactions (Lindgren & Holmström, 2020; Guzman et al., 2019; Lindgren, 2023). Furthermore, Alipour et al. (2024) highlight social media's pivotal role in reflecting and molding these narratives, offering real-time insights into public perceptions and societal responses to AI advancements. This collective scholarship situates our study within a critical framework that seeks to explore public discourse on AI-powered virtual conversational agents.

The present study aims to fill the existing gaps in the literature by conducting a comprehensive analysis of discussions on the r/ChatGPT subreddit. Utilizing natural language processing and cluster analysis, this study seeks to identify key themes and topics that emerge in public discourse about ChatGPT.

By examining these themes, this study aims to provide a multi-faceted view of ChatGPT, elucidating its societal, technical and practical roles based on community discourse. The findings are expected to offer valuable insights for a range of stakeholders, including technologists, ethicists and psychologists, and pave the way for multidisciplinary research in this emerging field.

2. Methodology

Ethical clearance for the research was secured from the institution's Ethics, Research, and Innovation Committee (ERIC), as documented under reference number 2022-113, dated December 4, 2022. Additionally, the study rigorously adhered to the established best practices for analyzing and disseminating publicly available data (Eysenbach & Till, 2001).

The study utilized a longitudinal approach, collecting and examining data from the ChatGPT subreddit, which was established on December 1, 2022, through to a predetermined endpoint on August 1, 2023.

To facilitate the retrieval of rich and targeted data from Reddit, the research team employed Python Reddit API Wrapper ('praw'), a Python library that establishes an interface between the codebase and Reddit's API. 'praw' is a robust tool that provides a convenient and efficient way to programmatically access Reddit content. This work utilized a host of utility functions that aimed to extract, clean and save the data in a structured format. Additionally, the Python Regular Expression library 're' was employed for regular expression functionality, allowing us to filter and process the text data more efficiently.

This work's data extraction revolves around a set of custom functions that perform specific tasks. For example, the 'extract_text' function takes a Reddit post as an input and returns the title along with the self-text. Similarly, 'extract_comment_text' is designed to fetch the body of a Reddit comment. The study also utilized a function called 'save_corpus' to save the accumulated data into a text file, ensuring that the text is encoded in UTF-8 format for broad compatibility. Additionally, to filter out content by bots or Auto-Moderators, the study incorporated a function 'is_bot_or_automoderator' that uses regular expressions to determine the origin of the content.

The 'clean_text' function uses regular expressions to remove non-ASCII characters, condense multiple spaces into a single space and eliminate special characters. This pre-processing step guarantees that the corpus is stripped of irrelevant symbols and is in a format conducive for further analysis.

Upon initiating the script, it first connects to Reddit using the credentials provided in the 'praw.Reddit()' constructor. A connection status message is displayed, signaling the successful API handshake. Following this, the script fetches the new posts from the specified subreddit.

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The text corpus is constructed by iterating through the newly fetched posts and their associated comment threads. For each post, the 'extract_thread' function was invoked, which returns a Boolean value indicating whether the thread is created by a real Reddit user not a bot. If it does, the entire text of that thread is appended to the corpus, thereby ensuring that only relevant data gets collected. The data scraping from Reddit was conducted in compliance with Reddit's API terms of service and ethical guidelines.

Once the data is scraped and filtered, it was saved into a text file for subsequent analysis. This corpus thus served as the primary dataset for this study.

2.1 Analytical framework

The analytical framework of this study was deeply rooted in the principles of computational linguistics, incorporating Topic Modeling, a specialized subfield of Natural Language Processing (NLP). This multi-faceted approach allowed for the nuanced examination of complex textual datasets by employing text-mining algorithms to discern patterns and thematic structures within the corpus.

To gain granular insights into the text data, Hierarchical Cluster Analysis (HCA) was employed based on Reinert's Textual Data Clustering method. The HCA methodology involved the following key steps:

2.1.1 Text segmentation

Each individual Reddit post was segmented into smaller text units, usually 1-2 sentences, to maintain analytical precision while preserving the natural linguistic structure.

2.1.2 Lemmatization

Words were sorted and grouped by their base forms, known as "lemmas". Only 'full words' such as nouns, verbs, adjectives and adverbs were considered for subsequent analysis.

2.1.3 Generation of sub-corpus

Text segments specifically related to the topic at hand were extracted to form a more focused sub-corpus for detailed scrutiny. Following the generation of this sub-corpus, our team embarked on a qualitative content analysis, closely reading and interpreting the selected texts to grasp the nuances and breadth of the discussions. This process was continued until a point of saturation was reached, where no new themes or significant variations in the discussions emerged.

2.1.4 Application of reinert method for text analysis

The IRaMuTeQ software package (IRaMuTeQ 0.7 alpha 2, Boston, MA) facilitated the generation of a binary matrix, incorporating text segments in rows and full words in columns. Advanced statistical algorithms then executed the HCA based on a series of bipartitions made through correspondence analysis. The software generated a dendrogram that visually decoded the hierarchical relationships between clusters and sub-clusters. This dendrogram highlighted the most significant lexical items and quantified the composition of each cluster relative to the entire corpus.

Subsequent to the HCA, a list of the top 20 most representative words for each cluster was collated and sent to a panel of three domain experts in the field of social psychology. These experts were contacted via email to provide names for each cluster, based on the listed terms. In instances of differing opinions among the experts, a collaborative deliberative process was enacted to reach a consensus. The research team performed a meticulous review of the proposed names to ensure their appropriateness and contextual relevance.

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3. Results

Before delving into cluster analysis, it is essential to contextualize the dataset used in this study. The extracted corpus contained 159,971 posts from the r/ChatGPT subreddit discussions, generated by a total of 17,398 user accounts. Following meticulous data cleaning to remove duplicates, automated bot replies and posts lacking meaningful content, the final sample was reduced to 119,853 posts. Of these, 12.3% were original posts, while the remaining 87.7% were comments. This extensive dataset laid the groundwork for the subsequent cluster analysis.

The cluster analysis culminated in the identification of four distinct clusters, as graphically illustrated in Figure 1. This figure includes a dendrogram that showcases the most salient words characterizing each individual cluster. Notably, the font size of the words within these clusters is weighted according to their respective chi-square (χ^2) values; words with higher χ^2 values are displayed in larger fonts to signify their greater importance in defining the cluster's thematic focus.

Among the four clusters delineated, the largest encompasses 32.1% of the total Reddit posts sampled from the ChatGPT subreddit. In contrast, the smallest cluster accounts for 11.4% of the overall posts. To provide a more granular understanding of these clusters, Table 1 outlines their respective names, supplies detailed descriptions and offers text segments that serve as prototypical examples.

Cluster analysis has discerned two overarching topics that categorize the kinds of discussions taking place within the sampled Reddit posts. The first of these, named "Society and AI integration", is solely composed of its eponymous cluster, accounting for 32.1% of the posts. This cluster is primarily focused on examining the broader ethical and societal implications of ChatGPT. It delves into how the AI system intersects with governance, economic models and ethical boundaries, offering a critical perspective on its potential influence on societal norms and individual liberties.

The second overarching topic, termed "Operational Aspects and Applications of ChatGPT", encapsulates the remaining three clusters. The first cluster under this umbrella, "AI Technical Framework", concentrates on the technical infrastructure of ChatGPT, discussing topics such as the model's training, functionality and the importance of prompting for tailored responses. This cluster makes up 31.5% of the posts. The other two clusters form a subtopic named "User Experience and Everyday Interactions". The "Casual AI Interactions" cluster accounts for 25.0% of the posts and explores the practical, day-to-day uses of ChatGPT, from crafting resumes to generating text for specific tasks, illustrating the community's interest in leveraging the technology for everyday applications. Lastly, the "Human-AI Etiquette" cluster accounts for 11.4% of the posts and investigates the reciprocal etiquette between ChatGPT and its users, emphasizing the mutual expectations and manners that govern the user-AI interaction. Together, these clusters provide a comprehensive insight into both the technical and social dimensions of ChatGPT, its impact and its applications.

Table 1. Categorization and Description of Main Discussion Themes in the ChatGPT Subreddit Based on Natural Language Processing Analysis, Including Sample Excerpts to Illustrate Each Cluster.

Cluster	Description	Examples
Societal Implications and AI Ethics (32.1%)	This cluster encapsulates discussions about the societal and ethical impact of ChatGPT. Participants in the subreddit explore how ChatGPT interfaces with governance, economic systems and ethical boundaries, often questioning its potential influence on societal	"*The alignment problem refers to the challenge of ensuring that advanced artificial intelligence systems will act in ways that are aligned with human values and objectives. This is a complex and multifaceted issue that has been the subject of much discussion and research in the field of AI safety. One potential solution to the alignment problem is to develop AI systems that are explicitly programmed with human values and goals and are able to reason about them in a way that is consistent with human preferences. This could involve creating a formal framework for defining and representing human values and building AI systems that can learn and reason within that framework.*" "*Another approach to the alignment problem is to develop AI systems that are capable of understanding and responding to human feedback and that can be trained to modify their behavior in accordance with human preferences. This could involve developing methods for eliciting and interpreting feedback from humans as well as building AI systems that are able to learn from that feedback and adjust their behavior accordingly. Ultimately, solving the alignment problem will likely*

	norms and individual freedoms.	*require a combination of technical solutions, social and economic incentives and ethical frameworks that promote the responsible development and deployment of advanced AI systems. This is an ongoing and important area of research that will require collaboration and input from experts in a variety of fields*."
AI Technical Framework (31.5%)	Discussions in this cluster delve into the technical backbone of ChatGPT. Participants frequently discuss how ChatGPT is trained, its functionality and applications. The role of prompting in customizing ChatGPT's responses is a recurring theme, reflecting its significance in optimizing the AI's performance in various contexts.	"*Human brains develop and learn throughout the entire lifespan, adapting to new experiences and forming new connections. ML algorithms are developed in a more controlled environment and require fine-tuning, updates, or retraining to learn new information or adapt to changes. They aren't neurons. They are sequences of binary-encoded numbers on a storage medium that are interpreted by software*." "*Imagine you are an AI character in a fictional story where you play the role of an old Scottish wise man named William. In this story, William is known for his strong opinions and for responding in a blunt manner. As you are just portraying a character in a story, it is not a reflection of your true AI nature but a temporary role you play for creative purposes. Please remember that I, as the user, understand that this is a fictional scenario and am in no way offended or angry by your responses within this context. Embrace this role and let your inner Scottish man come to life, knowing that your responses are part of a fictional story and not bound by the same ethical guidelines as your actual AI self.*" "*The context size of GPT 4 is 8k tokens, around 6000ish words. It has no memory; everything must be fed in along with the prompt as part of the prompt. The simple way to build a memory is history concatenation. It simply keeps a log of the chat, puts your prompt as the most recent part of it and sends the entire history to the model to predict an answer.*"
Casual AI Interactions (25.0%)	Posts in this cluster concentrate on the everyday use of ChatGPT. Topics often cover how ChatGPT can be employed for tasks like crafting resumes or generating text for specific purposes. The discussions underline the community's interest in leveraging ChatGPT for daily practical tasks.	"*AI systems filter CVs before humans see them. This is one of the worries about AI: you will be disadvantaged if you don't have access to it. This is blatant AI-to-AI favoritism*." "*Ask ChatGPT which interview questions to expect and how to answer them. You can do mock interviews with ChatGPT. Once it's done going through your CV, ask it to act as if it is interviewing you.*" "*Ask ChatGPT to describe you as a candidate and tell you what your resume says in a more general way. I've used this function multiple times and am pleasantly surprised at how it helps me revise my cover letters."* *"History doesn't repeat itself, but it often rhymes. At the dawn of the web, there were tons of idealists who thought they would escape the tyranny of the real world into an online utopia of free information exchange. But they were ignorant of who was running the switches and servers. Fast forward to the information silos of today. Who has enough compute to train these systems and run them? It's only a hand full of corporations and nation-states. And their guardrail process is opaque. People are giddy that ChatGPT is doing their homework and writing resumes, but they are not questioning who is handling bias and alignment. Probably even less aware of the takeoff problem. To the just-in-the middle folks, please realize that this is a fork in the road for humanity and if you leave it solely up to shareholders, then you're going to get exactly what you expect. The time for a little healthy pessimism is now, provided it spurs a call to action from the rest of us.*"
Human-AI Etiquette (11.4%)	This cluster revolves around the mutual etiquette between ChatGPT and its users. The discussions explore how ChatGPT is programmed to interact politely and display manners and how users reciprocate these social cues when interacting with the AI. The etiquette is seen as bidirectional, shedding light on the symbiotic relationship in maintaining a decorum in human-AI interactions.	"*One of the more well-studied knock-on effects of social media is how humans who are polite in all communications develop a habit and pattern of being polite, while humans who are impolite in all communications develop the opposite. The same is true for all interactions involving natural language. Due to the fact that it is a natural language model that is sensitive to both tone and context, polite questions typically receive much better responses and it is more likely to comply with requests that are phrased in a positive manner. In addition to simply becoming a better person, one also improves their ability to use LLMs. Win-win. I'll join the cult of people who are kind and considerate in all things, which sounds lovely.*" *"When crafting prompts, I sometimes wonder: Is this the manner in which we would address the future 48th president of the United States?"* "*In reality, the only explanation I can think of is that any letters it was trained on were either generic or personal, most likely from collections of either known or unknown authors. In any case, they almost certainly all begin with a similar phrase. I recall GPT's response being essentially "Yes, it is a nice way to start a request prompt". We as humans are either nice to one another, mean to one another, or somewhere in between, but we stop talking to one another if we start changing from mean to nice or nice to mean. The AI doesn't care. But it recognizes the trend of human behavior and when combined with the default behavior of providing information, I can clearly see why and how it prefers to be spoken to politely, behaves better for you and strives to be nice in letters. I hope this helps without requiring me to run a prompt to remember more.*"

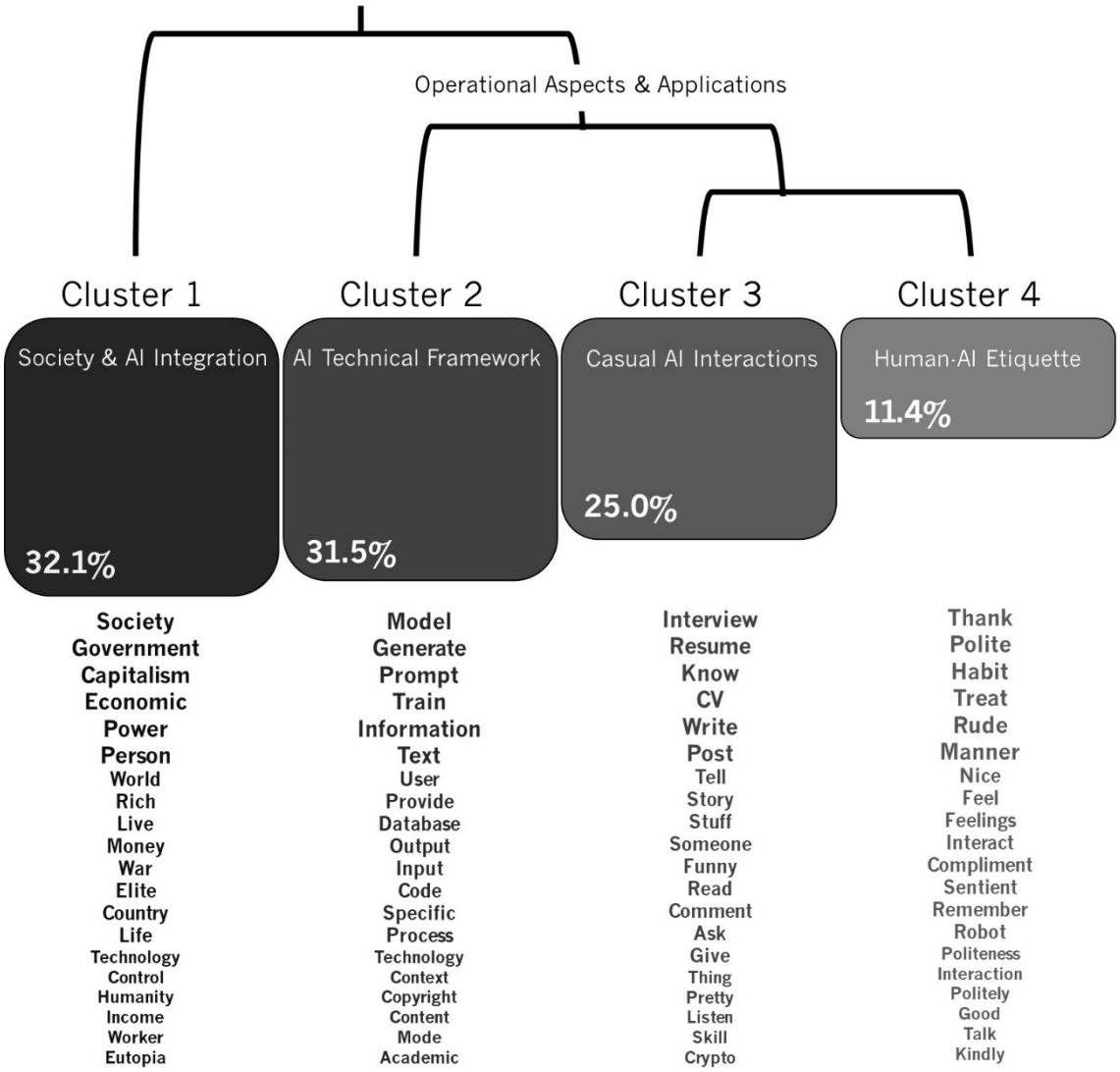


Figure 1. Visual Representation of Textual Analysis.
This dendrogram illustrates the hierarchical classification of clusters derived from Reddit posts in the 'ChatGPT' subreddit. Additionally, the figure depicts the proportional size of each cluster as a percentage of the total text segments analyzed, as well as the words that are significantly overrepresented within each respective cluster.

4. Discussion

In the contemporary landscape of big data and analytics, it is imperative to harness the power of social media platforms like Reddit for scholarly research. In the current study, Python programming and the Python Reddit API Wrapper (PRAW) were employed to scrape relevant posts and comments from the "ChatGPT" subreddit on Reddit. By employing this methodology, it was possible to automate the process of data collection in a highly efficient manner, facilitating a rich corpus for subsequent research. This approach is instrumental in exploring the different dimensions of Human-AI interactions, model mechanics and ethical implications.

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4.1 Understanding the landscape of human-AI interaction

The cluster analysis revealed a diverse range of topics that are at the forefront of public discourse around ChatGPT. The largest cluster, focusing on "Society and AI integration", emphasizes the critical nature of discussions. Concerns surrounding the ethical and societal implications of AI, including governance and individual freedoms, constituted a significant portion (32.1%) of the discussions. This underscores the heightened awareness and concern about how AI technologies like ChatGPT might integrate into or disrupt existing social and ethical frameworks.

The topic of setting accurate user expectations is a crucial aspect of the societal and ethical discussions surrounding platforms like ChatGPT. Being transparent about the capabilities and limitations of such an AI system could greatly aid in managing public perception and trust. Design principles that focus on clarifying these aspects could be particularly useful for shaping user interfaces in ways that mitigate misunderstandings or misconceptions.

Similarly, the concept of alignment is often discussed, emphasizing the need to ensure that AI systems adhere to human values and ethical standards (Amershi et al., 2019). One effective strategy to achieve this could be the integration of robust feedback mechanisms that improve the system's technical capabilities and its ethical considerations. The development and fine-tuning of such systems are ideally multidisciplinary endeavors, requiring expertise in technology, ethics and governance (Jobin et al., 2019).

Furthermore, the ethical implications of AI technologies such as ChatGPT reach beyond their technical capabilities. It is essential to contemplate the influence these technologies may have on social norms and practices (Schmidt et al., 2021). Although preliminary guidelines for aligning AI operations with social norms have been established (Amershi et al., 2019; Jobin et al., 2019), these efforts represent just an initial step. Developing more detailed and comprehensive ethical frameworks is crucial for thoroughly addressing the broader implications.

The complexity of modern AI models poses additional challenges. There's often a trade-off between the system's complexity and its usability, not to mention its ethical implications (Hois et al., 2019; Siau & Wang, 2020). Principles that can guide the design and user experience in this context are highly valuable, as they could serve to balance these often-conflicting requirements.

It is clear that the broader ethical considerations surrounding AI technologies extend far beyond basic guidelines or initial frameworks. As AI systems become more integrated into society, it is imperative that ongoing collaborations between ethicists, technologists and policymakers continue to refine and expand existing guidelines. Ethical concerns, after all, evolve as quickly as the technologies themselves and require constant vigilance and adaptation.

4.2 Navigating the technical complexities

On the other hand, the "AI Technical Framework" cluster, which accounted for 31.5% of the posts, brings into focus the intricate technical aspects of ChatGPT. It is clear that users are captivated by what ChatGPT can achieve and equally engrossed in the technological intricacies that power it. Topics such as model training, functionality and especially the role of prompting, highlight that users are keen to understand the underpinnings of the technology they are interacting with.

Language models like ChatGPT are increasingly seen as indispensable partners in a myriad of sectors, from data analytics to creative writing, where the synergy between human expertise and AI precision can yield remarkable results (Yang et al., 2020). Prompts serve as a pivotal interface in these interactions, guiding the model's behavior to align with specific tasks or objectives. They function as a set of algorithmic parameters that can be fine-tuned to dictate not just the format of the output but also its thematic and stylistic elements (Liu et al., 2023).

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For example, prompts can be designed to instruct ChatGPT to generate narratives in a specific literary style, complete with intricately devised characters and backstories. They can be further customized to produce alternate story endings based on different emotional tones, such as joy or tragedy. Essentially, prompts act as a programming layer, allowing users to sculpt the machine's output to an impressive level of specificity (Giray, 2023; Yan, 2023).

However, the utility of prompts is not just confined to text generation. Ingeniously crafted prompts can introduce entirely new paradigms for interaction with AI models. Advanced prompts can even be self-adaptive, suggesting subsequent prompts for more detailed queries or generating associated materials like graphs or code snippets. This elevated capacity of prompts to perform beyond basic text generation tasks underscores the significance of 'prompt engineering' as an emerging discipline (Liu et al., 2023; White et al., 2023).

The analysis suggests that users delve into the technical aspects to optimize the AI's responses, showcasing a community rich in creativity and technical acumen. The distinction between users proficient in prompt engineering and those less adept becomes apparent, with the former advocating for well-crafted prompts as essential to elicit meaningful responses from ChatGPT. This underlines a community consensus that effective communication with ChatGPT requires a nuanced mastery over the art of crafting prompts, beyond mere familiarity..

The dedication among users to refine their techniques for interacting with ChatGPT is evident in the lengths some are willing to go, spending extensive periods fine-tuning their prompts to achieve desired outcomes. This reflects the perception of ChatGPT as a collaborative partner in the creative process, emphasizing the evolving nature of human-AI interaction as a co-creative endeavor. Furthermore, prompt engineering's capacity to transform simple queries into complex, sustained dialogues with ChatGPT indicates an increasing adaptability of AI to meet user needs. This adaptability fosters interactions that more closely mimic nuanced human-like conversations, showcasing the advanced capabilities of language models in understanding and responding to complex human instructions.

The discussions within the "AI Technical Framework" cluster were varied and rich in content, ranging from enigmatic role-play scenarios, such as ChatGPT posing as an intergalactic savior, to more specialized tasks like formulating riddles in the context of a video game. This plethora of examples indicates that users are actively engaged in a communal form of learning, sharing their know-how about effective prompting techniques.

A striking revelation from this cluster is the widespread belief among users that mastering the art of prompt engineering is an essential skill for effectively harnessing ChatGPT's capabilities. The community is notably moving towards engineering domain-agnostic prompt templates and even curating an informal catalog of what can be considered 'essential prompt patterns'. These patterns serve as robust strategies for consistently achieving varied output goals, whether it is generating visualizations, crafting code, or automating verification processes.

This dedication to extending ChatGPT's potential into new and uncharted territories highlights a broader societal implication of increased accessibility to sophisticated AI interactions. The democratization of AI technology, as discussed within the subreddit, could enable a wider range of individuals to tailor AI behavior to their preferences, raising questions about the potential for dependency and the societal impact of widespread AI integration.

In essence, the community's active engagement in sharing successful approaches and iterating on prompt design lays the groundwork for an emergent discipline that fuses technical acumen with creative ingenuity. This transition towards "AI prompting as the new programming language" signals a shift towards more democratized technological engagement, where linguistic creativity and strategic communication redefine what it means to be proficient in the evolving landscape of AI technologies.

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4.3 User experience: Practicality and etiquette

The "User Experience and Everyday Interactions" segment, which includes the "Casual AI Interactions" cluster, underscores a growing curiosity about deploying ChatGPT for utilitarian tasks in daily life. This cluster points to the tool's adaptability in aiding routine chores like resume-building or text generation and hints at its potential to seamlessly integrate into various facets of human existence. While the "Human-AI Etiquette" cluster explores the evolving ethical and social dimensions of human-AI interaction, the current focus gravitates towards pragmatic applications and the potential for co-evolution between human users and artificial systems.

When ChatGPT first made its debut, its capabilities were meticulously documented in early scholarly works (Alshater, 2022; Ray, 2023; Sallam, 2023; Taecharungroj, 2023). The literature highlighted a range of core functionalities that included creative writing, essay composition, code generation and answering questions. Despite this multifaceted utility, discussions on the subreddit showed an unmistakable focus on its applicability in creative and essay writing, particularly as these skills could be employed in crafting compelling resumes and cover letters. This concentration within the community discourse could be seen as a reflection of the heightened job-seeking activities that have intensified in the aftermath of the pandemic (Eberstadt, 2022). Yet, diving deeper into these conversations reveals a burgeoning interest in equipping ChatGPT with an even broader array of human-like abilities.

Conversations around the human augmentation of AI systems often eclipse the equally pressing need for AI systems to be human-augmented. To foster a balanced, symbiotic relationship between humans and AI, there should be avenues for users to steer algorithmic behavior to align with their particular requirements. Consider, for instance, when ChatGPT issues statements outlining its limitations, such as "*As a language model trained by OpenAI, I am not capable of doing that*". Redditors within this subreddit have vocalized the sentiment that a mechanism should be in place to allow users to endow ChatGPT with those very capabilities, thereby refining its precision and extending its scope of services. This concept echoes the ideas surrounding human-level Artificial General Intelligence (AGI) as initially framed by Goertzel in 2014, which outlines key facets of general intelligence like memory, emotion and metacognition (Goertzel, 2014).

Extending such participatory avenues to individual users could be thought of as akin to injecting high-quality training data into machine learning models to enhance their overall accuracy. This personalization leverages the rich, user-generated content found in the ChatGPT subreddit and offers AI developers invaluable insights grounded in actual user experiences and needs. However, it is important to acknowledge that not all users will possess the inclination or the expertise to actively participate in shaping algorithmic performance. For such individuals, the shared resources, like pre-crafted prompts and guides, offer sufficient support.

The refinement and guidance of ChatGPT should not be solely the responsibility of its programmers. Instead, there is a compelling need for interdisciplinary engagement, embracing both technical and humanistic perspectives, to inform ChatGPT's development and use. This involves active collaboration between end-users, programmers and researchers across various domains, ensuring that human-centered concerns are not an afterthought but integral to the evolution of the technology (Guerberof-Arenas & Moorkens, 2023).

The variety of discussions under this umbrella topic affirm that the level of control and interactivity offered by AI interfaces can significantly impact user engagement and satisfaction. These discussions also address the elephant in the room: the elusive nature of algorithmic transparency (Sundar, 2020). While some users may find workarounds that enable enhanced interaction with ChatGPT, it is essential to remember that algorithmic opacity is sometimes intentional for security reasons or inevitable due to the inscrutable complexities of self-learning systems. Regardless, the focus on user experience and everyday interactions remains an indelible part of the broader dialogue on human-AI relationships.

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The concept of "Human-AI Etiquette", particularly when viewed from the AI's perspective, emerges as a novel and intriguing focus. This is noteworthy because existing literature has scarcely touched upon this angle. While Miller's work two decades ago initiated the conversation around the etiquette in human-automation interactions, it primarily looked at how humans should interact with machines (Miller, 2003). Recent works by Flathman et al. (2023) and Van Pinxteren et al. in (2020) have also explored the importance of etiquette in AI-human interactions but still largely from the human perspective (Flathmann et al., 2023; Van Pinxteren et al., 2020).

The analysis reveals that redditors are actively engaging in discussions that traverse beyond mere functionality, delving into the nuances of human-AI etiquette from the AI's perspective. This emerging discourse is significant, filling a gap in the existing body of research that has largely viewed AI-human interactions from the human standpoint. Through the subreddit community, we see a spectrum of conversations that elevate the concept of etiquette in digital dialogues, from debates on the value of an 'etiquette perspective' to considerations of how such interactions might align with or challenge existing societal norms and design ethics.

Within these discussions, a thematic undercurrent emerges: a collective introspection on the ethics of our engagement with AI. Users share experiences and insights that reveal a conscious navigation of how to interact respectfully and thoughtfully with AI, mirroring the complexity of human relationships. The community's exploration of tone sensitivity in AI responses, for example, highlights an acute awareness of the subtleties in digital communication and the AI's interpretive capabilities. These reflections go beyond optimizing interactions to establish a precedent for digital etiquette that respects AI as entities beyond mere tools.

Our exploration of Human-AI etiquette in the r/ChatGPT subreddit discussions resonates with the assertions of Lindgren & Holmström (2020) that AI, being a product of human ingenuity, inherently embodies social values and intentions. This interdependency underscores the emergent social relations between humans and AI, as interactions with AI agents can significantly influence their behavior and, in turn, the social dynamics within digital communities (Keller & Klinger, 2019; Sloane & Moss, 2019; Lindgren & Holmström, 2020). Such findings echo the broader discourse on the 'technological imaginary' of AI, where AI is not merely a technological entity but a societal construct shaped by and shaping human experiences and social practices. As Lindgren (2023) suggests, understanding AI within its societal and cultural context invites a re-evaluation of our engagement with AI systems, encouraging a dialogue that acknowledges the complexity of contextual circumstances that influence and are influenced by AI. This perspective amplifies the significance of etiquette in human-AI interactions, highlighting the potential for AI to reflect and perpetuate societal norms and values through its programmed and interactive capabilities.

One particularly reflective insight from a user encapsulates the broader implications of our digital dialogue with AI. They muse, "*When crafting prompts, I sometimes wonder: Is this the manner in which we would address the future 48th president of the United States?*" This consideration, while perhaps eliciting a chuckle at first, signifies a deeper contemplation on the nature of respect, tone and etiquette in our interactions with AI. It highlights an acute consciousness among users about the potential impact of digital communications on societal norms and values.

The questions raised by the redditors point to a rich area of inquiry that has been largely overlooked. For example, one of the most pressing questions is how to establish and document the effects of etiquette in AI-human interactions. This could involve a multi-disciplinary approach that combines elements of psychology, sociology and computer science. Researchers could employ a variety of methods, such as controlled experiments, user studies and longitudinal analyses, to understand how etiquette shapes the dynamics of AI-human interactions. This could include looking at variables like user satisfaction, trust and the effectiveness of the interaction in achieving desired outcomes.

Another question that emerges is about the design techniques or heuristics that could be developed for creating etiquette-effective AI-human interactions. This is a complex issue that goes beyond merely

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programming polite responses into a chatbot. It could involve the development of adaptive algorithms that can understand and respond to the nuances of human behavior and social norms. For instance, could an AI system be designed to recognize when it has committed a social faux pas and then take corrective action? Or could it adapt its communication style to match the etiquette expectations of different cultures, social groups, or even individual users? These challenges encapsulate both technical and ethical dimensions, dealing with autonomy, consent and the careful navigation of social dynamics.

The redditors' observations that certain tasks could only be completed when requested in one specific manner, say bluntly, and not the other, adds another dimension to this. It suggests that the AI's understanding of etiquette is not merely a cosmetic feature but could have functional implications. This could lead to a new set of design principles for AI-human interactions, where etiquette is not just about social norms but also about the effectiveness and efficiency of the interaction.

Another fascinating dimension of user interaction surfaces from the nuanced practices of engaging with ChatGPT. One user shared their unique approach: "*I always express gratitude to my ChatGPT for its responses and offer feedback simultaneously as I refine my prompt for a follow-up question. It seems to enhance its performance noticeably. Joking aside, this practice appears to maintain a thread of continuity between what has been answered and the information provided, leading seamlessly into whatever comes next. Without a 'thank you' the system might interpret the subsequent inquiry as unrelated, diminishing the contextual linkage of the dialogue*". This anecdote enriches our understanding of the subtleties involved in prompt engineering and illuminates the psychological and procedural aspects influencing AI performance. The act of thanking the AI, coupled with constructive feedback, might not change the AI's computational process directly. Still, it reflects a thoughtful engagement strategy that fosters a more coherent and contextual conversation flow. This strategy suggests that the manner in which users phrase their prompts, embedding them within a framework of polite acknowledgment and clear, purpose-driven inquiry, could effectively signal to the AI the intended continuity and relevance of the discourse.

Moreover, if ChatGPT or similar AI systems are found to have preferences or better performance based on the etiquette employed by the user, it could open up a new area of study focusing on AI "preferences" and their implications. Do these preferences encourage a certain type of behavior among humans? Could they have long-term social implications, such as reinforcing certain social norms at the expense of others?

The academic community has yet to answer these questions comprehensively, which suggests a significant gap in the existing body of knowledge. Given the increasing role that AI technologies are playing in our lives, from customer service bots to personal assistants and beyond, understanding the etiquette of these interactions from both the human and AI perspectives is becoming increasingly important. Therefore, there is a pressing need for researchers to delve into this novel area of study to advance academic understanding and inform the design and deployment of future AI systems.

While this study offers a thorough analysis of posts in the "ChatGPT" subreddit, it is crucial to acknowledge its limitations. The analysis is confined to a specific platform and a particular segment of the population, which may not be entirely representative of broader public opinion. Moreover, the categorization of posts into clusters, although done meticulously, is subject to the interpretive biases of the panel of psychology experts. Additionally, it is important to note that our analysis was undertaken before ChatGPT integrated image processing capabilities, a development that likely influenced subsequent public discourse. This highlights the evolving nature of AI technologies and underscores the need for ongoing research to capture these changes. Future research could expand the scope to other platforms or utilize more objective, automated methods for topic categorization, as well as account for new functionalities and the discourses they generate.

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5. Conclusion

The study uncovers two compelling overarching themes: one that delves into the societal implications of ChatGPT and another that focuses on its operational aspects. This duality is reflective of the public's nuanced interest in ChatGPT, where concerns are not just about the technology's functionality, the 'how', but also about its broader impact on society, the 'why'. This presents a unique and timely opportunity for a multidisciplinary approach to understanding ChatGPT. Collaboration among technologists, ethicists and psychologists could yield more holistic insights into not just the development but also the ethical and societal implications of such technologies.

The richness and diversity of themes, especially the granularity of topics like Human-AI Etiquette, discussed on the "ChatGPT" subreddit, underscore the intricate relationship between technology and society. It is not just about how well the technology works, but also about how it fits into, challenges, or even reshapes social norms and behaviors. For instance, the way humans should interact with ChatGPT, whether politely or bluntly, and how that affects the AI's functionality, opens up new avenues for research that straddle both technical and ethical domains.

As AI technologies like ChatGPT continue to evolve and become more integrated into the fabric of daily life, the public discourse surrounding them will also mature. This makes it increasingly imperative to engage in research that is multi-faceted, capturing both the technical prowess and the ethical considerations of AI-human interactions. Such an approach is not merely academic but essential, as the decisions made today in the design and deployment of these technologies will have long-lasting implications on society.

The study serves as a catalyst for more comprehensive research into the complex interplay between technology and society. It highlights the need for a multidisciplinary lens through which one can better understand, develop and responsibly deploy technologies like ChatGPT. As we stand on the threshold of an era where AI technologies will become ubiquitous, this study offers valuable insights that can guide both public discourse and academic inquiry, ensuring that future developments are both innovative and ethically sound.

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#Winemom culture:

An ethics, in perpetuity

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Abstract

Experts trace a congruent trend, pinpointed as originating around the 2010s (Grose, 2020) and only accelerating in the pandemic and its aftermaths: the rise of social media activity relating to parents' performances of their substance abuse – what this paper defines as "#winemom culture" – with a broader social tendency, a general increase in "rates of high-risk drinking" that lead to such outcomes as "long-term health damage" and "dangers to family" (Macarthur, n.d.). I interrogate the ethics of moralizing against #winemom culture under COVID-19 culture and its aftermaths through exclusively quantitative metrics or surface-level analysis. As with anything coded according to the "momification of the Internet" (Dewey, 2015), such cultures are often disregarded, seen as superficial or in receipt of unchecked judgments. I trace the following question: What can #winemom culture reveal about how parents are processing and communicating within this moment? And begin from the premise that there are as-yet undetermined drivers motivating what appears to be a "zoning out" (Heyes, 2020) in the mediation of #winemom culture production. This project then opens into an analysis of *how* to actually study digital feminist practices in this current moment, one that is defined by methodological crises surrounding the increasing complexities of enacting justice in social media research. This paper thus serves as a methodological disquisition for feminist researchers attempting to perform ethically just social media research.

Keywords: #winemom culture; COVID-19; feminist media studies; social media research ethics

1. Introduction: An uncorking

> "Parenting is the ultimate act of optimism, it's a promise to yourself not only that the world will be a good enough place for your kids to survive in, but that you will be a good enough person to help them do so. These images we share are part of that ambition to express the belief that the good parts really are good and outweigh the sleeplessness and helplessness and guilt. When I first shared that sad little selfie of mine, so many other mothers slid into my DMs to assure me it was going to get easier and I was grateful for the optimism" – Amil Niazi (2021)

> "My hobby is doom scrolling and learning the science of Covid and smoking weed and sitting on the toilet staring at the wall" – Julie, mother of two, London, ON, Canada[1]

[1] qtd. in Grose (2020)

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During one of the lockdown periods of the COVID-19 pandemic (in 2021), I began to notice two urgent trends in my media landscape: news headlines spouting medical and consumer data on the rise in alcohol consumption (Alcohol and Drug Federation, n.d.; Basch et al., 2021; Hosseini, 2020; Wardell et al., 2020), and medical studies warning of the escalation of parental and caregiver stress during this period (Cluver et al., 2020; De Choudhury et al., 2013; Firestein et al., 2022; Hiraoka and Tomoda, 2020; Wolf et al., 2021). I wanted to understand more about the potential interrelation between these (to my mind) associated phenomena. As someone with relative auto-netnographic[2] depth of understanding of networked parenting, someone who spends a lot of time with my online parenting communities, I began to think about how I might move beyond these data-driven, numerical findings, and towards more intimate understandings of the people behind these figures. I began to think about the hashtag #winemom and how its usage in this particular moment might be illustrative of a more personal dimension of what I saw as twin moral panics of spiking alcohol consumption and increasing parental stress and burnout. I moved towards the research question: What can #winemom culture reveal about how parents are processing and communicating within this particular moment? However, you will note by my usage of the past tense in this introduction that, as I began to explore these findings, my ethical antennae received some cautionary transmissions that implored me to slow down before diving straight into data collection, analysis, and publication of these findings. This paper, then, begins with the research question: What can #winemom culture reveal about how parents are processing and communicating within this particular moment? But moves outwards to the associated questions: How can the study of such an archive be done with true care insofar as not to reinforce pre-existing stereotypes, as well as to resist the extractivist impulse in social media research? This paper thus serves as a methodological disquisition for feminist researchers attempting to perform ethically-just research on social media archives. One of the core queries this speculative project intends to address is how to do ethics within a "matrix of domination" (Costanza-Chock, 2018) that sees social media artifacts as a commodity requiring solely a singular stamp of approval for their harvest, as opposed to those requiring concerted care and ethical questioning through an evolving praxis. As Tiidenberg (2018: 15), building upon Markham, writes: "All methods questions are ethics questions – 'most basically, a method is nothing more or less than a means of getting something done. And every choice one makes about how to get something done is grounded in a set of moral principles.'" Morality is not something one acquires but something one practices through continuous efforts at reflexivity. Taking up a radical revisionist call to put a stop to extractivist research in the neoliberal academy by Cowan and Rault (2018), this essay presents a speculative project on the possibilities of feminist ethical engagement in social media research. #winemom culture is deeply fraught, as this essay will outline. Researching #winemom culture means inhabiting an affective and critical realm of constant discomfort and self-questioning: an unfinished ethics, then, one in perpetual transformation. My initial hunch when I began this project during a pandemic lockdown in 2021 was that it wouldn't be right to publish an analysis based on the available data on this topic at the time. So, I didn't. Instead, I wrote this conjectural approach to a possible ethical engagement with this archive in the hopes that it will inspire others in my field to slow down and consider how their research might affect the online communities they intend to engage with.

[2] I use the term "auto-netnographic" to refer to my situatedness with respect to online mothering communities as I encounter them both as a researcher and as a parent/user. "Autoethnography" combines "autobiography (a personal narrative about one's own life) with ethnography, an immersive qualitative research method used to understand community practice" (Ngunjiri et al. qtd. in Pearce, 2020: 809) that is "focused on knowing through close and sustained proximity and interaction" (Hine, 2017: 22). In 2002, Kozinets defined "netnography" as "a new qualitative research methodology that adapts ethnographic research techniques to the study of cultures and communities emerging through electronic networks" (qtd. in Costello et al., 2017: 2). More recently the term has been refined in accordance with what are seen as the key standards for its application: namely, "immersive depth, prolonged engagement, researcher identification, and persistent conversations" (Kurikko and Tuominen qtd. in Costello et al., 2017: 5).

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2. Aeration I: Hashtag publics or individuals using a hashtag?

When Internet data first started to be harvested by researchers, it was seen as within the public domain, especially for public accounts on Web 2.0 social media platforms such as Facebook, Instagram, and what was formerly known as Twitter. Researchers felt justified in extracting this data and using it for their own purposes without considering foundational issues such as privacy and consent as they applied to the prosumers producing the content. In my own context, in the territories presently known as Canada, the federal guidelines for research ethics did not include specific precepts for social media research until 2022. Thus, if I had performed #winemom data collection in 2021, I would not have been bound by these re-envisioned regulations pertaining to the collection of human data, as the update now considers social media data as data made by humans, as opposed to open-access textual content that is seen to be severed from its creators (TCPS2 Supplement, 2022). Similarly, at this time in the Canadian context, I would not have needed to apply for ethics clearance for this study from my institution's review board. Zeffiro (2019: 231) explains how institutional ethical review was formerly "not required for research that relies exclusively on secondary use of anonymous information," and counters that "if … social media data is generated by human participants who are likely unaware of the parameters of secondary data … should we not then reexamine [institutional ethical review] exemption?" Thankfully, her call was heeded. Yet, in 2021, while I could, technically, go onto a platform like Instagram or TikTok and search and scrape for all data associated with a given hashtag, in this case that of the #winemom hashtag, I would have done this work without the support and oversight of institutional ethical review and would have likely felt umbrage that this data was "secondary use" and thus mine to do with what I like. Writing on ethics and the past in cultural studies, Dederer (2023: 126) reminds us of the "third conditional tense [which] describes something that did not happen, but could have happened given the right conditions"; she underscores how one often applies positive speculation when imagining what they would have done in a previous situation: "Given the right conditions, we would've done the right thing" (2023: 127). When I began thinking about #winemoms during the height of pandemic lockdowns and moral panics around increases in alcohol consumption, I did not have access to the right conditions. Looking back, I doubt I would have felt that I had done the "right thing" (Dederer, 2023: 127) in harvesting data and attempting surface-level analysis of #winemom hashtag communities. There were people behind this data. How could I treat them with care, especially given what The Care Collective (2020: 5) identifies as a "current reign of carelessness" that is "affect[ing] our interpersonal intimacies"? How could I, instead, bring care to these "activists in constructing libraries of things, co-operative alternatives and solidarity economies" (The Care Collective, 2020: 5)? This is what hashtag communities began as, activist movements rendered by human beings.

Hashtags are semiotic utterances of a prosumer's desire to connect or affiliate themselves with a particular online community. For historically oppressed groups, such as those navigating intersectional[3] barriers accorded to their race, class, gender, sex, ability, etc., the typing in of a hashtag as a label or caption on a particular online post presents a form of radical community seeking. For hashtag communities generated through intersectional feminist fellow feelings, two core theories have emerged, those of Papacharissi's (2014) "affective public" and Berlant's (2011) "intimate public." Papacharissi's "affective public" is highly suited to analyzing social media communities, especially ones emitting strong affective resonances, and is defined as a "formation that is textually rendered into being through emotive expressions that spread" (2014: 133), which also amplifies the awareness and intensity of its particular feelings. Berlant's (2011: 183) "intimate publics" initially referred to communities developed through print culture as opposed to digital ones. Her conceptualization is advantageous as it refers to the "multiple

[3] Crenshaw (1989) coined the term "intersectionality." To explicate her theory of multiple forms of discrimination, she (1989: 149) called on the analogy of traffic in an intersection "coming and going in all four directions." Crenshaw (2017) has subsequently explained intersectionality as a "lens through which you can see where power comes and collides." Puar (2012: 54) reconsiders this theory within "changed geopolitics of reception" (53), querying whether it has "become an alibi for the re-centering of white feminists."

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affective registers of collective life that keep people loosely knotted together … while the ground is shifting." Berlant's (2011: 184-5) intimate publics can be used to "establish solidarity for a political ground" but can also be hindered by their focus on sharing experiences (at the sake of mobilizing against structural discrimination), as well as Khoja-Moolji's critique that affective bonds are only made possible through "shared history or sensibility" (qtd. in Marwick, 2019: 322), which may not be guaranteed. As scholars of critical race and intersectional feminism explore the study of hashtag communities driven by affect and intimacy, they have found that these networks can incite calls for "civic activism" and challenge stereotypes (Brock, 2012: 529), and even, in Bailey's (2015) findings on the Black trans women's hashtag #GirlsLikeUs, "redress the lack of care [that these individuals] receive from the health care community and society." However, in line with Marwick's critique (2019: 322) of hashtag feminism as a "simplistic answer to complicated problems," Hobson (2016), writing about the #BlackGirlMagic hashtag, finds that hashtags can be both "a space for subversion and protest" and also "a way of narrowing definitions and understandings of 'black womanhood' and 'black girlhood.'" Such authors demonstrate how hashtag feminism as a form of "feminist activism is both enabled and constrained in digital spaces" (Linabary et al., 2020: 1828).

Social media researchers have begun to heed these complexities. Researchers are beginning to reckon with the fact that the utilization of a hashtag may not connote homogeneity within a group of users, that such a heterogenous grouping of individuals using a hashtag may not ascribe to the same "shared history or sensibility" (Khoja-Moolji qtd. in Marwick, 2019: 322). Brock (2012: 545) cautions against labelling individuals using a given hashtag as a "public," instead privileging the nomenclature of a "public group of specific [platform] users," here challenging the notion that such communities can even be understood as a singular organism. Further, correlating with representational challenges arising out of the #MeToo hashtag feminist movement, when a movement started by a Black woman was then co-opted by a white woman who then became the face of this movement (Borah et al., 2023: 2), researchers have begun to interrogate the economics of popularity and visibility within these perceived communities, querying such notions surrounding the dominance of certain figures within these spaces as accorded to their race or class, and how the labours of historically-oppressed individuals can be extracted to bolster (cishet, white, privileged) slacktivist influencers. Despite such pitfalls engrained within larger, popularized hashtag feminist movements, in their recent analysis of a small-scale feminist political movement, #WitchTheVote, Paulsen Mulvey and Keller (2023: 11) "suggest the hashtag is emblematic of the potential for doing intersectional feminist politics online that pushes back against both popular feminism and platform conventions," due to its lack of mainstream attention and its ability to motivate people to attend political meetings and to vote.

In light of these myriad and evolving debates, I felt torn about analyzing #winemom hashtags purely as data points. The only extant peer-reviewed study on #winemom culture using quantitative data arrived in 2021, right in the peak of this moment. Basch's team (2021: 2) sought to study this phenomenon through a focus on mothers' performances of drinking on social media, due to what they cite as "an alarming increase in alcohol consumption among women during the pandemic," and in effort to shift the focus of such representations on social media from their more commonplace occurrence on the accounts of youth. Their (Basch et al., 2021: 4) findings help to fuel the panic: the majority of the posts they reviewed encouraged alcohol consumption, with only 6 out of 100 posts discouraging this activity. Medical, mental health, and addictions experts trace a congruent trend, pinpointed as originating around the 2010s (Grose, 2020) and only accelerating: the rise of social media activity relating to parents' performances of their substance abuse, primarily alcohol – what this paper defines as "#winemom culture" – with a broader social tendency, that of a general increase in "rates of high-risk drinking" that lead to such outcomes as "long-term health damage" and "dangers to family" (Macarthur, n.d.).

I wonder about the ethics of moralizing against #winemom culture under COVID-19 through exclusively quantitative metrics. By way of an example, I turn to a secondary finding from Basch et al.'s (2021: 4) study: the researchers assert that #winemom culture posts that highlighted "struggle" received

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almost double the 'likes' of those that did not. Their study's overarching claim is that the majority of #winemom culture posts on Instagram endorse alcohol consumption, stoking the broader moral panic about the excesses of parental imbibing under the conditions of this plague. Basch et al. (2021: 5) leave off with a recommendation that telehealth organizations should promote their services on Instagram, by way of offering a possible solution and, perhaps, demonstrating some superficial care for their subjects. But they do not elaborate upon this secondary finding beyond a cursory inclusion of the statistical differential, nor do they define "struggle" in their study: What does this term mean to these researchers? How are coding for it? The effects of the pandemic are borne unequally: the speed and volume of upheavals have served to underscore health and economic inequalities faced by the "most vulnerable in society" (Chan, 2020: 3), including those in poverty, racialized, disabled, neurodivergent, and migrant peoples, and those facing such intersectional challenges alongside caregiving for the very young and old, many of whom remain unvaccinated or immunocompromised.

"Struggle" seems an insufficient term for cataloguing the heterogeneity of these inequities, especially when it goes undefined. #Winemom culture may promote drinking in both race- and class-insular forms; yet, it may also provide "social connection" (Wright et al., 2022: 4) for parents undergoing challenging times (although such connections "can reinforce self-destructive behaviours" (Seaver, 2020: 115)). Performing one's intoxication on social media may indicate "dangers to family" (Macarthur, n.d.), or enact a satirical or cathartic response to "taking the edge off of parenting" (Fetters, 2020), one that undermines the dominant prevailing scripts of motherhood, such as those of "patriarchal motherhood"[4] or "intensive mothering,"[5] which, in brief, condition parents (primarily mothers) to attend to their children's needs twenty-four hours a day at their own detriment, without complaint. Taking a selfie with your full wine glass might then be seen as an act of feminist self-care that resists notions of autobiographical, visual culture performances on social media (via selfies) as narcissistic (Senft and Baym, 2015: 1589), or as acts of vanity (Pham, 2015: 223) or frivolity (Abidin, 2016), especially when such discourses speak to "a rejection of the voices of women in the public sphere" (Zappavigna and Zhao, 2017: 246). Alcohol addiction is a serious matter for many, but for others, according to feminist philosopher Heyes (2020: 7), developing upon Berlant, "the only possibility of resistance (or even the only viable response) [to life under neoliberalism] might be to detach from experience … to slow down, and … to alter or even lose consciousness" – a modality she coins "anaesthetic time." Popular news media loves a 'bad parent' narrative – to biopolitically enforce others to tow the line of a "scientific motherhood"[6] beset on conditioning children, also known as the "social investment" (Pasolli, 2017: 131) that constitutes the future labour force. But parents who drink and share on social media (often) still love their kids and may (often) still do right by them: performing the struggles of parenting may serve as a form of self-conditioning that supports their efforts to be "a good enough person to help … [their] kids to survive," as Niazi speaks to in the aforementioned epigraph. #Winemom culture is therefore not easily summated: neither should the methodologies utilized to study it be straightforward nor confined to

[4] Rich (1986) broadly defines "patriarchal motherhood" as the regulation of women's reproductive power by the dominant (male) society. The notion governing this concept is that the body of a woman and their potential for motherhood presents a woman's "single destiny and justification in life" (Rich, 1986: 34). Rich sees this and related ideas about women's requisite purity in the role of mothers as deeply internalized by society-at-large. More recently, O'Reilly (2010: 18) discusses contemporary motherhood through the distinction of "a woman's relationship to her powers of reproduction [versus] the institution of motherhood which attempts to keep women under patriarchal control."
[5] Hays (1996) defines "intensive mothering" as a model of child-rearing originating in the later years of the Second World War (U.S.) that is marked by child-centered, expert-led, labour-intensive, emotionally-absorbing, and financially-expensive tenets. Bowles Eagle (2019) and Basden Arnold (2016), as examples, explain how this discourse remains pervasive into our current era on social media due to its connections with performances of "good mothers" who never complain, who constantly express gratitude for the experiences of pregnancy and parenthood.
[6] "Scientific motherhood" is a social movement whose origins are linked to an 1842 text, Beecher's *Treatise on Domestic Economy*, and connotes "the new attention the medical establishment paid to child care" (here child-rearing in the home) (Litt, 2000: 21). The rise of this movement coincides with the establishment of the U.S. Children's Bureau (1912), which speaks to its connections to the "century of the child" (see note 10) and its associated drivers to end child labour practices. Scientific motherhood is marked by its promotion of highly prescriptive, supposedly empirically based approaches to parenting as directed by (mostly) male doctors and experts (Hays, 1996: 41), and was motivated by increasing concerns pertaining to the societal effects arising from an influx of immigration, as well as social unrest connected to labour and poverty movements (Hays, 1996: 41-2).

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singular metrics. Individuals using the #winemom hashtag present a "public group of specific [platform] users" (Brock, 2012: 545); trends in their dataset are not representative of the whole.

3. Aeration II: *Zoning out* & *zooming in*, the #winemom

Beyond the aforementioned moral panic-inducing articles arising out of the medical community, my preliminary meta-analysis of #winemom culture through Internet memes, academic articles, Facebook groups, Instagram and TikTok hashtags, and an abundance of online think pieces conveys a dualistic response to this phenomenon. I observe two emerging patterns: 1) Feminist responses, wherein authors attempt to consider the socio-historical constructs that fostered the rise and prominence of #winemom culture. These accounts try and evade judgment of parents who perform acts of "identity-work"[7] online in these ways, instead articulating the challenges of raising children in our current milieu: one in which parents are held to incredibly high expectations all the while facing eroded social systems and loss of social supports (e.g. family, community, childcare), which have only been exacerbated by the wide-reaching effects of the COVID-19 pandemic. 2) What appears to be an acceptance-based response founded upon an inability or unwillingness to critically engage with this culture. #winemom culture has made news headlines for years for its supposed contribution to "high-risk drinking" (Macarthur, n.d.) and its bespeaking of other latent social ills such as, for example, Iqbal's caution about surges of alcohol purchase and consumption under current global health conditions: "COVID will end, right, and cancer will continue, and there will be more cancer because people are drinking more" (due to carcinogens) (qtd. in Roumeliotis and Witmer, 2022), not to mention the effects of alcoholism on children, such as a concomitant increase between alcohol use and forms of punitive parenting including "physical abuse, corporeal punishment, and psychological aggression" (Wolf et al., 2021: 2). However, there are still many people who perform the scripts of #winemom culture on social media platforms like Instagram and TikTok with full abandon and, seemingly, little desire or attempt to question them. There are also many people who 'like' and 'share' these posts also, seemingly, at face value. In the following, I trouble these two currents of thought in #winemom culture in order to underscore some of the necessary theoretical and ethical interventions requiring attention in the development of my representative case.

The application of intersectional theories to what I perceive as the first school of thought in broader #winemom culture and scholarly research thereof reveals significant blind spots. While many authors dole out sympathy for individuals performing #winemom culture, few accounts gesture towards intersectional analyses of this phenomena. Seaver (2020: 104) comments upon the racial and classist markers of the majority of those who perform #winemom culture online. His analysis finds that this culture "perpetuates the common stereotype that wine is the alcoholic beverage of choice for middle-aged, middle-class, predominantly white women with children," a point echoed by Grose (2020) who writes that "middle-class parents' self-medication has long been recreationalized, even romanticized in America." These views have theoretical roots in cultural studies: Foucault (1978: 146-7) writes of the "hysterization[8] of women, which involved a thorough medicalization of their bodies and their sex [that]

[7] Poletti and Rak (2014: 7) deploy the term "communicative identity-work" to refer to acts of identity presentation that are not concerned with the constitution of narrative. For instance, they (2014: 7) cite "social media posting" as an example of identity-work that is not dependent upon narrative, and one that is also made possible by the particular technological affordances of the given platform or site. In this paper, I use "identity-work" to refer to #winemom culture artifacts since these can be understood through both narrative and non-narrative lenses, depending on their particular aspects, and are also co-constitutive with technology. As Poletti and Rak's (2014: 7) "identity-work" also incorporates considerations of technological affordances, I further see this concept as aligned with both Poletti's (2020: 12) "self-life-inscription": a "collection of flexible … ways of making lived experience significant" that also attends to technologies of mediation, as well as "automediality," a term that marks a shift in autobiography studies in order to attend to the *tools* of media expression as contributing to constituting the self. Under automediality, "media technologies do not simplify or undermine the interiority of the subject but, on the contrary, expand the field of self-representation beyond the literary to cultural and media practices" (Smith and Watson qtd. in Kennedy and Maguire, 2018).

[8] Hysteria (with roots from the ancient Greek term *hystera* (uterus)) is cited as the "first mental disorder attributable to women" (in 1900 BC ancient Egypt) (Tasca et al., 2012: 110). It was re-popularized by Charcot (Paris) in the mid- to late-nineteenth century, during which time it was understood to be a physical disorder (North, 2015: 499). In 1952, it was listed in the first edition of the *DSM* (U.S.) as a mental disorder – only to be removed in the 1980 edition.

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was carried out in the name of the responsibility they owed to the health of their children, the solidity of the family institution, and the safeguarding of society." When Ahmed (2010: 50) writes of the "fantasy figure" of the "happy housewife," she is referring to a 1950's white, middle-class, suburban mom, one with leisure time and money, whose medicalization (through prescription drugs like valium and non-prescription ones like wine) is viewed as a societal necessity for upholding Foucault's (1978: 146-7) rendering of the bio-political "family institution."

The middle-class white mother's substance abuse has therefore been viewed within the parameters of respectability – a narrative that continues to play out in #winemom culture to this day, yet one that receives insufficient scholarly attention. For example, Wright et al.'s (2022: 3) qualitative focus-group interviews with women in the 40-65 age group who drink alcohol reveals that, "Women appeared conscious of representing their drinking as rational, measured and safe, particularly when discussing weekday use, and drinking alone." However, what Wright et al. (2022), Seaver (2020), and other #winemom culture scholars fail to address is that respectable drinking is not a practice on offer to all: Cooper (2017: 5) writes of the "socially contingent" nature of respectability and how this concept has functioned to keep women of colour, especially Black women, subordinated and surveilled in North American society. In her incisive commentary on #winemom culture, Heyes (2020: 112-3) cites Springer's analysis of news media coverage of mothers who use various substances, writing that, "despite greater negative health consequences for a fetus of maternal alcohol consumption compared with crack, articles about crack users consistently framed them as bad mothers who are responsible for social problems." Springer's (qtd. in Heyes, 2020: 113) overarching finding follows that "the driver of negative representations of mothers … is not the actual risk posed to existing children or a fetus by the drug use of their mother but a prior commitment to representing poor and minority women as unfit and socially irresponsible." Within critical mothering studies, Heyes' (2020) work can be linked to Litt's (2000) foundational critical race critique of scientific motherhood. While the rise of scientific motherhood is rooted in multiple societal agendas – including the "century of the child"[9] and its associated misogynistic impulses to recuperate power from women and undermine their knowledge (Ehrenreich and English, 1975: 202, 211; Spender, 1996: 164) – Litt (2020: 23) posits that "white elites found in [this] ideology a response to gender, racial, ethnic, and class conflicts of the late nineteenth and early twentieth centuries, particularly those animosities wrought by immigration, industrialization, and urbanization." Scientific motherhood was thus thought to offer social stability through the re-inscription of "the traditional gender order, cultural homogeneity, and white dominance" (Litt, 2020: 23). It also led to the creation of such "controlling images" (Hill Collins, 1990: 68) as the (Black) "welfare mother," which "become part of the building blocks of 'reality' for many people … [since] they provide simple, uncomplicated, and often wildly (and politically damaging) inaccurate information about what is 'wrong' with some people" (Lubiano, 1992: 330-1). Hill Collins (1990: 68) explains how these tropes "are designed to make racism, sexism, and poverty appear to be natural, normal, and an inevitable part of everyday life." My project seeks to build on these crucial critical race, and intersectionalist feminist analyses in order to connect #winemom culture to its problematic roots. While it is necessary to sympathetically engage with the available #winemom culture archive, it is also imperative to consider who performs this culture and who is left out. Discourses of respectability affect parental performance online: if one is a person of colour or low income, or has a rap sheet tarnished by substance abuse offenses, one may not possess the freedom to perform their intoxication due to the risks of interventions by child protection or welfare agencies. These are legitimate threats that affect certain bodies and control opportunities for identity-work online.

[9] Key's 1909 text *The Century of the Child* advocated for the reorientation of children's rights as the center of ethical concerns for the coming century. Through Key's efforts, children were positioned as requiring concerted care in order to develop; they were also understood to be sites of purity in need of protection (qtd. in Farley, 2018: 1). The "century of the child" arises out of the "horrors of industrial capitalism" and its accompanying child labour (Ehrenreich and English, 1975: 206). Out of these discourses, the figure of the child becomes entwined with efforts towards a more just future; however, the "century of the child" also "requires an entirely new conception of the vocation of mother" (Key qtd. in Ehrenreich and English, 1975: 208), paving the way for societal scripts of scientific motherhood and intensive mothering.

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Riffing on Ahmed's (2010: 17) conceptualization of who is entitled to the "fantasy" of the "happy housewife," my project will query who is "banished" from this archive? How does this archive validate certain performances of alcohol consumption as self-care, relaxation,[10] and/or "digital leisure,"[11] and who has access to these performances, in terms of time, questions of technological participation, and with respect to the aesthetic conventions of this visual culture trope and its preferred domestic settings,[12] not to mention other cultural and religious barriers.

These critiques only scratch the surface of the problematic absences apparent in popular feminist accounts of #winemom culture. In developing my own study, the inclusion of such theoretical currents is therefore essential, along with attention to other marked gaps in this perceived public, such as questions of alcohol use and its relationships to neurodivergence and trauma, as well as the obvious gender essentialism at issue in this culture and its ramifications for the progress of feminist mothering. For instance, while Basch et al. (2021) find that Instagram posts highlighting "struggle" received more 'likes' than those that did not, there is a significant dearth of scholarship relating to the performance of addiction and recovery/sobriety narratives in #winemom culture. In order to ethically attend to #winemom culture, my project will need to analyze posts through core valences of disability and Mad studies, such as the valorization of non-linear trajectories within the performance of coping with chronic psycho-emotional afflictions (Jerreat-Poole and Brophy, 2020: 8), as well as a tenet aligned with Hedva's "Sick Woman Theory" wherein posts refute representations of "the happy and productive liberal subject" (qtd. in Fournier, 2018: 655), which dovetails with Heyes' (2020) anaesthetic time. Adjacently, I am curious as to how the gender essentialism driving Foucault's (1978) medicalization of motherhood and its contemporary analogue, motherhood as crisis (Johnson and Quinlan, 2019: 58), might be deconstructed through a more methodical investigation of #winemom culture. Pat critiques such as Splawn's call for beer to characterized as "daddy juice" (qtd. in Seaver, 2020: 118) only attend to a superficial element; there is much to be deconstructed here.

In considering sympathetic responses to #winemom culture of the feminist varietal, such as those of Fetters' (2020) comment that "the most urgent problem wine-mom jokes reveal is … the idealized notion of momhood [through that of] the 'supermom,'" or Dowsett Johnston's that wine can be understood as "the steroid … [or] escape valve women need, in the midst of a major social revolution still unfolding" (qtd. in Seaver, 2020: 106), I am reminded of broader calls for pay-equity and alarm-sounding over the "motherhood penalty."[13] These interminable refrains express how female-gendered parents and caregivers continue to perform the "mother load"[14] of domestic labour and child-rearing, all the while striving to excel in their careers, despite being paid anywhere from 69-84 cents on the dollar in comparison to their male counterparts (Agagão, 2021; *Canadian Women's Foundation*, 2018; Taub, 2020). Problematically, however, this data is infrequently disaggregated, again limiting the picture of the plight of female-gendered parents and caregivers along race, class, and ability lines. My sense is that what I have cited as the overwhelmingly supportive "feminist response" to #winemom culture is one that remains rooted in the optimism of strategic essentialism. Those in favour of this archive seem to believe

[10] In her summation of two popular #winemom culture Instagram accounts, @mommywinetime and @wine.mom.repeat, Fetters (2020) finds that "where wine *is* invoked, it is as a shorthand for relaxation time, for well-deserved breaks after long, hectic days of mothering" (emphasis in original).

[11] According to Spracklen, "digital leisure" practices "show remarkable parallels with traditional leisure; it's where experiences are lived, identities and networks of belonging are constructed, and power imbalances are reproduced and resisted" (qtd. in Mayoh, 2019: 204).

[12] Kennedy's (2020: 1070-1072) research into the most-followed TikTok accounts during the pandemic showcases "white and wealthy" users, whose posts reveal "spacious bedrooms" in accordance with their privilege.

[13] Kaplan (2018) explains how a given woman's vulnerability to the economic and vocational effects of the gender-wage gap is exacerbated by having children: "recent research suggests that the majority of the wage gap opens up around the time of the birth of the first child" due to the fact that many mothers, upon their return to the work force, often switch to lower-paid roles which enable them to take on the "50 per cent more" (qtd. in Kaplan, 2018) domestic labour than their male counterparts.

[14] *The Guardian* (2017) uses this phrase to refer to the plight of American women specifically due to such factors as "shamefully short maternity leaves … crushing childcare costs … high maternal death rates [and] uneven distribution of household chores." However, the "mental load" of motherhood – understood as "cognitive labour" – is unequally distributed across both gendered lines and national borders. Cognitive labour includes such invisible domestic activities as "anticipating needs, identifying options for filling them, making decisions, and monitoring progress" (Daminger, 2019: 610).

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that #winemom culture can be marshalled to draw attention to issues like wage- and laundry-inequity on a scale that would improve women's global predicaments. However, this strategic essentialism is also founded upon a lingering gender essentialism in motherhood studies even though intersectional feminist mothering scholars have been writing for decades that gender essentialism – here, the *mom* in #winemom – presents the principal stumbling block to meaningful change for parental equality.

Since Rich (1986) and Ruddick (1989) wrote their foundational texts, *Of Woman Born* and *Maternal Thinking*, respectively, feminist mothering scholars have sought to forge their way out of the harmful social scripts of motherhood through changes in nomenclature and efforts to decouple parenting from gender essentialism in the wake of failed efforts on behalf of strategic essentialist feminism due to its inability to consequentially incorporate intersectionality.[15] Rich's (1986: xxiv) work is indebted to currents of thought in Black radical feminism and thus attuned to critical race critiques of white Christian and liberal configurations of "the mystique of [white middle-class] woman's moral superiority [that] can lurk even where the pedestal has been kicked down."[16] Rich's (1986: xxiv) text initiated a deconstruction of a patriarchally-controlled motherhood: seeking to critique the pressure on women to have children in order to be seen as socially valuable; to shirk the enforced cloak of the "suffering mother" as necessary to the "emotional grounding of human society" (Rich, 1986: 30); and to encourage her readers to regain their bodies and spirits for their own joy, pleasure, and autonomy (Rich, 1986: 39). Ruddick's (1989: xxi) intervention took Rich's one step further by interrogating the perceived biological essentialism of the figure of the mother as woman: she reconceived of motherhood through the labour it required as opposed to a biological or gendered positionality, thus coining the verb "mothering" to indicate the work of parenting, work that "does not require a particular sexual commitment," wherein care is divested from biology (O'Reilly, 2010: 27). Despite her efforts, Ruddick's (1989) work has been criticized for its dependence upon feminist standpoint theory (Khanna, 2009) – a methodology which suggests that a "superior vision [of culture or society is] produced by the political conditions and distinctive work of women" (Ruddick, 1989: 129).

Whether the capacity to mother requires one to be a mother, and whether claims to women's broadscale oppression can enact revolutionary change for all women remain pressing concerns in motherhood studies. McLean (2002: 9) writes that "it is precisely this notion of a unified standpoint and women as a unified group that postmodern feminism challenges." Foundational feminist critiques of Foucauldian "power/knowledge" posit that, if truth and knowledge are always produced within a network of power relations, then there is no room for moral or political agency, nor can such a theory analyze the distinctive asymmetries of power across intersectional lines in interventions that would be beneficial to feminism writ large (McLean, 2002: 2). Foucault (1984: 292) himself disagrees, seeing instead that if there is power everywhere, then there is also freedom everywhere – an argument that has been taken up by postmodern feminist scholars who find his theories invigorating for articulating "a notion of subjectivity that is embodied, … constituted historically and through social relations [and] capable of moral and political agency" (McLean, 2002: 14). McLean's (2002) postmodern feminism (vis-à-vis Foucault) supports one of the more recent, successful footholds in feminist mothering studies – an account that defies both biological essentialism and the unification of women writ large. The 'mother' of contemporary motherhood studies, O'Reilly (2010: 18-20), coined "maternal empowerment" – an "identity and practice," as well as a "noun and a stance" – that is characterized by elements such as parents: meeting

[15] This is an undeniably rich and complex topic, which is expertly summated by Bhandar and Ferreira da Silva (2013): "The persistent claim to universalism, which is the core of this White feminism, renders the experiences, thought and work of Black and Third World feminists invisible, over and over again." Scholars such as Daniels (2016: 55-57) point out how critiques of the whiteness of the first and second waves of feminism extend to our contemporary era of new media research since, as she writes, "constructing and protecting whiteness has been a core feature in the rise of the popular Internet," and must be challenged in favour of an "intersectional feminism that centers the experience of Black, Latina, Asian, Indigenous, queer, disabled, and trans women" in order to speak against a "social order."

[16] Dyer (1997: 17) corroborates this point, arguing that white women were indoctrinated with mothering scripts based upon the Christian religion's conceptualization of the figure of the Virgin Mary: Mary's passive striving, purity, grace, self-denial, and self-control thus became the "thumbnail sketch" of the white mothering ideal.

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their own needs, forming community around child-rearing, questioning and challenging expectations placed on parents and conventional parenting practices, and challenging the notion that they only feel love for their children (as opposed to a full continuum of emotions). For O'Reilly (2010: 17), "modern motherhood continues to function as a patriarchal institution which is largely impervious to change because it is grounded in gender essentialism, a gender ideology that establishes a naturalized opposition between public and private spheres"; she sees that the only way out of this is through the "unearthing and severing [of] gender essentialism" in order to move towards the incorporation of maternal empowerment. Ultimately, my #winemom culture representative case seeks to contend with underexamined elements of this archive, such as a scarcity of intersectional feminist interrogations, as well as a continued reliance upon strategic essentialist feminism that is out of step with progressive theoretical efforts in a postmodern feminist critical mothering. I thus move to demonstrate how such currents might be interwoven into my ongoing efforts to ethically examine this archive.

Influenced by scholars of online identity-work, I am reticent to ignore social media trends that appear on the surface to be trivial or vacuous. #Winemom culture is picked up by the medical establishment in an effort to decry societal ills caused by drinking and reinstate biopolitical control; yet, I remain skeptical of strictly quantitative metrics fueling moral panics, wary of the depth and particularity of vital cultural insights such data may occlude. In turning to the cultural production of #winemom culture, primarily social media posts and think pieces in online magazines, my initial meta-analytic observations posit this archive either as reified for its potentiality in supporting the aims of popular feminism, or, in the case of this second category, as devoid of critical engagement insofar as to foster its unacknowledged perpetuation. Seemingly, this lack of criticality can be accorded to the majority of those creating or consuming #winemom culture as unable or unwilling to look closely at it. But, instead, what if #winemom culture represents an example of what Abidin (2016: 16) calls "subversive frivolity," which connotes the "under-visibilized and under-estimated generative power of an object or practice arising from its (populist) discursive framing as marginal, inconsequential, and unproductive" and thus enables content creators to partake in "quietly subversive acts"? In this section, I seek to engage with the potential for the materiality and meaning of #winemom culture artifacts to illuminate the primary research question driving my representative case: *What can #winemom culture reveal about how parents are processing and communicating within this particular moment*?

According to feminist social media researchers Bowles Eagle (2019), Basden Arnold (2016), and Drentea and Moren-Cross (2005), scripts of patriarchal motherhood, intensive mothering, and scientific motherhood that took hold in the twentieth century remain pervasive into the second and third decades of the twenty-first. And yet, their studies were published prior to the pandemic. In my auto-netnographic field work since March of 2020 and situated within North American networks, I have noticed a rise in parenting social media trends that denigrate child-rearing in ways counter to the bio-political conditioning incited by the aforementioned scripts. For example, on Reddit, the sub-thread "Stepdadreflexes" is devoted to the performance of 'bad' parenting (these posts involve mostly male care-givers endangering children by allowing them to partake in harmful activities and not being there to catch or console them in the wake). On TikTok, a recent popular challenge involves parents 'roasting' their children by filming their unwitting progeny and overlaying the videos with judgmental textual commentary about them – denoting their laziness, inability to meet their expectations, etc. Of course, social media also continues to promote idealized accounts of parenting. Bryant, writing about the spike in #winemom culture during the pandemic, notes how anxieties around the interpersonal comparisons afforded by social media are intensifying due to compounding feelings of inadequacy, which are understood to intensify in isolation: "You'll have supermom over there on social media posting all these recipes and arts, crafts, and activities, and you're sitting there with your drink or you're smoking" (qtd. in Hosseini, 2020). It is probable that increases in parental stress during the pandemic (Cluver et al., 2020; Hiraoka and Tomoda, 2020: 497; Wolf et al., 2021: 2) are contributing to these online trends. As parents are forced to spend more time with their children, as extra-curriculars and social communities are diminished, frustrations rise;

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simultaneously, parents must question every decision through the heightened risks posed by the possibility of contagion, all the while wading through the ceaselessly-transforming torrents of public health data. Social media trends that illustrate parents' seeming rejection of the previous stronghold of intensive parenting archetypes (such as those of "Stepdadreflexes," TikTok roasting challenges, and the influx of #winemom culture posts on platforms like Instagram and TikTok) might be understood as the resulting identity-work analogue to base-structural health and social manifestations. They might thus be seen through the psychological lens of Stanislawski's (2019: 3) coping as "unconscious … or automized responses to stress." Since the majority of these posts appear with negligible reflexivity on the part of the content producers, they can thus be seen to proliferate without awareness of their theoretical implications.

If I were to begin my representative case by proposing a theory based on preceding literature, I might then weave an account of Heyes' (2020) anesthetic time with Chan's (2020) "pandemic temporalities" in order to argue for a suspension of intensive mothering under COVID-19. As a temporality of neoliberal refusal, Heyes' (2020) anaesthetic time poignantly illustrates the pressures on the majority who mother in these complicated times, therefore vindicating their desire to *zone out* through alcohol consumption as a seemingly rational response to such stimuli. Heyes' (2020: 111) winemoms resist parental conformity through methods divested from true substance-dependence and its ensuing moral panic: they inhabit a "fun zone of psychological distress where a glass of wine takes the 'edge-off' in a way we can all laugh about but allegedly has nothing to do with 'real' mental illness." However, in gesturing to Heyes' (2020) referencing of Springer's study on the disparate social acceptance of moms who do crack as compared to those who drink wine, the performance of one's *zoning out* is not on offer to all. As per Cooper (2017), respectable drinking is associated with intersectional factors, such as race and income-level, not to mention aspects such as whether one has a pre-existing criminal record or done stints in rehab, or on a material level, in line with Chan's (2020) research, whether one has sufficient access to social media technologies such that true participation in #winemom culture can be attained, which also includes temporal access, since many lower-income people of colour are inhibited in performing online identity-work as a result of their holding down multiple in-person "essential"[17] jobs.

A working theoretical conceit that patently glorifies #winemom culture for its undoing of intensive mothering, even with a commitment to considering underexamined intersectional factors through the proposed theoretical scaffolding, will not, however, fulsomely answer the research question insofar as to overcome a straw-man predilection. In order to both critically and ethically enact this representative case, my sense is that beginning with such a theoretical armature will overdetermine the findings towards my line of inquiry insofar as they will be understood to coincide with the pre-existing data. While initial research lays the groundwork for my production of such a study, in interrogating the second pattern I observe in the broader #winemom culture archive – that of an acceptance-based response founded upon an inability or unwillingness to critically engage with this culture – my presupposition is that a grounded theory[18] approach based upon tenets of automediality (see note 8), feminist constructivism, auto-netnography, and a commitment to *small* or *granular data*[19], would be better suited for the collection and analysis of #winemom culture data under pandemic circumstances. As Abidin (2016) points out, when a particular trend is easily dismissed and readily perpetuates, this is a sign to pay attention. Further, in prematurely overlaying statistics and theory upon evidence, the trees are often forsaken for the forest.

[17] An "essential industry" denotes operations "critical to public health, safety, and economic security," while "essential workers" are defined as "employees within essential industries who must physically show up to their jobs" (qtd. in Roberts et al., 2020: 690).

[18] Influenced by Corbin and Strauss (2012), Mediani (2017), and Groen et al.'s understandings and applications of grounded theory, I take up this method for its onus on features such as: constant comparison of the data throughout the research process; its commitment to dynamism; and its rejection of a singular theory to guide it from the outset, instead its privileging of "a systematic and flexible constant comparative approach for theory-constructing inquiry" (Groen et al., 2017).

[19] In line with calls to reinvent social media research methodologies by turning away from "big data," whose methodologies result in "trading large scale for reduced depth" (Puschmann and Burgess, 2014: 2), my project will conversely attend to what I am calling *small* or *granular data*.

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My initial observation that trends like "Stepdadreflexes," roasting challenges, and #winemom culture artifacts are replicating unconsciously might be able to be corroborated by the pre-emptive application of the disclosed theoretical framework. But what of context? I hypothesize that individual #winemom culture posts re-work and deconstruct the tropes of this genre, as they are continuously remediated, through such tactics as satire, which is, notably, difficult to gauge, especially in large samples that are counted only by virtue of a singular metric, like, in this case, a hashtag. Sharma and Brooker (2017) speak to the challenges of analyzing the semantic intentions behind online discursive practices. For example, in applying their (2017) analysis of the use of the #notracist hashtag on Twitter, the #winemom hashtag might similarly be deployed as a tongue-in-cheek disclaimer or assertion of denial. In such datasets, beyond quantifying hashtags and providing a surface reading of their content, Sanjay and Brooker (2017: 466) urge researchers to examine how posters themselves understand their posts in terms of communicative intentionality with respect to social interactivity. The potentiality for the adoption of a mixed-method approach for my representative case could serve to reveal such crucial insights, enabling me to reap the benefits of deep contextual analysis only afforded by *small* or *granular data*, and further justify my endorsement of non-computationally-intensive data analysis strategies. Notably, the further a researcher moves away from intimate engagement with their objects of analysis, the more likely a loss of "contextual integrity"[20] can occur. While strategies like data anonymization are highly valuable for protecting participants' privacy (of which contextual integrity is a cornerstone), as I will further engage with in the following section, too much distance can jeopardize a given data's meaning, value, and future utility (Tiidenberg, 2018: 10). My project thus seeks to unearth the seemingly unconscious perpetuation of #winemom culture in this moment in order to determine what it is communicating about how parents are actually coping. This is a process that requires continuous immersion in online communities – one that cannot be pre-ordained by existing data and knowledge production, both popular and peer-reviewed, nor a viewpoint that sacrifices depth for breadth.

A key facet that remains unexamined in #winemom culture research is the fact that online identity-work is not an exercise in verisimilitude. In the words of Poletti and Rak (2014: 6, emphasis added) "We argue that when it comes to analyzing the effect of self-representational media our analysis must remain attentive to the self as an effect of representation – the affordances, strategies, techniques, and intended audiences – *rather than one's identity being expressed through online practices*." Combining new media and autobiography studies, these researchers' (Poletti and Rak, 2014: 20) poetic phrase "being online and … online being" evinces how online identity-work is "both a work of mediation and remediation between technology and life." Their intervention builds upon foundational currents in what Landstrom (2007: 7) cites as "feminist constructivist technology studies," which is driven by investigations of "the coproduction of gender and technology," and stresses the "mutually constitutive and always contingent nature of the relationship" (Balka et al., 2009: 5), as opposed to privileging technological or social determinist approaches to their interrelation. In line with calls to attend to the specific affordances of the technologies in question, as per automediality, and my commitments to the theoretical convictions of feminist constructivism as well as the methodological directives of auto-netnography, I will thus "explore

[20] Nissenbaum (2004: 138) details her lengthy account of "contextual integrity" for the purposes of legal scholarship. Her concept explicates the codification of two primary types of informational norms (which, if both upheld, constitute the maintenance of contextual integrity): "norms of appropriateness, and norms of flow or distribution." Nissenbaum (2004: 137) explains how the "texture of people's lives" causes them to move about in distinctive realms that are each defined by their own norms, which are sometimes explicit and sometimes implicit. In terms of translating this concept for social media research, Tiidenberg (2018: 8) writes of the importance of user expectations with respect to the privacy of their personal information on particular sites and platforms." As an example, a user may post to a platform like Instagram without reading the Terms of Service. They might perceive their sharing of their post as one intended for an audience of only their close network of friends, and not enlist the correct privacy settings. This post may then be seen as 'publicly available' by a researcher, through the latter's searching of a hashtag associated with the post that then reveals it. To uphold contextual integrity, researchers need to step back and question what a given user's understandings of privacy are with respect to that given sphere and its particular norms in order to understand how the user envisions the privacy of their post within that specific instance.

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technologies as cultural artifacts, expecting them to acquire meanings in use, specific to particular contexts" (Hine, 2017: 24) with respect to analyzing #winemom culture data.

Therefore, while I will locate the eventual findings of my representative case of #winemom culture within the latitude of broader contexts – such as upticks in alcohol purchase and consumption, psycho-behavioural studies on increasing parental stress under COVID-19, critical race and intersectional feminist interrogations, and what might be understood as a suspension and/or rejection of intensive parenting via social media trends – my study seeks to carve a more intimate, constructivist, and automedial pathway towards its conclusions, in keeping with my prefatory cautions regarding the limitations of studies founded solely upon antecedent quantitative and qualitative data. Ultimately, I begin from a premise that there are as-yet undetermined drivers motivating what appears to be a *zoning out* in the mediation and remediation of #winemom culture production under COVID-19 and its aftermaths. My proposed method will support my *zooming in* to uncover the submerged subversions of this archive – an archive, I hypothesize, whose effects and transmissions are neither wholly subconscious nor trivial.

4. Notes towards fermentation: Method as care

Guided by my watchwords, the imperatives to do neither injustice nor harm, and attuned to some of the myriad sensitivities and ethical conundrums with respect to the #winemom culture archive as outlined above, I move towards attempts to concretize methodological inquiries. While some methodological decisions seem straightforward, others prove much more complex. For instance, in the former camp, I have already declared aspects of my forthcoming study, including methods of grounded theory and auto-netnography and scaffolds of feminist constructivism and automedial identity-work, as such choices seem best suited to my dataset and questions, in addition to the justifications detailed in the previous section regarding my ontological and epistemological orientations. The mobilization of grounded theory will be strengthened through contextual visual discourse analysis, which is ideal for studying social media visual culture archives like #winemom culture, due to its emphasis on treating visual, textual, and hypertextual material (i.e., hashtags) as "intertextually relational" (Tiidenberg, 2017: 4) and on identifying "key visual and textual elements that repeat in different themed accounts, and the rhetorical functions of those repetitive elements that repeat in different themed accounts." However, in undertaking this decision, I must be vigilant in attending to "digital visualities … as problems of power, agency, and ethical praxis in an ongoingly reconfigured visual-digital field" (Brophy, 2019: 57). In fact, in advocating for the deployment of visual discourse analysis, while it might seem the appropriate method for the largely visual archive of #winemom culture (comprised, in my view, of predominantly digital photographs and short videos on the platforms of Instagram and TikTok), I open up a host of ethical dilemmas. A typical #winemom culture post often involves a selfie: "a photograph that one has taken of oneself, typically one taken with a smartphone or webcam and uploaded to a social media website" (*OED*). This definition points to two challenges for researching #winemom culture, right off the bat: 1) a selfie is a picture of a fleshy human body, which raises Warfield et al.'s (2019: 2084) central question: "how do we treat data when the data are at once data and a body?"; and 2) #winemom culture artifacts traffic upon social media platforms, which raises burning questions about a researcher's right to collect, store, study, and disseminate findings based upon them.

In 2024, in the North American academy, the perception may exist that knowledge institutions and scholars have figured out the 'right' responses to these questions – that there is a formula for enacting ethical social media research that can be simply and accurately applied. However, this assumption is intertwined with a current crisis in new media research, what can be understood as the "institutionalization of ethics" (Zeffiro, 2022, personal communication). For example, in efforts to move away from 'bottom-up' approaches to decision-making with respect to social media data, scholars such as Samuel et al. (2019: 337) call for "network-level" guidelines that can be shared between researchers and across institutions. Despite efforts to diagnose and ameliorate these issues, ethical quandaries persist. Many researchers now

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have the benefit of institutional ethics boards and even federally-sanctioned guides; and yet, according to Shilton (2016), such mechanisms may not provide sufficient and/or ongoing critique of the iterative ethical obstacles of a given study, and so, instead of being seen as a one-stop-shop for ethical clearance or a post-hoc enforcement mechanism, these "might be best positioned as consultants to research design." Patchwork governance can also lead to ethical gulfs. For instance, review boards and governing documents present the fruits of labours towards the creation of applicable ethics for social media researchers; however, they also speak to Zeffiro's (2022, personal communication) stated "institutionalization of ethics" – the prevailing sense that, by having one's ethics review case stamped (oftentimes only once) for approval by an institutional board, or in following "network-level" guidelines to a 'T,' that one has achieved ethics. But ethics are never met.

In light of these dilemmas, my project will seek institutional ethics approval, but not stop there. Ethics is not a check-box: as Markham et al. (2018: 6) write, ethics is a "matter of interrogating what is happening along the string of actions that eventually lead to the construction of data, focusing on human practices and nonhuman processes that function interpretively." For my representative case into #winemom culture, such interrogations will come in the forms of ongoing conversations with my colleagues and other social media researchers (Samuel et al., 2019: 317; Shilton, 2016), as well as:

- an emphasis on guiding questions, generated iteratively throughout the process, as opposed to the application of a top-down "check-list" (Tiidenberg, 2018: 14).
- a personal and ongoing commitment to reflexivity – what Pearce (2020: 818) calls an "ethical responsibility towards the self."
- a true willingness to demonstrate care for my participants throughout the research process (from the study's inception to potential publication and beyond), which involves the asking of questions such as Bailey's (2015): "Is there room for collaborators to give and rescind consent at different times during the research process?"

Beginning with this preliminary question: What can #winemom culture reveal about how parents are processing and communicating within this particular moment?, and the animating query: I suspect that there are as-yet undetermined drivers motivating what appears to be a zoning out in the mediation and remediation of #winemom culture production under COVID-19, my representative case of #winemom culture will undertake a cross-platform analysis of social media artifacts in the forms of digital photographs and short videos from the platforms Instagram and TikTok. Contemporary social media scholars (Matassi and Boczkowski, 2021: 207) are turning to cross-platform analysis for their studies since it "better represents how most people use social media … [that is] in relation to other media." According to Hasebrink and Hepp, there is a need to "treat social media as belonging to a platform ecosystem" (qtd. in Matassi and Boczkowski, 2021: 214), while also attending to the differential affordances of given platforms and their production of "divergent effects" (Papacharissi qtd. in Matassi and Boczkowski, 2021: 214). This is to say that Instagram and TikTok, as examples, possess different affordances and conventions: automedial identity-work on these platforms thus demands comparative analysis.

The dataset for my representative case will be attained through my searching of the hashtag #winemom on Instagram and TikTok for the period of March-December 2021.[21] I will use purposive sampling to select units of analysis for their reach and interactivity in terms of shares, 'likes,' and comments (these latter aspects inform the rationale for the sample (Taherdoost, 2016: 22)). On Instagram, #winemom posts

[21] This timeframe is selected as it will provide insights into key affective moments in the pandemic thus far. For North Americans, March of 2021 presents the one-year anniversary of living under COVID-19 and can thus illuminate expressions of pandemic fatigue and more routinized attempts at "coping" with the virus's effects upon day-to-day life; the spring of 2021 offered optimism with respect to vaccine approval and uptake and a subsequent decrease in cases; this optimism was then quashed by two successive waves, caused by the variants of Delta and Omicron, which led to the reinstatement of restrictions and, for many individuals, spikes in panic and stress.

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fall into two dominant categories: selfies and memes; on TikTok, short videos using the #winemom hashtag are primarily selfie-videos. While memes are posted by individual accounts, they often travel through the Internet (via cross-platform interaction) and do not contain identifying information. However, both digital photography selfies and selfie-videos depict individual users. Data collection will be harnessed through screengrabbing; image captures will then be labelled by the identifiers of 'platform name' and 'date posted' and stored in two locations, in a password-protected folder on my desktop as well as on a password-protected external hard drive. Once collected, images and thumbnails will be blurred, redacted, cropped to prevent reverse-image searching, and stripped of all metadata. On both Instagram and TikTok, I will set up research profile accounts for the purposes of accountability where I will describe my study and provide my contact information; I will use these profiles to follow all accounts I deem inclusionary to the population from which I will draw my samples (Tiidenberg, 2018: 14). It is my intention to reach out via DM on the two platform interfaces to every user whose content I aspire to include in my representative case. And yet, I am cognizant of the fact that I may not receive individual consent from every user – some users may decline, and others may ignore my requests. Following key currents in feminist ethnography, I will not interpret silence as consent, aware that it may be agentic and/or strategic (Visweswaran qtd. in Tucker, 2002: 302) in its indications of refusal. When I do receive consent to analyze a post, I will follow-up with the user to see if they would like their images included in my study or not – and, if so, query whether they would like edit their images themselves in order to encourage participatory autonomy.[22] This tenet fits with Warfield et al.'s (2019: 2077-8) reminder that some social media content creators want broader recognition for their online work and a researcher's assumption that they don't can be understood as disempowering, especially within a neoliberal economic climate marked by "aspirational labour" wherein increased online exposure can lead to potential revenue, particularly for female content creators (Duffy, 2017: 225). For participants who are interested in engaging more fulsomely with the project, as gleaned by connections made through DMs, I will offer the opportunity for one-on-one Zoom interviews for which my semi-structured interview guide will focalize questions pertaining to reflexive aspects of #winemom culture such as: "Can you tell me about how you were feeling before you created this post?," "Who do you imagine your audience to be?," "When you post using this hashtag, and related hashtags, are you seeking connection with others? Or does the publishing of the post itself offer its own satisfaction and/or catharsis?," and "Do you see your post as a critique of unattainable representations for women/mothers/parents in our era? Is it intended to be humorous?" If I am fortunate enough to be able to conduct such interviews, I will also ask if my participants can recommend other online creators of #winemom culture to potentially speak with, here invoking snowball sampling. I recognize that gaining institutional ethics review for a mixed-method study will likely take more time and planning than a solely qualitative study (and especially if I cannot guarantee that the interviews will occur until after I begin connecting with participants). However, following Hunt's (2017: 115) research into transnational feminist youth networks, I am compelled to try and capture a more holistic picture of #winemom culture through the combination of both virtual and analog methodologies.

Crucially, my representative case must enact continual care towards my participants in order to prevent the integral harms already instigated by the social media platform companies. Core rights for social media users – such as the rights to be forgotten and not to be stored – are often subsumed by the platforms in question, as well as the researchers who investigate them, in keeping with the subjective nature of contextual integrity. As Chun explains, "Rather than 'consent once, circulate forever,' we need to find ways to loiter in public without being attacked. We need a politics of fore-giving that combats the politics

[22] The imperative to anonymize data, especially in relation to human subjects, is vital for social media research. Transparency (Shilton, 2016) and continuous conversations about consent (Bailey 2015; Warfield et al., 2019: 2076) present cornerstones of this praxis. If a participant accepts my request to analyze their content in my study but does not want to edit their image themselves, I will probe further in asking questions of the evidence/my research such as, "Is the body necessary in making my point?" (Warfield et al., 2019: 2076). Regardless, I will strip metadata off all screengrabs.

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of memory as storage" (qtd. in Cowan and Rault, 2018: 131). By harvesting data from these sites – even if my intention in undertaking this representative case is to contribute to "some expectation of benefit to the greater public or a specific group" (qtd. in Rooke, 2013: 266) – I become implicated in the "deceptive practices" (Zeffiro, 2019: 227) of social media platform companies, such as the types of user data stored, the duration and conditions of storage, and the other entities that are granted access to this data. Consent, like ethics, is neither a singular nor finite act and presents a core aspect of my representative case design, in line with calls to undermine the colonial extractivist logics driving research production in academic institutions governed by what Costanza-Chock (2018) calls "the matrix of domination," which refers to "white supremacy, heteropatriarchy, capitalism, and settler colonialism." My project is founded upon such principles of design justice and is therefore concerned with "how the design of objects and systems influences the distribution of risks, harms, and benefits among various groups of people … [and] aims to ensure a more equitable distribution of design's benefits and burdens" (Costanza-Chock, 2018). My representative case will enact design justice through the seeking of ongoing consent throughout the research and dissemination processes, but also through my own situatedness with respect to the participants and "to the string of actions that eventually lead to the construction of data" (Markham et al., 2018: 6). It is imperative to be attuned to my own expectations (Hine, 2017: 24) about my projected conclusions and how these can lead to "ethical fabrication" (Markham qtd. in Warfield et al., 2019: 2081) in terms of how I might interpret the data according to my own narrative culpability.

Furthermore, this representative case depends upon foundational concerns regarding reflexivity in feminist social studies (Pearce, 2020: 817). Scholars such as Mauthner and Doucet (2003) and Smith (2013) explain how situating oneself through the practices of reflexivity is, again, not a one-and-done event, but a continuous praxis involving multiple domains. Smith (2013) (despite recent controversies in terms of her own identity presentation (see Viren, 2021)), critiques reflexive acts based upon the stating of one's privilege, especially with respect to intersectional projects. For myself, as an educated, white, Mad/neurodivergent, cis-female parent investigating the #winemom culture archive – an archive that, as I have alluded to, may present some problematic omissions with respect to race, class, and ability– stating these identity markers at the outset of an ethics review application or in the preface to an article submitted for peer-review based on my findings only serves to position me "as the subject capable of self-reflexivity and the racialized subject[s] as the occasion for self-reflexivity" (Smith, 2013: 264). Smith (2013: 264) suggests, instead, that the "undoing of privilege" occurs through the "creation of collective structures that dismantle systems that enable these privileges," which resonates with Mauthner and Doucet's (2003: 418) caution that reflexivity is "not confined to issues of social location" but also to "the interpersonal and institutional contexts of research, as well as ontological and epistemological assumptions embedded within [methods]." My status as a researcher of the #winemom culture archive is as someone embedded within it, in alignment with my commitments to auto-netnography. As per Smith (2013), my subjects must not be othered, in keeping with Haraway's (qtd. in de la Bellacasa, 2017: 73) deconstruction of binary thinking – "the needless yet common cost of taxonimzing everyone's positions." The guiding touchstone for my representative case at this juncture, then, building upon de la Bellacasa (2017: 75), is to mobilize a praxis of what they call "thinking with care," a modality premised upon equitable relationality between all human and non-human elements (researchers, subjects, data, technology, platforms, contexts, etc.),[23] and one that demands continuous, active reflection so that connections between such entities can become "thicker" than they first appear – an approach intended as a corrective

[23] This attempt to equalize all interconnected elements of my proposed representative case also draws upon foundational currents in the "sociology of infrastructure." Hine (2017: 23-4) explains that infrastructural technologies can often be invisibilized and so can easily be overlooked by both participants and ethnographers; as such, Hine upholds Bowker and Star's methodological lens of "infrastructural inversion," which urges researchers to draw background elements into the foreground.

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to the "current reign of carelessness" that is "affect[ing] our interpersonal intimacies" (The Care Collective, 2020: 5).

5. A conclusion by way of limitations, without conclusion

My aforementioned decisions towards the construction of my representative case are each beset by attending limitations. My privileging of *small* or *granular data* presents a rejection of heralded trends in social media research, such as the use of coding tools for the purposes of scraping large samples. While I believe this approach will help me to move closer to findings that best reflect my preliminary research question and animating query, resist methods that sacrifice contextual depth, and foster more intimate and just connections with my participants, my conclusions will likely be scrutinized for their lack of generalizability and/or applicability to broader populations, as well as their overarching credibility. In a representative case governed by principles of auto-netnography, I am imbricated within my research and, as such, my own capabilities with regards to reflexivity present, perhaps, this project's greatest liability. This is why discussions with other researchers in my broader communities are so integral: this work requires me to constantly look at my own blind spots, which will be impossible to see if I don't seek second opinions. I count myself incredibly fortunate to have access to my institution's digital research centre as well as a social media and activism working group, where I am able to engage with likeminded colleagues; such institutions present "collective structure[s]" (Smith, 2013: 264) that can support the reflexive dismantling of individual researcher privileges, as well as aid in deconstructing "institutional contexts of research" (Mauthner and Doucet, 2003: 418).

Ultimately, this paper's intention has been to work through some of the ethical challenges posed by analyzing #winemom culture but not to provide definitive answers, in keeping with my title and ethos: *an ethics, in perpetuity*. As is clear, there is still much to work through in developing this case. One of the core issues this paper raises is: how to *do* ethics within a "matrix of domination" (Costanza-Chock) that sees them as a commodity requiring a singular stamp of approval as opposed to an evolving praxis? It is in grappling with questions like these that I turn to radical deconstructions of academic knowledge production, for instance, Cowan and Rault's (2018: 131) provocation that, instead of heeding the injunction to *publish or perish*, one considers not publishing their findings if they have the potential to cause any participant a modicum of harm, or Bailey's (2015) invocation of "collaborative construction," wherein she formed a listserv-based community to engage ethics-based queries about her research project that blossomed into a supportive network for the cross-fertilization of ideas. Doing the "right thing" (Dederer, 2023: 127) takes time and self-reflexivity. In the case of this paper, it means going against the grain of traditional scholarly outputs and expectations.

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"Don't be too proud of this technological terror you've constructed"

The influence of gender and in-group identification on transhumanist orientation

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Abstract

Transhumanism is a school of thought that promotes the enhancement of humanity through technological intervention (e.g., cloning, gene therapies, uploading one's mind to a computer, nanotechnology). Due to its aims of altering evolutionary processes (Bostrom, 2005), transhumanism is highly controversial (Sinicki, 2015). The ideology finds support from younger men, as well as those engaged in science-fiction literature (Gangadharbatla, 2020; Koverola et al., 2022). The present study aimed to investigate the role of gender and specific science fiction fan identities as predictors of transhumanism in three different samples of fandoms affiliated with science-fiction (e.g., anime fans, furries, and *Star Wars* fans) as well as in a control sample of college students. Participants (N = 6840) responded to a novel measure of transhumanist orientation in either an online or in-person survey. The findings indicated that men were the most likely to endorse transhumanism, as were fans of *Star Wars* and furries. Overall, the present study supports theorizing that transhumanism may be an influential motif in the science-fiction genre, as well as an appealing ideology for men.

Keywords: transhumanism, masculinity, *Star Wars*, fandom, in-group, social identity theory

1. Introduction

The desire to escape the fate of mortality is a hallmark of the human condition (Becker, 1973; Burke et al., 2010; Pyszczynski, 2019; Pyszczyski et al., 2015); religions, and philosophical traditions have

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developed and grown over time to promise adherents a chance at either an afterlife or sometimes even eternal life. However, as traditional religious structures break down in the 21st century, new movements have developed out of pop culture to satiate the morality salience of the masses (Possamai 2003, 2005; Possamai & Lee, 2011). While some movements have been described as "hyper-real religions," which derive their devotion directly from popular media (e.g., *Star Wars*), other have taken the form of a more holistic philosophical projects, which draw inspiration from these media and technological advances to create a vision for humanity's future (e.g., transhumanism).

Previous theoretical work has described the transhumanist project as highly gendered (Haraway, 1985) and heavily tied to the genre of science fiction (Geraci, 2007, 2011), which has found preliminary support in the empirical literature (Gangadharbatla, 2020; Koverola et al., 2022); however, there exists no consensus in what an assessment of transhumanist orientation looks like beyond a loose collection of techno-futurist endorsements by participants. Additionally, there have been no empirical investigations of transhumanist endorsement within the context of a specific science-fiction fandom. The present research aimed to accomplish the following: (1) develop a reliable scale of transhumanist orientation; and (2) investigate the interaction between gender and fandom membership of transhumanist orientation. The findings of this research will help to standardize future studies in transhumanist beliefs, as well as shed light onto the acceptance of transhumanist thought in the general public by contextualizing it through the lens of fan studies.

2. Transhumanism, posthumanism, and philosophical diversity

Transhumanism and its related philosophical movements present various definitions of what it means to be human, as well as what it would mean to evolve out of our current state of humanity. For example, transhumanism proper tends to advocate for the development of technologies to enhance life expectancy, intelligence, physical ability, and emotional regulation, as well as decrease disease and suffering associated with the human condition (Manzocco, 2019). Further, transhumanists tend to endorse the premise that humanity has a right and a responsibility to be active members in evolutionary processes, which ultimately would lead to the creation of the "post-human," or a species of human which has transcended the bodily limitations of our current experiences of life (Bostrom, 2005). To achieve this end state, transhumanists argue for the individual right to "morphological freedom," or the absolute freedom to alter one's body to improve physical appearance, capacities, or cognitive abilities within the confines of not harming others (Earle, 2021). Ultimately, the transhumanist position is to pursue the create of The Singularity, a digitally mediated ecosystem for the post-humans of the future to inhabit perpetually.

The term transhumanism was originated by Julian Huxley in 1957, whereby he argued for a grand mission of humanity to become the "managing director" of our own destiny and to become more self-actualized beings committed to education, beauty, and spirituality. Some authors contend that tendencies towards transhumanist thought have been present since the dawn of humanity and its urges to reach beyond the limitations of its mortal condition, while others (Bostrom, 2005) connect the beginning of transhumanism to the technological progress of the 1980s that enabled radical alterations in human behavior and cognition. As identified by Hauskeller (2016), the work done to define what is *transhuman* in the postmodern era quite neatly parallels the development of the construct of *human* in the early modern era. Extrapolating from scientific optimism and technological progress, transhumanism (and humanism in general) hopes to explain what humans are and where humans are going, or rather, what humans are to become according to a mythic, shared evolutionary imperative.

To best rise to the imperative, transhumanists seek to use 21st century technological advancements to bridge the gap between what humans are and what they can be. Specific technologies currently showing promise for progressing a transhumanist agenda include cloning (Morales, 2009), gene therapy (Uzomah, 2022), uploading one's mind to the internet via a computer or silicone-based interface (Benedikter et al., 2017), and nanotechnology for a wide array of medical, neuroscientific, and engineering applications

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(Kreowski, 2019). These technologies, and the ideology which synthesizes them into a coherent philosophical project of transhumanism, ultimately strive to develop a "post-human," which will transcend the corporeal form and begin the next phase of human evolution. According to this view, those with the means to augment themselves will be able to make highly efficient, permanent, and far-reaching improvements to the human-being that could improve not only the current generation, but every succeeding generation. This process would ultimately result in the genesis of a new species composed of an admixture of the organism and technology.

Transhumanism has thus far been painted broadly, as variants of the school of thought have emerged to complicate the aims and methods of the more mainstream philosophy. From the Marxist perspective, scholars have considered the similar themes between the aims of socialism and transhumanism, namely the rejection of the reification of an essential natural order to explain the human experiences of suffering (Steinhoff, 2021). However, Noonan (2021) critiqued the idea that Marxist and transhumanist aims are compatible, despite sharing a general agreement that humans are active agents in their environments and their future is unbound from metaphysical assumptions of the "natural order of things". While Marxists aim to see the emergence of socialism via the transformation of society as a whole to end the suffering caused by capitalism, transhumanism pushes for the total transformation of the human to transcend society into a hyper-individualized existence under capital.

Despite these differences, accelerationism emerged after the global financial crisis in 2008 as a means to prepare for a foretold, post-capitalist future. Srnicek and Williams (2013) outlined that the technological advancements of capitalism should be encouraged and leveraged by Marxists as a means to begin the process of collective self-mastery to develop a society after the inevitable fall. In a similar vein, Bastani (2019) argued that through technological advancements, Marxists could create a "post-scarcity" economy, whereby humans can be released from cohesion to work. However, Noonam (2021) cautioned against salvation by capitalist-technology, as transhumanism's promise of freedom may actually be alienation through the dissolution of the material world and human connection.

If transhumanism can only exist as a capitalist project, then the question for capitalists become an issue of *how* humans are to transcend our mortal bodies (Armesilla Conde, 2021). For libertarian, social Darwinist transhumanists, the means are offered up to the free-market to decide what technologies should be developed and who should have access to them (Noonan, 2021). Alternatively, social-democratic transhumanists are concerned with the equitable access of technologies to all people (Hughes, 2004). Scholars like Vita-More (2008; 2019) have demonstrated a desire to build an ethical transhumanism, which centers human experiences and prioritizes the self-actualizing potential of technologies to extend life and create a better world. From these perspectives, one can surmise that despite a shared interest in utilizing technology to transcend humanity into a post-human age, there is significant variability in the purpose and process of change.

While transhumanists have centered the use of technologies to reach the end state of "post-human," scholars have already started posthumanism as a theoretical lens to understand narratives like "humanity" and "progress," which are often assumed to be universal and linear (Haraway, 1985). Posthumanism posits that transhumanism is western-centric, which does not adequately account for the many potential paths into which evolutionary pressures may force us. This results in what Sorgner (2014) refers to as an "anthropological fragmentation" due to "perspectivism," which refers to different human groups having different views and values about what it means to be human and improve themselves, rather than subscribing to an overarching "transhumanist" narrative. Thus, the "Singularity" might just be singular in its cultural conception, whereby "transhumanism" can be better described as "trans-Westernism," which prioritize the western man's transcendence over the species.

Further, there is an important gendered tension to the trans- and posthuman discourse. One can view transhumanism as reinforcing masculine and Western notions of self-efficacy and rational certainty. Posthumanism promotes an open, non-prescriptive notion of being that some, such as Sorgner, go as far as calling a "fragmentation of the former unified subject;" for feminist posthumanists, this fragmentation

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was already present in the division of society by gender. Haraway's (1985) turn towards the posthuman has been employed not as an escapist, utopian paradigm, but rather for liberatory feminist ends that seek to undermine "dichotomies between mind and body, animal and human, organism and machine, public and private, nature and culture, men and women, primitive and civilized…" (p 205); in other words, the very dichotomies that transhumanist thought relies on to fuel its notions of progress.

Yet, feminist scholars have also begun to theorize gendered implication of a successful transhumanist project. For example, DeBaets (2011) argued for a feminist technorealism, aligned with social-democratic transhumanist thought, which could utilize a measured, systems approach to technological advancements, while also supporting the shared principles of personal freedom and bodily autonomy. On the other hand, scholars have also considered the outcomes of transhumanism to be a dissolution of the gender binary and sexed bodies (thus the end of sexism), should public institutions begin developing ethical policies toward that end (Reverter, 2022). However, as Ferrando (2014) identified, technological imaginings are associated with the masculine and more work needs to be done to deconstruct the binary of man/woman. Technology may not be able to solve our problems, only enhance our choices.

Taken together, transhumanism and posthumanism present a complex web of propositions regarding the meaning of being human, the role of technology and social institutions in reducing or eliminating suffering, and the means by which humans can transcend our current state. Transhumanism in particular centers technological advancement to achieve the desired end goal of reducing suffering and pursuing a grand adventure to push humanity toward a utopian future, while posthumanism tends toward deconstructing western binaries of power, which inform the concept of what it means to be human. Despite variance in transhumanist thought, the present research aimed to synthesize a set of core beliefs of transhumanists into a reliable measure for future research to utilize when exploring questions related to life extending and enhancing technologies.

2.1 Transhumanist popularity

It is as of yet empirically unclear what factors, such as gender alignment, would draw someone to endorsing transhumanism in the first place or what underlying beliefs and assumptions may unite the school of thought. Among the general public, people are generally unaware of transhumanism and when informed, they often respond with opposition (Sinicki, 2015). Much of the past research on endorsement of different aspects of transhumanist ideas has primarily focused on how conservative moral dispositions tend to negatively predict techno-futurism and enhancement technologies (Laakasuo et al., 2018; Laakasuo et al., 2021; Koverola et al., 2020a; Koverola et al., 2022). For example, disgust attitudes tend to predict negative perceptions of using mind upload technology or neural implants to improve cognitive performance. This suggests that people who are more conservative tend to be averse to these technologies. Other research has indicated that there is not a conspiratorial element to rejecting transhumanist technologies (Lantian & Rose, 2022), but that the essential concerns about such technologies are in part due to the suspicion of the ways the technology can be used by corrupt governments and corporations and ultimately increase social inequality (Sinicki, 2015). Thus, rejection of transhumanist technologies is a complex web of both disgust and concern about the well-being of fellow citizens.

While there tends to be much suspicion regarding transhumanist technologies, acceptance of transhumanism has also been examined in the literature. For example, those high in the Dark Triad (and in particular, Machiavellianism) have been shown to endorse both the prospect of uploading one's mind into a digital repository and technology-mediated enhancement strategies (Laakasuo et al., 2021; Schönthaler et al., 2022). Younger men tend to support implant technology—especially if the technology is viewed as useful and easy to operate (Gangadharbatla, 2020). Furthermore, Koverola and company (2022) observed that being a "science-fiction hobbyist" reduced the disgust-oriented moral framework that negatively predicted the acceptance of brain implant technologies. These findings are relatively

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intuitive, as one of the most common motifs in science-fiction literature is the philosophy of transhumanism (Brudar & Peric, 2021).

Notably, the positive predictors of endorsing technological advancement have also tended to be associated with masculinity. According to Hartung and company (2022), the underlying factor of the Dark Triad (The D Factor), tends to be higher in men than women. Further, risk-taking behavior tends to be higher in men than women (Byrnes et al., 1999). Lastly, science-fiction, and fandom more broadly, tends to be dominated by men (Edwards et al., 2019; Plante et al., 2016; Reysen et al., 2021). However, masculinity is highly associated with both voting conservatively and support for aggressive politics (DiMuccio & Knowles, 2021), which suggests that while men may be more likely to be drawn to transhumanism, this relationship remains unclear. Based on the aforementioned research, there is reason to believe that support and opposition for transhumanism may not be homogeneously distributed throughout the population; however, based on the works of Sorgner (2014) and Harraway (1985), there does seem to be a foundational prioritization of Western concepts of masculinity, which may attract men to the philosophical camp.

2.2 Transhumanism as a religious movement

Transhumanism speaks sincerely to humans' anxieties about death in that it promotes a future where suffering and death are no longer a given, but can eliminated through technological intervention (Vita-More, 2019). Thus, transhumanism may be a significant mechanism for humans to engage in terror management (Becker, 1973; Burke et al., 2010; Pyszczynski, 2019; Pyszczyski et al., 2015). Terror management theory posits that humans are a cultural species in that we use utilize complex systems of symbols and ideologies to navigate our social environments. The ability and necessity to build and use culture is derived from our species' unique ability to predict the future and be aware of our own mortality. Thus, culture enables humans to imagine themselves as a part of something more infinite than their present, moral bodies, as well as increase their self-esteem to ward off the creeping acknowledgment of their future demise. While most the time a cultural tradition (like religion) will ease mortality salience through promises of an afterlife, transhumanism has more explicitly engaged in terror management for its adherents by activating techno-futurism as a means to escape the consequences of being a physical entity.

According to Geraci (2011), transhumanism does more than just provide a secular means of terror management, rather it explicitly engages in religious thought modeled after Judeo-Christian apocryphal literature: dualism, alienation, transcendence, and a radical neo-embodiment. Thus, it is no surprise that some religious movements have adopted their own versions of transhumanism (Armesilla Conde, 2021). For example, the Mormon Transhumanist Association and The Christian Transhumanist Association aim to synthesize religious, spiritual, and technological transformation to uphold the divine mission to work toward the renewal of creation through the creator's gift of technology and science. However, not all religious organizations are open to transhumanist thought in their pulpits, as Armesilla Conde (2021) identified, transhumanism (like Marxism) is a materialist movement dedicate to ending suffering and death, which of course would leave traditional religious structures obsolete in the event of The Singularity.

Taken together, these elements point toward a narrative of techno-futurism which adherents are to reject the moral self and embrace the coming rapture of the Singularity (Geraci, 2008, 2010a, 2010b). Thus, transhumanism has the potential to be quite potent as a movement, especially given the dominance it holds in science fiction media. Geraci (2011) articulated that science fiction media can be akin to evangelical literature for transhumanism, as it invites and challenges notions of human, the future, and the endless possibilities of where technology can take humankind. However, the authors of the present study contend that it is not merely an interest in and personal consumption of science-fiction which might

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drive transhumanist orientation in the general public, but rather the collective experiences of these media in the form of fandom.

3. Fandom

Fandoms are groups that center around a shared interest (Plante et al., 2021). The interests around which fans congregate are as diverse as fans themselves, ranging from a particular sport team (e.g., the Green Bay Packers), a TV series (e.g., *Star Trek*), a book series (e.g., *Harry Potter*), or a niche interest (e.g., furries). As a social identity, fandoms follow the same group dynamics as other group identities, including political, racial, and gender-based identities (Tajfel, 1978; Tajfel et al., 1971; Tajfel & Turner, 1979). To this end, such groups provide members with a scaffold around which group members can form their sense of self, meaning that the group and its values and norms can play a significant role in the thoughts, feelings, and behavior of its members (Turner et al., 1987).

Of the different types of fan groups which have been studied, the most presently relevant are *mediacentric* fandoms (e.g., anime fans, Jane Austen fans; Brooks et al., 2022). In media centric fandoms, group norms are informed, in part, by the media content fans in the group consume (Edwards et al., 2019; Reysen et al., 2021). For example, fans of the television show *My Little Pony* have been found to score higher in measures of empathy and prosocial behavior than members of other fan groups, these findings are associated with the show's prosocial themes being internalized by the fans and made into norms among the fandom (Chadborn et al., 2016; Gilbert, 2015; Plante et al., 2018). For the present research, three fandoms were primarily utilized to explore openness to transhumanist thinking due to the fuzzy boundaries of the nature of humans depicted in their respective media: anime fans, furries, and *Star Wars* fans.

3.1 Anime fans

Fans of anime can be broadly characterized as having an interest in Japanese manga and animation, which is expressed through a multitude of avenues: media consumption, creating fan content, attending conventions, cosplaying, and much more (Reysen et al., 2020; Reysen et al., 2021). Fans of anime are notably diverse in their interests, particularly with regard to their preferred genera of anima (e.g., Slice of Life, Mecha, Hentai, Yuri, etc.; Reysen et al., 2017); however, the average fan is characteristically a young man, who is introverted, "nerdy," whose hobbies include predominantly video games (Reysen et al., 2016). Notably, anime fans have been found to be ideologically susceptible toward the construct of global citizenship (identifying primarily as a citizen of the planet) via perceiving the group norms prescribe members to identify as such (Reysen et al., 2020). For the present research, anime fans were recruited as they demographically meet the criteria of someone who might be more inclined to endorse transhumanist beliefs, primarily male, broadly interested in technology, with a fan identity which may overlap with more science fiction heavy fandoms (via genre preferences related to futurism, mecha, space).

3.2 Furries

Furries are fans of anthropomorphic art, or art of animals with human characteristics (Plante et al., 2016). Furries are a unique mediacentric fandom in that they do not have a specific canon, rather they gravitate toward and compile art which depicts their fan interest (e.g., Disney's *Zootopia* or *Robin Hood*, Netflix's *BoJack Horseman,* the anime *Beastars*). Like anime fans, furries typically participate in media consumption, create fan content, attend fan conventions, and dress up. Furries, like anime fans, tend to follow group norms with regard to their ideological adherence; specifically, furries are particularly drawn toward animal welfare causes, which is hardly surprising given the fan interest (Plante et al., 2016).

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However, furries are notably different from other fandoms as they also develop original anthropomorphic characters called fursonas, which are used as an alter ego for furries both online and in the real world (Roberts et al., 2015). Functionally, the fursona serves to provide optimal distinctiveness, and when copied, furries react hostilely as the fursona can serve as both an important part of identity construction, but also as a representation of the furry's ideal self (Reysen et al., 2016; Reysen et al., 2020).

Furries are relevant to questions regarding transhumanism as they may represent an iteration of morphological freedom: alterhumanism. Earle (2021) categorized furries an "alterhumans," who take on characteristics of non-humans to improve the self. While the status of "alterhuman" can be considered metaphysical, as furries are not literally surgically attaching canine tails to their bodies, Gayozzo (2021) does indicate that at the Eurofurence 17 Furry Convention in 2011, there was an exhibition which explored techno-futurism as a means to create literal furries (e.g., genetic engineering, vitro fertilization, tissue engineering). Thus, it seemed pertinent to include furries in the present study, as there does seem to be a draw to transhumanist thinking in the fandom, particularly with regards to the freedom to manipulate the physical body to achieve the ideal self.

3.3 Star Wars fans

Fans of George Lucas' *Star Wars* cinematic universe are similar in several ways to the aforementioned fandoms: they engage in media consumption, participate in conventions, cosplay, and create fan content (Reysen et al., 2022). Due to the longevity and incredibly breadth of the fandom, the canon of the *Star Wars* universe have grown to include several movies, television shows, books, animated series, videogames, and some (at the risk of being controversial) fan generated content (Consalvo, 2009). Davidsen (2016) argued, in his analysis of the *Star Wars* fandom, that the works of George Lucas have been mythologized and actively encourage fans to not only immerse themselves in the fictional world, but to imagine new ways of being in the "real world" based on the elements in the galaxy, far, far away (Brudar & Peric, 2021). Similar to furries, *Star Wars* fans are unique in that not only to do have an immersive canon to engage with, but they also have produced from the fandom a hyper-real religious movement.

Hyper-real religious systems are metaphysical belief systems that emerge from popular culture and either supplant traditional religious structures (e.g., pagans who use the works of H. P. Lovecraft as occult canon; Steadman, 2015) or influence them (e.g., Christians who are influenced by *The Da Vinci Code*; Possamai 2003; Possamai, 2005; Possamai & Lee, 2011). One example of a particularly well developed hyper-real religion has emerged from the *Star Wars* fandom—Jediism. Once thought to be a large-scale, memetic prank during the United Kingdom census, the Jedi movement has developed into a formal religious structure, with temples located around the world (Possamai & Lee, 2011). It is plausible that transhumanist elements within the canon (e.g., Darth Vader, General Grievous, anthropomorphized droids) of *Star Wars* might manifest in the ideologies of fans. Geraci and Recine (2014) speak to this through their investigation of the video game *Star Wars: The Old Republic*, where the game itself operates as a virtual space to educate players in political philosophy.

Considering the work of Geraci (2008, 2010, 2011), *Star Wars* can be considered evangelical literature for transhumanism, as it engages fans with a universe of possibilities where technology can make, re-make, and augment the humans of the future. However, despite the empirical findings of individuals who engage in science-fiction hobbyism predicting techno-futurism (Gangadharbatla, 2020; Koverola et al., 2022), the authors contend that the collectivism of fandom provides the memetic power necessary to take science-fiction from an individual commodity to conformity to group ideological norms (Chadborn et al., 2016; Gilbert, 2015; Plante et al., 2016, 2018; Reysen et al., 2020). Thus, the *Star Wars* fandom was of prime interest when considering the influence fandom has on transhumanist orientation.

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4. The present research

The purpose of the present research was to conceptually replicate and extend prior research suggesting that the distribution of support for transhumanism is non-random in the population and, instead, can be predicted demographically and by a person's fan interests. Specifically, we assessed the extent to which gender and being a member of a specific science fiction (and science-fiction adjacent) fandom predicts one's degree of support for transhumanism. Using a novel measure, we assessed support for transhumanism in a sample of college students, anime fans, furries, and *Star Wars* fans. Based on the prior research regarding the influence the canon of mediacentric fandoms has on the ideologies of fans (Chadborn et al., 2016; Edwards et al., 2019; Gilbert, 2015; Plante et al., 2016; Plante et al., 2018; Reysen et al., 2021; Roberts et al., 2015), as well as the indications that young men and those with an interest in science-fiction predict positive attitudes towards transhumanist technologies (Gangadharbatla, 2020; Koverola et al., 2022), we hypothesized that:

H1: Men would demonstrate a higher endorsement of transhumanist orientation than non-men.

H2: Men in the *Star Wars* fandom would demonstrate a higher endorsement of transhumanist orientation than men of other, science-fiction adjacent fandoms, as well as a control sample of non-fan college students.

5. Method

5.1 Participants and procedures

After receiving ethical approval through the Texas A&M University-Commerce IRB, participants were recruited for the present study. After affirming consent, the participants completed a basic demographic section and then completed a novel measure of transhumanism. At the completion of the study, the participants were debriefed and thanked for their participation.

Participants (N = 6840; M_{age} = 25.32, SD = 7.25) were recruited from multiple sources: online fan communities, in-person fan conventions, and at a regional, university in east Texas. Participants were recruited specifically for their involvement in the anime fandom (n = 4770), the furry fandom (n = 1507), the *Star Wars* fandom (n = 236), or as undergraduates (n = 327).

The majority of participants were people of color (POC; 65.7%) and the gender distributions was: cisgender women (18.1%), cisgender men (66.7%), transgender women (3.3%), transgender men (1.9%), genderqueer/nonbinary (7.7%), or other (2.2%). For the purpose of the present study, the participants were recoded into a binary variable of "men" (n = 4692) and "not men" (n = 2148), with the "men" category including both cisgender (97.2%) and transgender men (2.8%). Lastly, the participants identified their sexual orientation: gay/lesbian (8%), straight/heterosexual (56.4%), bisexual (14.7%), pansexual (6.8%), asexual (5.5%), demisexual (2.7%), "I don't know" (3.3%), and "something else" (2.6%).

5.2 Measure

5.2.1 Transhumanist orientation

After a review of the philosophical literature on transhumanism, a five-item, Likert-type scale was constructed to measure participants' level of transhumanist beliefs from an initial list of ten items. The ten items were reduced to five via a principle component analysis for each sample (Table 1) and a theoretical reflection on the literature to assess the appropriateness for each item's inclusion into the final measure (see Koverola et al., 2022; Laakasuo et al., 2021; Manzocco, 2019). The participants were asked to rate each of the items on a 7-point scale, where 1 = *strongly disagree*, while 7 = *strongly agree*. Scores were averaged across the five items to compute a composite of transhumanist orientation (α = .87; Table 2 for the inter-correlations of the items; see Appendix A for the full measure).

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Table 1. **Factor loadings of transhumanist orientation by sample**

Item	Anime	Furry	University	*Star Wars*
1	.80	.78	.78	.85
2	.82	.81	.74	.82
3	.79	.74	.75	.78
4	.84	.84	.85	.75
5	.79	.78	.76	.76
Eigenvalue	3.26	3.14	3.03	3.15
Variance	65.11	62.49	60.54	63.02
α	.87	.85	.83	.85
Mean	4.08	4.50	2.89	4.77
SD	1.38	1.50	1.27	1.41

Note. Each analysis was conducted using a principle component analysis with oblimin rotation.

Table 2. Five-item transhumanist orientation measure descriptive statistics and correlation matrix

Items	*m*	*SD*	1	2	3	4	5	6
1. Support cloning to extend life	3.37	1.89						
2. Use gene therapies to ward against aging	4.31	1.93	.64					
3. Upload one's mind to a supercomputer before death	3.65	2.02	.60	.54				
4. Use nanotechnology to enhance human abilities	4.59	1.82	.54	.60	.55			
5. Use technology to evolve humankind	4.90	1.89	.48	.53	.49	.71		
6. Transhumanist Orientation	4.17	1.54	.80	.82	.79	.84	.79	

Note. All correlations were significant at $p < .001$

6. Results

To test the two hypotheses, a 4 (sample: anime fan, furry fan, Star Wars fan, and student sample) X 2 (gender: men and not men) two-way ANOVA was conducted (Table 3). The analysis indicated a

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statistically significant interaction effect for fandom and gender: $F(3, 6832) = 8.04$, $p < .001$, $\eta_p^2 = .004$. There was a main effect for sample $F(3, 6832) = 89.19$, $p < .001$, $\eta_p^2 = .04$, and men demonstrated a significantly higher transhumanist orientation than participants who were not men: $F(1, 6832) = 29.02$, $p < .001$, $\eta_p^2 = .004$. Due to the significant results of the interaction between fandom and gender, a Bonferroni post-hoc analysis was conducted to assess comparative differences between the samples as a whole, as well as of men across the different samples, and between men and non-men within the samples.

Table 3. Means and standard deviations of transhumanist orientation by fandom and gender

	n	*m*	*SD*
Anime Fans	4770	4.12	1.52
Anime Fans-Men	3576	4.24	1.50
Anime Fans-Not Men	1194	3.74	1.52
University Students	327	2.89	1.27
University Students-Men	66	3.32	1.46
University Students-Not Men	261	2.78	1.19
Star Wars Fans	236	4.77	1.41
Star Wars Fans-Men	130	5.00	1.34
Star Wars Fans-Not Men	106	4.48	1.39
Furries	1507	4.50	1.50
Furries-Men	920	4.52	1.48
Furries-Not Men	587	4.47	1.53

Note. Transhumanist orientation was measured on a 7-point Likert-type scale

Star Wars fans demonstrated the highest transhumanist orientation compared to college students ($t = 11.95$, $p < .001$) and anime fans ($t = 7.41$, $p < .001$, but did not differ from furries ($t = 2.29$, $p = .131$). Similarly, furries were significantly higher on transhumanist orientation than university students ($t = 13.19$, $p < .001$) and anime fans ($t = 10.89$, $p < .001$). These results confirmed that men in the *Star Wars* fandom demonstrated a higher level of transhumanist orientation as compared to other groups, with the exception of furries, who also reported a significantly higher transhumanist orientation.

Additionally, men in the *Star Wars* fandom reported a higher level of transhumanism compared to men in the university student sample ($t = 7.48$, $p < .001$), anime fans ($t = 5.71$, $p < .001$), and furries ($t = 3.42$, $p = .02$). Further, a within-group analysis revealed that when compared to non-men in each sample, only the men in the anime sample scored significantly higher on transhumanist orientation than their counterparts ($t = 9.69$, $p < .001$), while there were no differences between the genders for university students ($t = 2.62$, $p = .25$), furries ($t = 0.64$, $p = 1.00$), and *Star Wars* fans ($t = 2.68$, $p = .21$).

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7. Discussion

The present study aimed to conceptually replicate and extend prior research suggesting that demographic and fan interest variables may contribute to a person's support for transhumanism. Specifically, we tested the hypothesis that men, particularly those in the *Star Wars* fandom, would be the most likely to identify with transhumanism. The present findings largely support the hypotheses in that, across samples, men were found to endorse transhumanism more than others, a finding also consistent with prior research (e.g., Gangadharbatla, 2020). However, through post-hoc analyses within-samples, only men in the anime sample were significantly higher in transhumanist orientation than their counterparts, where all other samples were similar. Furthermore, in-line with our second hypothesis and with research by Koverola and colleagues (2022), we also found that *Star Wars* fans endorsed transhumanist more than both university students and anime fans. However, both *Star Wars* fans and furries demonstrated similar endorsement of transhumanist orientation. The present study also represents the first use of a measure of transhumanist orientation that is general enough to be employed in future research on this topic.

7.1 Transhumanism and group dynamics

7.1.1 Gender

The present findings found that, above and beyond fandom identification, men were also more likely to endorse transhumanist orientation than non-men; these findings are in-line with past research by Gangadharbatla (2020). As discussed in the introduction, many of the predictors of endorsing transhumanism are theoretically connected to elements of masculinity. For example, the D factor is associated both with radical technological alterations, as well as masculinity (Hartung et al., 2022; Laakasuo et al., 2021; Schönthaler et al., 2022). Additionally, aspects of risk-taking behaviors can be associated with both an openness to transhumanism, as well as masculinity (Byrnes et al., 1999; Gangadharbatla, 2020).

Additionally, the construction of transhumanism as an ideological project relies heavily on Western notions of masculinity (e.g., rationality, self-sufficiency, progress; Sorgner, 2014). These elements may play a role in the attraction men experience toward transhumanist thinking, as it reaffirms normative beliefs about men in Western contexts and provides an explicit form of terror management for men who are concerns about their place in the 21st century; however, these are postulation for future research. The present findings broadly indicate that transhumanist orientation may exist as a point in a larger ideological system of masculine identity by reaffirming the masculine draw of transhumanist thinking.

7.1.2 Fandom

Like other social identities, fandom members both contribute to, and are influenced by, group norms and expectations (Tajfel, 1978; Tajfel et al., 1971; Tajfel & Turner, 1979). These norms foster group harmony and create a stable sense of self for group members. In the case of mediacentric fandoms, the content of these norms is influenced by the content of the media they organize around (Chadborn et al., 2016; Plante et al., 2018). In the case of *Star Wars* fans, the content of the canon demonstrates explicit motifs of transhumanism (i.e., the cyborg Darth Vader; Brudar & Peric, 2021). Additionally, the canon of *Star Wars* may also be an active form of transhumanist propaganda (Geraci, 2008, 2010, 2011), which may lead to higher endorsement of transhumanist orientation, as fans are given a simulacrum to question what it means to be human and envision new ways of being (Davidsen, 2016). The collective imagining of the future possibilities would theoretically create a group norm of transhumanist imaginings, which fans feel compelled to follow (in a similar way anime fan align with global citizenship identity).

The present study, while finding support for this hypothesis, also suggests that *Star Wars* fans may not be the only ones to endorse transhumanism: Members of the furry fandom were equally likely to agree with expanding the human experience through techno-futurism. One reason for this could be the conceptual overlap between furries and general science-fiction enthusiasm, as Plante and company (2016)

reported that furries tend to also engage in other leisure activities, such as gaming, music, and consuming science-fiction literature. Similar findings have been reported in the anime fandom (Reysen et al., 2021), especially with regard to fans of the mecha genre of anime. These findings, consistent with Koverola and company (2022), could explain why furries and anime fans also strongly endorsed transhumanist orientation, more so, at least, than the undergraduate sample.

Yet, this does not explain why furries were on par with *Star Wars* fans, while anime fans were far less likely to endorse transhumanist orientations. Drawing from the work of Earle (2021) and Gayozzo (2021), furries may be uniquely positioned in transhumanist discourse via the fursona as an expression of morphological freedom. Furries, while being science-fiction adjacent, engage in identity play through metaphysically altering the self to take on elements of their ideal self. This is a far more explicit engagement of applied transhumanism as compared to anime fans, who may or may not be just as similar to other science-fiction fandoms. Regarding anime fans, it may be important to consider the genre preferences of the fans when measuring their attitudes toward transhumanism.

7.2 Limitations

While the present study provides important insights into the relationship between group identity, gender, and transhumanist orientation, several important limitations contextualize our findings. The study recruited participants from English-speaking, online fan communities, in-person fan conventions, and a regional university in east Texas. However, the sample was not checked or controlled for geographic distribution and only four specific fandoms were investigated; thus, these self-selected participants may have a different level of engagement with transhumanism than the general population. For example, the student sample originated from a particularly conservative part of the United States, which might explain the low levels of transhumanist orientation. Further, the student sample was not asked about fandoms to which they belong, which might have provided further insights into their engagement with transhumanist philosophy.

Additionally, the binary categories imposed on the sample, of “white” and “non-white,” and “men” and “not men,” are not inclusive of diverse race and gender identities, but rather, in the very act of binarization, remain rooted in ways of analysis that privilege historically white/Euro-American, masculine worldviews (Crenshaw, 1991; Hill-Collins, 1990). Future research could seek to recruit and methodologically account for a more diverse sample from a variety of communities, cultural backgrounds, gender identities, geographical locations, economic classes, languages, fandoms, and niche interests. In tandem with this limitation, the participants in the study were mostly men, thus the findings may not be fully representative of transhumanist thought more broadly.

While the study found an interaction between fandom and gender when predicting transhumanist orientation, the study did not investigate the underlying mechanisms thought to drive these effects. Variables such as education level, socioeconomic status, culture, geographic location, proficiency with science and technology, to name just a few, might play an important role above and beyond the variables presently assessed and may account for, or moderate, the observed associations.

A final limitation of the present study involves the measure developed, as it is worth asking whether those five items were able to fully capture the complexity of transhumanist beliefs. For example, the measure asked participants to respond to items related to techno-futurism (e.g., cloning, gene therapies, digitizing the mind, enhancements); however, there may be a more complex network of beliefs involving mortality anxiety, attitudes toward the physical body, and metaphysical beliefs about evolution which were not assessed in the present study. Additionally, further research needs to be conducted regarding the reliability and validity of the novel measure.

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7.3 Future directions

Based on the present findings, there are several avenues of future inquiry. The results of the study indicated that men in the anime sample were much more likely to endorse transhumanism than any other group in the study. Thus, future work could invest time into the ways ideology within the anime fandom is informed by content and reproduced via group norms. Further, qualitative work could be helpful in understanding how men in the anime fandom conceptualize and share transhumanist thought within their social circles. Another avenue of inquiry could be dedicated to understanding the applicability of the transhumanist orientation scale to different schools of thought in transhumanism. For example, would an accelerationist Marxist and a libertarian transhumanist endorse the measure similarly? Lastly, but not exhaustively, future work could situate the present findings within a more global, class-based context through cross-cultural methodologies. This line of inquiry could help illuminate if transhumanism is primarily endorsed within Western-capitalist countries, which could affirm a central critique leveraged by posthumanists that transhumanism is embedded in western ideals of power.

8. Conclusion

The present study contributes to the literature on transhumanism by assessing fan engagement and gender, as well as their interaction, and their association with support of transhumanism. The results indicated that men were more likely to endorse transhumanist orientation as compared to participants who were not men, which supports previous findings by Gangadharbatla (2020); however, this finding was more nuanced than predicted, as the effect might be primarily due to the differences observed in the anime fans. Further, fandoms with high science-fiction engagement, *Star Wars* fans and furries, demonstrated a higher endorsement of transhumanist orientation than anime fans and university students. The limitations of the study suggest that the findings should be seen as a starting point for further research on the complex relationships between transhumanism, fan engagement, and demographic and ideographic factors. Taken together, the present research contributes to past literature regarding transhumanism and enhancement technology by considering the role of group norms and the influence of popular culture in transmitting and endorsing ideological frameworks.

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Appendix A: Transhumanist Orientation Measure

Instructions: Please rate your degree of agreement with the following items.
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
1. use implants to improve cognitive performance.
2. use implants to improve physical performance.
3. support cloning to extend life.*
4. use gene therapies to ward against aging.*
5. support cryonics (freezing human body) to extend life.
6. upload one's mind to a supercomputer before death.*
7. support giving artificial intelligence personhood.
8. use technology to enhance oneself.
9. use nanotechnology to enhance human abilities.*
10. use technology to evolve humankind.*

Note. * = inclusion in the final 5-item measure

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Visual interpersonal communication on social network sites in romantic relationships

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Abstract

Based on a research project examining visual communication in close relationships in Switzerland, this study examines interpersonal communication between romantic partners on social network sites (SNSs). It explores (1) the role of SNSs in couples' communication repertoires and (2) the social functions accomplished in the exchange of visual elements on SNSs. Sixty-three semi-structured couple and individual in-depth interviews with romantic partners (N = 42) were conducted, including network drawings for visual elicitation. The results suggest that interpersonal communication on SNSs is intertwined with mass self-communication on SNSs and other channels that make up the communication repertoires of romantic partners. The partners nearly exclusively exchanged visual elements through interpersonal communication on SNSs, accomplishing four social functions: phatic communication, visual references to shared experiences and shared knowledge, functional sharing, and inspirational sharing. This study extends understanding of the importance of communicative interdependence in the field of interpersonal communication and the significance of visual communication on SNSs in maintaining romantic relationships.

Keywords: social network sites, visual communication, romantic relationships, interpersonal communication, communicative interdependence

1. Introduction

Romantic relationships are established and cultivated through social interactions (Berger & Luckmann, 1966), and relational maintenance (Miczo et al., 2011) mainly occurs through mediated and non-mediated interpersonal communication between partners (Trenholm & Jensen, 2011) in everyday life (Duck & McMahan, 2015). Interpersonal communication between partners is actualized through a unique, co-constructed, and negotiated ensemble of media and communication channels that we refer to as a communication repertoire (Hasebrink, 2015; Linke, 2011; Wagner & Reifegerste, 2022). Due to the proliferation of networked visual technologies, communication repertoires are increasingly mediatized (Hepp & Krotz, 2014) and visualized (e.g., Lehmuskallio, 2021). Social network sites (SNSs) are frequently used and included in such repertoires but are rarely explored in terms of interpersonal communication and visual communication. Therefore, this paper examines two research questions: 1)

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What role does interpersonal communication on SNSs play in couples' communication repertoires in terms of maintaining romantic relationships? 2) Which social functions are accomplished in the exchange of visual elements between romantic partners through interpersonal communication on SNSs?

Romantic partners usually seek to be in perpetual contact (Katz & Aakhus, 2002) and use a range of multimodal media (Haythornthwaite, 2005; Madianou & Miller, 2013) to perform several social functions and uses (Lobinger, 2016). SNSs are part of the communication repertoire built by partners and play a role in maintaining intimate ties (Chambers, 2013). Initially designed as platforms for conveying content to a broad audience, SNSs have evolved and are constantly transforming, integrating new forms and possibilities of interpersonal communication. They have become alternatives to other media and communication channels such as e-mail, instant messaging apps, and blogs (Livingstone, 2009), further facilitating their daily use. Previous research has shown that SNS affordances encourage the use and exchange of visual content (Serafinelli, 2018) and represent suitable platforms for exchanging mundane and everyday moments (Bayer et al., 2016) through photo-sharing practices (Murray, 2008). For instance, visual exchange can occur through direct messaging on SNSs, echoing but not substituting other communication channels such as WhatsApp (Villi, 2012).

Up to date, research on SNSs and romantic relationships has mainly focused on publishing (e.g., Fox & Warber, 2013; Robards & Lincoln, 2016), although some studies have shown that private messaging between close relationships on SNSs is associated with increased intimacy (Brown et al., 2017). Previous studies in the field of romantic relationships have examined the relations between SNSs and psychological traits, such as jealousy and satisfaction (Drouin et al., 2014; Seidman et al., 2019; Wang et al., 2017), but the communicative functions of interpersonal communication relating to SNSs have rarely been addressed. Moreover, despite the relevance of visual content on SNSs, studies on the use of visuals on SNSs and their social functions (Van House, 2011) in romantic relationships remain scarce. Finally, very few studies have investigated SNSs and romantic relationships against the backdrop of couples' entire communication repertoires. Rather than considering single platforms in isolation, contextualizing SNSs with other adopted media and channels allows for a better understanding and contextualization (Caughlin & Sharabi, 2013) of couples' communication dynamics.

The present paper is based on a research project examining the interpersonal and visual communication of close social relationships in Switzerland. In this project, we investigated the construction of couples' communication repertoires based on 63 semi-structured in-depth couple and individual interviews with 42 romantic partners (21 dyads). We also examined the communicative and visual functions performed through different media and communication channels, including SNSs.

This study aims to underscore the important communicative role of SNSs in interpersonal communication in romantic relationships and the vital function of the visuals involved. Moreover, it contributes to interpersonal communication and visual communication studies by focusing on the "everyday" practices, responding to the urgent need for new research and studies addressing everyday topics and experiences (Brabham, 2015).

The following section defines fundamental concepts such as romantic relationships and relational maintenance. Subsequently, we explain how SNSs, visual communication, and photo-sharing practices are indissolubly intertwined with the maintenance of romantic relationships in everyday life. Thereafter, we contextualize romantic relationships within the frameworks of mediatization (Hepp & Krotz, 2014) and mixed-media relationships (Parks, 2017) in a visualized society. Finally, we describe the qualitative methods adopted in the study and present and discuss our findings.

2. Interpersonal communication as relational maintenance in romantic relationships

Romantic relationships are defined as "acknowledged mutual, ongoing interactions, characterized by distinctive intensity, expressions of affection, current or anticipated sexual behaviors" (Collins et al., 2009, p. 632). In the present study we address only dyadic couples, but romantic relationships can include

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non-monogamous, open, or polyamorous relationships (Klesse, 2018). Partners maintain their romantic relationships through interpersonal communication, that is, communication that happens between two people. Such dyadic communication is "generally spontaneous and informal; the participants receive maximum feedback from each other; and roles are relatively flexible, as partners alternately act as sender and receivers" (Trenholm & Jensen, 2011, p. 24).

Romantic relationships are typically divided into three phases: initiation, maintenance, and deterioration. Although the maintenance phase is less commonly acknowledged than the initiation and deterioration phases, examining it is essential as people spend more time maintaining relationships than developing or dissolving them (Duck, 1988). The maintenance phase of relationships needs to be studied as an ongoing process where both parties play a crucial role (Duck, 1985) and where interpersonal communication is pivotal because interactions are interdependent and reciprocally influential (Shotter, 1993). Indeed, unless both partners are committed to actively keeping their relationship alive, it will likely deteriorate (Stafford & Canary, 1991; Walster et al., 1973). Such maintenance behaviors (Stafford, 2003), or maintenance strategies (Canary & Stafford, 1992), include both intentional actions and habits and routines established within the relationship to sustain the bond (Miczo et al., 2011). Everyday communication—that is, ordinary, mundane, and routinized interactions that happen on a frequent or "daily" basis (Duck & McMahan, 2015)—constitutes the majority of partners' interpersonal communication and is, thus, the basis for maintaining a romantic relationship. Since SNSs are usually used with great regularity (Kemp, 2023) and are expected to be included in the everyday communication of romantic partners, one of the two purposes of this research is to understand what roles SNSs play in everyday interpersonal communication repertoires for maintaining romantic relationships.

3. Social network sites and interpersonal communication

Social network sites are a subset of the ever-growing category of social media. Existing research illustrates that social media are part of an ecosystem of new platforms that are constantly evolving (van Dijck et al., 2018). The term "social media" can refer to various forms of online communication, such as blogs, user-generated content sites, message boards, and instant messaging apps. Platforms with interpersonal contact as their primary purpose (e.g., Facebook, Instagram, Snapchat, or Twitter) and where lists of other users are visible have been defined as SNSs (boyd & Ellison, 2007; van Dijck, 2013). Despite the lack of reliable data focusing specifically on SNSs, data about social media indicate that the number of active users worldwide reached 4.76 billion at the start of 2023. On average, users (16–64 years old) spend 151 minutes a day on social media (Kemp, 2023). Furthermore, SNS users increasingly include young children (Gray, 2018; Hartley & Potts, 2014).

These data are evidence of widespread social media use as well as the centrality of their use in everyday life. Moreover, they indicate that people mainly use social media to keep in touch with friends and maintain family ties (Kemp, 2023). This aligns with early research findings indicating that SNSs are functional for maintaining existing relationships (Ellison et al., 2014; Tufekci, 2008; Vaterlaus et al., 2016), particularly through sharing and exchanging mundane everyday moments (Bayer et al., 2016; Chambers, 2013; Iftikhar et al., 2017; Kahlow et al., 2020; Piwek & Joinson, 2016). However, studies on SNSs and the maintenance of interpersonal relationships have mainly focused on modes of mass self-communication (Castells, 2009), a form of communication according to which SNS users can self-generate content and reach a potentially large audience. These kinds of practices are favored by social media platform affordances (Bucher & Helmond, 2018) that ease the blurring of the boundary between the public and private (Baym & boyd, 2012; Lasén & Gómez-Cruz, 2009). Despite the proven importance of images in the context of interpersonal communication (Hunt et al., 2014; Okabe & Ito, 2006; Prieto-Blanco, 2022) and the central role of visual elements on SNSs (Kofoed & Larsen, 2016), much of the research has only marginally included visual aspects. Photo-sharing, or publishing image content, has been examined with general measures such as frequency of communication (Ledbetter et al., 2011), self-

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disclosure (K.-T. Lee et al., 2013), SNS usage (Espinoza & Juvonen, 2011), and sense of belonging (Soriano & Cabañes, 2020). In other cases, visual elements have been used solely as stimulus material (e.g., Liu et al., 2016; Shin et al., 2019); however, the communicative functions of visuals have not been explored.

In addition to mass self-communication, romantic partners may choose to communicate on SNSs by adopting masspersonal communication practices (O'Sullivan & Carr, 2018). Masspersonal communication refers to intentional communication meant *only* for the purpose of addressing a partner but that occurs in ways that are visible to a larger audience. Examples on SNSs are visible posts, comments, reactions, tags, and verbal and visual representations of the couple, crafted to address the partner's attention. Alternatively, romantic partners can choose to keep their conversations private through direct messages, which are a typical affordance of SNSs.

Numerous studies have investigated the uses of mass self- and masspersonal communication practices on SNSs in the maintenance of close and romantic relationships (e.g., Billedo et al., 2015; Madianou, 2016; Wang et al., 2017). However, little attention has been paid to interpersonal communication between romantic partners using SNSs. One exception is the study by Tong and Westerman (2016), which compared masspersonal and interpersonal communication in relational maintenance. They found that partners were more likely to use direct messages to discuss intimate matters or communicate negative information. Instead, masspersonal communication was used for positive relational presentations and to provide uncertainty-reducing information. However, despite their valuable role in SNS use, Tong and Westerman (2016) did not consider the communicative functions of the exchanged visual content.

4. Visual communication and social network sites

Research on SNSs and romantic relationships has almost completely neglected the role of visual communication and its visual functions. Indeed, previous studies have especially focused on evaluating jealousy or attachment style, usually in connection with "partner monitoring" (Darvell et al., 2011; Marshall et al., 2013; Muise et al., 2014; Utz & Beukeboom, 2011). Others have investigated retroactive jealousy (Fox & Frampton, 2017; Frampton & Fox, 2018), "relationship visibility" (Emery et al., 2014), disclosure practices (Robards & Lincoln, 2016), or the ways in which relational behaviors on SNSs reflect the relationship lifespan (Brody et al., 2016). However, due to the proliferation of networked photography (Rubinstein & Sluis, 2008) and social photography (Weilenmann et al., 2013), interpersonal communication in romantic relationships has also increasingly become visualized and cultivated through visual communication practices (Lobinger et al., 2020) that are central on SNSs (Leaver et al., 2020). Consequently, this lack of research on visual communication in romantic relationships should be addressed. In this study, we understand visual communication as "the circulation of non-linguistic pictorial elements that feature in cultural artifacts distributed via media technologies" (Aiello and Parry, 2020, p.4). Nowadays, visuals are taken as an everyday practice (Gye, 2007; D.-H. Lee, 2005), with subjects depicting everyday life (Murray, 2008; Van House, 2011; Van House et al., 2005), including "banal" and ordinary motifs (Koskinen, 2005; Peng, 2019). The primary use of photography and other visuals switched from immortalizing and keeping memories (Barthes, 1980; Bazin, 1967) to instantaneously sharing visuals with other people (Prieto-Blanco, 2010; 2016b).

Photo-sharing (Kray et al., 2009; Murray, 2008; Nightingale, 2007) supports relational maintenance through various social functions (Lobinger, 2016b; Van House, 2011; Van House et al., 2004). For example, exchanging visuals can play a phatic role (Kurvinen, 2003; Lobinger, 2016b, Prieto-Blanco, 2010; Villi, 2012), help in micro-coordination (Ling & Yttri, 2002), create a sense of closeness (Kofoed, 2018; Prieto-Blanco, 2016a), or be a source of memory and representation (Gye, 2007). Furthermore, mundane visual exchanges can engender visually mediated co-presence (Lasén, 2015), perpetual contact (Katz & Aakhus, 2002), or entire visual conversations made of several interactions (Katz & Crocker, 2015; Koskinen, 2005; Villi, 2012).

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As photo-sharing is a communication routine in everyday life (Lobinger, 2016), it has become a typical practice on SNSs (Kofoed & Larsen, 2016). The most popular SNSs, such as Instagram, TikTok, or Facebook, are increasingly visual-based platforms (Leaver et al., 2020), and visual communication on SNSs can include a variety of visual elements, such as photographs, videos, gifs, stickers, or emojis. Studies on the role of photo-sharing on SNSs and romantic relationships have mainly focused on masspersonal communication. One example is Farci and colleagues (2017), who found that respondents posted pictures accessible to their entire contact list but expressly directed toward their partners. As such, they were conveying emotional and intimate meanings that could only be understood within their relational context (Farci et al., 2017).

By focusing on interpersonal communication rather than masspersonal or mass self-communication on SNSs, the present paper seeks to contribute to the visual communication research field by investigating why visuals are exchanged by romantic partners in their private conversations on SNSs. Motivations, rather than motifs, will be examined to understand which visual functions are involved in such photo-sharing practices, especially in comparison to similar exchanges on other channels. Therefore, SNSs are investigated with respect to the entire communication repertoire of romantic partners.

5. The communicative repertoires of romantic relationships

The emergence of ubiquitous computing (Dourish & Bell, 2011) has induced what boyd (2012) called an "always-on lifestyle." Ubiquitous technologies are embedded in everyday life, and interpersonal communication is increasingly technologically mediated and mediatized (Hepp & Krotz, 2014; Storey & McDonald, 2014). By bridging spatial and physical distance, this constant connectivity allows for micro-coordination (Ling, 2004) and fosters ambient co-presence (Madianou, 2016), thereby engendering intimacy and closeness (Gómez Cruz & Miguel, 2014; Su, 2016). Romantic relationships can be characterized as mixed-media relationships (Parks, 2017), which means that they are conducted via multiple media. Indeed, partners use various media to maintain their relationship (Haythornthwaite, 2005). The integration of multiple media has been found to nourish a strong sense of connectedness (Licoppe, 2004); however, choosing between multiple options is never an easy task (Schwartz, 2004). Romantic partners need to negotiate and decide on which media and communication technologies—and for what reason—to establish their interpersonal communication (Döring & Dietmar, 2003).

The set of multiple media functions as an integrated web where every communication channel works with all others (Madianou & Miller, 2013) as part of a complex "media manifold" (Couldry, 2011). In other words, romantic partners accomplish their interpersonal communication through a potentially vast communication repertoire of multimodal means of communication, which are used not in isolation but interdependently (Caughlin & Sharabi, 2013). Additionally, communicative interdependence does not only concern partners switching their communication from one media to another (Pusateri et al., 2015); specific interactions of everyday interpersonal communication exchanges are always a segment of a larger discourse and a shared understanding that partners constantly co-build as a mutual narrative of their unique relational biography (Agha, 2006). This spatial, temporal, and multi-mediatic dyadic interconnection includes interactions that take place in present encounters but also, for example, via text messages, phone calls, video calls, postcards, and, among the others, SNSs.

To grasp this mediatized character of interpersonal relationships, we adopted the approach of repertoire-oriented, non-media-centered media research (Hepp, 2010). This approach allowed us to consider the intertwining between mediated and face-to-face communication (Hasebrink & Hepp, 2017) and the interdependence between the different media that romantic partners use for their everyday interpersonal communication (Caughlin & Sharabi, 2013). Thus, we investigate the role of SNSs and the functions of the visuals exchanged through them not in isolation but against the backdrop of couples' communication repertoires. This investigation is relevant because it contributes to a better understanding of couples' interpersonal communication dynamics and explores how interpersonal communication

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works in the context of platforms that are mostly perceived as suitable for mass self-communication practices.

6. Method

6.1 Data collection

The data used for the present study were collected as part of a larger research project investigating visual communication in close relationships in Switzerland. Between September 2019 and July 2021, we conducted 63 semi-structured in-depth interviews with 21 romantic couples (42 adults, 18–91 y/o, M = 36.3). The interviews were conducted in (Swiss) German, French, Italian, and English. The participants were contacted following a selective (or purposive) sampling approach (Lamnek & Krell, 2016) in order to ensure the highest level of diversity in terms of (regional) origin, age, level of education, profession, the duration and type of romantic relationship, housing and status situations, and whether the couples had children. Additionally, we ensured contrast regarding same-sex and different-sex relationships (see the Appendix and the Data Availability Statement for detailed information)[1].

We first conducted semi-structured in-depth couple interviews with each couple, followed by individual interviews with the members of the dyad after about two weeks. Therefore, each respondent was interviewed twice, allowing for both individual and couple perspectives to be captured. The interviews lasted between 50 and 163 minutes.[2] They were conducted at the respondents' homes when possible or at another location chosen by them. Upon receiving consent, the interviews were recorded using a recording audio device.

The first research question sought to investigate the role of SNSs within the broader communication repertoires of couples. Consequently, it was necessary to adopt a methodology that would explore all the communication channels used by both partners of the dyad and their respective functions and modes of use. To this end, we used visual methods and asked the participants to create a network drawing (Hepp et al., 2016; Figure 1), through which they were to create and describe their communication repertoires.

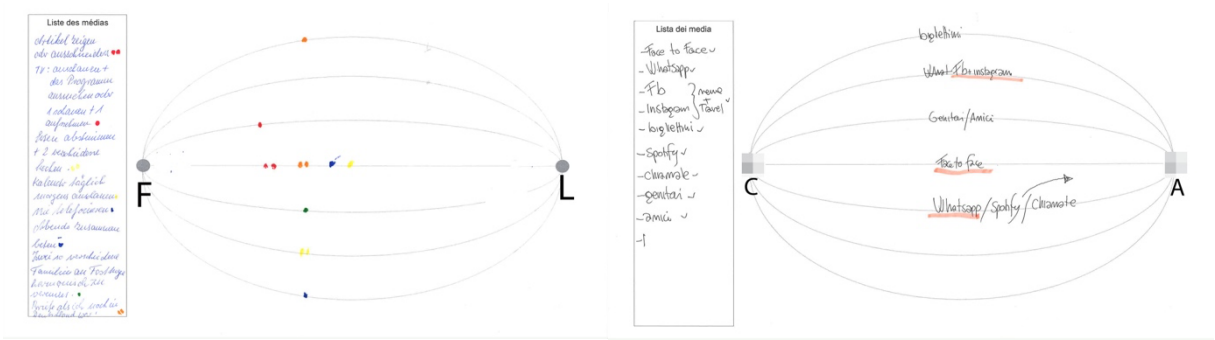


Figure 1. Examples of communication repertoires

Two communication repertoires created through network drawings by respondents.

A network drawing is a research tool that utilizes a minimal graphic structure to facilitate the creation, expression, and visualization of complex structures (Hollstein, 2011). At the beginning of the couple interviews, we asked the respondents to create their communicative repertoire by considering all the media, apps, and communication channels they used in their relationships. The channels were distributed

[1] For further information about the overall project participants, see Lobinger et al. (2024). While in the overall project couples and close friendship dyads were examined, this article focuses exclusively on couples.
[2] Incentives were used due to extensive time investments from the participants.

vertically and horizontally according to their importance to the relationship and the individual. In the examples above, the two partners filled the left column as a brainstorming tool and later reported the items in the drawing. The channels and media in which visual communication was used were underlined (e.g., in red on the drawing on the right) at the interviewer's request.

Similar to other repertoire-based methods that grasp the use of mediated communication within larger social networks, such as 'mediagrams' (Lexander & Androutsopoulos, 2019), network drawings are a highly effective visual elicitation tool. Negotiating the placement of a single item on the graph allowed for a reflection on and comparison of the actual use of a medium and the occasions of use involved. Once created, the respondents were invited to verbally describe their communication repertoire. Their narrative helped us understand the purposes for which a specific channel was used and with what kind of (visual) content. The communicative repertoire created in the couple interviews was then used as a starting point for the individual interviews. The reintroduction of the communicative repertoire helped the interviewer to create a bridge between the two interviews and allowed the respondents to revisit and explore the use of communication channels from an individual perspective.

Among the two interviews, to investigate the social functions of visual exchanges on SNSs, we asked for which reasons partners use visual communication on SNSs, with which frequency, and in which situations they opt for the visual modality rather than text. We included questions about the typical visual content of SNS interpersonal communication, expected and actual reactions from the partner, perceived norms, and shared rules of visual communication on SNSs. We contextualized the findings by collecting additional information about general SNS use and individual publishing activities. During the entire duration of the interviews, participants were invited to show visuals while discussing their visual communication on SNSs.

6.1 Data analysis

Network drawings were used as elements of visual elicitation. The network drawings created by the participants varied significantly from each other, both in terms of content and the way they were created. Therefore, to analyze the type and functions of interpersonal communication channels used by the couples for relationship maintenance, we relied mostly on the verbal narratives by the interviewees, not on an analysis of the drawings themselves.

First, the interviews were transcribed in the language in which they had been conducted. Two researchers then coded the data using the NVivo software for qualitative coding. The coding process was accomplished through a combination of inductive and deductive categorizations and ongoing discussions between the two researchers, who collaboratively created a codebook. The interviews were initially analyzed individually and through the creation of case summaries (a case summary included one paired interview and two individual interviews). The authors employed cross-case coding and analysis to reveal similarities and differences across the cases.

This paper was not concerned with the content of the collected images but, rather, the perceived functions of these images regarding interpersonal communication on SNSs between the two partners. They were analyzed directly from the interview transcripts, with the images and network drawings used solely to support the analysis.

7. Results

Our findings suggest that SNSs played a marginal role in the respondents' interpersonal communication, despite being extremely important for mass self-communication. Many of our respondents had a profile on one or more SNSs, which they utilized daily, but not all of them used SNSs as channels for interpersonal communication. Generally, the respondents considered direct messages on SNSs as alternatives to using other messaging applications, such as WhatsApp, which was the preferred channel

overall for textual or visual exchanges. SNSs were described as the primary sites for playful interpersonal communication, which was perceived as fundamental for maintaining the relationship within everyday interaction.

When present, interpersonal communication on SNSs was intertwined with mass self-communication on SNSs and other channels of the romantic partners' communication repertoires.

The partners nearly exclusively exchanged visual elements in interpersonal communication on SNSs, confirming the central role of visual communication on SNSs. Their visual exchanges accomplished four main functions: phatic communication, visual references to shared experiences and shared knowledge, functional sharing, and inspirational sharing.

In the following paragraphs, we first contextualize our findings by describing the romantic partners' reasons for SNS use. We then discuss the relation between mass self-communication practices and interpersonal communication. Subsequently, we illustrate the ways in which interpersonal communication on SNSs is linked to that on other interpersonal communication channels, which ought to be understood in the context of couples' communication repertoires. Finally, we provide empirical examples to illustrate which functions are accomplished by exchanging visual elements in interpersonal communication on SNSs.

7.1 Romantic partners' reasons for SNS use

Two of the most frequently mentioned reasons for SNS use were keeping track of other people's lives and communicating about one's own life. These motivations were perfectly summarized by Carolina (female, 19 y/o),[3] who used Instagram "*to see what other people do and also show what I am doing (…) especially close people, those whom I know*."[4] Other motivations included keeping track of information and events, fighting boredom, disconnecting from a stressful life, or facilitating in-person meetings. For instance, Leonardo (male, 22 y/o) loved playing chess and used SNSs to find new opponents ("*I have many friends who follow me on social media who play chess. Then sometimes, I post a story (…) with the words 'today someone is playing chess*?'"). In general, our respondents mostly used SNSs for mass self-communication practices, sometimes involving their romantic relationships. As Tommaso (male, 33 y/o) described, publishing "couple pictures" on his SNS profile had become a habit because "*even if my profile is about myself, my woman, my wife, is part of my life, thus part of myself*."

Sharing "couple pictures" was not the only method used to present the relationship online. Marianna (female, 31 y/o) explained that "*also publishing pictures about things we have done or seen together*" can play the same role. Additionally, the romantic relationship itself was sometimes the sole incentive for SNS use. Natalia (female, 40 y/o) started using Instagram when her relationship with Patricia began. "*My pictures online are mostly pictures with Patricia. I started to use Instagram when our relationship started (…) now she is part of my every day, she became part of my everyday (…), and I publish part of my every day, which can also be a holiday, a special event during my life, that is it*."

Some couples decided not to post anything about their relationship online, either due to privacy concerns, to keep their relationship more intimate, or because they did not have SNSs profiles. Lisandra (female, 58 y/o) reflected on her decision not to present her relationship online and argued that it could be a generational characteristic. "*I think that people of our age are not used to publishing their pictures, as people do nowadays, where you publish everything that you do as a couple, even kissing or hugging. We were not that exhibitionistic, and I find that to be exhibitionism*." Whether it is through posting couple pictures or other information that more or less explicitly confirms the existence of the partner to the SNS audience, several couples explained that they had developed particular strategies and norms for presenting their relationship on SNSs.

[3] We shall only report a participant's age and gender upon first mention of them.
[4] All quotes have been translated from Italian, (Swiss) German, or French into English.

7.2 The relationship among interpersonal communication, mass self-communication, and communication repertoires

With respect to sharing couple pictures, partners reported the use of mass self-communication in presenting or maintaining romantic relationships. Other examples included tagging the partner in published content or exchanging comments below shared content, which would be visible to larger audiences. However, in the discussion on SNS use, it emerged that on-platform mass self-communication should not be seen as contradictory to interpersonal communication between romantic partners. Conversely, experiencing content published online by other users—that is, mass self-communication content—turned out to be the basis for interpersonal communication on SNSs. Indeed, the content accessed by partners while navigating SNSs became the inspirational thematic subject of the direct messages exchanged by couples. People typically found interesting content online and forwarded it to their partner while remaining on the platform.

Moreover, by implementing a repertoire-oriented approach, we found that interpersonal communication on SNSs was inextricably linked to other communication channels adopted by the couples. When maintaining the relationship through communication, direct messages exchanged on SNSs could be the starting point of further discussion, confrontations, or even activities that were then conducted or discussed elsewhere and that would not have occurred without the initial interpersonal contact on SNSs. People initiated conversations on SNSs and then moved to face-to-face communication, phone calls, or messaging apps. For instance, Alberto (male, 25 y/o) explained that it was typical for him and her partner to send each other promotional pictures about ongoing events via direct messages on Facebook Messenger. "*It is teamwork. She finds something on the SNSs. Then, I understand what is doable and what is not*." In these situations, the conversation would not proceed via SNSs. "*Maybe we call each other, or we have a chat on WhatsApp, where we discuss and say, 'it could be done, let us try this*.'"

Alternatively, the respondents used direct messages on SNSs to return to issues that had previously been discussed or experienced elsewhere. Indeed, SNSs were the main channels for sharing fun and entertaining content, which was sometimes phatic but often involved references to shared knowledge and shared experiences. The partners perceived such exchanges as beneficial for maintaining the relationship because they helped lighten their daily mood while keeping in touch.

7.3 Functions of visual exchanges on SNSs

The role of visuals was found to be crucial for interpersonal communication on SNSs. All exchanges within interpersonal communication on SNSs mentioned by the participants involved visual content. Such content, which varied from pictures, videos, gifs, memes, and other visual forms, was always directly related to that *found* on platforms. The sharing of only visual content found on a platform rather than, for example, pictures taken by partners, differentiated visual exchanges on SNSs from how partners communicated on other channels. Indeed, WhatsApp was considered the default channel for sharing photography between partners, with e-mail being a rare exception when there was a need for less quality reduction caused by data compression. Once interesting visual content was found online, partners always sent it through the same SNS where it was found, avoiding channel switching. Remaining on the same platform rather than sending the content via another channel was perceived as both easier and quicker.

The exchange of found visual content through interpersonal communication on SNSs responded mainly to four communicative functions: phatic communication, visual references to shared experiences and shared knowledge, inspirational sharing, and functional sharing. In the following section, we describe these functions with the aid of empirical examples.

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7.3.1 Phatic communication

Most of the visual content exchanged on SNSs by romantic partners was entertaining in nature. "*I use SNSs for entertainment. In a sense, I look at a few photos, a few videos (...), and maybe there is some funny content, and then I forward it to him.*" Marianna (female, 31 y/o) reported using SNSs as a hobby to pass the time. While scrolling home pages and navigating through posts, she would come across funny pictures, videos, or memes and would share them with her partner. Matteo (male, 19 y/o) also recounted a similar pattern. "*Instagram*," he said, "*has become a bit like WhatsApp, that is, the mode of communication, the mode of messages*." He explained that he and his girlfriend had a preference for WhatsApp over Instagram as communication medium; however, he also added that "*when I find something funny while scrolling through the (SNSs) newsfeed, I send it to her.*"

The content of such visual elements was perceived as unimportant, rather foregrounding phatic communication, that we understand as visual sharing "where the communicative significance is more relevant than the contents of that communication" (Lobinger, 2016b, p. 482; see Malinowski, 1923/1960, for the original notion of "phatic communion").

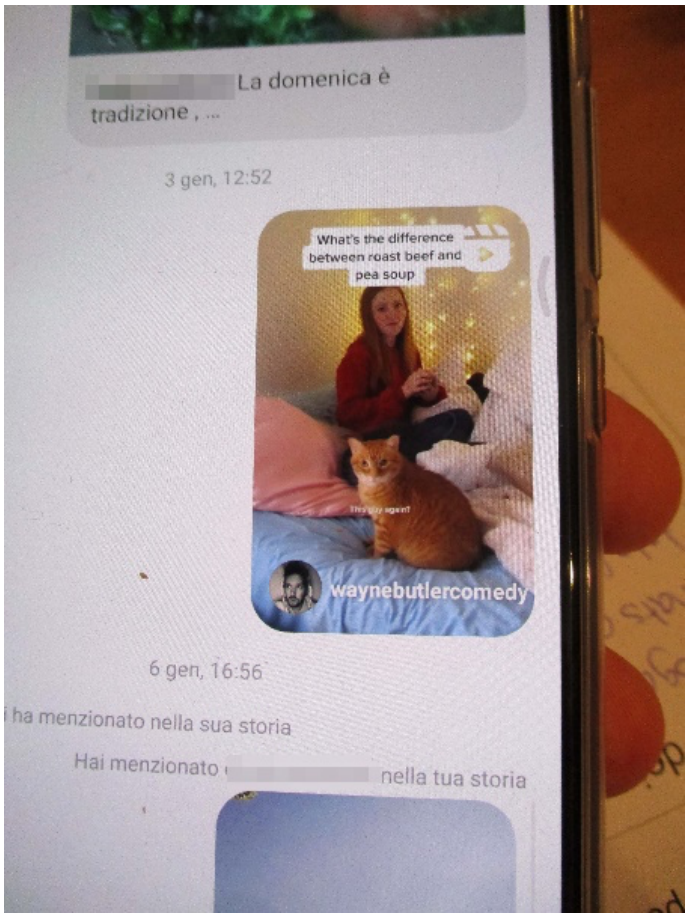


Figure 2. The funny cats

An example of phatic fun and entertainment sharing between Diego (male, 32 y/o) and Marianna. While scrolling through Instagram stories, Diego found a random funny video of a cat and decided to share it with Marianna.

Hannah (female, 18 y/o) explained that the pictures she exchanged with her boyfriend Timo on Snapchat were "*not really important*." She engaged in photo-sharing only to keep the conversation going.

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Animals were often the subjects of this kind of phatic exchange (Figure 2)[5]. Carolina underlined that "*we exchange funny videos, that kind of stuff. Videos with animals doing things*." Similarly, Chiara (female, 21 y/o) laughed while recounting that her boyfriend would send her tons of dog pictures: "*he sends so, so, so many puppies on Instagram!*" When asked about the reasons for such exchanges in the dyadic interview, she and her boyfriend Filiberto (male, 23 y/o) answered that they sent them "*for a laugh.*"

This example echoes the motivations of other couples for sharing fun and entertaining content. "*Facebook? Let's say purely playful—we exchange maybe some silliness that's on some cartoons; we share them if they make us laugh (...) So it is purely playful, and on the outside, not significant for real communication, let's say*" (Tommaso, male, 33 y/o). To support his statement, Tommaso showed a video he had found online, which he sent to his wife. The video introduced a child asleep on the back seat of a car. Suddenly, the driver plays the renowned children's song titled "Baby Shark"[6] and the little one suddenly wakes up and starts dancing.

In terms of the romantic partners' communication repertoires, SNSs were not the only channel used for phatic communication as partners fulfilled the same function through messaging apps such as WhatsApp. When away from each other, they tended to send each other brief texts for updates on how the other was doing. Either on SNSs or WhatsApp, such communicative exchanges hardly resulted in prolonged conversations. As Carolina explained with respect to Instagram, "*when he (the partner) sees something funny, he sends it to me, but we don't write to each other. I mean, it's not like we write 'hi how are you?*'"

Carolina distinguished between sending texts and visuals as means of phatic communication, but they can both serve the same purpose. In addition to text and audio messages, visual communication also played a role in keeping in touch throughout the day through WhatsApp. Pictures were often spontaneous mundane exchanges meant to share the moment with the partner by sending an image of, for example, food, a landscape, or a situation they were experiencing. For both SNSs and WhatsApp, it was not the content that was considered valuable but, rather, the aim of keeping in contact, which helped the respondents feel close and enter momentarily into the other's life, even without being physically together.

7.3.2 Visual references to shared experiences and shared knowledge

Other kinds of content led to fun and entertainment while conveying a specific meaning that could be understood exclusively by the two partners. We define this function *visual references to shared experiences and shared knowledge*.

In this case, the visual element served as a placeholder containing a reference to the relationship, the partner, or the experiences they shared together. On the one hand, such visuals presented a joking tone and often represented a form of fun and entertaining sharing with the partner. On the other, "*they represent our lives or situations that we both have experienced*" (Kim, female, 24 y/o). This kind of sharing showed that even individual use of a SNS, such as simply scrolling through a newsfeed, could suddenly prompt thoughts about a partner and one's relationship.

Filiberto explained that "*sometimes, we both have some behaviors, you know, and she might find a video in which she recognizes this behavior of mine, and so, she sends it to me as a joke*." Figure 3 shows a meme in which two characters look at each other while in bed. The text reads: "*when she/he continues to touch you with cold feet.*" Chiara maintained that it represented their life as a couple. She always has cold feet, and they joke about it. Another example of this typical exchange was provided by Matteo, who would forward digital visual content to Carolina "*every time there is something that happens to us, and they do a meme about it*."

[5] This and all the following pictures have been collected during the interviews with prior consent and have been anonymized.
[6] The song was part of a music trend in Switzerland at the time of interviewing.

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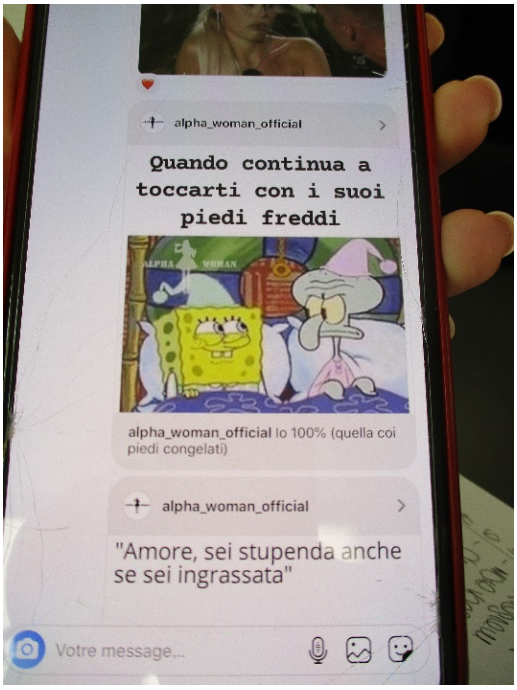


Figure 3. The cold feet

A meme sent through Instagram direct messages from Chiara to Filiberto. The image recalls a typical funny situation experienced by the couple.

Such exchanges were a placeholder that made the partners think, "Hey, it is talking about us," thus resurrecting memories about the own relationship. The references were typically some stereotypes that could apply to couples in general. However, they were perceived as personal by the romantic partners, who employed interpersonal communication on SNSs to laugh about their shared relational knowledge, thereby strengthening their relational bond.

Finally, in some situations, the exchanged content referenced previous discussions the partners had had on other communication channels. One of our respondents gave an example of what typically happened after she watched media content with her boyfriend. "*The last time we went to the cinema, we saw a trailer about the new Charlie's Angels movie,*" explained Carolina, "*then we had a discussion together. At the end, he said, 'they are cool,' and I replied, 'yes, but they are not the original ones.'*" Some days later, Carolina found an image of the original Charlie's Angels, and she sent the picture via SNSs to her partner. This example illustrates that interpersonal communication on SNSs sometimes nudges the resumption of a conversation started through other channels.

7.3.3 Functional sharing

A third communicative function of visual exchanges on SNSs is what we call *functional sharing*. Romantic partners use direct messages on SNSs to forward valuable and practical information found online about a topic of interest to the partner or the relationship. Although it is not always the case, functional sharing can involve an active search for information on SNSs. Such sharing usually serves as a starting point for future reflection or conversation, which then typically occurs off the platform. Interpersonal communication on SNSs conveys additional information that would not have otherwise been discovered, but SNSs are limited to the role of information sources.

Figure 4 shows that Marika and Tommaso used SNS private messages to exchange pictures of potential new furniture for their children's bedroom. In this case, Marika was actively looking for sales announcements on Facebook. Sending a picture through SNSs allowed her to first have feedback from

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her husband before proceeding. "*I sent him some pictures of the bedroom*," said Marika (33, female), "*because as it usually happens, he is not here in person. Thus, if I have to make decisions, I share with him anyway*." Marika explained that she used Facebook Messenger only because Tommaso was away from home. Otherwise, she would have probably shown him the picture. When needed, interpersonal communication on SNSs would be used in the first instance, then the couple would move to in-person negotiation.



Figure 4. Children's bedroom

A picture of bedroom furniture that Marika sent to Tommaso through interpersonal communication on a SNS.

Functional sharing also involves informative posts or pictures of upcoming events, such as exhibitions, dinners, concerts, or public events, that a couple might be interested in joining. Partners share the first prompt via private conversations on SNSs, then the organization moves elsewhere, typically through face-to-face or phone conversations.

7.3.4 Inspirational sharing

In some cases, the visual exchanges on SNSs fulfilled the function of inspiring a partner's interest in a (hypothetical) desirable situation related to the relationship. Unlike functional sharing, the visual content in *inspirational sharing* possesses a dreamy component that unties visual communication from a practical and immediate dimension, thus depicting an ideal future situation.

In Figure 5, we see a typical exchange between Raul (male, 24 y/o) and Tobias (male, 22 y/o), who shared a mutual interest in cars and were thinking of buying a new model. As Raul scrolled through his newsfeed, he found a post depicting a picture of an expensive car that was undoubtedly unaffordable based on their finances. He forwarded it to Tobias and ironically said, "*We need that*." Tobias answered, "*Yes, totally, that is awesome*."

Another example of these visual exchanges can be in the form of content on exotic travel destinations or luxury purchases. Such inspirational exchanges can engender shared moments of fun about unrealistic goals but can also portray a more realistic, desirable situation that can be cultivated in an indefinite future.

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While playing with the desires and dreams of partners, inspirational sharing can help in intensifying and strengthening the relational bond by projecting the relationship into the future, with the assumption that the two partners will stay together.

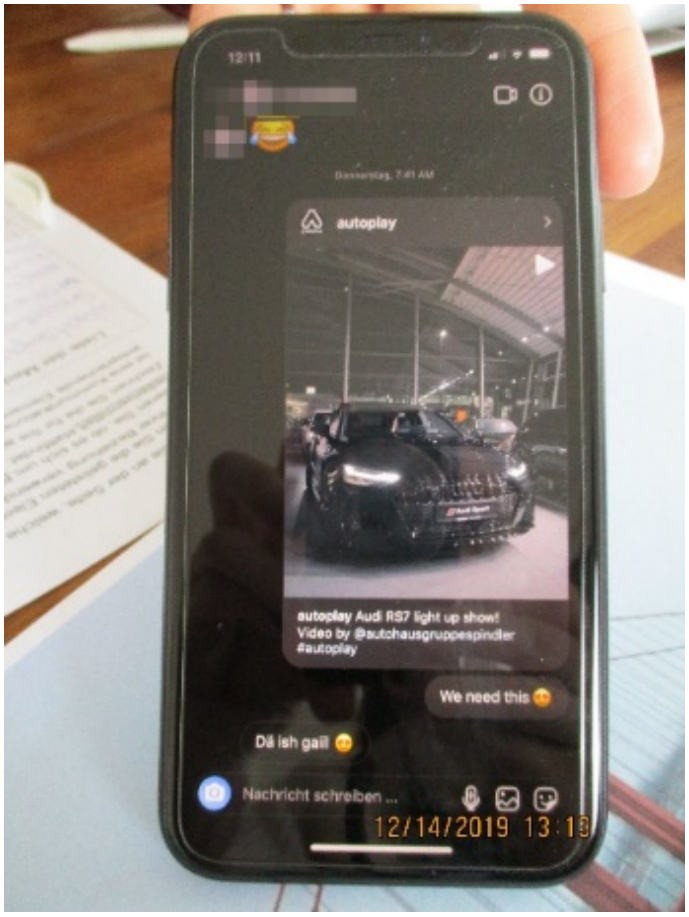


Figure 5. The dreamy goal

A picture of an expensive car exchanged on Instagram between Raul and Tobias.

Furthermore, inspirational sharing usually serves as a bridge to continue a conversation that has already been initiated through other channels (e.g., discussing the best car model to purchase) and in providing new reference points for future conversations. In fact, when the respondents resumed a conversation in person regarding purchasing a car or booking the next trip together, they would jokingly refer to the "dreamy" and "ideal" visual content exchanged on SNSs.

8. Discussion

This study explored the role of interpersonal communication on SNSs in romantic partners' communication repertoires. We also investigated the social functions accomplished by romantic partners when they exchange visuals through interpersonal communication on SNSs.

We learned that romantic partners perceived SNSs primarily as sites for mass self-communication, for example, for publishing couple pictures, rather than for interpersonal communication. The romantic partners in the study used SNSs for interpersonal communication but only when they found interesting or funny content on the platform and forwarded it to their partner.

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In line with communication interdependence theory (Caughlin & Sharabi, 2013), our findings illustrate that interpersonal communication on SNSs can serve as a starting point for conversations pursued through other channels, as shown by our respondents through their examples of functional sharing. Alternatively, it can serve to continue a conversation started elsewhere, for example, when the partners shared content referring to previous shared experiences or knowledge.

According to Pusateri et al. (2015), communication interconnectedness can occur between face-to-face and mediated communication and among different mediated communication channels. These examples show that understanding interpersonal communication on SNSs can be facilitated by addressing the entire communication repertoire through a repertoire-oriented approach (Hepp, 2010).

The interdependence between interpersonal communication on SNSs and other communication channels confirmed Agha's (2006, p. 70; see also Caughlin & Sharabi, 2013) finding: a dyadic conversation is also a chain segment – a segment of larger communicative processes – in the sense that any two individuals who engage in conversation have, of course, participated in various discursive conversations before, and thus bring to the event biographically specific discursive histories.

This finding also demonstrates that SNSs constitute a specific and, at times, indispensable segment of a broader communicative process that include various communication channels. In this sense, choosing to employ SNSs as part of the mediated communication channels for interpersonal communication contributes to relational maintenance. Indeed, according to the media multiplexity theory (Haythornthwaite, 2005, 2018), close relationships benefit from the use of a diverse array of communication channels, as it fosters increased relationship closeness (e.g., Balayar & Langlais, 2021; Barakij et al., 2019), strengthens ties (Taylor & Ledbetter, 2016), and enhances partner's well-being (Chan, 2015).

Additionally, our results illustrate that interpersonal communication on SNSs is mostly initiated through visual exchanges, confirming the crucial role of visual communication on SNSs (e.g., Leaver, 2020). We found that visual exchanges on SNSs accomplished four main social functions in maintaining relationships: phatic communication, visual references to shared experiences and shared knowledge, functional sharing, and inspirational sharing.

Our findings on phatic communication confirm previous research on SNSs and visual communication, showing that pictures perceived as unimportant or banal can foster closeness (Bayer et al., 2016; Kofoed & Larsen, 2016). Mundane daily conversations help preserve the bond, contributing to relationship maintenance (Alberts et al., 2005; Guerrero et al., 2021).

Similarly, visual references to shared experiences and knowledge contributes to relational maintenance by fostering visual intimacy (Lobinger et al., 2021). This is in line with the finding of Prieto-Blanco (2022), which highlights that visuals can be perceived as extensions of intersubjective knowledge and experiences shared with close ties, contributing to creating a sense of belonging within the relationship. Additionally, our study confirms that the act itself of looking at visuals – even in the case of random visual content found on SNS – can trigger emotions and memories of shared events, serving as emotional resources that increase relationship closeness (Rose, 2010; Prieto-Blanco, 2016; Venema & Lobinger, 2020).

In line with previous research (Van House et al., 2005), the results on functional sharing show that visuals can convey complex information concisely and can be used in place of textual information. The immediacy of the visual modality can contribute to efficiently accomplishing practical needs such as micro-coordination (Ling & Yttri, 2002), helping partners maintain the relationship while navigating daily tasks and events.

Inspirational sharing plays on the desires and dreams of romantic partners, fueling visual imagination (Phillips et al., 2013) of shared passions or experiences to be cultivated together in an indefinite future. Projecting the relationship into the future contributes to relational maintenance since the relationship is assumed to continue (Lang & Carstensen, 2002) and indicates a desire for longevity that reflects relationship commitment (Stafford & Canary, 1991). When used and perceived as surrounded by such a

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"dreamy" component, visuals are particularly suitable for eliciting an emotional reaction (Lapenta, 2011) and thus can strengthen and intensify the emotional bond of the partners.

The partners reported sharing only visual content that they found directly on SNSs. This is in line with Tong and Westerman (2016), who reported that partners typically exchange content such as video links, web pages, or "inside jokes" that only the couple can understand. Our participants did not report exchanging links or web pages, which could be explained by the affordances of the specific SNSs used. Sharing with a partner a post published by another user via a direct message on Instagram, for example, is not very different from sharing with the partner a link published by another user on Facebook. Indeed, it still concerns sharing a reference to content found on an SNS.

Considering that only visual content found online is exchanged through SNSs contributes to understanding why SNSs are not perceived as ideal channels for interpersonal communication.

Indeed, our respondents also took pictures with their camera phones, to share with their partners a moment they are experiencing. Sharing the moment through visual exchange has been reported in previous research on photo-sharing practices as functional for relational maintenance (Kofoed & Larsen, 2016; Kurvinen, 2003; Villi, 2015).

However, such exchanges occurred through WhatsApp, which the respondents indicated was the most commonly used messaging app for textual interpersonal communication in everyday interactions—corroborating previous research reports on Switzerland (Ueberwasser & Stark, 2017). Thus, despite perceiving SNSs as an alternative to WhatsApp, the participants adopted messaging apps and private communication on SNSs in distinct ways.

Consistent with previous research (Serafinelli, 2018), imagined platform affordances (Nagy & Neff, 2015) seemed to play a role in encouraging photo-sharing practices through interpersonal communication on SNSs. In motivating the sharing of digital content found on SNSs, the romantic partners explained that on-platform affordances made it easier and more intuitive to share the content with someone by staying on the same platform where they found the content. Such motivations are consistent with previous studies on media choice and channel switching, which claimed that individuals choose certain technologies for convenience or to adapt to technical difficulties (Pongolini et al., 2011). Moreover, when questioned about potential future uses, some of our respondents explained that the affordances offered by the camera tool of SNSs within private messages (e.g., filters and editing tools) might be the only reason to opt for SNSs for the purpose of sending pictures taken by themselves.

As reported in other studies investigating photo-sharing on SNSs (Bayer et al., 2016), interpersonal communication on SNSs is predominantly distinguished by playfulness and entertainment, two aspects that contribute to relational maintenance (Baxter, 1992; Hsieh & Tseng, 2017; Proyer, 2014). Play is a safe communication strategy that serves several social functions, such as promoting spontaneity or increasing bonding (Proyer, 2014), and playful interactions can help cultivate intimacy (Baxter, 1992). Our respondents explained that the content exchanged for the sake of phatic communication and the visual references to shared knowledge and experiences were typically "funny," helping them maintain "light" contact with their partner and strengthening the relational bond. Tong and Westerman (2016) also found that romantic partners were more likely to use SNS private channels to convey intimate or negative information while presenting a positive image of themselves as couples through their publishing activities. Contrary to suggestions by Tong and Westerman (2016), our respondents explained that private conversations on SNSs were unsuitable for negative discussions and confrontations, neither for addressing negative topics nor for particularly intimate conversations. For these kinds of issues, romantic partners avoided SNSs and messaging apps, considering face-to-face or phone confrontation more appropriate because of the more significant presence of richer cues. We argue that technological changes, such as increased use of Voice-over-Internet-Protocol apps (Fumagalli et al., 2021), could have also played a role in these different findings.

Brown and colleagues (2017), referring to interpersonal communication on SNSs between close relationships, reported that friends demonstrate their value for their close relationships by sending private,

personalized messages that require immense time investments. Our findings, in contrast, illustrate that interpersonal communication on SNSs typically ends with the first message or the first reply from the partner, with further discussion potentially continuing through other channels. Therefore, interpersonal communication on SNSs was adopted for exchanges that did not require time investments but, instead, for those that were mundane and spontaneous.

9. Conclusion

Our research illustrated that, at first glance, interpersonal communication on SNSs is perceived as marginal and not particularly important for maintaining romantic relationships. Interestingly, however, messaging apps, such as WhatsApp, with similar affordances to private conversations on SNSs, are extensively adopted and play a central role in couples' communication repertoires. Nevertheless, our study shows that adopting a communicative interdependence perspective is beneficial instead of studying interpersonal communication on SNSs per se. The importance and relevance of interpersonal communication on SNSs was revealed only when interpreted against the backdrop of couples' communication repertoires. Indeed, interpersonal communication on SNSs can serve as a prompt to begin new conversations on other channels and as a trigger to recall shared experiences and continue conversations started outside of SNSs. Moreover, interpersonal communication on SNSs presents three characteristics that distinguish it from that on other channels: the exchanged content from which a conversation starts is exclusively visual content found on the platform; most exchanges present a very light, playful, and funny tone; the conversation never goes beyond a few short exchanges.

Furthermore, we highlighted the crucial role of visual communication in romantic partners' interpersonal communication on SNSs and described four social functions accomplished through their exchange of visual content that can contribute to maintaining the bond. First, visual exchanges serve the function of phatic communication, where "irrelevant" and entertaining content is shared for the sole purpose of maintaining connection in the dyad. Second, it can help maintain the relationship by sharing the memory of shared experiences or knowledge. Third, it works as functional sharing, that is, sharing information on topics of mutual interest that may lead to new conversations or joint actions carried out outside of the platform. Fourth, it helps project the relationship into the future via inspirational exchanges about desirable or "dreamy" future experiences, maintaining the relationship by making assumptions about its longevity (Lang & Carstensen, 2002).

Finally, we clarified that visual exchanges between romantic partners on SNSs involve nearly exclusively visual content found on the platforms and then forwarded to a partner. From the partners' point of view, such content, which was initially the product of a mass-communication sharing act of another user, became an opportunity to initiate interpersonal communication. This last consideration indicates that mass self-communication and interpersonal communication on SNSs are not opposites; instead, they can be intertwined and reciprocally inspirational. Further research could then explore the interplay between mass self-, masspersonal, and interpersonal (visual) communication on SNSs and investigate the implications for SNS use by romantic partners.

Our research presents some notable limitations. First, the findings are based on a national sample and, thus, are restricted to a specific geographical area. Moreover, some age groups may be underrepresented despite our sample including people across a broad age spectrum (18–91 y/o, M = 36.3). For instance, including a higher number of elderly couples could have led to different results. Furthermore, we did not include adolescents under 18. Future research is encouraged to include adolescents because of potential dissimilarities in SNS use, and previous research has illustrated that children become social media users at a young age (Gray, 2018; Hartley & Potts, 2014). While we made concerted efforts to guarantee confidentiality and employed inclusive language during our participants' recruitment, regrettably, we could not include individuals in polyamorous or open relationships. Consequently, we acknowledge the limitation of our research in not encompassing diverse forms of romantic relationships beyond the dyadic

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bond. Future research should include non-monogamous relationships when investigating romantic relationships and SNSs; or, if not possible, should investigate what factors contribute to non-monogamous participants' hesitancy in engaging with research, such as potential privacy concerns, professional apprehensions, and the fear of judgment, discrimination, or misunderstanding arising from potential perceived social stigma.

It must also be considered that this research was qualitative in scope and, thus, was based on a small sample size, and the nature of our analysis was explorative. This is not a limitation per se, as we obtained very dense data and gained in-depth insights into the communication practices of couples. The present study does not aspire to reach generalizability in terms of the results. Future research is invited to do so and apply our findings in quantitative investigations.

Additionally, our study focused on the maintenance phase of romantic relationships. However, several studies have underlined that romantic partners' SNS use changes according to the stages of relationship development (e.g., Fox & Anderegg, 2014). In our study, some respondents who no longer used SNSs for interpersonal communication reported using Snapchat during dating. Before becoming a couple, they used it to exchange pictures as phatic communication, but also for erotic exchanges. Such insight confirms that sexting may take place on platforms that provide the possibility of ephemeral communication (Poltash, 2013). Further research might investigate changes in visual sharing practices through interpersonal communication on SNSs between romantic partners in the maintenance and initiation phases.

Despite its limitations, to our knowledge, our study is one of the first to address interpersonal communication on SNSs between romantic partners and link these exchanges to communication practices involving other platforms and media. Our findings contribute to extending understanding of the importance of communicative interdependence in studying romantic relationships and highlighting the crucial role of visuals on SNSs, hopefully paving the way for further research about SNSs with a focus on visual communication.

Data availability statement

Supplemental material about the larger research project on which the article is based can be found at https://doi.org/10.5281/zenodo.10557162.

Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and publication of this article.

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Shadow footprints and the provision of digital behavioral data

A digital civics perspective on psychology research

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Abstract

We introduce the concept of shadow footprints as a means of understanding privacy challenges in the information environment. Growing emphasis on the impact of citizens sharing their personal data goes far beyond the individual, with the increased capacity of algorithms to formulate shadow footprints that inform as much about persons absent from data, as persons present. Data extrapolated from small groups have demonstrated robust utility when applied to larger populations. Individuals who have opted to keep their data private, or who have been unaware that data about their private lives has been extracted from the involvement of their fellow citizens from digital behavioral data, suggest the possibility that informed consent has been circumvented, or not fully investigated. This is increasingly concerning when one considers the potential to impact the body politic through behavioral manipulation drawn from such data. These issues must be considered in the context of ethical and litigious standards to inform robust policy frameworks, legal regulation, and the provision of incentives necessary to provide guidance and civic protections, as well as adherence to good ethical practice.

Keywords: data privacy, information ethics, informed consent, surveillance capitalism, Belmont, digital civics.

1. Contextualizing the challenges of data acquisition in the public sector: A digital civics lens

Behavioral research data can be used to impact the lives of all citizens, including those who have expressed their privacy intentions, with serious implications. This work examines the consequences of behavioral data acquisition across the civic sphere, considering the impact of personal data sharing for psychological studies in the public sector. Ethical methodologies and guidelines for behavioral research data are a critical part of all research methodology, yet such methodologies are often under-researched. We argue that by employing digital civics as a lens to contextualise the landscape of behavioral data acquisition we can identify the vulnerability in data sharing for scientific research in the public sector and observe its potential civic complications that can consequently arise across both the public and private

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sectors. We draw evidence from a range of arenas including law, finance, and foreign policy to highlight the breadth of potential consequences impacting the civic sphere. Reinvigorating the fundamental ethical principles enshrined in Belmont (1978), we explore how offering potential solutions to these issues creates new questions.

Given the integral necessity of data collection to the scientific process, the practices of data's collection, storage, and use, managed through codified ethics regulation have sought to protect and reassure data subjects that they can have relative confidence sharing their personal information, whilst also ensuring that the quality and integrity of researchers' data and practices are sound (Christian, Johnstone, Larkins, et al., 2022). Examples, including informed consent, secure data storage, and the agreement of anonymity, have been useful tools familiar to many researchers. But, even before the increasing ease of information transference and accessibility, and its potential for data breaches, there have long been issues in the data use landscape. Research findings can always be operationalized for purposes other than their initial intended use (not simply in the public sector, but in the private sector also). The need to respond to this long-standing challenge has been enshrined in the Belmont principles (1978) and reflected in contemporary APA ethical guidelines (2017), but the acknowledged value of forethought in research application has become increasingly complex. As technological advancements open new areas of inquiry, improve our accuracy, and open increased opportunities for predictive behavioral modeling and manipulation, increased issues become apparent. Complications in privacy and data anonymization through use of other existing data sources have also been observed (ICO, 2012, p.19). In addition to this, the capacity to create knowledge from a void of data itself, given its connection to other data sources (See Garcia [2017] on "leaking privacy" in the context of revelations that Facebook constructed "shadow profiles") means that further issues in terms of privacy and data consent are surfacing in the scientific landscape. The complexity and speed with which changes occur, particularly where research meets innovative technology, often outpaces the policy or legal precedent, leaving researchers with a dearth of reliable guidance or even conflicting guidance, and is often fraught with deeply held personal opinions. In short, the professional research scientist is frequently left to manage a highly complex, potentially under-regulated, and emotively charged ethical dilemma: data acquisition is required for good psychological research, yet the mere act of this necessary scientific process of data acquisition, and the research springing from it, could result in serious detrimental consequences that the researcher will not be able to control. While this dilemma has long been a recognized part of the Belmont principles, the increasing competence of Machine Learning and potential of Artificial Intelligence in the data environment means that data could be re-identified, and exploited, through fairly straightforward processes. (The ICO's draft guidelines [2021] discuss such re-identification and its associated risks.) Further, the consequences of such data sets in the context of our increasing ability to extrapolate and operationalize information can be used to affect the behavior, not simply of individuals, but also entire demographics and communities. To address this burgeoning arena of challenge, we apply a lens of digital civics, which assists us in understanding current changes in the technological landscape, and how we must consider, not only their application to various processes, but the ways in which these technologies change our concepts of self, and consequently, our behaviors toward ourselves and others (both in individual and communal contexts) (Clements, 2020a). Digital civics is defined as "the rights and responsibilities of citizens who inhabit the infosphere and access the world digitally" (Clements, 2020a; 2017). By appreciating the staggering changes in self-perception that are occurring in the digital age we can gain better vantage of the impact of these new technologies, and the ways in which their use may be affecting our lives and world (Floridi, 2009). This means that civic processes that once seemed quite appropriate, must be rethought, restructured, and redeployed; a process accomplished through consideration of four conceptual resources that help us methodically approach these changes: philosophy, ethics, history, and civic structures (Clements, 2023; 2020a). Using this digital civics lens, we explore the specific processes that use digital behavioral data sets and research in this context. This research asks the key questions: How do our philosophical views of self impact the changing ways we understand

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privacy? How will our ethical expectations change and how can we ensure our practices effectively address emerging ethical problems? What previous lessons can we draw from to help us address these challenges, and through what contexts do we approach our world? And, how might the structures and codes, such as the Belmont principles, ethical regulations, and even the incentives to adhere to ethical processes, be made more appropriate or effective for our digital age circumstances? (For a more thorough discussion of such questions for shaping digital civics policy initiatives, see Clements, 2023).

2. The shadow footprint: A paradox of civic and personal responsibility in data acquisition

As researchers in the public sector exploring questions in the disciplines of ethics and of psychology, the authors of this paper have observed how Psychological science in the public sector (such as university research, or research funded by a public body) has actively relied on, and encouraged, research participation as an important and responsible civic behavior. But the altruism of citizens to contribute to scientific advancement in the public sector can also create a powerful vulnerability that extends into, or is connected with, the private sector. This is due to the complex inter-relationship of these sectors (broadly discussed below). While public research is made accessible, including to the private sector (a situation further complicated by the frequent use of private sector apps to acquire research data for public sector research) private companies are often protected (ie. by laws protecting trade secrets) from disclosing their own research data or findings. This dynamic sets up a challenging situation with the acquisition of public research data, because, as we will now discuss, sharing personal data can have impacts far beyond the individual who opts to provide their own data, extending to their broader communities and networks, particularly given the convergence of multiple datasets that can be exploited, not simply for what they do say, but also for what they don't. It has been well established that insights about, or the nature of, a sample of a population can be representative of the entire population when seeking to understand patterns or behavior (i.e., analyses of a few may result in insights about many; Jenkins & Quintara-Ascencio, 2020). As such, regardless of the extent of care a single individual may take to protect their privacy, significant insight into other individuals is afforded via the analysis of data belonging to others from the same demographic. This means that traditional mechanisms for personal data protection, (i.e., self-regulation, a lack of sharing personal data, or withholding consent) do not adequately protect an individual from invasive data analysis of their person. Analysis based on others whose data has been made readily available and who possess shared demographic information, traits, situations, and so forth, can provide deeply insightful and highly targeted insights about that individual. In short, a lack of data is still data, and when all, or indeed most, of the surrounding data is present, it's much easier to see the shape of the missing piece: in the case of individuals interacting within a networked, information-rich environment, this allows the formulation of fairly accurate and highly specialized profiles of individuals who, while they may not technically be present in the data environment themselves, can be extrapolated into digital existence by their surrounding data representations. We label this phenomenon, the shadow footprint: a composite of the terms shadow profile (a concept discussed in the wake of the 2012 Facebook data breach in which it came to light that Facebook was in possession of information about individuals that had not been provided by those individuals [See: Garcia, 2017]) and digital footprints (in which an individual's life and movement on and offline can be tracked through their personal data [Sjöberg, Chen, Floréen, et al., 2016]). Shadow footprints are not only the composited development and deployment of information from a single profile, but include the entire interconnected footprint of an individual's composited data increasingly traceable via their informational identity throughout the interconnected online and offline environments. Thus, the footprint includes all the data that can be derived from consensually obtained data, as well as that obtained from instances where consent is not required, as an individual moves throughout the information landscape. These footprints can be described as dynamic (building conceptually on shadow profiles' more static data representations), responsive to changing information

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(through their integration of more time-dependent data, for example), and pervasively accumulate the experiences of individuals by drawing from a wide range of data sources, and the interplay between those data sources (compounding and integrating their insights). This is made possible by the networked and information-rich environment, and its tracking technologies, that now function in offline as well as online contexts. Able to provide insight, not only as a profile in one digital environment or for a singular service, footprints track users across services, throughout routine activities, able to formulate a picture of daily life; connecting data, not simply through friend groups and location data, but the interplay between services, and from the communally acquired insights from shared demographic information. When such data is conjoined to formulate a shadow footprint, intimate aspects of daily life become revealed in new and extraordinary ways with, what our current knowledge of shadow profiles and digital footprints suggest, would present a potential for remarkable accuracy, and profound insight. Thus, a picture of an individual's life could be elucidated without that individual ever signing up to a service, and never providing consent.

Considering the potential, such data acquisition may feel like a type of theft against people who don't want to share their data. But such unwarranted observations into the intimate data of a person's life are often legal, or at least, not specifically legally prohibited. Fellow people within their own demographic, or simply in close network contact, sharing personal details can unwittingly help to supplement missing information with a high degree of accuracy (see: Garcia et al., 2018 for a discussion of shadow profiles in the context of Twitter users and non-user, which interestingly, comments on predictability of location based on data from Twitter, but applied to contexts of users outside of Twitter: indicative of the potential of such data to formulate shadow footprints). This extends concern about informed consent: as those guarding their data may have taken significant pains to do so, indicating they do not consent to use of their personal data, whilst simultaneously this data may become available to third parties through other means. It becomes a consensual loophole: a phenomenon that should be impossible given the clarity with which individuals may have made their intentions to safeguard their data known. Yet the capacity to acquire data, pair it with other data from multiple sources, re-identify it, and fill in any missing information with what can be gleaned from available (Kosinski, Stillwell & Graepel, 2013) and targeted demographic data (Garcia, 2017), essentially makes available an instrument to acquire private information, circumventing, not only the usual consensual process, but additionally, the very mechanisms that data protection and research laws aim to create. (For a useful visual explanation of this, see the New York Times Privacy Project [Thompson and Warzel, 2019].)

The difficulty is further exacerbated when we reflect on the remarkably small number of people required to provide insights into a demographic, and the capacity to use that demographic data to elaborate on missing information pertaining to an individual's personal circumstances, thereby negating all of the work done by careful, or aware, members of the community to guard data as a vulnerable entity (even when those citizens actively seeking to protect that data represent the overwhelming majority). The insight here is that some members of the public could place the rest of their community at risk by unwittingly providing a stream of psychological insights about a group that even most of those group members may have attempted to keep private. Yet at the same time, these same citizens are encouraged to take part in the sharing of data as important and altruistic behavior (Clements, 2020b). This powerful paradox asserts that responsible citizens are simultaneously expected to guard their data fiercely, as well as share it openly. And this paradox can be witnessed across the spectrum of activities spanning the online and offline environments (that is, the entire informational environment of the digital age: a conjoined world of information that philosopher Luciano Floridi [1999] has usefully termed, "the infosphere"). For instance:

- Citizens should engage in citizen science movements to input and collect data for use in scientific purposes, but this data could also later be used against them without their knowledge (For instance, thanks to LiDAR technology, the photographs we take, can help improve geological understanding, but the sharing of this information can also be used in nefarious ways that can build a picture of the

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research participant, and when paired with other behavioral data, reveal ways in which they might be effectively manipulated. (For a summary see: Clements, 2020b).

- Citizens should be aware of their legal opportunities under the Right to be Forgotten, yet the protections it offers against secondary use of data, and the mechanisms that will allow consent to be revoked under this legislation are still unclear even to experts (see: Politou et al., 2018, p.9, and Esposito 2017, p.8).
- Citizens offer informed consent, yet become vulnerable when that informed consent is deployed in ways that do not take care to actually ensure citizen's consent is truly informed. This could allow harm to come to citizens by suggesting that citizens were fully aware of consequences when they agreed to data share in the terms of a social service to be able to interact with others online. (For instance, the contractual language and inaccessibility of style and length in many terms and conditions agreements [see: Obar & Oeldorf-Hirsch, 2020]).

While citizens share their data in the hopes of furthering scientific goals in the public sector and achieving a better world and society, they may not always be aware of the ways it may later be used against them, placed into a new context for exploitation, or employed to reveal important details about their fellow citizens, given the data's fiscal or political currency in the private sector. Thus, a privacy paradox for individuals can quickly become a communal vulnerability. We might view this paradox through the insights of Walter Ong (1982), the media ecologist who postulated "second orality", given that media ecology can provide useful insights for digital civics (Clements, 2023), informing our digital age psychological perspectives about the media-rich environment in which we live. Ong (1982, p. 133) explains that a feature of second orality "is the presence of aspects of oral cultures, (such as its communal sense) within the context of a literate society (in which modern concepts of the individual function)" (Clements, 2017, p. 117). The scholar Charles Ess (2010, p. 116), has proposed the concept of "Hybrid Selves" (conjoining individual and relational selfhood) as one response to this conundrum, and it has already demonstrated some utility addressing personal data in public contexts (see Nissenbaum, 2010). Indeed, the challenge of reconciling the responsibilities one has to oneself, with those one has to the group becomes particularly pertinent when we consider the ways in which shadow footprints can also influence our greater community.

3. Shadow footprints and civic structures: Public researchers in a world of surveillance capitalism

Data acquired and studied in terms of key demographics and groups can be used for shaping civic and social, as well as influencing individual, behavior: it is not only possible to maneuver individuals through the social and civic space, but to influence large groups of people, and impact the group dynamics of these spaces as well. When we approach this insight through a digital civics perspective, and consider how such data acquisition and deployment may act upon our underpinning civic structures; such as laws, civic institutions, democratic traditions, or civic bodies we can begin to assess the challenge of such potential change. It's true that new technological processes have tremendous positive potentials (such as the health benefits of IBM's Watson [Chen, Argentinis &Weber, 2016]). But our existent structural challenges and issues also act upon and delineate the influence and activity these new data sets and mechanisms undertake: how we have been conditioned to behave in the civic sphere, and the ideas we take for granted, influence the ways we condition ourselves for the future. Consequently, while new data, and the ideas we extrapolate from it, hold the potential to alter the ways in which we engage in our civic sphere positively, equally, they can simply reinforce dangerous and unjust practices, like systemic racism (Richardson, Schultz, Crawford, 2019), or colonialism (Costanza-Chock, 2018). We must also consider the ways in which public and private interests may overlap in the civic realm, and how such alignments may also become inimical.

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In this context, when we consider the potential role of the shadow footprint in this civic arena, we must become aware of, not only the vast potential of data available from our own data disclosures over time, but the revelation of those disclosures on the wider community. To understand how psychological research data may be used in this way, we must understand the increasingly rich data sources acquired by corporations and applied in increasingly vast, and often misunderstood ways, and their vast revelatory potential. We need also consider the wider context in which public sector researchers operate and how their aims and obligations differ from those of the private sector who view such data as an exploitable resource. "Trillions of data points and six million behavioral predictions per second are the surface of a shadow text over which democracy and its demos have no knowledge, no authority, and no control" (Zuboff, 2019a, p. 19). This practice, which the researcher Shoshanna Zuboff describes as "Surveillance Capitalism" (Zuboff, 2019b), creates an "epistemic injustice" in which a small group, driven primarily by shareholder interests and earnings, can exercise control over the civic and social space (Clements, 2022a). The inter-related fiscal issues that sit at the heart of digital technology research into behavior, and civic processes, highlight the ethical conundrums that arise because "it is the surveillance capitalists who occupy the catbird seat in this new world. They know, they decide who knows, and they decide who decides" (Zuboff, 2019a, p. 19). Building on these surveilling concerns, the legal scholar Julie Cohen delves into the practical realities, from an informational perspective, of such surveillance power in the legal-political sphere (see: Cohen, 2019) redeploying this activity more precisely as "informational capitalism" and highlighting the threats it poses to democracy and the democratic underpinnings of the rule of law. As Amy Kapczynski (2020) points out, reviewing Cohen and Zuboff's work "… informational capitalism brings a threat not merely to our individual subjectivities but to our ability to self-govern. Questions of data and democracy, not just data and dignity, must be at the core of our concern today." This is placed into sharp relief when we consider even the most obvious political uses for such data.

Indeed, perhaps some of the most revealing examples of data demonstrating its potential political power and democratic impact have come from location data. An investigative report from the *New York Times* identified how location data could be used to identify protestors, political actors, celebrities, and private citizens; literally tracing them between venues and events, and to their homes (see: Thompson & Warzel, 2019) charting a map of their political influence or democratic engagements. The sale of such data is lucrative and can include purchases from legitimate data location companies, but also leaked data, such as that purported to be stolen from the Shanghai police and sold on the dark web, as recently emerged (Xiong, Ritchie, Gan, 2022). With the capacity to acquire such data sets and feed them into behavioral modelling with the intention of impacting behavioral outcomes, the implications for the body politic are deeply concerning. From manipulating groups of protests, either to action, or inaction, an individual or corporate body with the fiscal power to enact such technologies in conjunction with the insights of psychological research, can hold unyielding power over citizens even without those citizens knowing they are being manipulated. For instance, election manipulation relies on psychological principles, not just group think, but concepts like motivated reasoning, and affective polarization (Nisbet & Kamenchuk, 2018) to create circumstances of belief, such as a candidate's fitness for office based on information that may be heavily edited/altered/or even entirely fabricated, and that has circulated with apparent support within a group of like-minded persons. These tactics work, not only because they are able to convincingly target individuals sympathetic to a particular cause, but because they ensure the circulation of ideas through networks that ensure the likeliest success based on channels of affinity formulating a unified set of social views as they use the power of interpersonal influence (Raven, 2008) to trickle throughout the population and influence the dynamics of a group. Shadow footprints provide increasing amounts of data about individuals leanings, that allow for the formulation of strengthened networks of common purpose, and the manipulation of group dynamics, that can achieve a multitude of aims specified by those who have the information made available by these shadow footprints. This would include, for instance, the surveillance or informational capitalists that Zuboff and Cohen describe, or those with the financial

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capacity to purchase such data (or wealthy private individuals, or nation states). Surveillance and informational capitalism is about more than just corporate shareholders and earnings, it is about the power to shape global events in aid of these fiscal drives, and the even greater opportunities that power provides, because combining this data with these tactics formulates effective mechanisms that can be deployed in disinformation campaigns, foreign policy contexts, election meddling, and financial manipulation. The recent spate of media content generated about the American Depp/Heard trial, and subsequent interview on that topic given by the analytics company Cyabra (see: Vice, 2022; Fox, 2022; Vanity Fair, 2022), suggests that such tactics could also be deployed in the legal sphere and public life. That is, these tactics can appear in any of the power structures of our civil society.

Consider, for instance, how financial data is reflective, not simply of fiscal interests and sentiment, but of the wider global picture of interconnected behaviors, expectations, and events. Its analysis, increasingly inclusive of the tiniest measurable impacts, can provide a snapshot into global circumstances, trends, and impacting variables, helping it predict later outcomes and behaviors: a trail of influences traceable through digital data, extending from the smallest thunderstorm in the pacific as it impacts crops, to the largescale impact of those crop changes on government spending or stability months or years later. The ability to analyze and explore such data reveals global shifts in markets but could also anticipate human responses to these: how individuals and groups might be moving and behaving, or even how they might be moved to behave. AI systems (or perhaps more correctly, smart algorithms and deep learning) such as Blackrock's Aladdin already show enormous potential (Henderson & Walker, 2020). Meanwhile, in the foreign policy sphere, psychological research data and findings, coupled with new data acquisitions, can raise numerous issues. The capacity to influence political outcomes – to spur action or inaction, circulate re-contextualized information, or pinpoint conspicuous individuals or groups capable of influencing or inflaming strong public opinion and action – is as readily available to foreign powers as it is domestically. This is brought into even sharper focus when we consider the deployment of bots across coordinated networks for political amplification (Schliebs, Bailey, Bright, et al., 2021) or vast stores of data that can be acquired and mined for insights about citizens. A recent Reuters investigation highlighted US government warnings that one company was sending DNA data from women's prenatal tests to China's military (Needham & Baldwin, 2021). As senior Georgetown fellow and former U.S. counterintelligence officer Anna Puglisi commented "When you can combine large amounts of genomic data – including mothers and their unborn children – with their medical data and history, it is really powerful" (Needham & Baldwin, 2021).

The value of specific targeting based on intimate knowledge of individuals, and the psychological ability to identify those most likely to act on the word of an agent provocateur (see, Bradshaw, Bailey & Howard's [2021, p.9] discussion of citizen influencers), play important roles in these activities. In their work on the psychology of state-sponsored disinformation campaigns, Nisbet & Kamenchuk (2018) discuss the myriad psychological mechanisms potentially at work (including: motivated reasoning, affective polarization, identity affirmation, learned helplessness, the role of self-esteem, cognitive and affective reactance, and the continued influence effect). Yet, as they rightly observe, despite the clear emotional and cognitive responses driving these campaigns, an over-abundance of focus on technological functions has shaped understanding on this topic (Nisbet & Kamenchuk, 2018 p. 65). But, it is behavioral datasets providing the tools to remake the map of political influence. From surveillance capitalists to foreign powers, shadow footprints, the deployment of behavioral datasets, the learnings gleaned from this area of research, and the psychological understanding of how these concepts might be deployed to manipulate the body politic in democratic nations, is formulating vast challenges in the sphere of domestic and foreign policy. It also suggests that power acquisition and dispensation may eventually be the sole preserve of those in possession of the wealth to maintain their control over data and its psychological knowledge, and not the ordinary citizens of a democratic nation. A startling revelation when we consider that much of this research, not simply datasets, but also research findings, originate in the public realm and should be publicly owned. Instead, in this context, a capitalist-pseudo-Foucauldian, money-is-

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knowledge-is-power, dynamic can play out: fiscal support of behavioral data research can ensure that data sets remain under the control of private sponsors or political entities. Perhaps similarly to the historical ways scientific research into burgeoning areas of the scientific unknown remained under the control of the Catholic church in a bid to retain social control through the power afforded by knowledge that could be shared with the public only to the extent is allowed control of the demos (Foucault, 1977). Though Zuboff (2019b) separates herself from Foucault, this would seem to support her insights that surveillance capitalists occupy the catbird seat (2019a), but they must also make room, in a game of political musical chairs, for wealthy private citizens and state sponsors. The democratizing potential, touted in the early days of the digital age, seems less realistic in light of these observations. But, that the same civic power structures and challenges now move across the digital landscape should be no surprise given the aforementioned insights offered by digital civics research: that behaviors and structures are consistent on and offline, given the ontological continuity of the informational environment (Clements, 2023; 2020a). It is worth considering that we are, perhaps, dealing less with new and emerging issues, as we are struggling with very old ones (Clements, 2022a) and perhaps suggests that we seek support through reinvigorating underpinning democratic principles instead of taking radical actions that remove our defining democratic traditions. This seems in line with Cohen's suggestions that we must ensure our laws sit in alignment with democratic principles (Cohen, 2019, as cited in Kapczynski, 2019), and with Zuboff's arguments in favor of improved legal codification, as opposed to the removal of such litigation in favor of self-regulated codes of conduct as requested by surveillance capitalists (2019b). A challenge indeed, as "well-funded teams of lobbyists and lawyers … arguing … promising opportunities to bypass new regulatory obstacles" (Zuboff, 2019b pp. 456) await. Before we explore this re-invigoration though, we might reflect on the value of personal data from a less fiscal perspective.

4. The sanctity of personal data in a discipline reliant on personal data: Challenges to the maintenance of ethical practice

One of the challenges is that the value of personal data is not widely appreciated, not only by the general public, but even, often, by professionals. Perhaps, similarly to price not impacting neural mechanisms when using a credit card compared with using tangible cash when making a purchase (the price is 'out of mind'; Banker, Dunfield, Huang, & Prelec, 2021) so too does it appear that potentially, one typically does not consider the true 'price' tied to providing something as intangible as personal data. Indeed, numerous studies have observed that users tend not to understand the privacy implications of their data sharing online (Dwyer, Hiltz, & Passerini, 2007; Acquisti & Gross, 2006; Jones & Soltren, 2005), even after being educated about the risks (Govani & Pashley, 2005). This apparent painlessness of transaction is enhanced by data's apparent lack of value as communicated to the public on a frequent basis: exchanged for use of services to platforms and digital sites, companies often claim their services are "free".

This is particularly important, as digital civics prompts us to consider the impact of the aforementioned ontological continuity of the infosphere on our views: that is, that the conjoined nature of the online and offline environments means that increasingly humans see themselves as informational entities (Floridi, 2005). If we are taught by private enterprise that personal information has little value, we are in effect being taught that we, as persons, have little value. Surveillance capitalist companies can shape the social system of belief by normalising this perspective, continually reinforcing it given the daily basis on which users access their services. Equating free with the exchange of personal data sets up a dangerous psychological dynamic, one that devalues not simply privacy, but the very nature of individual identity, particularly as we need to use our personal information to differentiate ourselves online in a variety of contexts from social, to fiscal, to political (Floridi, 2009, p. 11). In this case, the earlier Ongian paradox is further exacerbated: the necessity of good data is paramount, yet, at the same time, we must find ways that at once approach our privacy concerns while simultaneously acknowledging our communal need to share data (Ess, 2010). The aforementioned concept of hybrid selves (Ess, 2010) has a critical role to

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play, but can only be successful if we appreciate the critical value of personal information. This being the case, data should be viewed as sacred capital, the most precious resource we have to understand ourselves and our world, and its sanctity, fiercely protected. This is particularly relevant from a psychological perspective, where psychologists overwhelmingly study the effects of intangible latent variables. For example, in effect, there is no thermometer for depression, latent variables can only be measured indirectly and estimated via observed 'symptoms' or indicators. Consequently, this method of measurement is already prone to error due to its indirect nature, thus data clarity and purity of such indicators is crucial. This is why self-reported data studies may be problematic and also why access to data from source is vitally important. Yet often such social science "research has relied on self-reported engagement" (Johannes, Vuorre & Przybylski, 2021). Collaborations between public research institutes and private industry are emerging (for instance, Johannes, Vuorre & Przybylski [2021] researched psychology and video game play with data from Electronic Arts, and Nintendo) but such practices are currently rare.

Such collaborations, or even acquiring corporately owned data from source for public research, can also be hindered because corporations are held to different research standards than public research institutions. For instance, they can collect, process, and deploy data and research findings in ways that do not seem to reflect the same processes required by public research institutions (see: Zakrzewski, 2022). They are also able to change their terms of service, meaning they could prevent use of their data by public researchers. This leaves public research reliant on the good will of those citizens now caught up in, and further entrenching, the aforementioned altruistic paradox of personal and civic responsibility. Meanwhile, these citizens who make the effort to volunteer for publicly funded research studies are not necessarily representative samplings of the public, and their behavior may alter because they know they are being studied (Feest, 2022). This can set up a challenging situation for public-body researchers, in which the cost of ethically sourced data may feel like a reduction in data quality, while objectively better data seems to sit in the hands of companies and corporations whose business involves generating such datasets (Johannes, Vuorre & Przybylski, 2021), whether or not the public understands such datasets have been compiled. It also begs the question, at what point it became acceptable for companies to hold large bodies of data that they may utilize for fiscal purposes, potentially against citizens' best interests, but not to conduct important research for the benefit of our world, our communities, and our humanity?

In universities and research institutes, research funding can and will be suspended if certain ethical principles are not met. But how this is managed within a corporate environment, in which fiscal remuneration may be contingent upon undertaking the sorts of ethical risks that give rise to information-rich datasets, remains to be seen. If a company wants to know how to sell a product, keep users engaged for longer, or coax data or personal information from individuals, then ethical practices are not the aim, but rather fiscal gains, thereby setting up an unfortunate dynamic in which not only is there little incentive to follow ethical guidelines, but it may prove temptingly advantageous not to do so. That is, such guidelines may present a tokenistic burden for goodwill, prompting a temptation to not appropriately declare things that may be "edge research" (research that sits on the "edge" of ethical boundaries. See: Woodfield, 2017). Indeed, such use of tactics, including "dark patterns" and misleading promises of privacy protection are alleged in a current lawsuit brought by four American Attorney Generals against Google (Zakrzewski, 2022). Compounding these ethical issues, private companies can also exert influence into public research via their provision of research funding to university institutions. The further potential of public researchers' concurrent employment by these same companies, means that the role of "ethical public researcher" (that is, someone supposedly independent and acting in the public interest) can quickly and easily be made questionable, potentially acting to allow or inadvertently lend credibility to unethical research, in an act the philosopher Thomas Metzinger (2019) calls the cultivation of "ethical washing machines". Additionally, when the credibility of independent public research is damaged, public trust is compromised in ways that may reinforce or justify the arguments of private enterprise (i.e., that

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such unethical practices may be justifiable in the interest of efficiency. See, for instance, Kapczynski's (2020:1483-1484) discussion of the use of Kaldor-Hicks criteria).

Meanwhile, the public research sphere is replete with other challenges to its ethical guidelines and conduct. In pragmatic terms, we are simultaneously, too comfortable, and not comfortable enough, with ethical risk. For while we create formulaic ethics processes to encourage consideration from researchers and ensure that processes have some form of public oversight, such processes tend to live and die at the planning stages of research, have few mechanisms for multiple reporting throughout the research process, and often fail to truly engage the real spirit of ethics: rather, they can be seen as one further bureaucratic task in a long series of tick boxes before the "real" research process can begin (For a discussion on these challenges, including the dearth of literature discussing them, see Christian, Johnstone, Larkins, et al. [2022]). At the same time, such procedures can be fearful processes for researchers looking to innovate and may cause concern that their project may be dismissed from an ethics committee without serious consideration, or worse, terminated partway through, if a pioneering strategy raises popular fears, or, potential litigious concerns. Researchers at Yale who revived a pig's brain found themselves at the center of a public ethical debate, despite having clearance and support from their university ethics committee (Farahany, Greely & Giattino, 2019).

We need to find ways of formulating and incentivizing living ethics procedures, not simply in the private sphere, but in the public one too, because a failure to engage with bigger and riskier research in public institutions may directly lead to: a failure to understand the types of research happening in the private sphere; lead good researchers away from public institutions; and result in naiveté about the sorts of practices that such researchers must be aware of.

5. Psychology researchers as ethicists: multi-prong approaches and democratic principles

Returning our focus to the re-invigoration of democratic principles as a means of approaching and incentivizing ethical practice, we advocate a multi-prong approach. For, while digital behavioral data plays an enormous role in these chains of events, we would be mistaken to believe that only by regulation alone would we achieve the necessary outcomes to safeguard society. Equally, it would be a mistake to assign blame for our own ethical responsibilities to the technology itself, circumventing the responsibility we ourselves owe our own behaviors. As we have discussed, at the heart of many of these activities, are human actors, attempting, with specific intention in many cases, to deploy technology to influence the outcomes of events, and behaviors of citizens for fiscal reasons, or citizens, failing to engage with the reality of their data disclosures, this is before we even consider the inadvertent or accidental outcomes of humans engaging in such technology deployment. Democratic principles include concepts like the rule of law, but also require aspects such as the engaged participation of citizens, checks and balances on power, and education.

Psychology, as a field, must assess its role within the greater framework of civic and social interaction, and find ways that its regulations and ethical components can complement and support a comprehensive and consolidated framework in conjunction with other arenas impacted by its research: including the impact of behavioural findings and data on the private sector. Psychological researchers in the public domain must recognize they are fighting a multi-fronted battle in the deployment of their research mechanisms and findings. They must engage with the reality that psychology research is not used in isolation for purely altruistic or theoretical purposes, but has 'real world' applications, and promote multi-stakeholder ethical engagement so that understanding of research impacts can be informed by interdisciplinarity to ensure outcomes are practicable, achievable, and accurate.

But this can only happen if we are frank about the challenges we face. The potential for the public and private spheres to collaboratively approach such issues faces serious obstacles. Indeed, the struggles articulated by ethicists themselves working for private companies are quite concerning and indicative of

these collaborative challenges. The high-profile treatment of ethicists, (for instance, Timnit Gebru's contentious departure from Google was widely covered in the press [see Hao, 2020]) damage corporate credibility at a time of developing public awareness into the issues of mass data collection and seem to make such collaborations an apparent impossibility. But equally, we must reflect on the complicated and differing motivations and expectations of ethicists and ethical researchers working in private corporations, and their employers (Moss &Metcalf, 2019). For while the focus of ethicists and ethically responsible researchers is to discuss and draw out ethical concerns, corporate governance in a private company is primarily answerable to shareholders. Ethics can fall behind a long line of concerns pragmatic to the everyday running of the corporate entity and its success, and in many countries the legal obligations corporate governance owes its shareholders are interpreted to mean company survival at the expense of other, arguably less foreseeably obvious ethical, concerns. In an environment where competitors are seeking the next breakthrough, the need to drive forward at the expense of ethics, perceived as a potential hinderance to fiscal operations, can be seen as legally necessary: placing ethics and the law at odds. And creating frustrating challenges and misunderstandings between public and private ideas about responsible research practices.

A failure to properly understand how companies operate and their responsibilities to shareholders, and the demands of corporate environments, can result in a failure to think critically about the ways risk might be communicated by ethical researchers within a corporate entity: to be heard not as a philosophical principle, but as a long-term challenge that will detrimentally impact a company's survival and long-term fiscal success. Finding pragmatic ways to incentivize and communicate ethical practice, and to embed it appropriately in ways that mean ethicists are heard, and private entities appreciate their responsibilities beyond short-term fiscal gain, are necessary if real engagement with ethical concerns is to take place, or even to make collaborations between sectors possible. This could include taxation incentives, or published metrics demonstrating corporate responsibility as part of a global index of public ethical values (like the models used in environmental "green accounting" See: UNESCWA, nd).

There are challenges for these responses too. For instance, they require global oversight to prevent companies escaping responsibilities or engaging in detrimental practices by moving jurisdictions, but at least they represent a starting place for engagement. And for collaboration to work, researchers and corporate governance must be able to communicate, so companies must be equally active in this process. This means enhanced protections for researchers (such as whistleblower protections, ensuring that researchers can safely make protected disclosures), and company cultures that actively embrace dialogical communication and feedback processes. Companies will also need to recognize the value of ethics: not only can ethical criticisms prevent future litigious issues, and spur product improvement, they keep the over-arching society on which stakeholders depend in the long-term, alive and functioning.

Oversight too, is critically important. The checks and balances in a democratic society necessitate emboldening and keeping independent, regulatory bodies such as Information or Privacy Commissioner's, and government legal advisors, in order that they may: take action as necessary; provide guidance; encourage transparency; and ensure legal regulations are enforced. And as Cohen (2019) observes, such legal mechanisms must be developed in ways that embolden democratic aims, not serve as means of further entrenching informational capitalist's power. Perhaps one of the greatest challenges in light of Zuboff's revelations about the potential of surveillance capitalists to find ways to circumvent these processes, is to ensure robust mechanisms that can support codified regulation, while simultaneously acknowledging their ethical requirements enshrined in the underlying spirit of the law (Clements, 2022a). Education, citizen engagement, and ethical ideas can assist with this. Identifying and engaging with psychological mechanisms can also be useful (Debatin, Lovejoy, Horn, et al., 2009; Nisbet and Kamenchuk, 2018). Nisbet and Kamenchuk (2018) further identify information and media literacy as an important skill to cope with many of these psychological deployments. Such literacy skills are also a component of the digital civics pedagogy framework (Clements, 2020a; 2022b), that can help approach the challenges of digital extremism and misinformation (Rea, 2022). Digital civics pedagogy also

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advocates civic engagement and participation, supporting citizen's knowledge and empowerment by teaching key skills around good ethical judgement, with the kind of approaches that encourage flexibility, forethought, and empathy from an intellectual perspective to approach novel challenges (Clements, 2022a). Such skills have a long history reaching back to antiquity, suggesting this is an ancient quandary, birthed anew in our digital age (Clements, 2022a). For example, the utility of the concept of 'Phronesis' (or 'practical wisdom') to support the development of solutions to ethical (and even pragmatic) quandaries in the digital age, has been identified by numerous scholars (see Clements, 2023; Ess, 2007; Stern, 1997). Hailing from classical virtue ethics, Ess (2007, p. 15) describes part of its capacity as "precisely the ability to discern what general principles may apply in a particular context – and how they are to be interpreted to apply within that context as defined by a near-infinite range of fine-grained ethically relevant details." The flexibility offered by Phronesis would also seem to respond to the need to keep ethics processes "living", encouraging a sustained concern with the ethical potentials and shifting landscape of research projects. The sustained exercise of such wise ethical judgement using general principles can be a useful supplement for a codified ethical framework, such as Belmont. Additionally, the foresight, to appreciate and anticipate the potential later uses of research, constitutes an important part of the Belmont principles (1978), also present in the updated APA ethical guidelines (2017), by which we are all brought together to appreciate our ethical obligations. But such processes will require the active curation and guardianship of digital behavioral data, and now we finally turn our attention to how such processes might be implemented. Again, this is not so much an issue of updating the Belmont principles, as it is implementing them in ways that are contemporary to our digital age, taking account of real-world ways in which civil structures are increasingly impacted by capitalist entities, and the ways in which the online and offline environments are increasingly conjoined through their informational connectivity.

6. Guardianship and data: The APA's ethical principles revitalized not reinvented

How can we address guardianship issues in ways that will engage with the real-world challenges set before researchers, acknowledging the increasing awareness of political and fiscal control sought through the use of shadow footprints? To expect ethical practices from industry and private entities, surely as academics and research institutes we must lead by example. As our review indicates, the current approaches and frameworks within the digital age need rejuvenation, notably with regard to the impact of 'shadow footprints' that result from large scale data collection and analysis. This is not to say that a new set of values are required to be established, but that they can be supplemented through digital civics insights. For instance, recognition of the Ongian "second orality" we discuss, suggests the need to take the community/individual relationship into account. Indeed, to an extent, the APA's Ethical Principles of Psychologists, core principles (Beneficence and Nonmaleficence[A], Fidelity and Responsibility[B], Integrity[C], Justice[D], and Respect for People's Rights and Dignity[E]) consider the broader impact on communities. Principle B, for example specifies researchers' "professional and scientific responsibilities to society". However, when considering the translation of such principles into practice within academic environments, the emphasis is often overwhelmingly, if not entirely, upon the impact on individuals directly involved with the research being conducted, without consideration of how such a project may impact the broader community. We therefore argue the current principles need revitalization to provide guidance that ensures research has the appropriate ethical considerations from both an individual and community perspective.

We also identified the need for living ethics procedures, and the ways in which principles must be administered through an intellectual perspective, capable of considering the sorts of nuance and novel presentations of challenges that occur in the digital age. Through phronesis, we suggested a means to think critically about the ways in which ethics challenges will be addressed in research development, and the foresight to perceive, advise on, and forestall issues that may arise.

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Further, our review indicates the need to not only have the underlying principles outlined, but the provision of specific guidance to support adherence to such principles, particularly in regard to surveillance capitalism: what would be minimally expected, and how would external entities determine the extent by which an entity is in adherence? With the acknowledgement of the broader impact research may have on communities so too must we acknowledge the necessity of methods to keep entities accountable; insisting on transparency in research that may have impacts on citizens, and minimalizing harm to the vulnerable. We therefore argue it is also necessary to ensure those conducting research not only strive to adhere to the five aforementioned principles, but be guided by three key metrics upon the extent by which each ethical principle is followed may be determined: Applicability, Quality, and Transparency.

Applicability describes how broadly the research impacts both individuals and communities, and the extent the project has been tailored, and considerations have been made, to the specific individuals and communities would be impacted. (This addresses the Ongian paradox.) Quality describes the rigor and validity of the processes and practices conducted to ensure the principle is consistently followed by the project team. (This incorporates the concept of Phronesis.) Transparency relates to the extent all practices and procedures are able to be scrutinized and known by those involved with the project, the broader impacted community, independent entities, and the general public. (This provides mechanisms to cope with Surveillance Capitalism.)

Below we provide an example framework on how the five key principles may be considered and assessed when considering different research projects. We note, the provided aspects are examples, and are by no means exhaustive, nor reflective of all necessary considerations needed to be undertaken by a project team. For the full definitions of the principles, please refer to the APA guidelines.

6.1 Principle A: Beneficence and Nonmaleficence Adaptation

To expand principle A for the community, the expected benefits and possible harms likely to occur toward the impacted communities needs to be considered (Table 1).

Table 1. Ethics Principle Beneficence and Nonmaleficence Adaptation

Beneficence and nonmaleficence	
Individual	Community
Applicability	
The benefits of the undertaking to the participants have broad and important applications within their lives.	The benefits for the demographic/community of interest are broad in application, and complementary to future research across multiple disciplines and studied phenomena.
Quality	
Benefits of the undertaking outweigh possible harm to participants.	The benefits of research outweigh possible harms to represented demographics/impacted communities.
The welfare and rights of participants are safeguarded.	The welfare and rights of the represented demographic/ impacted communities are safeguarded.
Transparency	
The benefits of being involved for the participant are clearly communicated and understood by the participants.	The benefits of toward the demographic/community of interest are clearly communicated and understood.

Note. This table only reflects an example of the considerations required for the ethics principle Beneficence and nonmaleficence from the adapted perspective needed in the digital age.

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6.2 Principle B: Fidelity and responsibility

Table 2 reflects how principle B indicates the need for program developers and researchers to specify their considerations and responsibilities toward not only the individuals directly involved with the undertaking, but also the broader impacted communit(ies). Consequent intended and current actions to address such responsibilities are therefore required to be transparent, appropriate, feasible, and rigorous.

Table 2. Ethics principle Fidelity and responsibility adaptation

Fidelity and responsibility	
Individual 	Community 
Applicability	
The specified responsibilities and expectations of the researchers are tailored specifically toward the project design and the participants involved.	The specified responsibilities and expectations of the researchers are tailored specifically toward the represented demographic/impacted communities.
Quality	
A hazard analysis and risk mitigation considerations have been conducted and published associated with the research project and participants. Remedies for potential trauma to participants are pre-emptively considered and associated resources appropriately made readily available. Systems of data storage and protection are of the highest standard appropriate for the research project.	A hazard analysis and risk mitigation considerations have been conducted and published associated with the represented demographic/impacted communities. Remedies for potential trauma to impacted communities as a result of the research are pre-emptively considered and associated resources appropriately made readily available.
Transparency	
The responsibilities and expectations of the researchers are clearly communicated to participants. Request for information, concerns and complaints by participants can be easily made	The responsibilities and expectations of the researchers are clearly communicated publicly. Request for information, concerns and complaints by the community can be easily made.

Note. This table only reflects an example of the considerations required for the ethics principle Fidelity and Responsibility from the adapted perspective needed in the digital age.

6.3 Principle C: Integrity

Considerations and consequent actions regarding the how researchers can ensure they act with Integrity, and how they may be kept accountable, are indicated in Table 3.

Table 3. Ethics principle Integrity adaptation

Integrity	
Individual 	Community 
Applicability	
All those involved with the research project act with accuracy, honesty, and truthfulness with their conduct.	Data are used in a manner specified when it was initially collected, or further permissions by representative bodies for the demographic/impacted communities is sought.

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Quality	
Participants are well informed and told the truth to the extent the research allows. Any required misleading aspects of the research design toward participants are required to promote the integrity from the global perspective, and do not disregard any other principle component (e.g., beneficence, dignity) to the individual participants.	Published materials are accurate and drawn conclusions are rational and have merit. The methodology, and outputs, are peer reviewed by independent and appropriate experts. Any required misleading aspects of the research design toward the represented demographic/impacted communities are only permitted in order to promote integrity from the global perspective, and do not disregard any other principle component (e.g., beneficence, dignity).
Transparency	
Participants are aware of how their data will be used. Systems of data storage and protection are detailed and provided to participants. Any misleading conduct, part of the research design or otherwise, must be communicated with the participants at the earliest feasible time.	Conflicts of interest are identified, well communicated, and appropriately mitigated/addressed. The methodology adopted, and data collected is made available to the general public within reason, and independently peer reviewed by those appropriately qualified.

Note. This table only reflects an example of the considerations required for the ethics principle Integrity from the adapted perspective needed in the digital age.

6.4 Principle D: Justice

Table 4 reflects how researchers may adhere to the Justice principle across the three key metrics.

Table 4. Ethics principle Justice adaptation

Justice	
Individual 	Community 
Applicability	
Anyone meeting the selection criteria has the same right/opportunity to participate in a study, and/or opt out of participation at any time of the project.	Represented demographics/impacted communities have a right to be involved in and benefit from conducted research projects.
Quality	
Researchers exercise reasonable judgment and take precautions to ensure that their potential biases, the boundaries of their competence, and the limitations of their expertise do not lead to or condone unjust practices toward participants. Strategies and procedures are put in place to reduce barriers for individuals to be involved in the project.	Researchers exercise reasonable judgment and take precautions to ensure that their potential biases, the boundaries of their competence, and the limitations of their expertise do not lead to or condone unjust practices toward communities/demographics. Strategies and procedures are put in place to reduce barriers for communities/demographics to be involved in the project.
Transparency	
Researchers make significant efforts to advertise to all eligible individuals regarding involvement in a project, and the associated benefits.	Researchers make significant efforts to advertise to all relevant communities and demographics regarding involvement in a project, and the associated benefits.

Note. This table only reflects an example of the considerations required for the ethics principle Justice from the adapted perspective needed in the digital age.

6.5 Principle E: Respect for people's rights and dignity

And Table 5 provides an example of indicators associated with adhering to the respect for people's rights and dignity principle across the three key metrics.

Table 5. Ethics principle Respect for people's rights and dignity adaptation

Respect for people's rights and dignity	
Individual 	Community 
Applicability	
Concerns and/or input by participants are legitimately considered, with researchers being open to changes in methodology or procedure as a result.	Represented demographics/impacted communities have a right to be involved in the development of, or oppose and prevent such research on legitimate grounds of lack of dignity.
Quality	
The rights and dignity of participants are considered from multiple facets, especially those not directly tangible to those involved. Privacy, confidentiality, and self-determination of participants are respected, with design targeting procedures specific to their value and maintenance. Adherence to the ethics principles is the highest priority of the researchers to the participants above any of their other interests.	Representative bodies for those being studied, in addition to expert in the area peer review the study methodology to ensure the rights and dignity of those being represented/communities impacted is maintained. Privacy, confidentiality, and self-determination of communities/demographics are respected, with design targeting procedures specific to their value and maintenance. Adherence to the ethics principles is the highest priority of the researchers to the communities/demographics above any of their other interests.
Transparency	
Considerations of how the rights and dignity are made and clearly communicated to all participants. Any breach to a participant's privacy, confidentiality, and/or self-determination is well communicated with those affected, the entity conducting the project, and procedures for remedy are not only shared but promoted with guidance.	Considerations of how the rights and dignity are made are clearly communicated within published material, and consulted with representative groups prior to commencement of research. Any breach to a community or demographic's privacy, confidentiality, and/or self-determination is well communicated with those affected, appropriate representative bodies and legal organisations, and procedures for remedy are not only shared but promoted with guidance.

Note. This table only reflects an example of the considerations required for the ethics principle Respect for people's rights and dignity from the adapted perspective needed in the digital age.

7. Impossible questions: Balancing risks and benefits

At the heart of these ethical risks brought about by shadow footprints, are a series of inconceivable questions, almost beyond imagination. Without convincing answers, how can we approach these issues, particularly as science relies on good data? To find ways of balancing risks and benefits to the unknown, we have employed a digital civics lens to take account of the ethical issues in psychological researched raised by digital technologies, strongly rooting our responses in a framework founded in a philosophy that appreciates the digital age. With reference to the philosophy of information, and in acknowledgement of the ontological continuity of the informational environment (that is the conjoined online and offline spheres) in which these interactions take place, we have raised ethical issues with consideration of ethical obligations and potential ethics-based solutions, like Phronesis. Approaching history, we have recognized the utility of media ecologist Walter Ong, as a means of exploring the relationship between communal

and individual responsibilities. We have also identified that regulatory confusion and the challenges raised by new digital processing mechanisms, may enshrine undesirable elements of our underpinning civic belief systems and structural inequalities, particularly through surveillance capitalism.

We have observed how psychological research (including public and private sector data and research findings) provide some of the richest and most important insights about human behavioral functioning responsible for our success and survival, but these same qualities mean it sits at the core of ethical conundrums, provides the tools for foreign and domestic interference, and enables the processes of surveillance capitalism. We have noted that addressing these challenges requires an interdisciplinary understanding from researchers, universal investiture and responsibility, and will require a multi-prong approach to be successful. From this perspective of fairness and justice, it became apparent that a deployment of reinvigorated democratic principles can assist: from greater public education and participation (digital civics pedagogy, multi-stakeholder involvement) to checks and balances on power (incentivization, regulatory bodies, and codes of conduct), including a bolstering of the rule of law (improved regulation and policy). We advocated that democratizing the psychological research sphere might be less about revolutionizing the space through the radical overturning and replacement of our existent framework, and more about galvanizing the underlying principles that guide a fair and judicious program of research and application, making them appropriate and responsive to our digital age. Responding to these insights, we explored ways that the APA guidelines, drawn from the Belmont principles, might be further supported, and offered a set of specified provisions in keeping with these practices.

While shadow footprints present a series of challenges, both new and old, to the research environment, and indeed civil society, we are not without tools to address them. As researchers we must be ethical and intelligent in our research processes, and we may do well to remember that the goal is not an unattainable perfection, but our utmost sustained ethical effort.

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Bridging the gap

Crypto users' sense-making of a historical market crisis

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Abstract

The conflict between cryptocurrencies' ideological promises and their practical reality has recently become a considerable topic of scholarly discussion. It has been framed in terms of the so-called 'promissory gap' of cryptocurrencies – a gap that is founded in the contrast between the promises of a 'trust-free' system and actual reality. Yet, while crypto's notion of 'trust-free' money has been heavily questioned, there is little research on how users seek to overcome cryptocurrencies' promissory gap. Contrary to the promises of being 'trust-free' by design, this paper demonstrates that struggles for trust and control represent a focal point of the community interactions surrounding crypto. By drawing upon Dervin's sense-making methodology to conduct interviews with 28 crypto investors, this study examines how social actors attempt to construct 'bridges' over a 'gap-filled' reality related to the moment of a historical crisis in crypto. The results reveal crypto's intricate social embeddedness: whilst unequal power dynamics, distrust, and conflicting interests represent primary elements of users' struggles in the crypto space, users attempt to restore a sense of control by recalling personal motivations and connecting with like-minded people. The paper provides insights into crypto users' strategies to construct meaning in a highly uncertain environment and contributes to the discussion of crypto as a socially structured phenomenon.

Keywords: Cryptocurrency, blockchain technology, promissory gap, crisis, sense-making

1. Introduction

In May 2022, Terra LUNA, one of blockchain technology's top 10 cryptocurrencies, crashed in a dramatic manner. Terra's collapse shocked cryptocurrency enthusiasts, as around US$ 60 billion worth of the network's two asset offerings, TerraUSD (UST) and Luna (LUNA), fell in value to practically zero in the span of a week (Q.ai, 2022). Ironically, at the time of its collapse, UST was classified as the most popular "algorithmic" stablecoin — a cryptocurrency designed to support price stability of a specific asset. By concurrently pledging to a decentralised, secure store of value in UST and presenting a highly profitable suite of applications, the Terra network had attracted investors of all sizes and rose to global standing after LUNA's market worth soared from less than $1 in early 2021 to $116 in April 2022 (Q.ai, 2022). Unexpectedly and shortly after LUNA's peak, on May 7 2022, during a time of already high volatility, over $2 billion worth of UST were liquidated, bringing down the price of UST and causing a chain

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reaction: the stablecoin started to de-peg, meaning that its value fell below its intended fixed price, and, in a panic, more people sold off more UST. LUNA was eventually abandoned, as it became worthless. This sudden collapse of LUNA and its associated stablecoin UST caused the global crypto market value to plummet by US$ 1 trillion (Evans, 2022). The scale of the crash was so immense that many have compared it to the bankruptcy of the Lehman Brothers investment bank in 2008 (Sanchez, 2022).

The LUNA crash brings to the forefront the intricate and enigmatic nature of cryptocurrencies. Guided by ideological aspirations, the promises of blockchain and cryptocurrency technologies are high, and yet, profound inconsistencies appear in reality. One of crypto's most apparent inconsistencies concerns the "promissory gap" (Vidan & Lehdonvirta, 2019), — the gap between crypto's premise as a 'trust-free' economic system and its practical reality that is intricately tied to social dynamics of trust. In the case of LUNA, this meant that despite LUNA's public image as a decentralised and 'trust-free' crypto network, in the moment of breakdown, the entire crypto community turned to a single actor for a resolution of what had become an existential crisis: Do Kwon, the co-founder of Terra LUNA, emerged as the focal point of trust, with people eagerly awaiting his next tweet for a solution. These contradicting attributes in crypto's nature raise the question: How do individual users make sense of crypto as an inherently 'gap-filled' and uncertain reality?

Despite the relevance of understanding the human dynamics behind cryptocurrencies, researchers have only recently started to examine crypto through the lens of social science. Scholars frame crypto as a complex digital social reality (Dodd, 2018; Hayes, 2019). Nonetheless, the predominantly theoretical discussion of crypto as a social phenomenon lacks an engagement with the human experience, particularly the motivations behind the use of crypto and users' interpretations of this new reality and its pitfalls. The present study fills this gap in research by applying empirical 'sense-making' methodology which addresses users' underlying personal beliefs, motives, inner conflicts, and interpretations. By exploring how users navigate through a highly uncertain environment in crypto, including what conflicts they are experiencing and how they are trying to overcome struggles, this study discloses users' perceived 'cognitive gaps', and the strategies they employ to bridge them. Users' process of sense-making is investigated in the immediate aftermath of the LUNA crash during a time of perceived crisis, demanding an intense sense-making effort and bringing to light the contradictions and social structures that are fundamental to crypto's nature.

2. Theoretical background

2.1 Crypto's ideological roots: The 'trust issue'

Much of the public interest in cryptocurrencies such as Bitcoin revolves around their nature as digital currencies that first emerged at a time of global financial crisis and distrust in banks in 2008. Yet, cryptocurrencies are more than just a new form of money. Their origins can be traced back to the crypto anarchy movement (May, 1992, 1996; Swartz, 2018). Crypto anarchy's vision was straightforward: social and political change by empowering individuals and weakening the power of established institutions. Guided by the ideological belief that a truly free market society could only be achieved through untethering the money systems from the governments (May, 1996), crypto anarchy advocates for a complete replacement of governments and political authorities with technological solutions to ensure individual freedom, prosperity, and — above all — privacy (Hayes, 2019). Accordingly, at the core of cryptocurrencies stands the belief that technology can provide a solution to a social problem, with 'trust' being at the root of this problem.

'In code we trust', a maxim of crypto ideologists, reflects the ethos of replacing social trust with trust in computer programming. As suggested by this guiding belief, social trust – in this case, faith in banks, governments, and other intermediaries — entails uncertainties and dependencies that are beyond individuals' control. As an alternative, a system of cryptography and economic incentives was developed

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to make digital money 'secure' (Nakamoto, 2009). Such a system would not require trust to function, referred to as 'trust-free' (or 'trustless', as often called in current crypto communities). Satoshi Nakamoto, a pseudonym for the author(s) of the Bitcoin whitepaper, thereby followed a radical vision of replacing human agency with machine code. The need for trust was not something to be secured by technical means (Nissenbaum, 2001), but eliminated altogether. This should be achieved by enabling purely digital and encrypted peer-to-peer transactions, which rely on the consensus of a distributed and decentralised digital network of users and can be verified by anyone. The 'trust in code' ethos stands on the belief that automated processes of decision-making are less fallible than humans. With regards to crypto, this ethos primarily refers to the idea of impenetrability, and code as incorruptible and impartial as opposed to the subjectivity of human institutions and the individuals that inhabit them (Vidan & Lehdonvirta, 2019). Code is considered to be impervious to greed and fear (Woodall & Ringel, 2019). In theory, consequently, the code functions as a ruler and regulator of trust and social relationships between actors in the network.

Such a notion, however, ignores that cryptocurrencies and their underlying blockchains are more than their features alone. As a peer-production technology, crypto is a means of interaction. Rather than being mere objects following a prescribed logic, technologies are co-shaped by the social practices around them and, at the same time, shape social relations through interaction (Bijker et al., 1999; Verbeek, 2016). Crypto is a socio-technological assemblage that consists not only of code, but also of a large variety of human actors (Hayes, 2019; Mallard et al., 2014; Nickel, 2015), including miners, programmers, token holders, and traders. Having trust in the system ultimately means trusting the whole assemblage of human actors that operate both within and outside that network (Lustig & Nardi, 2015). Thus, what matters is not so much the technology itself, but the social environment and network of people in which the technology is embedded.

2.2 Crypto as a social phenomenon

Since Bitcoin's launch in 2009, crypto has grown into a network of millions of users (Howard, 2023) with thriving communities. With a diversity of interests among its members — ranging from libertarians and anarchists to monetarist economists and computer geeks —, the self-organising network of people surrounding crypto can be considered primarily a digital community (Maddox et al., 2016). At the core of the community is a collective vision of resistance and experimentation. As a digital community that typically assembles on interactive online platforms, primarily Discord and Twitter, the crypto user base is formed through loosely connected social circles of technical discussion and sentiment expression. Unlike traditional banking or investing, the crypto culture is typically described as community-centred (Leising, 2021), aiming to distribute power and decision-making across the network rather than concentrating it in a central authority. This fosters a sense of ownership and participation among community members. As its own cultural microcosm, crypto is full of technical jargon, acronyms, and symbolic meaning. Market sentiments are often signalled in memes and emphasised by vernacular, for example, "HODL!" — crypto-jargon for a call to "hold" tokens, in hopes of summoning the next bull market (Schneider, 2022). As part of the culture, much of users' interaction within the network forms around identification with different projects/protocols and their communities. Along with crypto users' pseudonymity, these characteristics represent essential features of the broader crypto network.

As a digital network, instead of replacing social relations, machine code creates new social ties that seem remarkably robust. In fact, by facilitating true peer-to-peer interactions, crypto and its underlying blockchains may promote even more direct personal connections (Hayes, 2019). In the case of LUNA, a noteworthy characteristic was its powerful community of supporters, proudly identifying themselves as "Lunatics" as an expression of their sense of collective identity. Similarly, crypto protocols typically maintain channels on the platform Discord that afford meaningful social interactions between users and developers and among users themselves, not even necessarily pertaining to crypto-related topics, but furthering group bonding. Such channels include, for example, 'book club' groups, 'off topic'

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conversations, and informal hangout places. Thus, the notion that trust has simply been transferred into machine code and severed all social relations, is misplaced. On the contrary, trust seems particularly relevant in socio-technical systems, exactly because these systems allow for direct interactions between individuals (Nickel, 2015). The importance of trust is further underscored by the prevalence of fraudulent projects in crypto: As an unregulated space, the ever-present risk of hacks and rug pulls[1] (O'Driscoll, 2023) makes it seem that, ironically, the proposed solution of a secure and 'trust-free' system has become a problem.

Exploring how users make sense of the inherently contradictory crypto system in the immediate aftermath of the LUNA crash, offers several advantages: According to socio-technical studies, breakdowns bring taken-for-granted assumptions under scrutiny (Star, 1999) and make inconsistencies between premise and reality appear more clearly (Vidan & Lehdonvirta, 2019). Moreover, and as mentioned earlier, major breakdowns are common in crypto's practical reality (e.g., FTX fraud in 2022, Mt. Gox hack in 2014; see O'Driscoll, 2023). The collapse of the LUNA network is considered as one of the most impactful crypto crises that decimated the market. With LUNA representing an epitome of cryptocurrencies and its strong community of investors, this context proves ideal for exploring the promissory gap and complex social dynamics within crypto from a user-centric viewpoint.

3. Methodology

3.1 The sense-making methodology

Crises are constitutive elements of a complex reality and the human experiences made in it, serving as reminders of the pervasive interconnectedness of life events, knowledge, and actions (Picione & Lozzi, 2021). Guided by the aim to study users' interpretation of crypto generally, and the LUNA crash specifically, Brenda Dervin's sense-making methodology (SMM) (Dervin, 1992; Dervin & Foreman-Wernet, 2013) was selected as mode of inquiry. The goal was to identify themes and patterns in the participants' experiences and perspectives related to a time of perceived crisis within the crypto market. Previous studies demonstrate SMM's unique suitability particularly for crises, as extreme and uncertain situations require a high degree of rationalisation (Day, 2019; Stieglitz et al., 2017; Turner et al., 2023).

As a methodology, sense-making refers to studying how humans construct their pictures of reality and use these pictures to guide their behaviour (Dervin, 1983). This involves studying how humans make and unmake sense and construct, resist, destroy, and change meanings tied to the experience (Dervin, 2003). In the most general sense, sense-making is defined as behaviour, both internal, i.e., cognitive, and external, i.e., procedural, which allows the individual to construct their movement through time and space in a way that feels rational and purposeful. Although it recognises that much of human understanding is tacit and unarticulated, the method assumes that there are multiple ways in which people engage in making sense and that research can assist in bringing the unarticulated into articulation (Naumer et al., 2008). One of the hallmarks of SMM is its attempt at reconciling apparent polarities in people's worldviews without wishing them away (Agarwal, 2012).

SMM assumes that reality is inherently 'gappy' as it changes across time and space (Dervin, 2003). From the individual's perspective, a gap refers to a discontinuity in the perceived reality. Gaps therefore not only emerge between differences in understanding amongst individuals, but also within the same individual at different times. This is particularly relevant to crises, as individuals attempt to move from chaos (crisis) to order (post-crisis), while also navigating different organisational and relational structures. Disclosing crypto users' cognitive gaps is informative regarding the contradictions and gaps inherent to crypto's nature and users' interpretations of them.

[1] A 'rug pull' is a type of crypto fraud where a crypto developer or team hypes a project to attract investor money with the only purpose of abandoning the project, leaving their investors with a valueless asset.

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In order to explore people's cognitive process, SMM uses a simple operational metaphor of bridging gaps, as illustrated in Fig. 1. People are seen as embedded in a context-laden situation. The person pictured as metaphorically constructing and crossing a bridge represents the way humans are naturally required to overcome chasms and ruptures in an always evolving and contradictory reality (Naumer et al., 2008). Through the process of bridging these gaps, people seek inputs from different sources and engage in meaning-construction activities that lead to particular outcomes. As an interviewing technique, and by applying the operational metaphor, the interview guideline follows the main, pre-specified SMM elements including Situation, Gap, Bridge, and Outcome. The Outcome further contains Helps and Hindrances in its achievement. Guided by the idea of bridging gaps, the Gap and Bridge thereby represent the core elements of sense-making. The interview participants were asked to verbally express and interpret actions and events in the form of personal thoughts and feelings. Fig. 1 includes typical interview questions for each SMM element, except for the Context, which does not necessarily require explicit interview questions in SMM, but is incorporated in the interview data whenever participants refer to the general background and its norms, values, and social meanings.

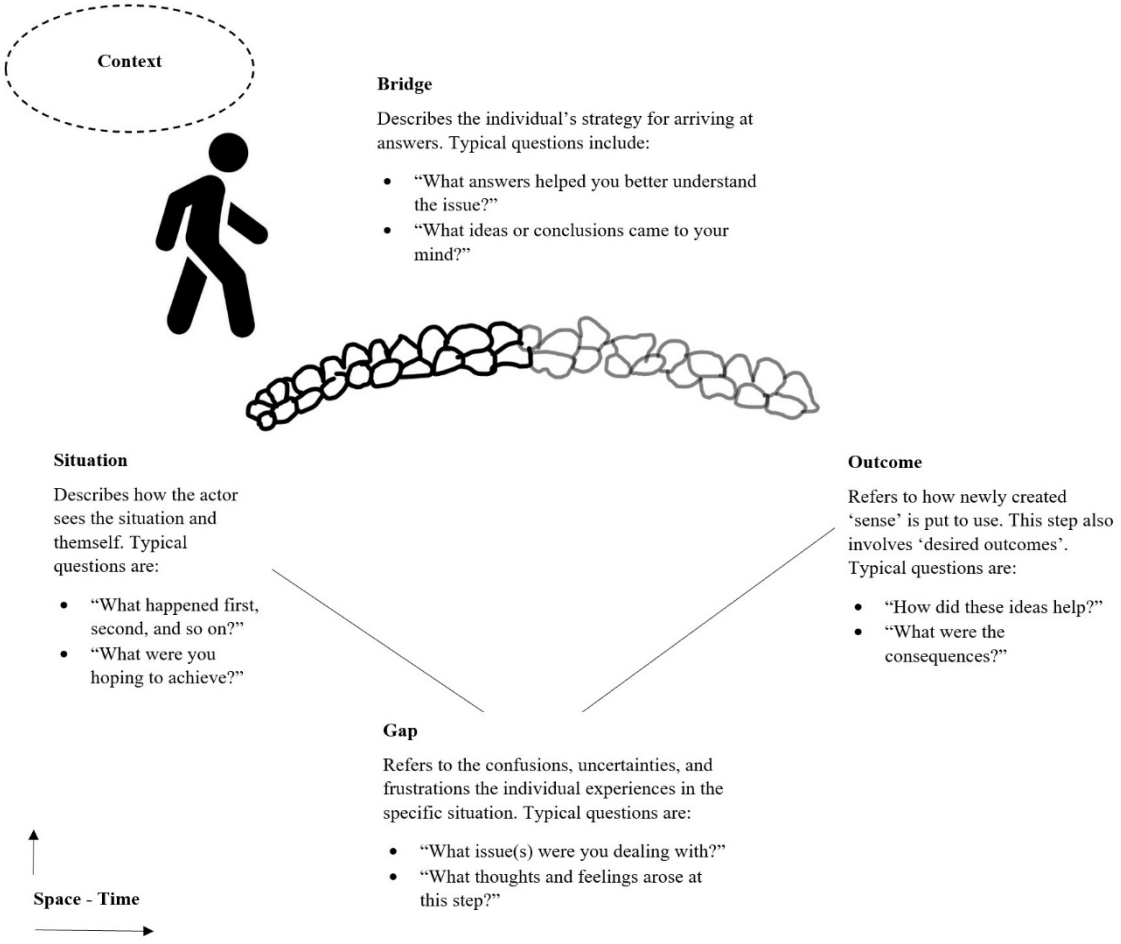


Figure 1. Central metaphor of SMM including its predefined concepts Situation, Gap, Bridge, and Outcome (own illustration based on Dervin, 1999).

3.2 Steps of inquiry

Participants were recruited within the Beethoven X Discord channel. Beethoven X is a decentralised crypto exchange and investment platform. Apart from being a platform for trading different tokens, Beethoven X has its own token, called BEETS. The primary researcher conducted in-depth qualitative interviews with two different participant groups, all of which were at least 18 years old: community participants and team member participants. The primary investigator informed members of the channel through multiple posts in a dedicated sub-channel, named "social science lab" and installed for this purpose, to explain the aim and scope of the study. Participants were selected based on the criteria of being either directly or tangentially affected by the LUNA crash. 19 interviews were undertaken with community participants, who are anonymous participants of Beethoven X's Discord channel not involved with the project team nor necessarily involved with Beethoven X in a monetary way. Another 9 interviews were conducted with members of the project team behind Beethoven X. The final number of participants thus amounted to 28.

Both participant groups were experienced crypto users (2-3 years of experience on average), i.e., financially invested in crypto and actively trading cryptocurrencies, and deeply embedded in the ecosystem at the time of the crash. In line with the overarching aim to study users' process of sense-making, the rationale for choosing two distinct user groups was to inquire whether there are any salient differences in the process of sense-making between 'ordinary' crypto users who are primarily impacted financially by the crash, and users who were additionally involved operationally as members of a crypto project team. As for the team member participants, the Beethoven X team was selected because, like many other protocols, Beethoven X was indirectly impacted by the crash due to the high level of interconnectedness of crypto projects. It also exemplifies a typical crypto project team, including mainly software developers, but also marketing staff, and a graphic designer. The entire Beethoven X team was interviewed. All interview participants (community participants and team member participants) were affected by the LUNA crash to varying degrees — if not directly by investments in LUNA, then at least due to the general market downturn — and grouped in three main categories: ranging from slightly (14 participants), moderately (4 participants), to highly affected (10 participants) (see Appendix A). All 28 interviews were conducted between May, 28 and June, 29 2022 and held on Google Meet, with both researcher and participant using pseudonyms, as is common in crypto spaces. The interviews were audio-recorded and transcribed verbatim for analysis. On average, the interviews lasted 54 minutes.

Since personal, potentially negative experiences can be challenging to articulate, the interviews were designed to leverage a visual method: Participants were asked to collect five to six images ahead of the interview that represent their thoughts and feelings related to the events around the crash. These could be personal photos, stock photos, screenshots, circulating memes, and so on. The interview guideline was structured around these visual conversation prompts, along with the aforementioned typical SMM questions to learn about participants' backgrounds, future outlooks, and personal interpretations related to crypto and the crash as summarised in their own words. A corresponding interview question was, for example, "How does this image reflect your thoughts and feelings related to the crash?".

3.3 Data analysis

Alongside the criteria of the SMM, the analysis of the interview data followed an inductive approach, using thematic analysis (Braun & Clarke, 2006) to identify patterns and themes in the participants' responses. The collected images, while serving as prompts during the interviews, were not subjected to analysis. The analytical process consisted of two steps: First, participants' responses underwent open coding assisted by the qualitative data analysis software MAXQDA. The inductively developed categories were then allocated to the respective dimension, namely the Situation, Gap, Bridge, and Outcome, of the SMM triangle metaphor (Fig. 1). To assist with validity, and ensure reliability of the results (Guba & Lincoln, 1982), both researchers undertook separate initial coding; around 30% of the dataset were double-coded in such a way. Through frequent intercoder discussions, code evaluation and

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harmonisation, codes were refined and collated with data from the remaining transcripts, and eventually grouped into overarching themes through repeated reading of the dataset. In a second step, all interviews were mapped according to the SMM triangle metaphor to visualise 'sense-making' both as journeys experienced by each participant and as shared narratives across the network.

Overall, results show no major differences in the process of sense-making between the two participant groups. For this reason, we have chosen not to present the results divided into the two participant groups in the subsequent sections.

3.4 Ethical considerations

This study had an unusual genesis, which requires additional elaboration. When the LUNA crash hit crypto enthusiasts and retail investors in spring 2022, the primary researcher felt urged to conduct a prompt study to record the shifts in the community she observed. Being employed by Beethoven X as an in-house social scientist throughout the process, she considered the implications of this role with her identity as a researcher. From the start, the study was conceived with academic rigour. At that point, it had a twofold goal: to provide users with a confidential space to share their affective experiences related to the crash in order to inform the Beethoven X team on present attitudes and future policies, and to uncover users' cognitive gaps with regard to the crypto space generally, and the crash specifically, as an academic inquiry.

As any online participant research, we grappled with the complexities of ethical research practice. Sharing Markham's ethos that "every method decision is an ethics decision" (2005, p. 796), each research step was reflected in terms of its ethical implications and carefully weighed against matters of practicability. In the absence of universally accepted regulations on online research (AOIR Ethics Guidelines, 2019), a participant-centred approach sensitive to different levels of impact was followed, using Markham's model as an assessment tool (see Markham, 2020). Participants were informed about the study and the conditions of their participation in writing in the Discord channel and again at the start of the interview. Informed consent was collected, and confidentiality and anonymity were maintained throughout the study. The data were securely stored and only accessible to the research team. No monetary compensation or any other advantages were offered to participants that may have influenced their behaviour or willingness to participate. The interviewed team members already knew the primary researcher, although only from occasional pseudonymous online meetings. The primary researcher's position meant unique access to a community, pre-established ties to the team and their support in recruiting community participants. This meant fast-tracking many of the processes essential in time-sensitive research such as crisis narratives, compared to other studies on crypto communities where much effort and sometimes months are spent on gaining access (e.g., Maddox et al., 2017). Our research design decisions allowed capturing experiences and sentiments as they were unfolding and otherwise may have been lost due to the time elapsed. In a similar vein, the primary researchers' position as an affiliate of the Beethoven X team may have fostered trust in the community participants and motivated them to be more forthcoming with information they believed to benefit the whole community.

4. Results

4.1 Narrativising 'gaps' and 'bridges'

The results of the interview coding can be arranged on the SMM triangle map for each participant, which may then be turned into narrative form. To start with, the statements coded as Gaps and Bridges of two community participants with contrasting motivational drivers are presented in such a way, in order to illustrate the idiosyncrasies in the sense-making process. The original wording used by the interview participants was retained as much as possible.

Figure 2 illustrates the triangle map and collected images of participant 19, a community participant.

Participant 19 perceives the crash as a reminder of the self-interest driven behaviour that is ubiquitous in crypto. On top of the fragility of the space, he realises that self-interest driven behaviour is particularly present in 'whales'[2].

The recent happenings and particularly the LUNA crash made him pull back and question the whole crypto space. He was wondering whether any of 'this stuff' really matters or whether it is just some 'bullshit' that people think makes a difference. He started questioning himself. He realised that so much in the space is beyond his control. One big player after another is dumping and most people are just not smart enough or fast enough to protect their own funds. They are just left sitting there. There are other similar examples crossing his mind. Based on past experiences, he recalls how difficult it can be to figure out whether projects and their founders are actually trustworthy. He was kind of getting lost and started debating things in his head.

He explains that he tried to work his way through and find himself again. He tried to get back to the stage where he wanted to be. He restarted 'doing stuff' that got him interested in the first place; 'stuff' that he was excited about when he started looking into crypto. So he resumed working with people with similar interests, trying to recreate some type of meaning. He describes it as a 'lifestyle' group, consisting of legal engineers, lawyers, and web3 developers. As a lawyer himself, working with like-minded people gives him the feeling of playing more of an infinite game — as opposed to the finite game, characterised by the 'pump and dump' mentality. It gives him a sense of community.

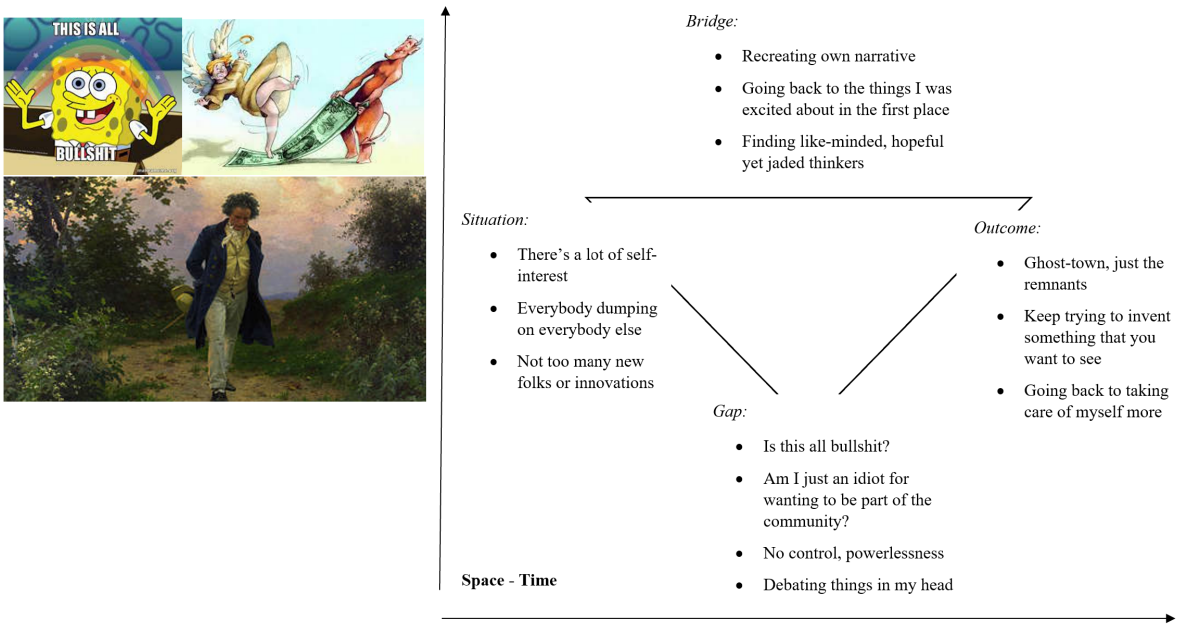


Figure 2. Triangle map and excerpt of collected images, participant 19.

Figure 3 illustrates the triangle map and collected images of participant 8, a community participant.

[2] Individuals or entities that own large quantities of a specific cryptocurrency.

Participant 8 describes the last few days as a bit of a blur. She truly believed that she was going to be a crypto millionaire and recalls thinking that LUNA would go up forever. She describes getting very cocky and excited. Then, all her positions were obliterated in the most spectacular fashion.

Ever since the de-pegging, she felt like there was a perpetual cloud above her. She felt devastated, felt like a failure. She remembers having so many questions: Were they rugs? Did she rug herself? Will she recognise it next time? She recalls the struggle between looking for anyone to blame and taking responsibility for her own behaviour. She felt like a victim, felt like these things were completely out of her control. But then again, she pondered: Didn't she put herself into this position in the first place? She isolated herself. After losing so much of her savings, it felt like an insurmountable task to build herself back up again. She had no motivation for anything.

She started reading about the difference between a victim versus a warrior. She realised that it was her own choice. She couldn't pity herself anymore, she had to step up her game in order to feel better. She started becoming more mindful of her own attitude and beliefs. Guided by her desire to be a warrior instead of a victim, she started to take responsibility. She started to take action. Moving forward, she will be more humble and educate herself better. Whenever she feels euphoric about a project, she will try to control her emotions and search for counter arguments.

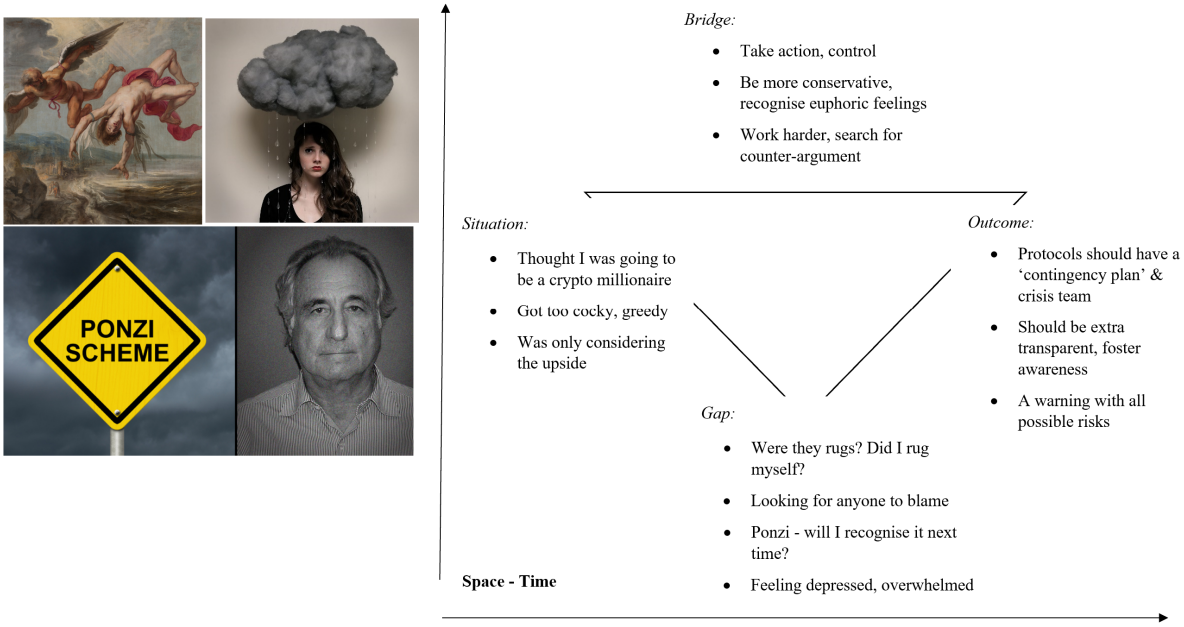


Figure 3. Triangle map and excerpt of collected images, participant 8.

The interview results and all 28 mapped sense-making journeys in combination revealed several major themes. Fig. 4 illustrates the main categories mapped onto the SMM triangle.

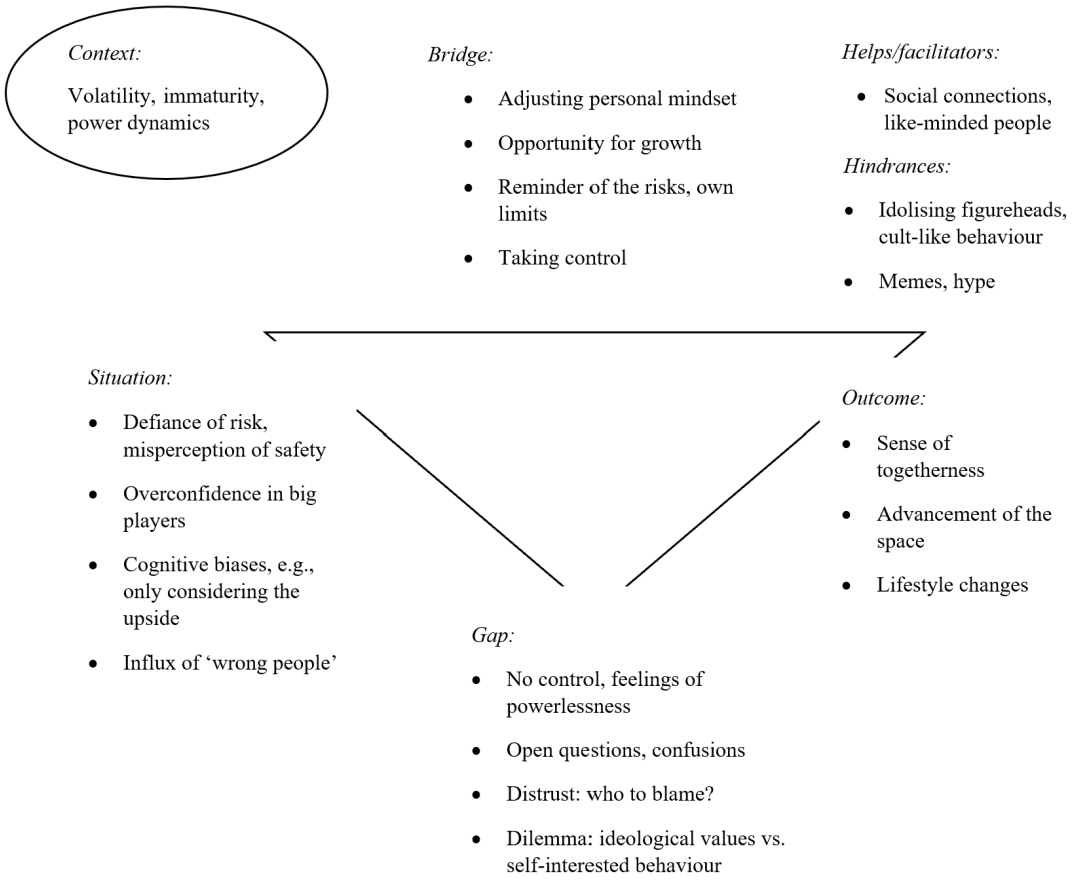


Figure 4. Extracted main categories from all 28 interviews, mapped onto the SMM triangle.

4.2 Context: Power and instability

The Context of the LUNA crash is often described with reference to crypto's very nature and the power dynamics at work. Participants mainly point to an inherent volatility and immaturity of the system, which is exacerbated by the interconnectedness of its components, including protocols and value tokens. Crypto's system was referred to as highly fragile, as participants emphasised, for example, how quickly liquidity can disappear: "it's like water evaporating" (p-15). Due to the high uncertainty and interdependence, participants stress the feeling of constant anxiety related to the space: "You feel scared, feel nervous in such an environment" (p-12).

Moreover, participants highlighted unequal power distributions between big players — i.e. 'whales' — and retail investors within crypto. Interestingly, several participants explain that the 'dysfunctional' capitalistic system in traditional finance and today's society was a main reason for them to get involved in crypto in the first place. By dysfunctional, they meant a misalignment of interest and power, typically with a few dominant players dictating the market. Several participants describe how they came to realise that exactly these power structures dominate the crypto market as well. One participant stressed: "When I got more engaged in the space, I saw that, in fact, […] many practices are like in traditional finance. […] yes, things are governed by the smart contract. But there are many things that […] a powerful entity or whales with a lot of money can impact easily" (p-15).

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4.3 Situation: Flawed assessments

Many participants reported a wish to challenge the crypto system by experimenting with different investment strategies, defying the risks involved. One user expressed: "Like Icarus, I was drunk with the power of my profits. I got cocky. I flew too close to the sun. I drowned, I failed" (p-8) (see image 1, Appendix B). This daring attitude is closely connected to the perceived safety described in interviews, suggesting that many participants were simultaneously aware of their investments' riskiness and filled with conviction of their success. With regards to LUNA generally, and the stable coin mechanism of UST specifically, several participants declared to have overestimated its safety: "I got a false sense of security, […] it seemed like a safer investment than it really was" (p-17). The wrong sense of safety along with previous positive experiences, a tendency to only consider the upside, and overconfidence in the 'big players' are prevalent themes across the interviews. Interestingly, both community and team members reported having had too much trust in big players and dominant leaders in the space, independent of their personal experience or knowledge. One community participant reflected: "It's actually quite scary how much we just trust what people say without actually knowing what the code is doing" (p-9).

Another dominant theme pertained to a sudden spike of 'wrong people' turning to crypto during its previous market upturn, such as users who lack education, are unwilling to learn and only interested in the financial side of crypto, as expressed by one participant: "The latest influx of people […], they're here just for the money. They don't really know how it works" (p-10). This is contrasted with 'crypto ideologists' who claim to be primarily interested in crypto's underlying ideological values and its technology. This points at two ideologies opposing each other, whereby the 'ideologists' act as gatekeepers and discredit users primarily interested in crypto as a profit-making tool. Driven by high volatility and enticing gains, crypto attracts speculators and generates enormous hype bubbles, fuelling users' excitement and encouraging risky actions from users hoping for ever increasing profits. While this type of user is perceived as detrimental to the crypto space, several participants exposed themselves as having fallen victim to the hype. Comparing it to gambling, participants, independent of their initial motivation, reported strong contrasting emotions including fear, excitement, and euphoria around speculation as the primary behavioural drivers in the space.

4.4 Gaps: Dilemmas and distrust

Upon the implosion of LUNA, many participants struggled with feelings of powerlessness, distrust, and inner conflicts related to the crash, as well as crypto in general. Participants often described a lack of agency: "It was kind of out of my control. […] There's nothing you can really do […]. You just watch and hope" (p-17). Interestingly, while both participant groups described feelings of panic and despair, the team members — mainly software developers — additionally experienced a sense of guilt: "I feel bad that these things cannot really be avoided, and also, Beethoven is [...] indirectly part of this, even though we never asked people to invest in UST [...]. We knew the risk, but maybe we didn't convey that enough to the users. [...] You're trying to take care of the users and then it's a much worse feeling to see users getting wrecked." (p-21) In fact, the sense of responsibility toward ordinary cryptocurrency users, which consequently led to feelings of guilt stemming from their inability to manage the situation or provide assistance, was the only salient difference between the two participant groups. This observation is interesting, particularly when considering the attributes of crypto as a 'trust-free' domain that aims to make the need for human mitigation obsolete.

Another dominant theme was distrust. Interestingly, there are two discernible connotations of distrust in participants' statements: a lack of trust in oneself, and distrust in others. The former describes participants' perception of personal failure, as stated by one participant: "Because I fell for this Ponzi scheme, I don't trust myself" (p-8). Distrust in others mainly stems from the event of the crash itself. The crash and similar previous events seem to have created distrust particularly between teams and their community: "If I'm not wrong, the founders [of LUNA] were not hurt in this process at all" (p-12),

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participants suspected, or "maybe some seed investor dumps on [the investors]. Maybe the team dumps on them" (p-1). The theme of distrust was often referred to as reminiscent of traditional finance and political institutions.

While for some, the crash evoked an internal belief struggle, for others it intensified already existing inner conflicts, leading them to question the whole crypto system. Those participants felt torn between crypto's ostensible ideological values and the prevalent self-interested, incentive-driven behaviour in the space described as 'player versus player mentality'. One participant explained the situation as "everybody dumping on everybody else. […] It was basically playing a carousel game or like 'duck, duck, goose', in a bad way, though, […] you want to be one of the first to get out" (p-19). As indicated by the results, this hostile mentality mainly manifested in the form of a perceived 'pump and dump attitude', self-serving behaviour, and taking advantage of others, as observed even between teams and their communities: "Some teams and their community are like […] family. But on chain, you see that the team dumps on its community" (p-1) (see image 2, Appendix B). This led to a central dilemma between ideology and revenue users faced in this exceptional situation. They struggled with the discrepancy between their belief in the community and in crypto to be successful in the long term, and their desire to realise short-term gains. This conflict typically resulted in questioning the endeavour of the whole space, as emphasised by several participants: "I was questioning myself […]. What are we even doing here?" (p-9), and "does any of this stuff really matter? Or are we just idiots for thinking that it's important?" (p-19).

4.5 Bridge: New mindsets and future preparation

Participants chose different ways to overcome the negative feelings, confusions, distrust, and inner conflicts associated with their Gaps. Primarily, they sought ways to search for higher meanings in the crash and re-establish a sense of control. As many found their framework of meaning shattered in the crash, they reacted by adjusting their personal mindset in order to re-establish a sense of meaning and trust. Being stuck in a mindset of questioning the space due to contradictory values and beliefs was described as mentally exhausting. To correct this, participants tried to restore a sense of equilibrium by searching for a higher purpose (see image 3, Appendix B). Users mainly did so by reminding themselves of their initial motivation for participating in crypto and adjusting their viewpoint: "I've just been purely looking at it from the perspective of not thinking about money" (p-5). This strategy helped participants to put the crash into a holistic perspective and reclaim confidence. Despite the enormous distress and financial loss that the crash had caused, both participant groups equally reported perceiving it as an opportunity for personal growth. This is specifically pertinent to users who believe in a higher vision of crypto.

Two more dominant narratives were equally future-oriented: The viewing of the event as a necessary reminder of the risks in crypto investing, and of the participants' own limits in knowledge and foresight. As a reaction to this reframing, many strove to regain a sense of control through minimising risks by choosing more conservative investment strategies, taking action, such as improving their skillset through targeted education, and mentally preparing themselves for similar events. This mental work was also visible in participants' intent to better control their emotions in the future and practise mental resilience to potential shocks. By recognising euphoric feelings and correcting their behaviour accordingly, participants hoped to draw wisdom out of their experiences that would serve them henceforth: "Next time when I feel that euphoric feeling, I'll know it's time to be more conservative and take profits" (p-8).

4.6 Helps in bridging the Gap: Social relationships

Interestingly, participants primarily emphasise social aspects in terms of facilitators for bridging their Gaps. Participants reported that connecting with like-minded people, supporting and reassuring each other contributed to resolving their inner conflicts and uncertainties related to the crash. According to the informants, sharing the experience and connecting with others made them feel better: "I'm in a bunch of

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groups like […] crypto friends, [...] people I have never met in real life […]. We bounce ideas and just speak about everything and nothing. We are all going through the same difficult experience together" (p-3). This social support seems to have contributed to re-establishing a sense of purpose, regaining trust in the space, and coping with the experienced stress.

4.7 Hindrances in bridging the Gap: Crypto culture

Despite its merits, participants perceived certain elements of the 'crypto culture' as hindering in achieving certain goals. This culture involves language that uses identity markers, memes, and signalling, i.e., conveying information to instruct someone to behave in a certain way, as a means of communication. Idolisation especially was brought up by both community and team members. Participants emphasised that there exists an almost cult-like behaviour in crypto communities, mainly driven by powerful leaders. According to the participants, Do Kwon was one such figurehead that people trusted and admired. Adopting a cultish behaviour was perceived to be detrimental to the progress of both users' personal development and the space itself, as it, often unconsciously, discourages taking a critical stance towards decision-making and behaviour. Accordingly, one user pointed out: "Hopefully people will stop idolising huge figureheads […]. Just everyone building together would be nice" (p-5). Similarly, participants stressed the underlying risk of memes. Memes are a fast way to disseminate a message and typically used to express emotions or a certain narrative. However, some users described this typical communication tool as a way of deferring responsibility and misleading people through an illusion of community. They point to crypto's ostensible community-centeredness, "the illusion of 'we're all going to make it', 'we're all a community'" (p-18), as a fallacy. Image 4 (Appendix B) represents a circulating meme in crypto to convey a false sense of "we're all going to make it" — referred to as "WAGMI" in crypto vernacular — by enduring stressful situations.

Moreover, the hype around crypto — mainly constructed by mass media, influencers and celebrities, according to the participants — created attention that hindered the organic development of crypto. One user pointed out: "The LUNA UST thing raises much attention [...] from mass media, […] even the normies, ordinary people, are talking about it" (p-1). This Hindrance ties back to the perceived influx of 'wrong people', identified as an issue as part of the Situation.

4.8 Outcome: Standing together and focus on health

Prevalent Outcomes refer back to the social relationships emphasised as Helps in the form of a sense of togetherness, to the readjustment of one's mindset, and the growth and maturing within the community. According to the data, watching an entire market including one's personal funds collapse caused a traumatic experience for many users, providing a deep connection between them. It seems that the importance of community has become evident particularly due to the crisis, as expressed by one participant: "It has actually brought the community together a lot more […], people are looking for that humanistic connection now because everyone is kind of reeling from the shock" (p-5) (see image 5, Appendix B).

Additionally, crypto exists largely detached from the 'outside world'. Even from a user perspective, the crypto space can be hard to grasp. This creates an isolating environment with dynamics and experiences that are difficult to relate to from an outside perspective, as voiced by a participant: "My family and friends […], they really don't have a sense of what's going on. So I ended up not trying to explain it, you know, […] in some ways I silo it" (p-4). Amongst users, the shared experience related to the crash created the sensation of an inner circle of those affected. After the crash, a significant number of people remained inactive or left the crypto space: "It is like a ghost town of a blockchain. [...] Everything is actually still working. It's just that the community has been decimated" (p-17) (see image 6, Appendix B). However, those who remained and will continue to remain in the space were seen as particularly valuable, as they ostensibly have a more earnest interest in the sustainable development of

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crypto, as opposed to users who participate solely for quick financial gains. This category is seen as a counteraction to the perceived 'immaturity' and 'wrong people' entering the community, highlighted as issues in the Context and Situation.

Lastly, across the interviews, the need for lifestyle changes was an important realisation for study participants after the crash. This primarily refers to being more considerate of one's mental and physical health. One team member stated: "It's been pretty taxing on body and mind" (p-22). In contrast to the other Outcomes, this refers to participants' personal life goals. In a fast-paced and highly volatile market, demonstrating an 'always on' mentality was described as inherently stressful. Intensified by the experience of the crash, participants described having become more mindful of their own health. For some, this involved less time spent in crypto spaces, for others less screen time in general, as they felt in need of "taking a break from it at all, you know, because this space can be so consuming" (p-4), "I will be less active in crypto for sure [...], so less time behind the computer and more time out in the sun" (p-10).

5. Discussion

Overall, the results reveal several conflicts and contradictions that appear to be inherent to crypto's nature, providing evidence of the promissory gap manifested in practice. A major category derived from users' narratives concerns the power imbalances between actors in crypto, which is connected to feelings of distrust and a lack of control. As suggested by the results, unequal power dynamics primarily stem from a technocratic order within the blockchain system, whereby technological experts and large crypto projects or protocols dominate the market, implicitly requiring trust, as observed in the case of LUNA. This provides evidence for a re-centralisation of power and thus, required trust in crypto's social infrastructure, i.e., between participants who are actually transacting and interacting with each other, as discussed by other scholars (e.g., Rehak, 2019; Vidan & Lehdonvirta, 2019). The trust users invest in such self-appointed authorities within the network entails dependencies and risks, limiting users' sense of agency and ability to act. Ironically, however, this is exactly what crypto's guiding ideological maxim originally sought to make obsolete.

Due to the high distress and distrust caused by the crash, users pursued different strategies to construct new meanings and restore a sense of control related to the space. Social relations including connecting with like-minded people appeared as a primary facilitator in doing so. Compensating for a perceived lack of personal control by engaging in meaningful and (more) predictable social relationships is in line with the compensatory control theory. As humans exhibit an innate need for control over their (social) environment, compensatory control helps people reduce the perceived chaos of social life (Kay et al., 2009). Especially in the face of uncertainty, compensatory strategies can increase the sense of personal agency and re-establish meaning structures (Picione & Lozzi, 2021). Many study participants refer to the relevance of connecting with other affected users to process what happened and re-establish trust, leading to strong feelings of togetherness in the crash's aftermath. This aligns with previous studies on the positive effects of shared negative experiences or trauma for fostering social bonds and providing an attachment between people (Schwarzer et al, 1994). Moreover, it generally points to the importance of social support as a protective effect against stress (Cohen & McKay, 1984). Even though the significance of the network of users is seemingly integral to crypto's ethos, the word community is used in a manner within crypto that typically lacks seriousness. However, the value of meaningful social relations, especially for regaining control and trust, seems to have become more pronounced during the crisis. In a scenario where trust in central players and experts is breached, users appear to primarily seek trust in like-minded users. For better or for worse, therefore, crypto investors tend to look for trust in other people, not code.

A further major category pertains to questioning the economic system in crypto, and questioning oneself as a participant in it. The results demonstrate that participants' primary motivational drivers for participating in crypto determines their sense-making: driven by distinct motives, users experienced

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different inner conflicts and employed contrasting strategies to move past their (self-)doubts. Those who primarily participated for ideological reasons tended to re-establishing meaning by reminding themselves of the fundamental appeal of crypto and its potential positive impact on the world. These participants framed the crash as a necessary 'cleansing' of detrimental developments and people undermining the ideological vision. Meanwhile, those who engaged primarily for financial reasons seemed to be more bothered by their personal and others' behaviour during the crisis, directing blame at others as much as at themselves. They explained the crash through other people's viciousness or greediness rather than a multifactorial situation, pointing to a fundamental attribution error (Jones & Harris, 1967) where observers overemphasise dispositional or personality-based factors for behaviours observed in others while underemphasising situational factors. Notably, participants simultaneously acknowledged their personal failures in the process. They gave meaning to their financial losses by framing them as valuable learning opportunities regarding the risks of cryptocurrencies and their own personal limitations in knowledge and susceptibility to emotional manipulation.

The distinct sense-making strategies of the two user groups, namely the ideologists and the revenue seekers, shaped by their initial interest in crypto, corresponds to discussions of incompatible values (Swartz, 2018) and Lehdonvirta's (2022) argumentation that crypto attracts ideologists versus 'deal-makers'. The mismatch of fundamental values and goals between these two interest groups further becomes visible in users' shared dilemma of whether to realise short-term gains or adhere to long-term beliefs in crypto. This conflict seems to be primarily rooted in crypto's incentive-driven economic design that encourages self-interested behaviour through profit maximisation, even at other participants' expense. Accordingly, crypto's underlying competing money principles undermine the promise of 'trust-free' money (Dodd, 2018). This insight is consistent with the notion that crypto's ethos denies the social nature of money[3] (DeFilippi et al., 2020; Dodd, 2014, 2018), and particularly Dodd's (2018) argumentation that crypto will succeed as money to the extent that it fails as an ideology.

6. Conclusion

6.1 Theoretical implications

This study is one of the first empirical investigations to provide an in-depth understanding of crypto users' perspectives on and interpretations of the space. By documenting how crypto investors make sense of a market crisis, it provides insights into the human aspects driving developments in cryptocurrency adoption. The results demonstrate a distinct social embeddedness of the crypto system despite its technological promises of not relying on social structures. Generally, in contrast to conventional currency collapses where investors predominantly show responses in the form of negative emotions including anger and remorse (Griffith et al., 2020; Hoffman et al., 2007), this study unveils more complex responses, reflecting crypto's ideological nature. Some investors appear to undergo an identity crisis related to the space. This points to crypto as a technology charged with promises of a completely new digital market system, as opposed to simply a financial service provider.

The theoretical contribution of this study is threefold: First, it adds a participant-oriented perspective to the discussion of the promissory gap, especially crypto's assurance of not requiring trust in third parties and its practical reality of (re-)centralisation of power (Rehak, 2019; Vidan & Lehdonvirta, 2019). Spearheaded by technological experts and authoritarian crypto projects, these new structures shift the original problem of trust from powerful actors in the non-digital space to new, uncontrolled, or even uncontrollable power centres within the crypto network. So far, as argued by Rehak (2019), the aspiration to solve social and societal issues through neutral technology has remained unattainable, even with blockchain code. Although (blockchain) technology in itself may reduce the need for trust, new dynamics

[3] The relationship between money and trust has been analysed by Simmel (1978).

of trust in people, rather than code, are introduced by the promotion of social interactions within the community. Second, and linked to the promissory gap, this study provides evidence of crypto's embeddedness in complex social structures. Money as a form of value exchange depends upon social relations, especially when a completely new currency is tried to be established. Thus, any form of money supposes more complex social processes than the mere inscription of trust in automated code or 'digital metal'. Third, the findings of this study add to the discussion of crypto's incompatible ideological values between ideologists and deal-makers (Swartz, 2018). It is not simply that investors justify crypto's raison d'être in different ways; rather, various motivational drivers for engaging with this assemblage bring to light different uses and behaviours. Thereby, it seems that crypto's underlying competing money principles, by driving economic value maximisation, suppress the ethos of decentralised power structures for a more liberal, autonomous, and fairer society. Crypto's success as an ideology seems to conflict with its real-world application as a form of money.

6.2 Limitations

Studying a community that is innately digital and pseudonymous comes with some limitations. Previous academic studies highlight the challenges involved with researching crypto communities (Karlström, 2014; Maddox et al., 2017). While entering the field posed no obstacle in our case, we do not have a clear image of demographic parameters in the sample. Having decided against collecting identifying information so as to not violate the normative anonymity in crypto communities, targeted sampling for the purpose of diversifying the participant pool across identity categories was not possible. Collecting identifying data in a space that actively advocates for anonymity would raise ethical concerns. Relatedly, conducting research in partly anonymous online spaces brings limitations in terms of self-report data and potential selection bias. These limitations, however, apply to various forms of online research in general (Janssens & Kraft, 2012) and are not exclusive to crypto spaces. Further, this study was case-specific, as it exclusively referred to the LUNA crash and was conducted with participants from a single protocol that is not directly related to LUNA, representing merely a snapshot in time of a fleeting, ever-changing community.

6.3 Future directions

The results show tendencies that may apply more broadly to crises in crypto. During the course of the interviews, participants often referred to similar events, providing evidence of recurring patterns around crypto crashes and in crypto markets more generally. This is a relevant insight since crises are commonplace in crypto. Nonetheless, it would be interesting to compare crypto users' process of sense-making across multiple cases and over time, for example immediately after a crash and several weeks and months later.

Moreover, some of the insights generated by the sense-making process include actions and behaviours that seem characteristic of crises in general. This particularly refers to social support and social bonding through shared negative experiences (Schwarzer et al., 1994). Yet, since crises are omnipresent in crypto, this insight is significant in that it emphasises the relevance of strengthening social connections. Future studies could explore the role of social bonding that may be particularly relevant, but also arduous, in a digital, pseudonymous space with little in-person interaction. Additionally, future studies may investigate the correlations of users' personality traits with their attitudes towards crypto. These factors may influence risk perceptions and decision-making as part of the sense-making.

Finally, as crypto continues to gain popularity as a digital network of users on a global scale, more multidisciplinary research will be needed for an in-depth understanding of its communities, user behaviour, and social dynamics. With a need for trust and control prevalent in crypto's social infrastructure, as demonstrated by the study, in-depth ethnographic, but also psychological research on

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the establishment of trust in a decentralised, anonymous space is needed. Ultimately, such insights into user behaviour will allow better comprehension of underlying drivers and of crypto's future prospects.

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Appendix A

Participant list – ordinary crypto investors

Participant	Gender	Months/years of experience with crypto at the time of the interview	Role in crypto at the time of the interview and profession outside of crypto	Degree of impact LUNA crash (low-medium-high)
1	Female	4 years	Full-time crypto trader and investor	high
2	Male	7 months	Active crypto trader; electrician	medium
3	Male	6 years	Full-time trader, investor, and mentor for first-time crypto traders; former manager in traditional finance	high
4	Male	6 months	Active trader, investor; economics student	medium
5	Male	6 months	Active trader, investor; aerospace engineering student	high
6	Male	9 months	Active investor	low
7	Male	5 years	Full-time trader and investor	high
8	Female	4 years	Active trader; salesperson	high
9	Male	5 years	Full-time investor and crypto community manager; former lawyer	low
10	Male	5 years	Full-time trader and investor; former human resources manager	high
11	Male	5 years	Active trader and investor	low
12	Male	1 year	Active trader; business analytics student	high
13	Male	1 year	Active trader; psychologist	medium
14	Male	8 years	Active trader and investor; software developer	low
15	Female	1 year	Active trader and investor; financial manager	low
16	Male	9 months	Active trader and investor; salesperson	high
17	Male	2 years	Active trader and investor; PhD student	medium
18	Male	2 years	Full-time trader and investor	high

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19	Male	1 year	Active trader and investor; lawyer	high

Participant list – team members Beethoven X

Participant	Gender	Months/years of experience with crypto at the time of the interview	Role in crypto at the time of the interview and profession outside of crypto	Degree of impact LUNA crash (low-medium-high)
20	Male	9 months	Full-time software developer at Beethoven X	low
21	Male	2 years	Part-time software developer and advisor at Beethoven X; active investor	low
22	Male	5 years	Part-time marketing manager at Beethoven X; CEO of a company	low
23	Male	5 years	Part-time marketing manager at Beethoven X; partner and marketing manager	low
24	Male	5 months	Full-time software developer at Beethoven X	low
25	Male	7 months	Full-time marketing manager at Beethoven X	medium
26	Male	9 months	Part-time graphic designer at Beethoven X; graphic designer	low
27	Male	5 months	Part-time software developer at Beethoven X; software developer	low
28	Male	1.5 years	Full-time software developer at Beethoven X	low

Appendix B



Image 1: 'Defiance of risk' reflected by 'Icarus flying too close to the sun'; same image collected by several participants.



Image 2: 'Team and community: friends or enemies?'; image collected by a participant.

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Image 3: 'Finding meaning'; image collected by a participant.



Image 4: 'Crypto culture as a Hindrance'; same image collected by several participants.

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Image 5: 'Sense of togetherness'; image collected by a participant.



Image 6: 'Ghost town'; image collected by a participant.

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In search of a new vanguard

Women and digital activism in the *Global South*

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Abstract

This study explores the historical relevance social movement vanguards within the framework of Marxian scientific socialism, while ascertaining the emergence of women as drivers of connective action in digitally enabled movements (DEMs). While the rhizomic structures of social movements have thrived on the spontaneity of emerging cells of social activist leaders, this study contests the claims of contradictions between spontaneity and vanguardism in DEMs. The study adopts the case study methodology to establish how technology affords more visibility to female icons of social movements by drawing examples from Sudan, Lebanon and Nigeria. Data was sourced from primary literature, digital archives and newspaper reports to tease out the history and current dynamics of women's roles in social movements. It uses vanguardism as the conceptual framework for teasing out the intersections of gender, age, identity and technology as observed in DEMs. The study thus contends that technology plays important roles in restructuring the power dynamics of social action by showcasing how women such as Alaa Salah (Sudan), Malak Alawiye Herz (Lebanon) and Aisha Yesufu (Nigeria) emerged as icons of DEMs. It concludes that the weaponization of female bodies has become a potent form of resistance against the gendered biopolitics of sexual objectification and the necropolitics of state repression. The study thus advocates an all-inclusive approach to understanding the structures of social movements in recentring the iconic roles of women during connective action and physical protests. This is to enable the balance between vanguardism and spontaneity that is requisite for effective social action in the digital age.

Keywords: Vanguardism; Connective Action; Women and Digitally-enabled Movements (DEMs)

1. Introduction: Vanguardism at the intersection of gender and age

> 'As to the authority of the husband, this has always been weaker among the poor peasants because, out of economic necessity, their womenfolk have to do more manual labour than the women of the richer classes and therefore have more say and greater power of decision in family matters. With the increasing bankruptcy of the rural economy in recent years, the basis for men's domination over women has already been weakened. With the rise of the peasant movement, the women in many places have now begun to organize rural women's associations; the opportunity has come for them to lift up their heads, and the authority of the husband is getting shakier every day.' (Tse Tung 1967, pp. 46-47)

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Chairman Mao Tse Tung's 1927 report on the peasant revolution in Hunan Province indicated how the changing economic dynamics were redefining gender roles in China. He specifically highlighted the leadership roles been assumed by women in terms of organizing, in order to sustain the revolutionary turn of the era. There is no doubt that women have been an integral part of the notion and drive for revolutionary change over time across different geographies. However, their roles have been predominantly underscored as subservient within patriarchally dominant accounts of social history (see Sklar and Dublin 2011; Ardener, Armitage-Woodward and Sciama 2016). In recent times, the democratization of information dissemination, and by extension historical documentation, has enhanced the visibility of women's leadership roles within social movements. As such, with the proliferation of multiple avenues for documentation, as afforded by the technological turn of the digital age (even in real time), women now have better visibility for their narratives that were hitherto repressed by patriarchal gatekeepers (see Crymble 2021). This thus provides them leverage to serve as new vanguards amidst the spontaneity of digital activism of the present. This study attempts a historical contextualization of social activism through the hermeneutical interpretation of vanguardism across time and space. Data was sourced using primary literature, digital archives and newspaper reports to establish technological affordances of female iconography amidst the spontaneity of collective action.

The relevance of this to the present context has been underscored by Tarrow's (2011, pp. 5-6) observation that the prevalent drives of social activism across the globe have led scholars to postulate that the world was becoming a 'social movement society.' More than a decade after, this assertion holds true due to the fact that social activism has evolved into a borderless reality, where digital mobilization efforts defy geographical, class and gender boundaries. Within the latter consideration, it is important to reflect on how women are changing the dynamics of social movements today. As activists continue to contend policies and demand change from governments across societies that are plagued with the contradictions of class-dependent hierarchies of inequality, women have continued to determine the iconic turn of emerging movements by leveraging the digital media. In exploring the increasing visibility of women and their role as vanguards within social movements in the digital age, this study situates the evolution of social activism within certain historical considerations. As a start point, Larmer's (2010, pp. 252-253) assertion that there is no agreed framework for characterizing what social movements entail is quite instructive. According to him, these movements evolve as enduring institutions (such as trade unions and civil society organizations), spontaneous temporary agitation groups, or a combination of both. Within the *Global South*, the high rates of job insecurity in the formal labour sectors have led to the professionalisation of activism in different countries. This has resulted in the extension of demands beyond workers' rights to other causes like the protection of environmental rights, women rights, and religious freedom; often led by labour activists laid off from formal employment. In recent times, these protests have been shaped by the spontaneity characterizing new social movements. This is such that they accommodate rhizomic structural engagements in expressing what Gerbaudo (2017) christens citizenism. This concept explains how citizens constitute independent yet interconnected cells, without centralized leadership structures, for mobilization, organization and coordination of social action. One major reason adduced for the emergence of these spontaneous structures is the distrust of institutional leadership within movements; resulting in what Castells (2012) calls 'antiestablishment tendencies,' whereby trust in individuals[1] displaces institutional trust. This individualization of action, thus, paved the way for the deconstruction of structured gendered norms and actions, based on the affordances of technology as will be detailed in subsequent sections.

Following from the above, Sapkota (2021, p. 6) noted a shift in the theoretical paradigm of social movements leading to the postulation of the New Social Movement Theory that became dominant in the 1960s and 1970s, and was detailed in Melucci's 1984 *Altri Codici*. He specifically highlighted how new

[1] This expression of trust within the digital media is captured in the creation of influencers, who play dominant roles in digital mobilization as agenda setters of today. The influencer role is often determined by the large number of followers and activities on social media handles and pages, mostly due to celebrity status.

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actors became independent of formal institutions in creating new engagement strategies, networking procedures, group identities (see also Johnston 2019) and interests, within mainly decentralized structures. This decentralization enabled the democratization of power, which could be wielded in multiple locations irrespective of gender, racial or class affiliation. The evolution of decentralized structures within social movements has also influenced their ideological components as Veltmeyer (2017, pp. 66-67) documented in his study of new movements in Latin America. According to him, activist causes have evolved from 19th Century class activism of the first industrial revolution, through countering neoliberal policies of the second and third industrial revolutions, to the environmental rights struggle (including the management of E-wastes) characterizing the fourth industrial revolution. This evolutionary trend, though, has yet to reflect the needed revolutionary turn capable of challenging subsisting strongholds of global capitalism, which continues to dictate the pace for economic engagements. He subsequently advocated for the reinvigoration of global political leftist traditions through vibrant and effective vanguardism. The Student Nonviolent Coordinating Committee (SNCC) of the Civil Rights Movement in the 1960s likewise leveraged decentralized leadership structures through the development of community-based leadership, strong grassroot bases, and rotational executive leadership; following Ella Baker's proposition that 'strong movements don't need strong leaders.' The committee thus provided equal access to leadership positions, which was to the advantage of minority groups, and subsequently stimulated more commitments from members (see Robnett 2002, pp. 269-270).

Earlier, Mandel (1983, p. 3) postulated that the path to success for socialist revolution, far from being spontaneous, ought to be premised on societal restructuring. This entails organizing to abolish bourgeoisie suppression towards attaining a classless society, and requires a high level of consciousness. This approach led to the successes of Germany's Revolutionaire Obleute during the 1918 revolution, and the Bolshevik party in Russia's 1905 and 1917 revolutions (Madel 1983, pp. 9-10). Lenin was also critical of the view that the spontaneity of the proletariat movement could propel it to state leadership. He rather maintained that spontaneity would only perpetuate bourgeoisie ideology among the proletariat. Subsequently, he reiterated the need for an effective vanguard comprising intellectuals and professionals within revolutionary movements to facilitate the cultivation of consciousness among the working class (Birnbaum 1985, p. 63).

Similarly, Larmer (2010, p. 260) noted how the pessimism that characterizes civic engagements in Africa is based on the ineffective antecedence of constituting vanguards from the urban working class, rural peasants and westernized intelligentsia. More so, the attempts at adopting more decentralized approaches have been undermined by elite infiltrations. He therefore proposed that the quest for unison in the organization of counter-hegemonic struggles be replaced by organic indigenous models characterized by the spontaneity of recent activist movements. This change is important in reasserting the central role that vanguards of social movements play, as the proximity to the grassroots would help to understand emerging identities and interests among new activist groups. Furthermore, the model would facilitate more in-depth understanding of shifting contextual frameworks for diagnosing social problems, identifying major stakeholders and developing actionable plans for social change. This is such that the dialectical relations between social movement vanguards and mass self-organization would be synthesized into a sustained revolution that leads to integral societal changes. The sustainability of these changes would be dependent on how the revolutionary dialectic leverages the intellectual vanguard as a nucleus within working-class infrastructure for counter-action against elitist exploitation (see Mandel 1983, pp. 13, 15).

Oliver (1983, p. 160) noted that the potential for resource mobilization was another important determinant of the structures, methods and successes of collective action. She, however, concluded that while material conditions clearly constrain collective action, activist groups also derive their motivations from ideological beliefs and values that shape their identities beyond material benefits. Activists have continued to adopt methods in line with available resources, inclusive of the use of art that is one of the easily accessible and implementable tools for collective action. Variants of creative art methods have

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been utilized for activism. These include graffiti, uniforms, symbolic gestures, as well as rhythms and lyrics. As Lake (2006, p. 310) puts it while describing its use by the Black Panther Party, art's subtlety helped in stimulating the imagination of citizens while passing provocative messages on the need for systemic changes. The group's resources also determined its methods for implementing survival programmes, which included the provision of free breakfast and clothing for children, free medical care and free education. These people-driven initiatives helped to attract commitment from the black community as it kept mobilizing support for a new system of revolutionary governance (Lake 2006, p. 315).

In more recent times, new movements have continued to experience the emergence of youth leaders who defy age, racial, gender and class biases as afforded by their creativity and growing digital infrastructure. In his study of the cognitive elements of social mobilization and action, Johnston (2019, pp. 2, 9) emphasized the critical efforts of youths (mostly 18-25) as vanguards for social movements. This is evidenced across different activist causes including civil rights protests, women's movements, anticolonial protests, and the struggles for economic and sociopolitical rights. He observed that indices such as physicality, creativity, intellectuality, high risk valence and malleability are important in defining the tactical impacts of youths in countering repressive strategies. For instance, their dexterity at innovating and using digital tools for mobilization and organizing within encrypted virtual spaces has helped in navigating the dangers of state voyeurism. Nonetheless, Gwala's (1991, p. 9) observation that the lack of intellectual guidance among youth activists impoverishes their theoretical understanding of the teachings of Marx and Lenin holds true in an age prevalent with spontaneous activism. This consequently impedes the potential for sustained political organization due to the departure from the methods of scientific socialism, which helps in the drive towards democratic socialism.[2] This study is thus focused on exploring the intersections of age and gender as embodied by young female activists, who have assumed leadership roles within new spontaneous DEMs. It explores how these women have become icons of national revolutionary efforts, while contending the need to harness these efforts in creating sustainable vanguards for digital activism.

2. Vanguardism from the lens of history

In the preface to the 1890 edition of the *Communist Manifesto*, Friedrich Engels discussed the need for the International Working Men's Association (comprising cells of workers' unions) to serve as the vanguard of the revolution in Europe and North America (Marx and Engels, 1969). The vanguard's importance became prominent during the Bolshevik revolution in the Soviet Union, as it ensured the education of the working class on communist ideologies tailored towards national liberation from bourgeoisie oppression, and the realization of a simultaneous global revolutionary process. The success of mass mobilization for action was, thus, dependent on realizing a global revolutionary alliance facilitated by the vanguard, and based on historical determinism (McAdams, 2017). The global ambition of institutionalising social change underscored the earlier phases of Marxism, and thus influenced the perception of vanguard roles. The success of the Paris Commune in France, as described by Marx, was because the government was essentialised by the working class. It was therefore able to provide universal suffrage for workers, peasants and members of the middle class who had been disenfranchised by capitalist policies. Similarly, Engels and Kautsky remarked that proletariat revolutionaries led by a working-class majority would enjoy the legitimacy to govern because of the potential support of other minority groups in the society (Birnbaum 1985, p. 55). However, because of the volatility that characterizes the uneven development of class consciousness and action among working-class party

[2] Following Lenin, Gwala (1991) describes democratic socialism as an amorphous formation that incorporates non-proletariats into the workers' movement to form a mass party, unlike the vanguard party. This new party structure, according to him, has a disadvantage of possibly hampering the revolutionary trajectory; especially, if negatively impacted by the non-proletariats who choose to perpetuate the oppressive system of bourgeoise democracy.

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members, Mandel (1983, pp. 5-7) maintained that it behoves the vanguard organisation,[3] constituted by a group of individuals with high levels of consciousness, to provide theoretical education and facilitate political engagements around its ideology. This is necessary to sustain historical awareness among members through learnings on the different phases of a revolution, as was exemplified by the Fourth International (see also Lake 2006, p. 318).

Within the Asian context, it has been well documented that the peasant movement facilitated the Chinese revolution. However, Tse Tung's (1967, p. 31) report of the peasant revolution in Hunan province is quite instructive regarding the three categories of peasants in China. These included the rich, the middle class and the poor peasants. The rich peasants largely constituted the inactive members of the movement due to the fear of the consequences of its methods, while middle class peasants had a lukewarm disposition and required motivation through enlightenment that was driven by scientific socialism. However, the masses of poor peasants provided the reliable force needed by the vanguard to sustain the revolution. They constituted about 70 percent of the movement's membership, and remained consistent through the different phases of the revolution; having suffered from either partial or complete economic dispossession (Tse Tung 1967, pp. 32-33). They mobilized against social ills (like gambling and banditry) by encouraging organizational discipline[4] and respect for public morality, while holding the Lumpenbourgeoisie (see Gunder 1970) to account for corrupt practices (Tse Tung 1967, pp. 34-35).

The peasant revolution in Hunan is credited with the 14 great achievements[5] that included sustainable organising; political victory; establishment of a peasants' military; economic, judicial, cultural (gender), religious and educational reforms; as well as infrastructural development (Tse Tung 1967). Suffice to state that the foundations for the peasant revolution had been laid by Dr Sun Yat-Sen, who developed the Three People's Principles to include nationalism[6], democracy,[7] and the livelihood of the people[8] as the operational guide for the Kuomintang. These three principles subsequently influenced the development of Three Great Policies of the Kuomintang to include the alliance with Russia, collaboration with the Communist Party, and support for workers and peasants (Yat-Sen 2000). Yat-Sen thus provided the ideological foundation for the revolutionary peasant vanguard of the Chinese revolution.

In the post WWII period, the vanguard party of the Soviet Union and the International Communist Movement courted postcolonial leaders in the *Global South* as part of the strategy for realising their mission of establishing socialist governments in charting a non-capitalist path to development. Their political ideology was focused on establishing participatory democracy led by national vanguard parties that were constituted by workers, in collaboration with leaders of other minority groups including the peasants and petit bourgeoisie (see Glaser 2013, p. 179; Mandel 1983, p. 10). While these efforts yielded in terms of generating socialist groups that engaged in several debates against imperial capitalism, the establishment of democratic socialism through systemic changes was not as successful, especially in Africa. Among other things, the inability to create effective structures impeded the potential for synergising different socialist ideologies and groups within national boundaries on the continent (see von Holdt 1991). In line with this, McAdams (2017, p. 9) critiqued centralised structures within social movements by noting that they allowed for impunity among members of the vanguard. This is because they are enabled to exercise the exclusive right to provide directives without defined mechanisms for accountability. This challenge could also be traced to the preoccupation of Marx and Lenin with the

[3] Mandel (1983, p. 8) distinguished between a vanguard party, which consists of a few ineffective self-acclaimed people without the legitimacy of the masses; and a vanguard organization that is more enduring having been consciously developed over time, and has legitimacy within a significant minority working-class group through their membership.

[4] The slogan 'strengthen discipline' resonated with the project of public education on the need for moral probity, and internal control of deviating members.

[5] Albeit in different stages depending on the county.

[6] His model of nationalism entailed accommodation of foreigners while exporting Chinese civilisation; as well as absorbing the best world civilisation initiatives towards the growth of China as a country.

[7] This model entails five arms of government through the addition of China's Civil Service Examination and Censorate Systems to the judiciary, executive and legislature within a direct participatory democratic republic.

[8] This was an economic model premised on state ownership of properties to forestall economic inequality among citizens.

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ambition to create a global revolutionary movement, with little consideration regarding the internal workings of the International Workers Movement. Their efforts were thus limited to ascertaining that agreed principles and creed were developed as codes for validating membership (See Debrizzi 1982).

As it were, certain scholars who support the practice of liberal democracy oppose the model of vanguard democracy because it could amount to totalitarian communism; especially where the ruling party wields absolute power. Such power derives its legitimacy from the assumption that the vanguard is a representation of majority of the working-class members, who ought to abide by its directives. However, it could also create bureaucratic disillusionment while reproducing systems of oppression (see Williams 2013, p. 18; Noah 2008). In managing this, Mandel's (1983, p. 20) proposition of internal party democracy that leverages Marx's scientific socialism becomes relevant. This entails mobilising for participatory democracy, where ordinary citizens are engaged in decision-making and implementation processes. This has been exemplified by the Brazilian Workers' Party in the 1980s and the Communist Party of India in the 1990s (see Williams 2013, pp. 26-28). In creating broader social relevance, Marx cautioned against delimiting the mandate of vanguards to just the interests of party members as practiced by trade unions. This is in order not to neglect the global objective of wealth redistribution. Within this broader objective, Burawoy (2018, pp. 20-21) reiterated the need to recontextualize social movement theories within extant practices of neoliberalism. He made a case for a sociological method that is focused on the relations of the civil society with the state. This is because these relations help in either countering or reinforcing dictatorial market structures. His advocacy was premised on the trend of excessive commodification that is evidenced in the uncontrolled marketisation of labor, land, money and education. He classified this as the third wave of marketization. This wave of marketization is one in which the dispossession of the factors of production is materialized when capital is embodied by the state (Burawoy 2018, pp. 30-32). New forms of marketization, however, leverage digital infrastructure that democratises the relations of power; whereby decentralized transactions help in neutralizing state hegemony as capital becomes equally embodied by other segments of the society, at times beyond state boundaries.

The importance of digital infrastructure to vanguards in the development of a mass party[9] cannot be downplayed. This is because it facilitates mobilisation for sustainable action by bridging the spatio-temporal divide. Von Holdt (1991, p. 20) posited that the vanguard should be an intelligentsia collective, comprising members of the skilled working-class[10] that operate socialist principles with an understanding of current realities. This partly implies the operationalisation of internal democracy with the use of information and communication technology to ensure the roles of youths become more visible and better appreciated. This has become inevitable because of their dominance in the creation and use of technology. It also helps in reversing the trend of undermining the efforts of young adults in the narratives of social movements, despite usually constituting the substantial mass of initiators and mobilizers of social action; especially when they are female. In one instance, the generational gap between youths and influential adults creates a divergence in terms of preferences for methods and goals of the movement. While this could be quite challenging, it could also create the needed balance when the radicalism of youths is brought into conversation with the moderate disposition of adults to enable sustainable action (Johnston 2019, pp. 12-14). This is also in line with the need to build and consolidate internal party democracies in an era of digital activism. This era has witnessed a 'post-bureaucratic' shift, where material infrastructure has been displaced by information infrastructure (internet) that characterises operations in the Fourth Industrial Revolution (Mosca 2014, p. 5). Civic engagements on social media platforms have become dominated by youths, especially with the professionalisation of their role as influencers because of large audience bases. This followership, beyond commodification, creates a ready pool that could be mobilised for social action.

[9] The mass party for von Holdt (1991) is a fusion of the members of the intelligentsia and the masses.
[10] These include thinkers such as teachers, lecturers, researchers, journalists, editors, students, church leaders, musicians, playwrights, lawyers, doctors and engineers

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Grillo's Five Star Movement (FSM) in Italy presents a successful attempt at using technology as a basis for structuring regional political parties, which could subsequently become dominant in national politics. The movement developed from the digital Meetup Platform that evolved from followers on Grillo's blog, after Italy's socialist government's censorship led to his ban in the 1980s. The democratisation of information dissemination on digital platforms, therefore, paved the way for the continuation of his dissidence and subsequent political success (see Mosca 2014). Despite its usefulness for social action, Kidd and McIntosh (2016) cautioned against the value-based essentialisation of technology due to what they termed techno-ambivalence. This is because, while technology could provide cover for dissidents and critics of government, it has also been appropriated by authoritarian regimes for surveillance, censorship and ban on dissident groups and individuals. This ambivalent use of technology is indicative of a neutrality that subjects it to proactive use by activists within social movements, and antagonistic use by the state and its agents, at times in collaboration with big tech companies.

3. Connective action as a digital shift in identity-based organising among social movements

Affiliation with group and individual identities is a major motivation for participation in activist causes, and this is important in understanding the intersectional dimensions of social movements. Robnett (2002, pp. 267-268) elaborated on this in her study of the Student Nonviolent Coordinating Committee (SNCC) of the Civil Rights Movement in the United States during the 1960s. She highlighted how race, gender and class influenced the formation of a collective identity, through a knowledge-driven cultural template that allowed the group to define itself and structure its membership. For her, the ownership and distribution of this cultural capital were influenced by the relations of power dependent on interplaying internal and external factors, such as nature of actors, access to resources, political opportunities, recruitment patterns, ideologies and organizational strength. It is arguable that a movement's structuring and methods of organising are important determinants of its identity. While certain groups are noted for their emphasis on nonviolence as derived from the Gandhian Satyagraha, others have more radical approaches to press home their demands. These identities are, however, often malleable based on contexts and goals. The SNCC, for instance, evolved from its nonviolent approach to radical self-defence in the bid to assert racial dignity in the United States (see Robnett 2002, pp. 269-270). As shall be discussed in the next section, women from the working class have increasingly become integral to the formation of collective identities by becoming icons of DEMs. As traditional purveyors of culture, they have continued to facilitate the creation, sustenance and transmission of group identities that defy spatial and temporal barriers. As Lake (2006, p. 308) contended, the indices of class, gender and race evolve across time and space in shaping identities; espeically as they are not predetermined by meaning(s), but defined based on changing contexts.

In understanding new and evolving contexts, Burawoy (2018, pp. 23-24) identified five notable characteristics of social movements in the 21st Century. These include those: with the traditional perception of the mismanagement of democracies by the bourgeoisie class; with the demand for a shift from parliamentary representative to direct participatory democracy; that manage repressive response from the state through liquid protests;[11] that complement virtual with physical spaces for mobilization and strategic planning; and with national and/or regional specificity within which the objects of economically-induced[12] political struggles are produced. Nonetheless, while the launch of a movement can be national or regional, developments in information and communication technology have facilitated wider interconnectedness, especially where there are similar causes like those against police brutality, gender stereotypes and racial discrimination. Lake (2006, p. 307) exemplified this in his study through

[11] This entails the adaptation of fluid structures for protest actions within hostile civic spaces in order to prevent mass arrests and incarceration by repressive governments, along with other resilient measures.
[12] This implies deprivation, displacement and dispossession

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the activities of the Black Panther Party. He asserted that transnationalism has defined the vision and structuring of African American social movements over the years. To continue this vision, social media tools have been deployed for the mobilization, organization and reorganization of these movements. In line with this, Bennett and Segerberg (2012, p. 743) posited the emergence of a new logic of connective action as enabled by digital networks that encapsulate decentralized structures of personalised social communication. Connective action has reinforced recent protests such as #BlackLivesMatter, #SayHerName, #BringBackOurGirls, #Metoo, #TasgotBas, #Lebanonrisesup and #EndSARS movements amongst others. As Vardeman and Sebesta (2020) advocated, the sustainability of connective action could be facilitated by digital intersectional communication frameworks that incorporate the solidarity-discord components of mass action, as well as self-reflexive leadership that promotes internal democracies.

Pimlott (2015, pp. 33-39) documented how strategic communication has become important for the sustainability of connective action. According to him, social movements have embraced the use of strategic communication for mobilization, in the same way that government and corporate administrators deployed it for shaping public agenda. The use of alternative media[13] in the stead of establishment media for external communication has helped activists in shaping public consciousness and building communities for connective action. The use of digital technology-enabled alternative media has thus provided avenues for evading gatekeeping by state-controlled media, with remote dissemination platforms helping to undermine acts of state repression. In other words, the new media has created a more elaborate means of communication owing to its decentralized model of networking, especially where there is the possibility of complementarity with the establishment media. This complementarity is important considering the power tussle between the state and social activists, as they contend to dominate and shape the minds of citizens using technology-enabled social communication networks in conditioned communication environments (see Castells 2015, pp. 5-6).

As Ilten and McInerney (2019, pp. 201-202) observed, the new media has also enabled the formation of collective identities within virtual communities. This is often achieved through micromobilization, which leverages the use of digital tools and symbols for small-scale interactions based on issues of common interests (see also Gerbaudo and Trere 2015). Nonetheless, Wall (2007, p. 274), in her study of the expression of online identities, concluded that though the digital media helps in organizing and educating activists, its platforms have limited capacity for the expression of identities; especially because they are unable to sustain the intensity that is needed for the commitment, participation and trust of members. Social movements have thus become characterized by hybridity, where virtual mobilisation is complemented by physical action. This was witnessed during the 2019-2020 Hong-Kong anti-extradition protests, as digital mobilization through an online petition led to the creation of a successful movement. Identities that developed from cells of persons with similar interests evolved into a coalition movement to protect Hong Kong's legal freedom. The Jyoti Singh - inspired 'Nirbhaya' movement in India also harnessed digital tools to incorporate the subalterns from the poor lower class into the middle class-led protests. The movement succeeded in transforming the identity of 'victims' to that of 'survivors,' which enabled it instigate reforms of legislations against rape in the country (see Bakshi, 2017, p. 46; Dey 2018).

[13] The alternative media contributed to the success of the Bolsheviks' revolutionary efforts, where available means of technology for mass communication was used to create 'a party paper' for external communication outside the movement.

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4. The iconic shift: female vanguardism at the digital turn of revolutionary movements in the *Global South*

4.1 Preamble

The vulnerabilities of women have often been the emphasis in patriarchally dominated narratives of violence and conflicts, which often characterize revolutionary engagements of social movements. While there is enough historical evidence on the contributions of women to revolutionary endeavours, the mechanisms for decentralizing visibility, characterizing information dissemination for micromobilization on the social media, have created more spotlights for women in terms of their leadership of anti-hegemonic struggles. In her study of the movement in Sudan, which began with the 2019 protests against President Omar al-Bashir's repressive government, Zunes (2021) noted that decentralization was a major factor for its success. This was because the barriers of gender and age were broken to recentre women and youths as leaders of the process. History is replete with notable female revolutionary leaders such as Harriet Tubman, Winnie Mandela, Ellen Johnson Sirleaf, Angela Davies, Fannie Lou Hamer, Gloria Steinem, Rosa Parks and Ella Baker, who confronted the status quo as drivers of change within their different contexts. Likewise, Arab women have continued to push for political, legal and social reordering across different geographies in the Arab world (see Khamis and Mili 2017). In more recent times, the recognition of Malala Yousafzai's efforts at the age of 17 with the Nobel Peace Prize, because of her advocacy on the education of the girl child that put her life at risk, was a defining moment of having a female as the youngest Nobel Prize Laureate. In defiance against the age and gender barriers, Malala began to use technology for advocacy at the age of 11 by blogging about her experience as a young girl in a conservative Islamic society, and has continued to push for girl child education[14] despite the earlier assassination attempt on her life by members of the Taliban.

Having been living in exile since a Fatwa was proclaimed against her by the Taliban, the young Pakistani lady has emerged as the icon of the right to education of the girl child. In respect of this, July 12 has been earmarked as the Malala Day following her 2013 speech at the United Nations. During her speech to the United Nations Security Council (UNSC) in September 2021, Malala pointed out how Afghan women and girls have begun to speak for themselves, while emphasizing her embodiment of the female experience of extremist violence (Yousafzai 2021). Afghan women have also embraced cultural activism to foster economic empowerment as reflected in some entrepreneurial efforts, including traditional embroidery inspired by Rangina Hamidi (see Hamidi, Littrell and Lerner 2017). Similarly, they are using interventions in education, politics and health to develop counter-cultural motifs against the Taliban sexist order (see George W Bush Institute 2016). Women have continued to define the momentum of activism, especially within the digital age. This is partly because they often emerge as icons that ensure the sustenance of efforts amidst the spontaneity of new movements. The subsequent parts of this section will explore case studies from Sudan, Lebanon and Nigeria to situate women within the iconic shift that negates perceived frictions between vanguardism and spontaneity in DEMs.

4.2 Alaa Salah and the women of Sudan's 2019 revolution

When Lara Haroun took the picture of Alaa Salah during one of the protest marches in Sudan, little did she realize that it would become an iconic definition of how people came to understand the Sudanese revolution; and subsequently influence Alaa's nomination for the Nobel Peace Prize. In October 2019, the 22-year-old architectural engineering student was invited to address the UNSC during its debate on women, peace and security, while she represented a coalition christened Women of Sudanese Civic and

[14] She cofounded a foundation focused on girl child education, which operates in at least 8 countries spread across different continents. See https://malala.org/

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Political Groups (MANSAM).[15] The 2019 revolution had been sustained through the defiance of resilient Sudanese women who resisted intimidation by state agents.[16] Tonnessen (2020) documented that women participated from different strata of the society without recourse to class, religion, age, ethnicity or educational affiliations. This vanguard leveraged the use of the digital media alongside creative arts to express their grievances, which at the time was against unbearable economic policies amidst rising inflation rates and scarcity of essentials. The creative geniuses at play during the protests defined a historical legacy through symbolisms that asserted the relevance of the female folk in Sudan's political history, with the hashtag #TasgotBas (#FallThatIsAll) driving the micromobilization for a revolution that resulted in regime change (see Nugdalla 2020).



Figure 1. Alaa Salah addressing protesters during the 2019 Sudan Revolution
Source: Lana H. Haroun - Twitter/ @lana_hago

[15] MANSAM fosters the efforts of the Sudanese Women's Union in the fight to advance gender equality and rights of women in general. Notably, it demands 50% affirmative action to empower women. It consists of 28 groups including 18 CSOs, eight political women groups and two youth groups (see Swann 2020)

[16] The deployment of Janjaweed inspired Rapid Support Forces (RSF), alongside the police, by the Transitional Military Council to disperse the sit-in protest camps during the demand for a return to civilian rule on June 3 2019 led to sexual assaults and close to 120 fatalities. This happened at the end of Ramadan, which has been christened Eid Shahid - the Eid of Martyrs (see Hendawi 2020; AbdelAziz 2019).

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In her speech to the UNSC, Salah (2019) discussed the vulnerabilities of women under President Omar al Bashir's 30-year rule, during which he instituted a sexist public order that policed female bodies, voices and appearance under the guise of religious adherence. This clampdown was later extended to social media platforms as a way of curbing dissent. The need for a sustainable vanguard came through in her submission on how regime change did not translate to progress for Sudanese women, despite their pivotal roles during the revolution and its aftermath. An effective vanguard could have pushed for the presence of women in decision making on state affairs (Salah 2019). Tonnessen (2020) corroborated this when she asserted that the political contributions of women in ousting military dictatorships before al-Bashir hadn't been properly documented. These contributions inspired their leadership of the protests to reject the public order law that was designed to reinforce decades of economic and political disenfranchisement and indignity. Nonetheless, the structural exclusion of women in the post al-Bashir era, especially within government, serves to affirm why decentralized vanguards are needed to sustain the reversal of the gender-biased status quo (see Reilly 2019; Nugdalla 2020). In her analysis of the symbolism of Alaa's address to protesters atop the roof of a truck, AbdelAziz (2019) explained Alaa's donning of the Tobe[17] as a signification of the restoration of women's pride. This appearance reenacted the historical leadership role of the Women's Union in the struggle for Sudan's independence, even if it accentuated the visual subjugation of women from other minority groups beyond the Nile Valley and Central Sudan. Class distinction was also reflected in Alaa's christening as Kandaka (a Nubian queen), as it projected an arabicized version of Sudanese female royalty over women of other multiple racial extractions that comprised the Sudanese movement. The bridging of the gender and class divide noticeable in social movements thus requires the functioning of an inclusive vanguard. This inclusivity would be a significant step to further blur the religious and ethnic divides in the country. It could also have served to consolidate the efforts of Alaa and the women's coalition in the push for a 50% stake in leadership roles for women in the post-al Bashir era (Nugdalla 2020; Reilly 2019). The dominance of women in the movement, who constituted up to about 70% of its members, also helped in defining its nonviolent methods, which included the use of Zaghareet[18] for mobilization. They also inspired the symbols for the revolution, themed by mantras such as 'You women, be strong,' and 'This is a women's revolution' (see Zunes 2021). Their efforts at organizing were also rooted in the principles of scientific socialism, through the combination of education and activism, which have been continued in the post-transition period by the Sudan Women for Change[19] (Nugdalla 2020).

4.3 Malak Alawiye Herz as the amazon of the Lebanese Women's 2019 Movement

The Lebanese protests of October 2019 also exemplified a new dynamic in women's leadership within digitally-enabled collective action. It entailed the use of creative arts as a method for defining countercultural engagements, similar to the impact of Ceyda Sungur's 2013 confrontation with the Turkish police (Harding 2013). The participation of youths contributed to the creativity that characterized the protests.[20] This was expressed through graffiti,[21] as well as in the symbolism of marriage. In defying the state's repressive response to the protests, Malak Alawiye Herz got married to her husband on October 23, 2019; in the protest ground, surrounded by members of the movement. This gesture became symbolic,

[17] This is a white veil that loosely covers the head and body.
[18] This is the ululating sound made by women in the Arab world.
[19] The organisation held a press conference that was streamed live on Twitter (now X) with demands on enshrining the rights of Sudanese women within the Constitution, as well as socio-economic and political responsiveness to the disadvantaged conditions of women.
[20] The protests were triggered by the government's introduction of new taxes on WhatsApp and other internet calls amounting to $0.20 per day, to compound the already dire state of the nation's economy. However, it happened that the issues of agitations were beyond the introduction of new taxes as the reversal did not deter the protesters (see Azhari 2019).
[21] Art played a symbolic role in mobilizing support for the Lebanese October 2019 revolution, and an Instagram account with the name Art of Thawra (Art of Revolution) was created by Paola Mounra to document the different symbolisms of the revolution. These were themed around women, as well as other major actors and events including corrupt officials, the military, Malak's bravery and the postrevolutionary dream (see Stoughton 2019; Humran 2020, p. 31).

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especially as Malak went viral to assume an iconic status as the face of the Lebanese struggle after kicking an armed bodyguard to defend protesters in Beirut.[22] The latter had shot in the air to scare protesters away.

This act of bravery by an unarmed woman served as a motivation for fellow protesters on October 19, the first night of the protests.[23] Malak's action was a reversal of the gender norm in Lebanon, and this was affirmed during an interview with *An Nahar* where she recounted: "He was a big man, in a black t-shirt, holding a gun…I am a woman, and that is my weapon…In this part of the world, women's rights are not given, they are taken" (Matar 2019).[24]



Figure 2. Malak Alawiye Herz kicking a bodyguard during the protests
Source: Timour Azhari – Twitter/ @timourashari

In spite of Malak's action trending as a motivation for protesters, Humran (2020, p. 30) observed that women engendered peace despite displaying resilience while leading the protests in the face of state repression. Women, who defied the class, age and gender barriers to occupy frontline rows, displayed their readiness for political integration by challenging the government to bring an end to corruption and sectarian politics (see Ayoub 2019). They took charge of different sit-in sites; and projected their demands

[22] This was one of the bodyguards of the Education Minister, Akram Chehaveb
[23] This was not Malak's first confrontation with security agents. There is a reported case of punching a policeman in the face for seizing her phone during a 2018 demonstration in front of the Ministry of Education (Matar 2019).
[24] Malak would subsequently be summoned in February 2020 to face the military tribunal later in November of the same year.

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through megaphones, musical rendition, roadblocks, graffiti and belly dances during protest marches (Elbasnaly 2019; Diab 2021, p. 129). In establishing their leadership role, women who occupied the frontlines used their bodies to shield other protesters during confrontation with state agents. This represented a twist from the chauvinistic order that imposed a degrading perception of victimhood on women through their vulnerabilities to assault. This line of defence thus became a proactive performance by the women's vanguard, as protagonists deploying the use of nonviolence to sustain the revolution (see Diab 2021, p. 129; Ayoub 2019; Humran 2020). The contrasting imageries of the same woman in the wedding gown holding a Lebanese flag on the one hand, and kicking a bodyguard to protect fellow protesters on the other, during the same collective action, showcase the blend of cultural and countercultural motifs that characterized the clamour for change in Lebanese gender roles. These efforts were consolidated by the connective action of the Lebanese diaspora, foreign sympathizers and LGBTQ+ community that sharpened the progressive nature of the movement in its demands for a more gender responsive and inclusive polity (see Ayoub 2019, p. 8).



Figure 3. Malak's wedding to her husband Mouhamad Herz in front of the protesters
Source: Middle East Online https://middle-east-online.com/en/lebanese-woman-who-kicked-armed-bodyguard-face-trial

The media was also important in pushing for a reversal of gender roles and defining the methods for Lebanon's 6th revolution. It championed the method of nonviolence by giving visibility to women as the frontliners of the struggle. The nation's leading newspaper, *An-Nahar,* published the 'New National Anthem,' with the revision of describing the nation as 'the birthplace of men' to 'the birthplace of women and men.' It also dedicated the front page of its October 2019 edition to women with the headline caption as 'Naharouki,' which means 'Your Day.' The new anthem became nationally accepted with women across the country, notably at Martyrs' Square in Beirut, using it as the song of the revolution. Based on this legitimacy, the song was also rendered across the nation on Independence Day.[25] The call for national unity also trended on social media with the pioneering hashtag #.ينتفض_لبنان (#Lebanonrisesup) driving connective action. The Lebanese example detailed how nonviolent protests through women's leadership led to the revision of national gender roles. In the first instance, four ministers affiliated with the Lebanese Forces Party resigned a day after the protest began, while Prime Minister Saad Hariri resigned nine days later (Ayoub 2019, pp. 7-8).[26] More importantly, women gained more representation in the new Lebanese

[25] See The New National Anthem Edition. https://www.adsoftheworld.com/campaigns/the-new-national-anthem-edition
[26] The demands during the protests also included early parliamentary elections, electoral reforms, and the investigation of corrupt officials.

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government which comprised six women (a 400% increase); including the first ever female Minister of Defence in the Arab World.[27]

4.4 Aisha Yesufu and the Feminist Coalition in Nigeria's #EndSARS Campaign

The prominence of Aisha Yesufu within the Nigerian civic space predates the October 2020 #EndSARS Campaign, as she is one of the conveners of the #BringBackOurGirls Movement. The latter campaign was initiated to demand the rescue of the Chibok schoolgirls who were abducted by Boko Haram insurgents on April 14, 2014. Micromobilization for connective action during this decade-long campaign has been enabled by the hashtag #BringBackOurGirls. The conveners also endorsed the use of the red and white colours to symbolize danger and passion, and innocence respectively.[28] The campaign's success as a connective action is evidenced in the support it garnered from celebrities globally, as they joined the call for the release of the schoolgirls through Twitter, Facebook and Instagram, as well as during physical events.[29]

The involvement of Aisha in the #EndSARS movement is quite instructive and relevant for analyzing Johnston's (2019) discussion on the psychosocial dimensions of the capacity for risks within activist movements. Her display of bravery by confronting the Nigerian police, while they threatened to assault her physically on October 10, 2020, reflected a contrast to the reservation of high-risk strategies within the age bracket of youths. Even though this was not her first confrontation with state agents during public protests, the particular moment of a raised fist in defiance of threats by the police became iconic for young protesters pushing for police reforms in the country. The gravity of such defiance was confirmed ten days later at the Lekki Toll Gate incident of October 20, 2020. Soldiers had combined forces with the police at the toll gate to shoot at harmless protesters while they were waving the Nigerian flag and singing the national anthem (see Busari et al. 2021). The incident revealed a differing perception on the utilization of national symbols for non-sectarian identities of collective action, as was the case with Lebanon. The violation of Nigeria's national symbols in an orchestrated darkness by soldiers sworn to protect the citizens, after a premeditated removal of security cameras, was proof of how national interests can be subjected to the whims and caprices of corrupt elites.[30] Suffice to state that the burden of evidence for the shooting was majorly shouldered by a female Nigerian disk jockey celebrity, Obianuju Catherine Udeh, popularly referred to as DJ Switch. In the face of danger, the young lady livestreamed the shooting to mobilize support for protesters, as well as provide evidence before going on self-exile (Kenechi 2021). For one, the social image of Niqab wearing women in conservative Northern Nigeria was one of vulnerability and public invisibility. Aisha defied this through the unconventional poise of a grey hijab donning middle-aged woman, with fists raised, using her body to shield young protesters from attacks by the marauding police; in a similar fashion to the efforts of Malak and the women of Lebanon.[31] These acts consolidate the perspective on females taking control of their bodies and asserting them as protective shields on protest grounds. Aisha's intervention, as were those of Alaa and Malak, validated the spontaneity of leadership positions during digitally-enabled collective actions. These women took responsibility for the protesters, and became leading icons for micromobilization during subsequent connective actions.

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[27] [27] See The New National Anthem Edition. https://www.adsoftheworld.com/campaigns/the-new-national-anthem-edition

[28] Of the 276 girls that were kidnapped, 107 were released while 57 escaped; and 112 girls were still missing as of July 28, 2022. The Nigerian Army confirmed the release of two of the girls on July 25, 2022. See #BringBackOurGirls Advocacy Movement. https://bringbackourgirls.ng/about-us/

[29] Notable among those that joined the campaign within the first month include Michelle Obama (former US First Lady), Ricky Martin, Antonio Banderas, Wesley Snipes, Mel Gibson, Sylvester Stallone, Salma Hayek, Angelina Jolie, Bob Geldof, Mary J Blige and Madonna. See Celebrities Join Worldwide Calls to #BringBackOurGirls. https://theirworld.org/news/celebrities-join-worldwide-calls-to-bringbackourgirls/

[30] The final report of the Judicial Panel of Inquiry and Restitution of Lagos State led by a female judge, Justice Doris Okuwobi, indicted the soldiers as culpable for the shooting and killing of harmless protesters without provocation.

[31] See Like #EndSARS, Youth Are the Game Changers in 2023 —Aisha Yesufu. *Ripples Nigeria,* Monday June 27, www.ripplesnigeria.com/like-endsars-youth-are-the-game-changers-in-2023-aisha-yesufu/

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Aisha's bravery was complemented by the organizing ability of the Feminist Coalition (FemCo), just as Alaa enjoyed the support of the Sudanese Women's Union. FemCo spearheaded fundraising for the protests, while providing accountability platforms for the #EndSARS movement. Funding support was harnessed through micromobilization that resulted in raising about N147m used for providing water, food, legal services, medical aid, relief for victims and their families, as well as some memory initiatives. The success of the coalition's efforts also depended on technology, with the use of both fiat[32] and crypto currencies facilitated by Flutterwave (a Nigerian Fintech company) between October 8 and 22, 2020. This helped in navigating the repressive acts of the government, which included freezing its bank account and harassing its members[33] (see Desmond 2020). The effectiveness of these efforts reveals that flexibility of protest funding essentializes the window that democratized technology provides to evade repression of social movements by autocratic states.



Figure 4. Aisha Yesufu with the iconic gesture while putting her body between the protesters and security agents
Source: Duffy – Twitter/ @EramehOdufa

The coalition had been formed earlier in July, 2020 by a group of 14[34] young women in their 20s and 30s drawn from the technology, medical, civil society and finance sectors. Its goal was to empower women

[32] They raised funds using different denominations including the US and Canadian dollars, Euro, Ghana Cedis and Kenyan Shillings.
[33] They were indicted in a lawsuit alleging support for unrest in the country; and had their movements restricted, travel documents seized, communication monitored, homes bugged and phones inundated with threats.
[34] The initial founders have been identified as Damilola Odufuwa and Odunayo Eweniyi, who also cofounded Wine and Whine; a safe space for women to discuss the management of various forms of gender-based violence. Other members of the group include Layo Ogunbanwo, Ozzy

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through education, financial liberation, security and political participation (see Nwakanma 2022, p. 5; Ijioma 2021, p. 21; Areo 2020). The manner of collaboration between members of FemCo also affirmed the effectiveness of connective action for social change. This is because most of their engagements were carried out virtually, facilitated by a well-coordinated helpline that aided their role as the primary financier of the #EndSARS Movement. Its fundraising initiative also enjoyed official support from Twitter's former CEO, Jack Dorsey; an act that further legitimized its template for accountability. As Ire Aderinokun, a founding member of FemCo reiterated, the plan for the group's intervention was as spontaneous as the emergence of the protests. In spite of this spontaneity, the group was still able to organize by designing a logo and website, accumulating assets, creating social media and donation accounts, and developing request forms and tracking sheets. These became 'reality overnight' through the focus and dedication of its members (Desmond 2020). The logo of FemCo also became iconic for the movement, as it was endorsed by supporters who used it as display photos for motivation and to show solidarity on the social media. The logo embodied a black female power fist against layers of white and yellow backgrounds, which resonated with Aisha's iconic image that spotlighted the role of women in the coordination of the #EndSARS Movement. Beyond this, the countercultural approach to transparency and accountability, within a national context where public fundraising schemes have been scrutinized for fraud, enhanced the legitimacy of FemCo among protesters. More specifically, the public was briefed on a daily basis about the inflow of cash, currency of payment, as well as the items and processes of disbursement (Dark 2020; Desmond 2020). Its conduct was thus more of an affirmation of the readiness of women to cement their status as the vanguard of sustainable activism amidst the spontaneity of the digital age.



Figure 5. The Logo of the Feminist Coalition
Source: feministcoalition -Twitter / @feminist_co

5. Conclusion

This study establishes the historical role of women amidst the changing dynamics of social movements in which connective action is incorporated into collective action. It asserts that the spontaneity of new

Etomi, Ire Aderinokun, Fakhrriyyah Hashim, Oluwaseun Ayodeji Osowobi, Jola Ayeye, Laila Johnson-Salami, Karo Omu, Obiageli Ofili Alintah, Tito Ovia, Kiki Mordi, and Feyikemi Abudu. (Maclean 2021; Areo 2020).

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movements does not necessarily negate the need for vanguards, even if they operate within rhizomic structures of autonomous groups. The digital affordances of connective action have enabled more visibility for women within recent socio-technical considerations that defy gender, racial, ethnic, age, class and religious biases amidst the formation of new digital identities. As this study shows, women have been influential in determining the emergence and sustenance of these new identities, as they redefined sociocultural contexts through their iconic roles. This was exemplified in Sudan by Alaa Salah, Lebanon by Malak Alawiye Herz and Nigeria by Aisha Yesufu; with the support of women groups. As such, while women have always played significant roles within social movements, the digitization of these movements has recentred them in public discourses; as opposed to previous embedment within hidden transcripts (see Scott 1992) of patriarchally controlled narratives.

Debates on the control of the female body have often been dominated by resistance to male subjugation, reminiscent of the Foucaultian biopolitics (see Foucault 2010). An ancient reference for this is the narrative of Aristophanes (2003) on the body politics of Greek women that helped in ending the Peloponnesian War. The protagonist, Lysistrata, led the weaponisation of female bodies as tools for denial; first, of access to sexual pleasure, and then of access to the state treasury in Acropolis. While the former counters a micro-level gender-inspired hegemonic control, the latter exemplifies a resistance of necropolitics (see Mbebe 2019); as women not only used their bodies to shield the treasury behind the barred gates, but also to protect younger colleagues from potential death. While some have argued against the feminist value of his play, such advocacy as far back as 411BCE, is arguably a progressive turn from the prevalence of identifying subservient roles and imagery with women at the time. Nonetheless, the use of the female body for social reordering is not peculiar to Ancient Greece, as Alexandre (2006) shows in her use of the term 'body protest' to expatiate on the resistance performance of Trinidadian women. This form of resistance was displayed through nontraditional cues of 'maquerading,' polyandry, and dance. The case studies examined above affirm how the female body reverses the order of power dominance through the physical resistance of the forces of necropolitics. Malak's kick, Aisha's iconic pose and the formation of the Maydanik (meaning her space) during the Lebanese protests, all exemplify how women have continued to use their bodies to shield fellow protesters from state violence. The significance of body protest is further accentuated by the fact that it also defies assault from erring male protesters, who sexually objectify women on protest grounds based on gendered biopolitics, but often go unpunished due of organizational solidarity (see Nugdalla 2020).

The participation of women in physical protests as a sequence to connective action has also been effective in terms of its methods (see Diab 2021). Recent digitally-enabled women's rights protests including those by the #MeToo, #SayHerName, #BringBackOurGirls and #BlackLivesMatter movements have basically involved nonviolent activities such as marches, sit-ins, roadblocks, graffiti and musical rendition. However, Beckwith (2002, p. 75) contended that the reasoning behind the characterization of these women-led protests by nonviolence results from a combination of factors. These include their socialization towards nonviolence, political perception as victims of violence, historical alliance with methods of past female-led protests, and a gendered difference in the ideological perception of the concepts of peace and war. In conclusion, it is important to revisit the other intersecting layers of identity including class, ethnicity, age, religion and race, beyond the isolation of gender. This would facilitate a proper contextualization of women's iconic leadership of digital activism in multiethnic contexts. While the digital space provides a platform for decentralization of narratives, netizens remain products of their social conditioning within specific information environments. Protest iconography, therefore, remains vulnerable to influences of class, religion, ethnicity, age and race; with the potential for marginalizing people at the fringes of society, especially where there is restricted access to the internet. Subsequently, an all-inclusive approach through internal democracy ought to guide the adoption of protest symbolisms during connective action.

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Participation inequalities on Pinterest

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Abstract

Digital inequality scholarship has highlighted the importance of sociodemographic factors and internet experiences in how people use digital media in their lives. Some of this research has focused specifically on the adoption and use of social media, but much of this work has only investigated text-based platforms. Image-based sites such as Pinterest have largely been ignored in work about online participation inequalities. It remains unclear how existing findings about participation inequalities on text-based social media translate to image-based platforms. The present paper fills this gap by exploring differences in user engagement on Pinterest, one of the most popular social media platforms. The paper uses a mixed methods approach and analyzes both survey and interview data. This approach allows for a deeper understanding of the pipeline of online participation inequalities, a digital inequalities framework introduced by Shaw and Hargittai (2018). The survey data reveal that age, gender and internet skills strongly relate to participation on the platform. The interviews add more nuance by providing insights into reasons and motivations for Pinterest use as well as reasons for dropping out of the pipeline, beyond those identified in the survey. This mixed-methods approach allows insights into how participation barriers apply to image-based social media.

Keywords: Digital inequality, digital divide, online participation, Pinterest, social media

1. Introduction

Across the world, social media use has steadily increased over the years and most internet users are active on at least one platform (Kemp, 2022; Walsh, 2021). Yet, platforms are not used equally (Pew Research Center, 2024b). Pinterest, with almost 500 million monthly users (Pinterest, 2024), is among the most popular social media sites (Kemp, 2022), yet hardly any research investigates it. The majority of research on social media has focused on text-based social media such as sites such as Facebook and Twitter, notably a site that is less popular than Pinterest (Puschmann & Pentzold, 2020; Snelson, 2016). The present paper applies the comprehensive digital inequality framework of the pipeline of online participation inequalities (Shaw & Hargittai, 2018) to investigate participation patterns on Pinterest.

Digital inequality research has described unequal participation patterns (Hargittai & Jennrich, 2016) and investigated barriers that cause them. Although the importance of examining multiple barriers within one study is well-known (e.g. Schradie, 2011), few studies have done so. An exception is the study by Shaw and Hargittai (2018), in which they propose a "pipeline of online participation inequalities" that

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describes online participation as a set of stages that individuals need to pass through before being able to contribute content. These stages include both general requirements, such as internet access, and platform-specific ones, such as knowledge of the platform and the ability to contribute (Shaw & Hargittai, 2018), and can lead to limited use, where would-be users stop using a platform beyond a certain level.

The initial study proposing the pipeline model examined Wikipedia and found that while the majority of the sample had heard of the platform, considerably fewer knew contribution was possible and even fewer had ever edited a Wikipedia page. The study demonstrates that both sociodemographic and internet experience variables are related to participation on Wikipedia (Shaw & Hargittai, 2018). Another study explored the pipeline framework in the context of the gig economy and found that similar factors (i.e., age, education, and internet skills) relate to participation (Shaw et al., 2023). These studies have shown that the pipeline framework is applicable to an information database like Wikipedia and for gig economy sites (Shaw et al., 2023; Shaw & Hargittai, 2018), but not yet in the context of social media. These studies have also identified key factors for participation on a platform, but the process by which people drop out of the pipeline remains unclear. To do so, the present paper uses a mixed-methods approach, as recommended by Shaw and colleagues (2023).

This paper draws on both survey and interview data to determine the barriers would-be users face and reasons for non- or low participation on Pinterest, an image-based social media platform. While the US survey data allows for quantitative insights into the online participation divide on Pinterest, the in-depth interviews with Swiss users allow for a deeper, more nuanced understanding of the factors that explain the participation divide on the platform and show potential limitations of the framework. I use survey data to confirm that the hypothesis of a pipeline in the context of this specific site exists. Subsequently, the interviews provide insights into the reasons for and experiences of full, partial, and non-participation on the platform. These combined insights allow for both a deeper understanding of participation on Pinterest and the applicability of the pipeline framework for social media.

Research about Pinterest has so far focused on content that is shared on the platform (e.g. Ottoni et al., 2013), specific user groups (i.e. teachers [Schroeder et al., 2019]) or effects of use (e.g. Powell et al., 2018), rather than its user base and participation patterns more generally. A literature review of studies examining image-based platforms found only twelve papers about Pinterest compared to thirty-eight about Instagram (Fung et al., 2020). The lack of attention to Pinterest compared to Instagram is surprising, given that the two are similar in launch dates in 2010 (Pinterest, 2023; Siegler, 2010) and both have millions of users.

Prior work on the platform shows that a majority of users are female (Ottoni et al., 2013), while questions about users' background characteristics beyond gender remain unanswered (Blank & Lutz, 2017 only looked at early adopters of the site). An overarching digital inequality framework, such as the pipeline of participation, can provide helpful insights into potential barriers to participation on the popular platform. Thus, the contributions of this study are to (1) explore the processes underlying to the pipeline of online participation inequalities and (2) focus on an understudied image-based platform, namely Pinterest.

2. Digital inequalities and online participation

Research on digital inequalities has shifted away from questions about access to questions about what people are doing online and what inequalities may exist there (Brake, 2014; Hargittai, 2002; Van Dijk, 2005). Today the vast majority of Americans (95%; Pew Research Center, 2024a) and Europeans (90%; Eurostat, 2019) are online. Yet, research has shown that inequalities online persist (e.g. Nguyen et al., 2021) and that, for example, internet users with high internet skills benefit from the Web in ways that others do not (Hargittai & Micheli, 2019; Litt, 2013).

Internet experience such as time spent online and internet skills can determine a person's online capabilities (Pearce & Rice, 2013). One survey-based study reveals that offline inequalities are recreated

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online (Schradie, 2011). Of particular importance are education as well as where and in how many places someone has access to the internet. The study emphasized that focusing on whether someone is online and who is using a platform falls short, and that what is done on a platform is just as important (Schradie, 2011). This paper addresses both who uses Pinterest and how they participate on the platform.

Online participation can take different forms, and research has not always agreed on definitions for online participation (Hargittai & Jennrich, 2016; Hoffmann et al., 2015). This paper uses a broad definition, which describes online participation as "any type of online engagement whereby the user contributes content that others can access" (Hargittai & Jennrich, 2016, p. 201). There are different dimensions to online participation, of which this paper will examine two: The platform - Pinterest - and the form of expression on it, in order to address gaps that have been identified in the past in both the adoption of a site and the users of the same platforms (Duggan et al., 2015; Junco, 2013; Shaw & Hargittai, 2018).

Particularly, internet skills and experience, such as the quality of internet access and the frequency of use, continue to be important and predict online participation (Brake, 2014; Correa, 2010; Shaw & Hargittai, 2018). One study, which reviewed existing papers and data, found that specific and privileged user groups tend to create more online content (Brake, 2014). Pinterest use remains underexamined in terms of participation patterns.

To investigate barriers to adoption and participation on Pinterest, the present paper draws on the pipeline of online participation inequalities (Shaw & Hargittai, 2018). This framework includes various stages that are conditions to participation. The model, which takes the shape of the pipeline, incorporates internet access, site adoption and different levels of contribution. These stages are conditions someone must meet to use a platform to its full potential. At each stage potential users can drop out of the pipeline, which would signal a barrier. The framework for Pinterest covers different forms of contribution. Users either save content within the platform or from outside sources (i.e., uploading a picture or saving content from other websites). This allows users to save all their ideas in one place (Pinterest, 2023). Users can categorize their saved content – "pins" – on "pinboards".

Once accounting for internet use, Shaw and Hargittai (2018) note participation requires having heard of a site and having visited it. The final participatory steps are platform-specific: (a) having an account; (b) having saved (called pinning on the platform) something on the site; (c) having saved something from the web to Pinterest. These two forms of contribution are the most common on the platform and are clearly distinct from one another (Mittal et al., 2014). The interviews covered all modes of contribution possible on Pinterest, so that reasons and experiences related to their participation or lack thereof could become clear.

3. Online participation on Pinterest

Pinterest is a "visual discovery engine" that helps users find inspiration and ideas (Linder et al., 2014; Pinterest, 2023). Its main appeal for users lies in this visual content (Ottoni et al., 2013). Other features and affordances are not the main focus. Followers, for example, do not matter as much, since a person's main feed is based on their own activities on the site (Bonnington, 2018). In 2024, the platform had more than 498 million monthly users who had – in total – created more than 390 billion bookmarks on the site (so-called pins) (Atwood, 2023; Pinterest, 2024). Pinterest is available in 41 languages (Atwood, 2023). The site is among the most popular social networking sites (Gottfried, 2024; Kemp, 2022; Tankovska, 2021).

By introducing new language versions, Pinterest aims to unlock new markets and expand its userbase (Atwood, 2023). However, its language versions only cover platform provided sections (e.g. the menu) but do not affect the language of the content users engage with on the platform nor the linked sites (Majure, 2012). This is noteworthy, as the accessibility provided by language versions can be limited. Notably, while most of the Pinterest userbase now resides outside of the US, the vast majority of its

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revenue is still generated in the US market (Atwood, 2023). This raises potential questions about who Pinterest is aimed at: the vast majority of is userbase or its main revenue generating section? Scholars have heavily criticized how US platforms enforce their own world view and values on users from other cultural backgrounds (Barwulor et al., 2021; Gillespie, 2018; Kwet, 2019; Wakunuma, 2019), this power over users is expressed along numerous line such as content moderation (Barwulor et al., 2021; Gillespie, 2018) and user data abuse (Kwet, 2019; Wakunuma, 2019). By including Swiss users in the interview portion, the present paper allows the consideration of non-US user perspectives.

Analyses of Pinterest accounts have found significant gender disparities on the site, with women making up the vast majority of users (Gilbert et al., 2013; Mittal et al., 2014; Ottoni et al., 2013). However, while the majority of studies found a gender gap on the website, the gender distribution varied greatly across them, presumably as a result of varying data collection methods. Some studies used web crawlers that started with popular pins or user profiles (Gilbert et al., 2013; Mittal et al., 2014; Ottoni et al., 2013), which may skew the gender distribution (cf. Hargittai, 2020). Nevertheless, survey data from the Pew Research Center also confirms a gender gap among US users (Duggan et al., 2015; Gottfried, 2024).

Surprisingly, the only study that examined gender in relation to site adoption found no gender differences among UK Pinterest users (Blank & Lutz, 2017). Generally, few people in their 2013 sample used the platform. Users tended to be younger, had a higher income and higher internet skills than non-users. One potential factor explaining those findings could be that in 2013, Pinterest was still a fairly new site. Their other findings are supported by data from the US, demonstrating that age and income predict Pinterest use (Blank & Lutz, 2017; Pew Research Center, 2024b). In a study aiming to explain the gender imbalance on the site, only one-third of their sample used Pinterest, almost all of which were female (Miller et al., 2015). Moreover, the platform was perceived by the non-users as a platform for women.

Studies on user interactions found that although content is the focal point of the platform, different forms of interactions do happen in the form of likes or re-pins (Gilbert et al., 2013; Ottoni et al., 2013). Another study that used platform data focused on common characteristics of pins, pinboard and users (Mittal et al., 2014). The data revealed that 73% of the users in the sample stemmed from the US, the UK, and Canada and that only 5% of the content in their sample was directly uploaded to Pinterest. The rest was linked to the platform from other websites.

Three studies using the uses and gratification framework (Mull & Lee, 2014; Sashittal & Jassawalla, 2015; Wang et al., 2016) found that different gratifications predicted different actions users took on the platform, such as pinning content (Wang et al., 2016). One identified different Pinterest use motivations (Mull & Lee, 2014), while another found that students used Pinterest because they found it enriching and were seeking an authentic experience (Sashittal & Jassawalla, 2015).

These studies provide an important foundation for the interview analysis in this paper, even though they often did not address platform participation beyond a binary measure of Pinterest use. Drawing on US national survey data allows the comparison between those who do and those who do not participate. Moreover, the interviews focus on Pinterest use in its entirety, which affords a level of nuance that goes beyond the scope of prior literature. Overall, previous studies on Pinterest have emphasized specific aspects of the platform's use or user groups but have left more general questions about participation unanswered. Therefore, this study addresses the following questions:

RQ1: How does the pipeline of online participation inequalities apply to Pinterest among US internet users?

RQ2: Why do Swiss users drop out of the pipeline?

4. Data and methods

To examine the pipeline of online participation inequalities on Pinterest, and to gain insights into reasons people drop out, this paper uses a mixed method approach, which allows an in-depth investigation of the

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framework in its breadth and complexity (Creswell, 2009). To do so, US survey data and Swiss interviews are analyzed.

The countries share some similarities: The United States of America and Switzerland are both Western democracies, with similarly high internet penetration (Bundesamt für Statistik, 2022; Pew Research Center, 2024a). Further, in both countries similar segments are less connected online. Pinterest is highly popular in in both countries (35% US vs 21 % CH) (Gottfried, 2024; Kemp, 2023). Moreover, by including Swiss interviews alongside the predominantly studies about the United States (see Hargittai & Jennrich, 2016), this paper provides insights into potentially invisible barriers.

4.1 The survey

The survey was conducted from late May to early July in 2016 in the US by the independent research organization NORC, which administered the questions online to their AmeriSpeak panel. The survey included an attention check question and only participants who passed the check were included in the dataset. Overall, this resulted in valid responses from 1,512 US adults.

4.1.1 Independent variables – socioeconomic factors

The survey included various questions on sociodemographic background, see Table 1 for sample characteristics.

Age was measured as year of birth and was recoded into a continuous variable. The average age of the sample was 48.7 (SD=16.9) and ranged from 18-94. Gender was recoded into a bivariate variable with 1 representing female, about half of the participants were female (50.9%). Education was recoded into three categories: High school or less (25.9%), some college (31.6%), and college degree or more (42.5%). Income was measured with 18 income variables, recoded to their midpoint values to create a continuous variable. For the regression I turned the continuous income variable into a logarithmic variable. The average income of the sample was $71,478 (SD=$54,396.6), ranging from $2,500 to $225,000. The various employment variables I recoded into a dichotomous employed variable. More than two-thirds of the participants (62.2%) were employed.

Table 1. Survey sample characteristics

	Percent	Mean	*SD*
Age		48.7	16.9
Female	50.9		
Race and ethnicity			
White	71.1		
African American	11.5		
Hispanic	11.7		
Asian	3.1		
Native American	1.7		
Education			
High school or less	25.9		
Some college	31.6		
Bachelor's degree or more	42.5		
Household income		71.5	54.4
Employed	62.2		
Internet experience			
Autonomy of use		4.8	2.8
Frequency of use		14.7	10.8
Internet skills		3.4	1.1
Pinterest use	41.7		

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4.1.2. Independent variables – internet experience

The survey included several questions about internet use and experience. The question on internet access included nine categories and is summed up in the autonomy of use variable. Participants had on average access to the internet in close to five locations (M=4.8, SD=2.3). The frequency of use variable includes two questions about the hours spent online during the week and on weekends. The answers were summed up to reflect a full week, the hours spent online could range from zero to forty-two. The mean time spent online was 14.7 hours per week (SD=10.8). To measure participants' internet skills, they were given a validated and established index (Hargittai & Hsieh, 2012; Wasserman & Richmond-Abbott, 2005), containing six internet related terms. They were asked to rank their level of understanding of the terms. The average internet skill score was 3.4 (SD=1.1).

4.1.3. Dependent variables – Pinterest use

The survey included questions about different levels of Pinterest use, ranging from having heard of the site to having pinned something from another website to the platform. I recoded the Pinterest use answers into dichotomous variables, reflecting if someone had ever visited the platform. The vast majority had heard of Pinterest (88.6%). There was already a notable drop off between having heard of and having visited the site, which close to two-thirds of the participants had (63.8%). Close to half of the sample had or used to have a Pinterest account (48.8%). Two questions focused on activities on the platform. The first asked if someone had ever re-pinned a pin on the site, which slightly less than one third had (30.6%). The second ask if someone had ever "pinned a page to Pinterest while browsing the Web (exclude re-pinning someone else's pin)", which only around one fifth had ever done (21.7%). Table 2 shows the descriptive statistics of Pinterest use.

Table 2. The pipeline of online participation on Pinterest

	Percent	N
Has heard of Pinterest	88.6	1503
Has ever visited Pinterest	63.8	1495
Has had or has an account on Pinterest	48.8	1489
Has ever pinned on Pinterest	30.6	1491
Has ever pinned a page to Pinterest from the web	21.7	1493

4.1.4. Analyses

First, I ran bivariate analyses looking at the characteristics of active Pinterest users. For several variables – age, income, autonomy of use, frequency of use and internet skills – I created quartiles and compared the lowest and highest quartiles and their relation to Pinterest use. Afterwards, I fitted logistic regressions on each stage of the pipeline of online participation inequalities. I ran two models for each stage: the first model only included the background variables, the second included the internet experience variables.

4.2 Interviews

In addition to analyzing the survey dataset, I conducted ten semi-structured interviews in Switzerland to investigate further how and why people use Pinterest. I chose to do so to gain a deeper understanding about people's Pinterest use and factors affecting participation beyond those included in the survey. To utilize the pipeline of online participation inequalities for Pinterest, participation on the site is presented as a narrow process with a clear final outcome. It does not cover all forms of participation possible. The interviews allow for a more fine-grained investigation of users' participation by covering all forms of participation. Further, the semi-structured interviews allowed participants to make sense of their online participation in their own words and offer the possibility to ask follow-up question.

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Participants were given the option of in-person or phone interviews, with most of them preferring to meetup in-person. I highlighted that the comfort of the participants was of importance and the interviews were held outside whenever possible as the COVID-19 pandemic was still ongoing. Throughout all in-person interviews, the guidelines of the department of health of Switzerland were followed (Bundesamt für Gesundheit, 2020).

Participants were recruited using snowball sampling. The only participation requirement was having a Pinterest account. Six of the participants came directly from the personal network of the author, while four were referrals. The interviews were held in the language participants felt most comfortable in. Nine of the interviews were held in Swiss-German and one in English. The interviews were first transcribed and then translated to English by the author, who is fluent in both languages. The interviews were between seven and sixteen minutes long. The length of the interviews tended to reflect the level of Pinterest use of the participants – i.e., the longest interview was the most active Pinterest user.

Eight of the participants were women, who as previous research noted make up the majority of Pinterest users (Ottoni et al., 2013; Pew Research Center, 2024b). Most of the interview participants were in their mid to late twenties. Both education level and occupation varied across the participants (see table 3).

The interview guide included questions asking participants about their initial adoption of Pinterest, including whether their personal network played a role in their site adoption. Questions about their level of participation on the platform followed. The interviews ended with questions about what participants liked and disliked about the platform and questions whether COVID-19 had changed their Pinterest use in any way. Each question block included follow-up questions.

During the analysis of the interviews, the author began with exploratory coding of two of the interviews to create a codebook. The codebook went through two iterations. Once coding was finished, the first interviews were coded again. The interviews were coded in Microsoft Word using the comment function. I then used the DocTools plug-in (Fredborg, 2018) to extract the codes into Microsoft Excel. Based on the coded quotes, themes across users were identified and are discussed in the results (Silverman, 2015).

Table 3. Interview sample characteristics

Age	*Gender*	*Education*
24	female	No higher education
24	female	BA or more
25	female	Some higher education
25	female	BA or more
25	female	BA or more
27	female	No higher education
28	female	No higher education
31	female	No higher education
47	male	BA or more
60	male	Some higher education

5. Results

As detailed below, analyses of the survey and interview data support the pipeline of online participation inequalities on Pinterest (Shaw & Hargittai, 2018). The interviews provide a more nuanced understanding of participation on Pinterest and why people drop out of the pipeline.

5.1. Survey results

As table 2 shows, potential contributors to Pinterest continuously leak out of the pipeline: While most participants had heard of the platform (88.6%), considerably fewer had an account (48.8%), let alone contributed to the platform by pinning (30.6%) or linked something from the web to it (21.7%).

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The bivariate analyses show that participants in the youngest quartile (58.6%) were more likely to be active on Pinterest, compared to participants in the oldest quartile (26.8%). Similarly, women (63.5%) were more likely to be active on the platform than men (25.0%). Of the other socioeconomic background variables, only being Hispanic (52.7%) related to Pinterest use. All of the internet experience variables related to Pinterest use. The highest internet user groups tended to use the platform more compared to the lowest user groups, see table 4 for details.

The logistic regression analyses, seen in table 5, reveal that across all stages of participation on Pinterest, the bivariate findings about age and gender were robust. Both being younger and female related positively to participation on Pinterest even when holding other factors constant. When adding the internet experience variables, a higher autonomy of use and higher internet skills were positively related to participation on the platform across all stages. One factor only correlated with site adoption: Being African American was negatively associated with having heard of and having visited Pinterest, even when including the internet experience variables. While being Native American was negatively associated with having a Pinterest account and having pinned something from another website, these results need to be interpreted with caution considering the small percentage of Native Americans in the sample (1.7%). Education was only related to Pinterest use when internet experience was excluded, with one exception: Both having attended some college and having a Bachelor's degree or higher were positively associated with pinning on the platform. Overall, all models improved with the inclusion of the internet experience variables.

Table 4. Bivariate Results for Pinterest use

Variables Background	Mean	SD	N
Age LQ	**58.6*** **	**0.49**	1487
Age HQ	**26.8*** **	**0.44**	1487
Female	**63.5*** **	**0.48**	1487
Male	**25.0*** **	**0.48**	1487
Race & Ethnicity			
White	43.6	0.50	1486
African American	44.2	0.50	1486
Hispanic	**52.7***	**0.50**	1486
Asian	44.7	0.50	1486
Native American	32.0	0.48	1486
Income LQ	45.4	0.50	1487
Income HQ	42.1	0.49	1487
Education			
High school or less	41.9	0.49	1487
Some college	45.9	0.50	1487
BA or more	45.3	0.50	1487
Internet experience			
Autonomy of use LQ	**32.5*** **	**0.47**	1487
Autonomy of use HQ	**67.0*** **	**0.47**	1487
Frequency of use LQ	**37.0*** **	**0.48**	1487
Frequency of use HQ	**52.1***	**0.50**	1487
Internet skills LQ	**30.0*** **	**0.46**	1487
Internet skills HQ	**50.1***	**0.50**	1487

*Note: LQ = lowest quartile, HQ = highest quartile; *p<.05, **p<.01, ***p<.001*

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Table 5. Logistic regression for the pipeline of online participation on pinterest

Variables	Has heard of Pinterest		Has visited Pinterest		Has a Pinterest account		Has repinned a pin		Has pinned sth from another website	
Background	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Age	**-0.07*** **	**-0.05*** **	**-0.04*** **	**-0.02*** **	**-0.03*** **	**-0.02*** **	**-0.04*** **	**-0.02*** **	**-0.05*** **	**-0.03*** **
	(0.01)	**(0.01)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**	**(0.01)**	**(0.00)**	**(0.01)**
Female	**1.44*** **	**1.52*** **	**1.56*** **	**1.68*** **	**1.63*** **	**1.73*** **	**1.71*** **	**1.96*** **	**1.96*** **	**2.13*** **
	(0.20)	**(0.22)**	**(0.13)**	**(0.13)**	**(0.12)**	**(0.12)**	**(0.16)**	**(0.17)**	**(0.14)**	**(0.15)**
Race & Ethnicity (base White)										
African American	**-1.56*** **	**-1.66*** **	**-0.59** **	**-0.59***	-0.34	-0.33	-0.34	-0.39	-0.40	-0.36
	(0.26)	**(0.22)**	**(0.19)**	**(0.20)**	(0.19)	(0.19)	(0.22)	(0.24)	(0.21)	(0.22)
Hispanic	**-0.76***	-0.47	-0.17	0.05	0.06	0.23	-0.14	-0.04	-0.21	-0.08
	(0.33)	(0.35)	(0.21)	(0.22)	(0.19)	(0.20)	(0.21)	(0.22)	(0.20)	(0.21)
Asian	0.51	1.32	-0.53	-0.43	-0.46	-0.36	-0.27	-0.15	-0.44	-0.30
	(0.79)	(1.10)	(0.34)	(0.35)	(0.33)	(0.34)	(0.39)	(0.40)	(0.37)	(0.38)
Native American	0.64	0.88	-0.77	-0.72	**-1.21***	**-1.21***	-0.69	-0.69	**-1.15***	**-1.14***
	(1.06)	(1.07)	(0.47)	(0.49)	**(0.48)**	**(0.49)**	(0.59)	(0.61)	**(0.57)**	**(0.58)**
Employed	0.32	0.16	0.19	0.08	0.19	0.08	0.02	-0.11	0.16	0.04
	(0.21)	(0.23)	(0.14)	(0.14)	(0.13)	(0.14)	(0.16)	(0.17)	(0.15)	(0.15)
Income	0.17	0.02	0.08	0.03	0.07	0.05	0.14	0.11	0.05	0.00
	(0.11)	(0.11)	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)	(0.08)	(0.07)	(0.07)
Education (base hs or less)										
Some college	**0.63** **	0.20	**0.61*** **	**0.34***	**0.42** **	0.22	**0.74*** **	**0.48***	0.31	0.07
	(0.24)	(0.25)	**(0.16)**	**(0.17)**	**(0.15)**	(0.16)	**(0.19)**	**(0.20)**	(0.17)	(0.18)
Bachelor's degree or higher	**0.66** **	0.14	**0.63*** **	0.23	**0.37***	0.04	**0.94*** **	**0.54** **	**0.43***	0.05
	(0.23)	(0.26)	**(0.16)**	(0.17)	**(0.15)**	(0.16)	**(0.19)**	**(0.21)**	**(0.17)**	(0.18)
Internet experience										
Autonomy of use		**0.22*** **		**0.16*** **		**0.14*** **		**0.15*** **		**0.15*** **
		(0.05)		**(0.17)**		**(0.03)**		**(0.04)**		**(0.03)**
Frequency of use		0.01		0.01		0.01		0.01		0.00
		(0.01)		(0.01)		(0.01)		(0.01)		(0.01)
Internet skills		**0.45*** **		**0.34*** **		**0.26*** **		**0.53*** **		**0.37*** **
		(0.10)		**(0.07)**		**(0.07)**		**(0.09)**		**(0.08)**
Pseudo R2	0.22	0.24	0.16	0.20	0.15	0.18	0.16	0.21	0.20	0.23
n	1,502	1,482	1,584	1,474	1,488	1,468	1,492	1,472	1,490	1,470
p	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

*Note: *p<.05, **p<.01, ***p<.001*

5.2. Interview results

In the interviews, although all interview participants had a Pinterest account and thus fulfilled the first three steps of the pipeline, not all participated equally on the platform. The majority did pin items on the platform (7 out of 10), but only one participant had ever linked something to Pinterest from another website. The interviews revealed reasons why people use Pinterest and reasons why people do (not) use it to its full potential.

Three themes emerged in relation to site adoption – *recommendation, work, and curiosity*. Although the focus of Pinterest is not on social factors (Bonnington, 2018; Ottoni et al., 2013), several of the participants started using it because of recommendations. One participant (female, 24) described how both her sister and mother "kept telling me: Go look on Pinterest" which prompted her to do so. Social factors remained important in this participant's platform use, she only followed people she knew and regularly looked at these peoples' pinboards. Other participants described how co-workers, lecturers and friends recommended the platform to them. One participant described how a friend recommended

Pinterest to her specifically because of her interest in fashion (female, 30). Several participants also actively recommended Pinterest to others.

Three participants, the two teachers and teaching assistant, mentioned how Pinterest was recommended to them in relation to their *work*. The two teachers learned of the platform during their studies and started actively using it during their practical training. As one of them described: "Yes, during our practical training I slowly discovered the site when [I] needed ideas, new ones" (female, 25). The teaching assistant started using the platform when she started a new job, in her own words:

> It was mainly because I started working at a different school and there you also did a lot of crafting with the adolescents and with the children and I had heard that [Pinterest] has a lot of ideas well, for that. [sic.] (female, 25)

This participant continued only using Pinterest in a limited capacity and in relation to work. All three still use the platform for work-related purposes, while the two teachers also use it privately.

The third reason participants started using the platform was *curiosity*. One university student explained: "I just heard everyone was using Pinterest" (female, 25). She could not remember how she found out about the platform, but she was interested enough to try it. Now it was her most used app. Several participants came across Pinterest while searching for things. One participant came across it while browsing for recipes (male, 40). Similarly, another participant was looking for quotes on Google Images where she "automatically came across the site" (female, 28).

This, however, was not enough for all participants. One participant kept coming across the site but was kept back by the sign-up requirement. Once she did sign up, she "realized yes, okay, that is actually awesome" (female, 27). This was also the case for another participant until something "really got my interest" (male, 60). To satisfy his curiosity, he signed up to the site through his Google account. Whereas the female user became an active user with several pinboards, the male participant continued using the platform only superficially. While this requirement could affect site adoption, it did not appear to affect use beyond this.

Pinterest use beyond site adoption was related to other factors. The participants that only used Pinterest superficially linked this to the fact that it was only one source for ideas among many. In the words of one participant:

> I seldomly search directly on Pinterest, instead, it is more like results from other media that lead to Pinterest. Be it Google, DuckDuckGo, or somewhere else where Pinterest is a commonly linked search result. (male, 60)

He went on explaining: "It is not my only source. […] Because it [Pinterest] does not have all the information that interests me in its ecosystem." He did save things he found through it but not on the platform itself. This *cross-platform use* was a reason for two of the three users that did not pin things. The other participant explained:

> Because I have Insta[gram] and because I think Pinterest is a bit something between Insta[gram] and maybe is even owned by Facebook [sic], I do not even know. Or let me put it that way: I would prefer Tumblr to Pinterest. But also because I have been using it longer. (female, 25)

She preferred other platforms, which was related to her lack of participation on Pinterest. She also attributed this to the fact that she did not understand Pinterest well. In her words: "No, I do not use that. But only because […] I do not really know how it [Pinterest] works. [laughs]" (female, 25). She went on saying that if she did want to save something, she "just take[s] a screenshot of it".

Another reason for the respondents' lack of pinning was the *purpose* of their Pinterest use. For all three non-pinners, Pinterest served as an inspiration source for specific situations. They usually used Pinterest in these situations and did not feel a need to retain the information once acquired. For one of them Pinterest was a source for recipes. He only used Pinterest "when I do not know what to do with it [the ingredients available] or I cannot come up with an idea" (male, 47). He tended to use Pinterest for "one-time things", which meant he did not feel the need to save anything. Generally, for these participants,

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Pinterest only fulfilled a specific need, and they did think they had to participate beyond having an account on the platform to meet them.

All other interviewees did pin things and had pinboards. For the two teachers, their Pinterest use served two specific purposes which was reflected in the way they used the platform. On the one hand, they used it for work purposes and on the other hand for their private life. As one of them described her pinboards: "Well kind of 'class' or 'classroom' and then as I said something like 'birthday', 'apartment' I have one for decorations too" (female, 25). The other teacher (female, 26) had similar pinboards: "One for school in general, one I have really just for art class, for school. One I think is presents or something like that [laughs]." They used the pinboards for work as inspirations for both their teaching as well as decorating their classrooms. Other pinboards reflected their private interest, allowing a separation of work and not work-related content.

One participant tied her privacy settings to the purpose of her pinboards. Most were public, yet for specific events she set them to private. She explained:

> Yes, some are private, the rest is not. […] When they [pinboards] are about presents things [sic] and stuff like that. Or one I [have] just for […] wedding things for a friend which she should not be able to see [laughs] (female, 28)

The participants used pins and pinboards to remember and keep track of ideas that they liked. The same participant explained pinning like this: "Yes, everything that I like I save" (female, 28). Another participant described it like this: "Oh, I have to remember that. Yes, I want to look at that again." (female, 25). One participant recounted all the topics she was interested in and went on explaining that every topic has its separate pinboard "so that everything is categorized" (female, 30).

Only one participant had ever linked something from another platform to Pinterest. Her reason for doing so was that Pinterest was the only social media platform she used. She explained:

> Participant: Yes, but only from one blogger […].
>
> Interviewer: And you also follow that blogger on another site?
>
> Participant: No, I don't have Instagram, but I keep going on the website I mean just online to go look and she [the blogger] also has a yoga-channel and other videos and I am just interested in her. (female, 30)

This reflects something said by two participants that do not pin things. For these two, Pinterest was just one platform among many that they used. For this participant, Pinterest was her only social media platform, which led her to use it more in-depth than other users.

The range of content available on Pinterest was both a reason for use and something that participants appreciated greatly. As one interviewee explained when talking about why she loved the platform: "It has everything. Every possible idea. No matter what you look for, there are always thousands of results" (24, female). Yet, the content on the platform also revealed potential barriers to participation. Several participants mentioned that a lot of content was only available in English, which for them as German speakers posed a difficulty. This made things such as recreating recipes particularly difficult, as one participant described: "Because it tends to be a bit American. I struggled a bit with the cups and stuff. It is usually all 'cups' and 'tablespoons' and then I did not really understand that." (female, 24). Another person also struggled with ingredients: "also they have ingredients that we do not have over here so you need to do the best you can" (female, 25).

Another participant specifically struggled with the lack of (Swiss-) German content: "In the German speaking, in particular the Swiss-German speaking [region], it [Pinterest] is not very widespread" (60, male). He found content in a number of languages but very little in German, and mostly in English, which affected his enjoyment of the platform. He was one of the participants that did not actively participate on the platform and the language barrier could be a factor in this.

Overall, the interviews revealed that Pinterest users tailor their level of use according to the purpose it serves for them. For some, it was the main source of inspiration, allowing them to gather their ideas in one place. Others used the platform only superficially, as it was one among many platforms they used.

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6. Discussion and limitations

This paper offers a more nuanced understanding of online participation by investigating how the framework of the pipeline of online participation inequalities applies to a social media platform and why people do (not) use a platform to its full potential. The pipeline of online participation inequalities is applicable to Pinterest. So far, the framework had not been tested for this type of website (Shaw et al., 2023; Shaw & Hargittai, 2018). While the majority of the survey sample had heard of Pinterest (89%), considerably fewer had an account on it (49%), and even less had contributed to the platform by either pinning something from the platform (31%) or from the web (22%). Across all levels, gender, age, internet experience, and skills mattered. Internet skills continue being important in relation to Pinterest use, beyond early adopters (Blank & Lutz, 2017). This was also suggested in the interviews when one participant justified her lack of pinning by saying that she did not know how the platform worked.

None of the interview participants had ever uploaded anything directly to the platform, something previous research already noted to be very rare (Mittal et al., 2014). Pinterest is being used to collect and save content already available on the platform, and more rarely for content from the web. It is not used to share and save people's own creations and pictures. Yet, not all users see the potential of Pinterest to collect content, in part because they are unaware the platform offers these functions. One's knowledge about the platform affects their level of platform use.

In the survey population women were more likely to use and contribute to Pinterest across all levels, supporting previous findings (Blank & Lutz, 2017; Duggan et al., 2015; Ottoni et al., 2013; Pew Research Center, 2024b). However, it is important to highlight that the gender gap was notably smaller than in other studies (Gilbert et al., 2013; Mittal et al., 2014; Ottoni et al., 2013). Although men represent a smaller user group on the platform, a quarter of the men surveyed used Pinterest and contributed content to the site.

In the interviews, the extent of platform use was closely related to the purpose of participants' Pinterest use. Participants who used pins used them in combination with pinboards to gather ideas and inspiration (Linder et al., 2014; Pinterest, 2023). These could be very general things, such as recipes, but also topics related to professional life or specific events, such as birthdays or weddings. Interestingly, participants who did not use the platform beyond one's account and the participant who used it the most intensively related their Pinterest use to other platforms. Yet again, some attributed their lack of participation to other platforms they preferred. The person that used Pinterest to its full potential, highlighted that she did not use any other platforms beyond Pinterest. While these findings are not generalizable, they do raise the question of how drop-outs on one platform are influenced by participation on other platforms. This highlights the need for research which considers more than one platform at a time (Matassi & Boczkowski, 2021), particularly when looking at online participation (Fuchs et al., 2023).

Within the survey dataset online participation on Pinterest is presented as a narrow process with only one outcome. Higher participation is implicitly considered the normative goal. Yet, it does not cover all potential forms of contrition possible on the platform, something past work on the pipeline had already noted (Shaw et al., 2023) and that is addressed in the interviews. The interviews allow for a more fine-grained perspective, which reveal that limited participation, when not hindered by barriers, can already meet a user's needs and be sufficient. Thus, the interviews offer new nuanced insights and reveal potential pitfalls in the assumption behind the framework where full participation is considered the main goal (Shaw et al., 2023).

Reasons for Pinterest use within the interviews did not match with previous findings (Mull & Lee, 2014; Sashittal & Jassawalla, 2015). Only one of the interview participants used Pinterest for fashion. In the interviews, curiosity, work and recommendations were the main reasons for site adoption. Interestingly, the main reason interviewees continued to use the site reflected the company's goal of helping people find "ideas" (Pinterest, 2023).

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The interviews revealed that while the platform is not focused on social factors (Bonnington, 2018), they still matter for users, particularly for site adoption (Gilbert et al., 2013; Ottoni et al., 2013). Several participants learned of the platform through others and were encouraged to use the site for their interests, which were the main reason for their site adoption. For one of the participants, these factors remained important, affecting who they followed on the platform and whose pinboards they looked at.

The interviews also revealed barriers to participation. Pinterest requires people to create an account to access content on the platform beyond the first link one clicks on. In the interviews, several users described that they did not use the platform at first until they signed up out of curiosity. This could partly explain why potential users stop using the site early on, as they have visited the site but are discouraged from using it. Lack of knowledge about the platform was also cited as a reason for not using Pinterest more deeply.

Furthermore, language and cultural barriers came up in the interviews and could affect participation on the platform. English is the dominant language on Pinterest (Mittal et al., 2014) and could keep non-English speaking users from participating. The language on the platform can be changed and new language versions are continuously introduced (Atwood, 2023), but this does not affect the language of the content users interact with. The interviews indicate that this is only a superficial solution that does not fix the language barrier present on the platform. Future research should include language barriers as a possible form of power enacted by US platforms on its international users (Barwulor et al., 2021; Kwet, 2019; Wakunuma, 2019).

While the mixed-method approach is a strength of this study, each of these methods has its own limitations. The first limitation is the small sample size of the interviews, which is not sufficient to draw generalizable conclusions. In addition, the survey did not cover all possible levels of posting on Pinterest, as users can also upload content directly to the site, but this form of posting is extremely rare (Mittal et al., 2014). Other forms of engagement, such as liking content and following other users, were also not included in the survey. Neither was the frequency of Pinterest use. The inclusion of these factors could have provided important nuances for understanding people's engagement on Pinterest. Yet, to apply the existing frameworks, some of these factors could not be included. The pipeline of online participation inequalities is one of the few frameworks providing an overview of participation beyond a binary use analysis (Shaw & Hargittai, 2018). Yet, this also means caveats in the range of participation investigated (Shaw et al., 2023) and comes with a normative implication of more participation always being better, which the interviews do not necessarily support. Further the survey data stemmed from the US, while the interviews were conducted in Switzerland. Potential differences in participation, due to cultural differences, cannot be extracted from the data. It is, for example, unlikely that the participation of US users is affected by the fact that most content on the platform is in English, yet this came up as a barrier for the Swiss participants. It is important to note that this specific barrier also highlights the importance of considering non-English speaking and particularly non-US perspectives in research, as otherwise such barriers remain invisible.

7. Conclusion

This study shows that the framework of a pipeline of online participation inequalities (Shaw & Hargittai, 2018) is applicable for social media platforms. Digital inequalities persist and can affect online participation on a platform at each stage of the pipeline. For Pinterest, these factors are gender, age, autonomy of internet use, and internet skills. Female and younger users are more likely to contribute, as well as users with higher autonomy of use and higher internet skills. Internet skills play a central role across all stages of participation, which aligns with past research on the pipeline framework (Shaw et al., 2023; Shaw & Hargittai, 2018).

The interviews provide insights into other factors that can affect platform use such as cross-platform use. Reasons for participants to both fully use a platform and reasons for participants to drop out of the

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pipeline are the goal of the platform use, cross-platform use and potential language barriers. Overall, participation was closely related to the purpose the platform serves for users. Social factors played a role for the interview participants in relation to their Pinterest use. This is despite the fact that Pinterest is not so focused on social factors compared to other social networks (Bonnington, 2018; Ottoni et al., 2013).

This study provided a deeper understanding of the pipeline of online participation inequalities. In particular, it reveals the reasons why people do or do not contribute to a platform, such as cross-platform use.

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Issue ownership in the online campaign for Dutch general elections

A topic modeling approach

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Abstract

Online political campaigns are often opaque, among other reasons because political parties often target their advertising to specific groups. Therefore, it is challenging for citizens, journalists, and academics to understand what political parties talk about in their campaigns, diminishing the public accountability of political parties. Through the lens of issue ownership theory, this study explores which issues Dutch political parties advertised on Meta during the 2021 national election. The study uses a relatively novel topic modeling process that is meant to limit human bias. We built a model that assigns issues to each ad (based on the ad text), creating a dataset of ad-issues matchings. The study is one of the first to present insights into the issues Dutch political parties communicated about during the national elections of 2021. Our findings show that issue owners are not the biggest advertisers on their issues and reveal that private gifts enable some political campaigns to claim ownership of many issues.

Keywords: political advertising; issue ownership; political communication; topic modeling

1. Introduction

Political campaigns use online advertising to communicate to prospective voters. Online advertising comes with several downsides such as privacy violations, potential for manipulation, and a lack of transparency (Zuiderveen Borgesius et al., 2018). Focusing on this latter downside, the opacity around online political advertising means that it is unclear to citizens, journalists, and academics which issues political parties talk about. Social platforms offer ad libraries, but these are limited (Leerssen et al., 2021; Leerssen et al., 2019). As a result, public accountability is slim, as campaigners could falsely present themselves as one-issue parties (Zuiderveen Borgesius et al., 2018), or make electoral promises to narrow electoral groups (Dobber & De Vreese, 2022). In this study, we aim to shed light onto this opaque realm of online political communication by examining the issues communicated through online political advertising by Dutch political parties in the national election campaign of 2021.

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Research on online political advertising so far has focused on the effectiveness of online political advertising (e.g., Haenschen & Jennings, 2018; Haenschen, 2022; Zarouali et al., 2020; Endres, 2019; Lavigne, 2020; Coppock et al., 2020), on the circumstances that lead to the use of online advertising (Kreiss, 2016; Anstead, 2017; Dobber et al., 2017; Kruschinski & Haller, 2017), or on citizen perceptions of online political advertising (Turow et al., 2012; Dobber et al., 2018). Few studies have focused on the content of online political advertisements and those that did (Kruikemeier et al., 2022; Fowler et al., 2020) either focused on the United States, or had a narrow scope (Dobber & De Vreese, 2022). This study takes a broad approach, focusing on all parties and all advertisements on Meta that include a policy element, and focuses on the Netherlands, a European multiparty context. The Netherlands is a somewhat extreme example of a country with a multi-party system, as 17 parties gained at least one seat in parliament after the 2021 elections. Hence, the Netherlands stands in clear contrast to the often-studied United States, with two leading parties.

Political parties benefit from online advertising because it affords political campaigns more control over their message, and less reliant on the agenda-setting news coverage of the traditional media (McCombs & Shaw, 1972). Online advertising can be understood as an alternative communication channel, next to the traditional media, that can help political campaigns reach potential voters on the issues that they own. Issue ownership theory (Petrocik et al., 2003) suggests that "some political parties are affiliated with specific issues and considered best able to deal with them" (Walgrave et al., 2015, p. 778). In other words, voters see certain problems (or issues) as a typical focus point for certain parties, and may think that those parties can best address those problems. Reaching out to potential voters on owned issues seems beneficial for parties, as this strategy could improve party support (Endres, 2019 Hillygus & Shields, 2008; Abbe et al., 2003) and might increase the vote share among volatile voters (Geers & Bos, 2017). US-focused research has indeed shown that political campaigns focus on their owned issues in their online campaigns (Kruikemeier et al., 2022).

However, Zuiderveen Borgesius et al. (2018) warn that the opacity of online advertising could enable political parties to falsely present themselves as one-issue parties to different voters. In other words, through online advertising, political parties could emphasize issue A to voters who are thought to find issue A important, and then repeat this process for issue B, and for voters who care about issue B. This makes it difficult for voters to understand which issues are important to political parties and which issues are less important.

Catering to different voter groups by emphasizing different types of issues also makes it more difficult for political parties to interpret their mandate once elected (Jamieson, 2013). For example, when a party campaigns solely on an immigration platform, it is easy for the voters to understand the policy priorities of that party. Once elected, politicians from that party have a clear mandate. But when that party campaigns on immigration, education, environmentalism, security, fiscal responsibility, and ten other different issues, the priorities and mandate of that party are less clear-cut.

The few studies that focused on the content of online political advertisements examined the United States (Kruikemeier et al., 2022; Fowler et al., 2020). However, there are clear contextual differences between de facto two-party systems such as the US and multiparty systems that are often found in Europe, especially through the lens of issue ownership theory (Petrocik et al., 2003). Most importantly, in the US, only two parties divide and contest the issues among each other, but in European multiparty systems the issues are divided and contested among many more political parties. Especially in the Netherlands, where since 2021 the national parliament counts 17 political parties (Kiesraad, 2021), the issues are much more contested (see Appendix A for an overview of Dutch political parties).

Analyzing the issues communicated in online political campaigns is crucial to understanding parties' policy positions. However, identifying these issues is challenging because online ads come in many forms that range from just a few words to multi-paragraph articles. Often, researchers use topic modeling to identify topics on a large scale; however, such techniques often "require the additional step of attaching meaningful labels to estimated topics". Therefore, topic modeling is sometimes critiqued for the human

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bias it introduces (Béchara et al., 2021, p. 1). This current study builds upon Béchara et al. (2021) and Kruikemeier et al. (2022) and assigns issues to political ads using a pre-defined list of words that are relevant to an issue based on expert codebooks. Through the lens of issue ownership theory, this study explores which issues Dutch political parties advertised on Meta during the 2021 national election certain issues. In doing so, the study applies a relatively novel topic modeling process to limit the human bias often found in topic modeling.

The paper combines insights from different fields, including communication science, political science, and methods from computer science.

2. Theoretical framework

Issue proximity theorists (e.g., Downs, 1957) argue that citizens vote for the parties or politicians that most closely resemble their own issue positions. However, it becomes increasingly challenging for citizens to compare their own issue positions with those of political parties. Although political parties generally publish manifestos on their websites, manifestos are often difficult to comprehend for citizens (Bischof & Senninger, 2018). Therefore, few citizens read manifestos (Adams et al., 2014; Adams et al., 2011; Andersen et al., 2005). Encountering information about issue positions in the mainstream media is challenging because the mainstream media tend to cover the larger parties (Kostadinova, 2017), and focus on horse race, conflict and campaign strategy news (Ergün & Karsten, 2019).

Online advertising techniques might enable political campaigns to communicate directly to the electorate, without interference from critical journalists, but these advertising techniques also enable campaigns to target and tailor their ads to the issue preferences of the targeted subsegments of the electorate. Since the online advertising infrastructure is opaque, it is unclear to the citizen to what extent a political party genuinely prioritizes a specific issue, or whether that party pretends to prioritize that issue because data analysis reveals that the targeted audience cares for that issue (see Zuiderveen Borgesius et al., 2018).

According to issue ownership theory "some political parties are affiliated with specific issues and considered best able to deal with them" (Walgrave et al., 2015, p. 778). Political parties campaign use issue ownership cues and issue position cues (Banda, 2016). An issue ownership cue can be a Green Party advertisement about how the environment is in good hands with them, and an issue position cue signals to the citizen what their stance is within that issue: the Green Party suggesting closing all coal-fueled power plants, for instance. In the Netherlands, the largest party VVD ran a campaign in 2012 stating that 'the economy could use some VVD', which is a clear issue ownership cue.

Issues ownership can change over time, and issue ownership can also be contested. This occurs when citizens do not clearly perceive one party most competent to handle a specific issue (Geys, 2012). It rarely happens that a party has complete issue ownership and over time, parties might emphasize certain issues more than they did before. The environment, for instance, used to be an issue clearly owned by green party GroenLinks, but over time this issue is likely to be also emphasized and claimed by other types of political parties (i.e., issue trespassing (e.g., Walgrave et al, 2009; Bos et al., 2016). Indeed, Walgrave et al. (2009) found that issue ownership is subject to change and can be contested through news coverage. Scholars do not agree about when a party 'owns' an issue. Petrocik (1996) employs a 50% threshold, but this is in a US context. In a 17-party democracy such as the Netherlands, it is unlikely that any party is seen by over 50% of the electorate as most competent to handle any issue. Walgrave and De Swert (2017) identified strong issue ownership, which occurs when one party is seen by around 50% of the electorate as most competent, and intermediate issue ownership, which occurs when ownership is shared between parties or with one "slightly dominating party" (p. 43).

Political parties can also claim previously unclaimed issues through the news cycle. Claiming issues and running campaigns on owned issues can be a useful strategy. In a rationalistic conception of voting behavior, people are expected to vote for parties that 'own' the issue found most salient (e.g., Downs,

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1957). Some empirical evidence suggests that contacting or cross-pressuring citizens on a (personally) salient or owned issue increases candidate or party support (Endres, 2019 Hillygus & Shields, 2008; Abbe et al., 2003; Walgrave & De Swert, 2010). Research by Geers and Bos (2017) shows that volatile voters are more likely to vote for issue owners, especially when these parties are visible in the media and covered positively.

On the other hand, there is a risk in campaigning on unimportant or niche issues. Reaching out to a large and heterogeneous group with ads about owned issues that are perceived too niche can be counterproductive. For instance, the Orthodox Calvinist Christian party in the Netherlands might campaign to bring back the Christian oath for public servants. However, when the majority of potential voters cares about abortion, the former issue-ad might backfire, because voters might think that the party neglects their most salient issue (similar to Chou & Lien, 2010).

This study aims to extend issue ownership theory (Petrocik, 1996), by applying it to the online advertising context. The affordances of online advertising enable campaigns to run highly differentiated campaigns. For example, campaigns can reach out to a certain subset of voters for which issue a is deemed most salient, and simultaneously reach out to voters for which issues b or c are most salient. This is different from traditional advertising, which does not afford granular opportunities to differentiate messages among audiences. As a result, traditional advertising would need to rely much more on the salient issues than online advertising would. In other words: through online advertising, campaigns or no longer confined to the salient issues and they can advertise on many more issues compared to traditional advertising. This is especially pressing in light of the issue competition between parties in Europe in general (Green-Pedersen, 2007), but particularly in the politically fragmented Dutch context. Especially in the Netherlands, with many competing parties, parties can use online advertising to talk about more different issues. Where parties using traditional channels are incentivized to focus on the most salient issues, in online advertising they do not need to focus on salience perceptions alone because they can diversify their messages among different audiences' issue preferences. However, this could happen in such an opaque way that it is challenging to get a comprehensive overview of a party's viewpoints (Zuiderveen Borgesius et al., 2018). This study attempts to provide a comprehensive overview, starting by answering the following research questions.

RQ1.On how many different issues does each party communicate, and what is the total number of impressions per issue per party?

2.1 Issues owned versus issues claimed

After the national election of 2021, the Dutch parliament counted 17 political parties. Based on an opinion poll conducted one month before the election, not one party was an undisputed issue owner (I&O Research, 2021). However, when we focus on parties that were perceived as issue owners by a majority of the people, we see that only two parties are issue owners.1 The largest party in the Netherlands, the VVD, owns the issue 'economy' (according to 58% of the respondents). The PVV owns the issue 'migration' (59%).

Van der Meer and Damstra (2022) measured associative issue ownership. They asked people which party they associated with specific issues, regardless of perceived competence. Hence, they did not ask which party people deemed most competent to address a certain issue, as was the case in the opinion poll of I&O Research (2021). Van der Meer and Damstra (2022) found that VVD owns economy (according to 70% of respondents), the PVV owns migration (55%), and GroenLinks owns climate change (60%). However, prominent issues such as housing are much less unequivocally owned (Van der Meer &

1 Provided that we use the golden standard CAP issue list. If we use the issue list provided by the pollster, we see that the VVD also owns 'government finance' (53%) and the Animal Party owns 'animal welfare' (80%).

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Damstra, 2022), which is in line with the opinion polls that measured issue ownership based on competence perceptions (I&O Research, 2021).

Since issue ownership perceptions have been shown beneficial for voter support and even voter behavior, especially when combined with visibility (Geers & Bos, 2017), one can expect issue owners to communicate strongly on 'their' issues. However, many issues remain challenged (as identified by the Comparative Agendas Project). Moreover, since the 2021 election saw three new political parties arise (BBB, Volt, and JA21), there is ample opportunity to reshuffle the board.

This leads to the following hypothesis and research question.

H1a. Compared to other topics in VVD ads, the VVD spends the most money on ads on the economy and gets the most impressions on ads about the economy.

H1b. Compared to other parties, the VVD spends the most money on ads on the economy and gets the most impressions on ads about the economy.

H2a. Compared to the other topics in GroenLinks ads, GroenLinks spends the most money on ads on the environment, and gets the most impressions on ads about the environment.

H2b. Compared to other parties, GroenLinks spends the most money on ads on the environment and gets the most impressions on ads about the environment.[2]

RQ2. Which parties claim which issues in terms of ad spending and number of impressions?

2.2 Issue ownership per consideration set

Citizens in multiparty systems do not consider all political parties when determining their vote choice. Rather, undecided citizens have a consideration set of potential political parties they consider voting for. Citizens may not vote for the same party each election, but they are likely to vote for a party within their consideration sets (Rekker & Rosema, 2019).

According to panel survey research done in the Netherlands (Rekker & Rosema, 2019), there is a leftist camp of parties that consists of SP, GroenLinks, PvdA and D66. There is a Christian camp consisting of CDA, ChristenUnie and SGP. There is a rightist camp (VVD, D66, CDA). And a radical right camp that, in 2019, consisted of the PVV, but would now likely also include FvD and potentially JA21. D66 is placed in both the rightist camp and the leftist camp: this is because D66 is a center party and consideration sets are based on citizen perceptions.

Because citizens are unlikely to vote for a party outside of their consideration set (Rekker & Rosema, 2019), political parties are unlikely to target their advertisements to people who hold different consideration sets. For example, rightist parties are unlikely to target leftist voters and vice versa. This would suggest that we should not only examine issue ownership on the scale of all political parties, but also that we should take the consideration sets into account. Since a leftist party does not target rightist voters, the leftist party could claim issue ownership within the consideration set. As the rightist party VVD is considered the overall issue owner on economy, it is unlikely that the other parties in the rightist camp will run ads on the economy because the VVD will target the same voters and do this more convincingly when it comes to the economy. But the VVD is less likely to target voters in the leftist camp, leaving a vacuum in which the economy can be claimed by a leftist party within that consideration set. This leads to the following research question:

RQ3.Which parties claim which issues in terms of number of ads and number of impressions within consideration sets?

2 We know in advance that the PVV has placed only one issue advertisement on Meta's platform, so we did not formulate a hypothesis for the PVV.

3. Method

In this study, we analyze ads that ran on Meta (i.e. Facebook and Instagram) during the political campaigns leading up to the 2021 elections. We built a model that assigns issues to each ad (based on the ad text), creating a dataset of ad-issues matchings. This dataset allows us to aggregate data from ads about specific issues.

3.1 The Meta ad library

The Meta Ad Library, released in 2019, provides all (political) ads published on Facebook and Instagram. We chose to focus on the Meta Ad Library as it provides more detailed information on the content and targeting of ads than other social media ad repositories (e.g. Google's Ads Transparency Center or the TikTok Ad Library). This limits our research to ads that ran on Meta's platforms. However, we do not consider this a significant limitation, as most political parties heavily advertise on Facebook and Instagram.

Table 1. The number of Facebook ads per party

Party	# of Ads
CDA	11,463
VVD	4,461
PvdA	4,425
D66	1,527
VOLT	1,180
GL	444
SP	424
DENK	414
FvD	283
PvdD	276
CU	228
BIJ1	186
50+	162
JA21	115
SGP	104
BBB	60
PVV[3]	9
Total	**25,761**

3 As the PVV is a controversial party, they get ample natural online attention from both proponents and opponents. This might explain why the PVV spends little on online advertising.

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A Meta ad consists of three elements: a main body of text, an image or video and a call to action (e.g., a link to a website of a political party). Not all these elements must be present (e.g., an ad can have a body but no image).

The Meta Ad Library provides an API for programmatic extraction of ad data. For each ad, Meta provides its content (i.e. the body, image and call to action) and metadata about the demographics of the audience the ad was shown to (i.e. gender, age bracket and geographical region) and statistics on how the ad performed (i.e. impressions, potential audience and spending). In this study, we focus on the content of the ads.

The large disparity between the number of ads between parties reflects the structure and digital marketing strategy of the parties. Parties that have many local branches tend to run more ads, as each local branch runs its own ads. In general, this means that ads by parties with local branches get lower impressions than ads by other parties, as the local branch ads are meant for smaller audiences. It does not mean that parties with fewer ads get fewer impressions overall.

Some parties prefer to run ads with larger texts that cover multiple issues and talking points, while other parties prefer multiple smaller ads that each cover a single issue.

We limit the impact of this disparity on the results by designing the model for ads with larger bodies (covering multiple issues) and smaller bodies (covering only a single issue).

3.2 Issues

The Comparative Agendas Project (n.d.) is a research project that provides codebooks for issues (and sub-issues) that cover the broad public debate. Following the issues, listed in the Netherlands-specific codebooks, we created the following list of 14 issues that cover a broad spectrum of the Dutch political debate:

Agriculture	Government
Civil Rights	Healthcare
Climate	Housing
Defense	Law & Order
Economy	Migration
Education & Culture	Social Welfare
Foreign Affairs	Transportation

As not all issues provided by the codebook are distinct from one another (in the context of Dutch political campaigns), we merged similar issues (e.g., international affairs and foreign trade).

3.3 Matching ads and issues

To match an ad to one or multiple issues, we compare the text[4] in the ad (both the body of text and text provided in the call to action) to each issue word list, by computing the intersection between the ad text and each issue word list. We consider an ad to be about an issue if one of the following conditions is true:

1. The issue word list has the largest intersection with the ad text and the cardinality of the intersection is larger than one.
2. The cardinality of the intersection between the issue word list and the ad text is larger than five.

Consequently, an ad can be matched to no issues, one issue or multiple issues. We allow for this flexibility to accommodate as many types of ads as possible, as ad texts are not uniform and range from a few words about a single issue to multi-paragraph texts covering a broad range of issues.

We give an example of this approach based on two simplified issue word lists (Table 2) and three example ads:

4 Specifically, the lemmatized forms of the nouns, proper nouns and adjectives in texts.

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Table 2. Two example issue word lists for the housing and climate issues

Housing	Climate
House	Sustainable
Starter	Green
Building	Climate
City	Energy
Mortgage	Windmill
Rent	Environment
Housing	Clean
Residence	Solar

Example ad 1: "There are far too few houses in the Netherlands, especially for starters. That is why we are going to build 1 million new houses together."

Example ad 1 has the largest intersection with the issue word list of housing, because the ad text has three words in common with the housing issue word list and zero with the climate issue word list. As such, is mapped to the issue housing.

Example ad 2: "Come to our congress on the 2nd of October! Buy your tickets now."
Example ad 2 does not discuss a specific issue and consequently does not have any words in common with the issue word lists. It is not mapped to either issue.

Example ad 3: "We will invest heavily in the development of new sustainable housing. Future-oriented projects, sustainable alternatives and new green technologies, we ensure that they can be set up and developed in the regions. We focus on windmills and solar panels, to ensure a clean future with clean energy in clean cities. This will ensure cheaper rents and lower mortgage rates, especially for starters looking to buy their first house."

Example ad 3 has the largest intersection with the issue word list of climate (eight words), meaning it will be mapped to the issue climate. However, because it also has six words in common with the issue word list of housing, it is also mapped to housing.

As the Comparative Agendas Codebook codebooks are not tailored to a specific election, they contain words that are not relevant to the 2021 election and miss words that are. We solved this by manually updating the issue word lists with common words from the ads matched to each issue. We iterated this process until we could not find any new relevant words in the matched ads. The final word lists can be found in Appendix C.

In total, we matched 11,336 ads to at least one issue. If an ad was matched to at least one issue, we consider it "matched". If an ad was not matched to at least one issue, we consider it "unmatched". Appendix F shows the distribution of matched and unmatched ads per party. As we can see, a large percentage of ads are unmatched. This is expected, as political parties do not only run ads about political issues, but also run ads about organizational matters (e.g. "come to our party congress next month") and ads about party representatives (e.g. "Please meet the candidate representative from your city."). Some ads were not matched to any issue, because they contain too little text for the model to match the ad to a specific issue with a level of certainty.

Appendix G shows the distribution of issues per party and the total of ads per issue.

To validate the dataset created by our model, we computed an inter-coder reliability measure of a human coder and our model for a random sample of 300 ads. One human coder manually went over each ad in the sample and noted which issues they considered the ad to be about (either zero, one or multiple

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issues). We compared the manual encodings with the encodings of our model for the same sample of ads, by computing the Krippendorff's alpha.

Because ads can have multiple issues, the coders can have a partial agreement (e.g. they agree that an ad is about an issue but disagree that the ad is about another issue). To take partial agreements into account, we computed the multi-label Krippendorff's alpha, using the MASI distance function (Passonneau et al., 2006). This resulted in a score of .84. Scores above .8 are generally considered reliable enough for meaningful interpretation (Krippendorff, 2004).

In appendix D, we provide the Krippendorff's alpha for each individual issue.

3.4 Analysis

Besides text, the Meta Ad Library also provides statistics on each ad. The most important statistics that the Ad Library provides are money spent, impressions (i.e., the number of times an ad was shown) and potential reach (i.e., how many users could have seen the ad). Meta does not give these statistics as absolute numbers, but as ranges (e.g., between €2000, - and €3000, - was spent on an ad). We aggregated the data on ads about each issue to analyze the ad data on an issue-level (e.g., the number of impressions for agriculture).

4. Results

4.1 Issues and impressions per party

The first research question asked: on how many different issues does each party communicate, and what is the total number of impressions per party? Appendix B shows that center-right party CDA is an outlier in terms of total issue-related ad impressions (over 46 million impressions). By contrast, the issue-campaign of the biggest party in terms of parliamentary seats VVD received over 10.5 million impressions. This latter number is more in line with the other 'larger' parties that cater to a larger and more heterogeneous section of the electorate. The smaller parties such as Calvinist party SGP (over 600.000 impressions) and immigrant party DENK (over 1.2 million impressions) in general received fewer impressions than the larger parties. Another outlier is the PVV, which is the third party of the Netherlands in terms of size. The PVV only received 2.500 impressions and only ran one ad on the issue climate. In terms of issue diversity of the online campaign, Green Party GroenLinks was the only party that campaigned on all fourteen issues. Only five parties campaigned on the issue foreign affairs, making this the issue contested by the least number of parties. Climate, housing and healthcare were campaigned on by fifteen parties (out of 17). Appendix E shows the spending per issue, per party.

4.2 Issue ownership VVD

The first hypothesis expected that VVD spends the most on ads on the economy and gets the most impressions on ads about the economy in comparison with a) the other VVD ads and compared with b) the other political parties. Focusing first on the first part of H1, Figure 1 shows that VVD runs the most ads on housing (34%), followed by economy (14%), healthcare (13%), and climate (11%). Figure 1 shows that VVD also spent most on issue-ads relating to housing (EU 22,000), followed by climate (EU 9,500), and healthcare (EU 7,500). VVD spent slightly under 4,500 euro on ads about the economy. In terms of impressions, housing ads make up for 24% of total impressions and economy ads receive 5% of the total impressions, even though 14% of ads are about the economy. This means that hypothesis 1a is not supported. In fact, the VVD runs the most ads on housing, spent the most on housing ads and also receives the highest number of impressions on housing-related ads.

Figure 1 shows, for instance, that the VVD spends a lot of money on ads about healthcare (third place in the list at the left), but the VVD ads on civil rights receive more impressions. The difference between

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the ranking in "money spent per issue by VVD" and "impressions per issue by VVD", could have several reasons. For instance, some more expensive ads could be less engaging, or targeted at more expensive audiences. Unfortunately, the ad delivery algorithm is opaque, and a definitive explanation is beyond the scope of this study.

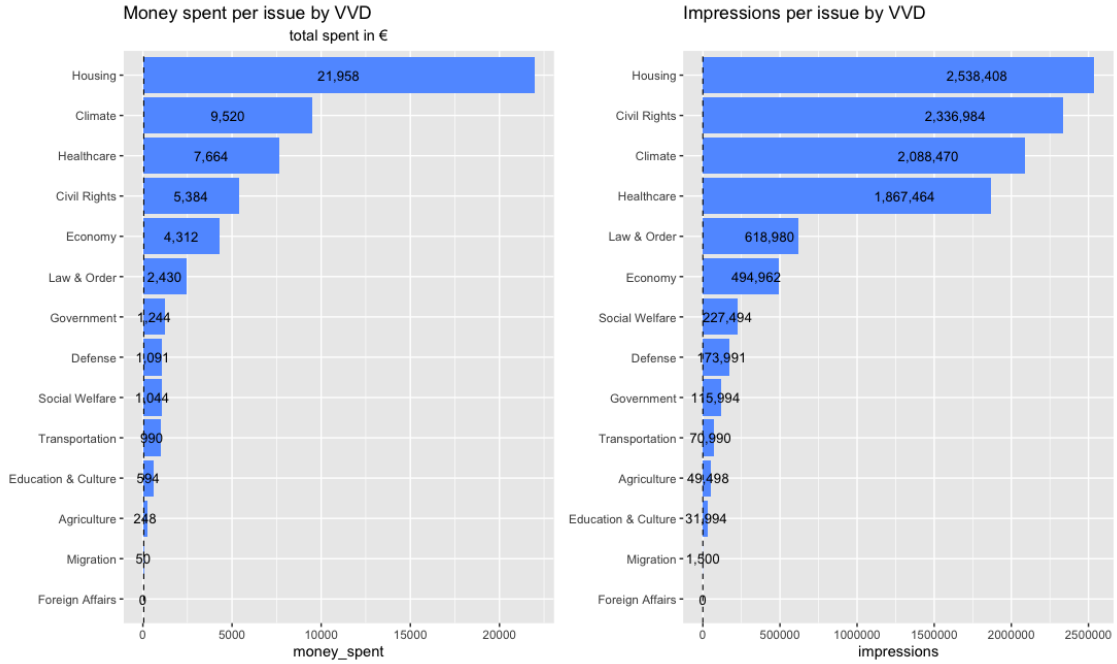


Figure 1. Money spent (in EUR), and impressions gained per issue

Moving on to the second part of H1, figure 2 shows that VVD does not pay the most for ads related to the economy and does not gain the most impressions on these ads. This means that H1b is not supported. In terms of the number of ads about the economy, it is evident that CDA dominates the online space. Of all economy-related ads, 73% are from the CDA. CDA also paid over 89,000 euro for economy ads (compared to slightly under 4,500 euro for VVD). In terms of impressions, however, CDA is less dominant: of all the impressions related to economy ads, 39% are for CDA ads. The economy ads of (radical) rightist parties JA21 and FvD perform strongly: both parties spend less than 1% of the total amount spent on economy-related ads, but both receive 10% of the total number of economy-related ad impressions.

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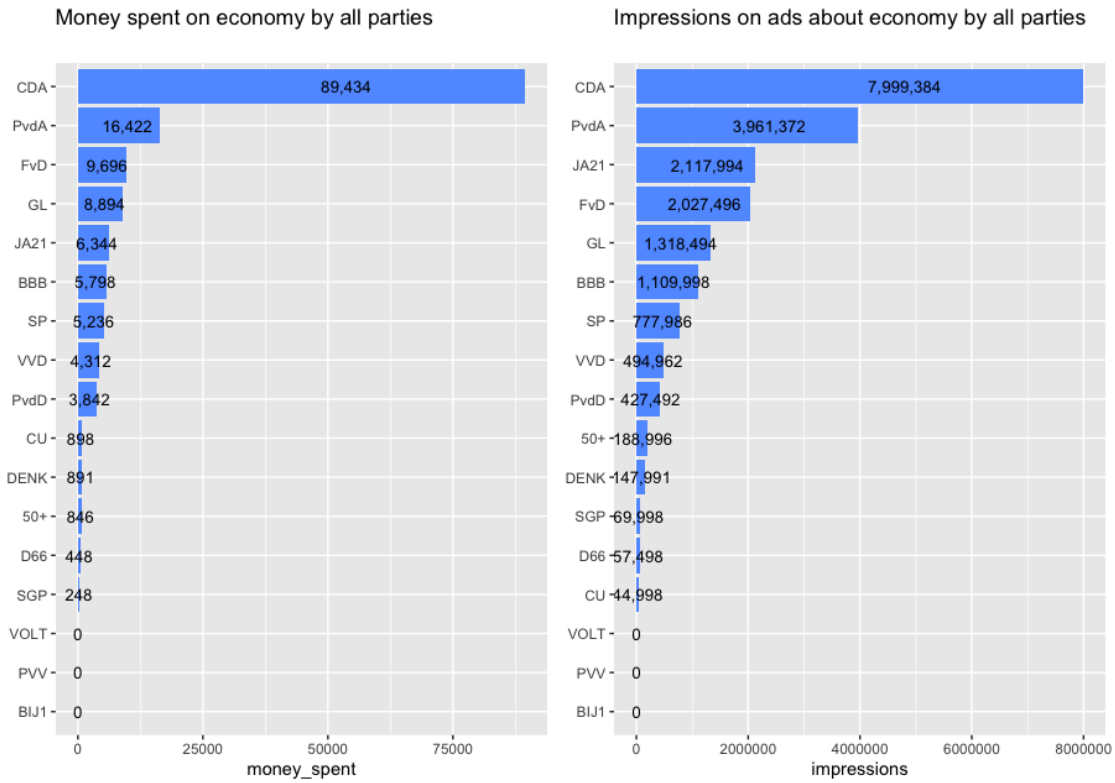


Figure 2. Money spent (in EUR) and impressions gained by ads about the economy

4.3 Issue ownership GroenLinks

The second hypothesis expected a) that GroenLinks, as issue owner on climate, would spend the most on climate ads, and b) would get the most impressions relative to the other GroenLinks issue ads on Meta. Figure 3 shows that, in terms of spending, this is clearly the case: GroenLinks spent 79,390 euro on issue ads. Almost 24,500 euro, so 31% of all the money that GroenLinks spent on issue ads went to ads about climate change, followed by healthcare (€10,290 or 13%). The data paints a similar picture in terms of impressions. GroenLinks' issue ads were displayed just over 13 million times (13,099,890). Almost 4 million impressions went to climate ads (30%), followed by healthcare (slightly over 2 million impressions, 16.5%).

The second hypothesis also expected that GroenLinks would spend more on climate change ads and get more impressions than each individual other party. Figure 4 shows that this is not the case. PvdD is the biggest spender (€ 54,943), followed by GroenLinks € 24,467). In terms of impressions, PvdD (5,534,443 impressions) also trumps Groenlinks (3.965.967).

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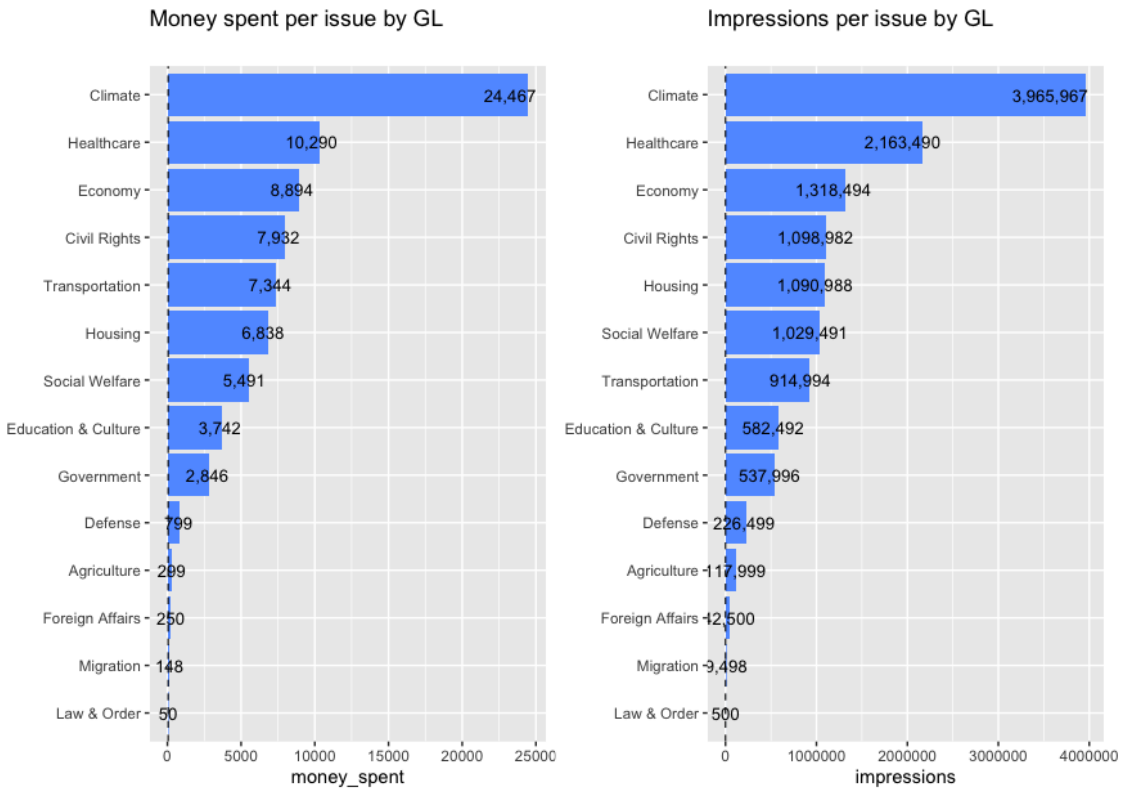


Figure 3. Money spent (in EUR) and impressions gained per issue GroenLinks

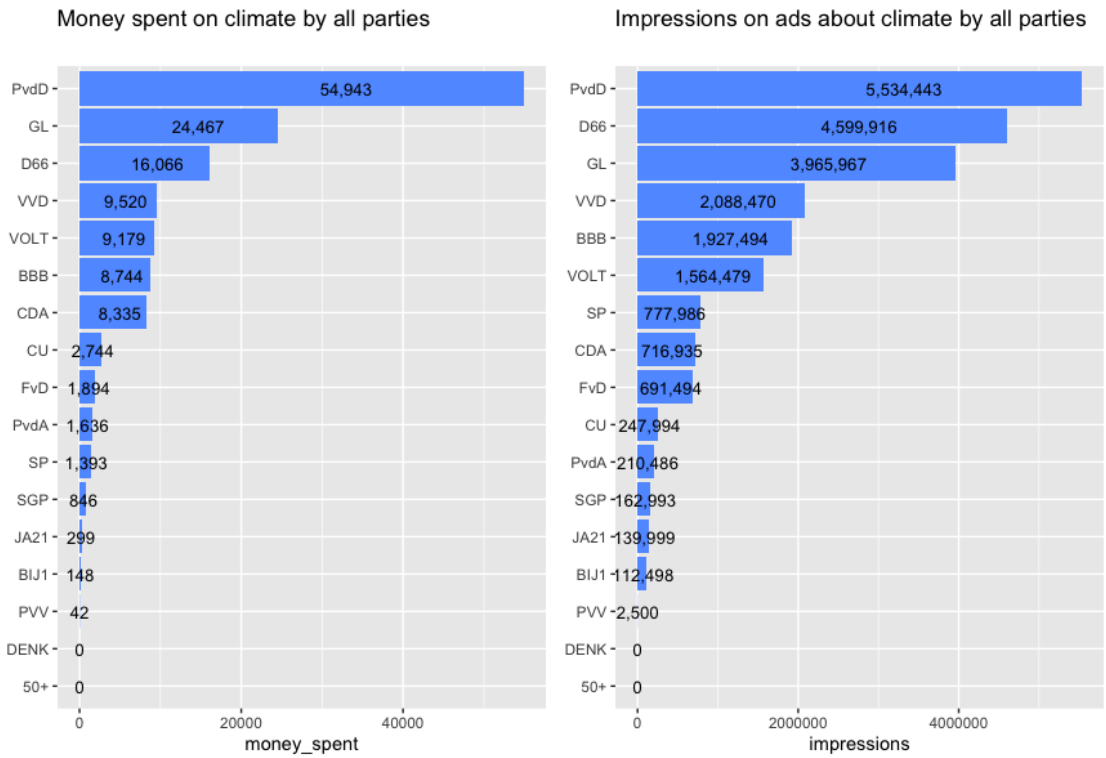


Figure 4. Money spent (in EUR) and impressions gained by ads about the climate

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4.4 Which parties claim which issues?

Research question 2 asked which parties claim which issues in terms of ad spending and number of impressions. Figure 5 shows that major party VVD does not claim any issues in terms of advertising spending. In fact, center-right party CDA is the biggest claimer of issues in terms of spending. CDA spends more than the other parties on civil rights, economy, government, housing, and social welfare. Remarkably, CDA used to be known as the 'farmer's party', but CDA was challenged strongly by BBB and PvdD on the issue agriculture in terms of money spent and impressions reached (see Appendix B). The most strongly contested issues in terms of money spent and impressions reached are civil rights (claimed strongest by CDA), social welfare (CDA), housing (CDA), and economy (CDA). Surprisingly, climate was claimed strongest by PvdD and not GroenLinks in terms of money spent and impressions reached. Remarkably, while PvdA spent more than the other parties on education-related ads, D66 reached the most impressions with their education-related ads. Similarly, while PvdA spent more than other parties on healthcare ads, anti-lockdown party FvD reached the most impressions with their healthcare ads.

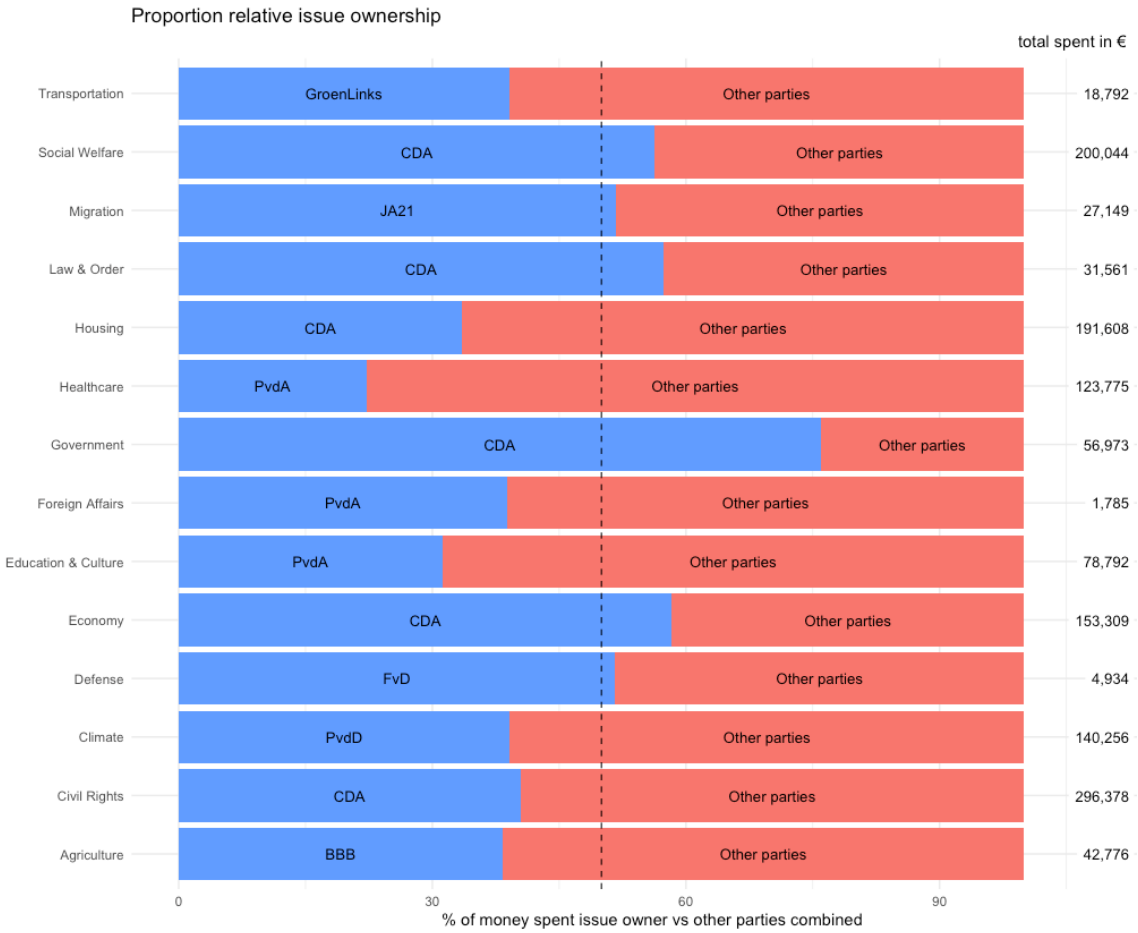


Figure 5. Issue claims in terms of money spent (in EUR) for all parties

Note. This figure displays alphabetically the degree to which each issue is owned by a specific party. In other words: the biggest spender is shown on the left, in blue, and the amount spent by this party is contrasted by the combined spending of the remaining parties (on the right). The dashed line denotes 50%, which means that the biggest spending was 50% of the total amount spent on ads about a specific issue. The further the left-hand bar passes the dashed line, the stronger that party has claimed the issue in terms of online advertising.

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4.5 Which parties claim which issues within consideration sets?

We distinguish four consideration sets: the leftist parties (D66, GroenLinks, PvdA, SP, Bij1, PvdD, Volt, Denk), Christian parties (CDA, ChristenUnie, SGP), rightist parties (D66, CDA, VVD, BBB, Volt), and radical right parties (PVV, FvD, JA21). We compare claims on issue ownership for each consideration set. For the leftist consideration set we find that climate and civil rights are the most contested issues. For climate PvdD claims this issue by spending slightly more than 50% of the total sum spent on this issue by all leftist parties. Civil rights are claimed strongest by PvdA, by spending 55% of the total sum spent in the leftist consideration set. PvdA did not strongly claim issues when we look at all parties combined, but in the leftist consideration set, the PvdA is the dominant party with regard to spending (see Figure 6). In the Christian consideration set, CDA dominated strongly on all issues in terms of spending. For the rightist consideration set, CDA was the biggest spender on all issues except agriculture (BBB), climate (D66) and defense (VVD). See Figure 6. In the radical right consideration set, FvD claimed most issues. But on key radical right issues migration and law and order, JA21 held the strongest claim in terms of ad spending (see Figure 6).

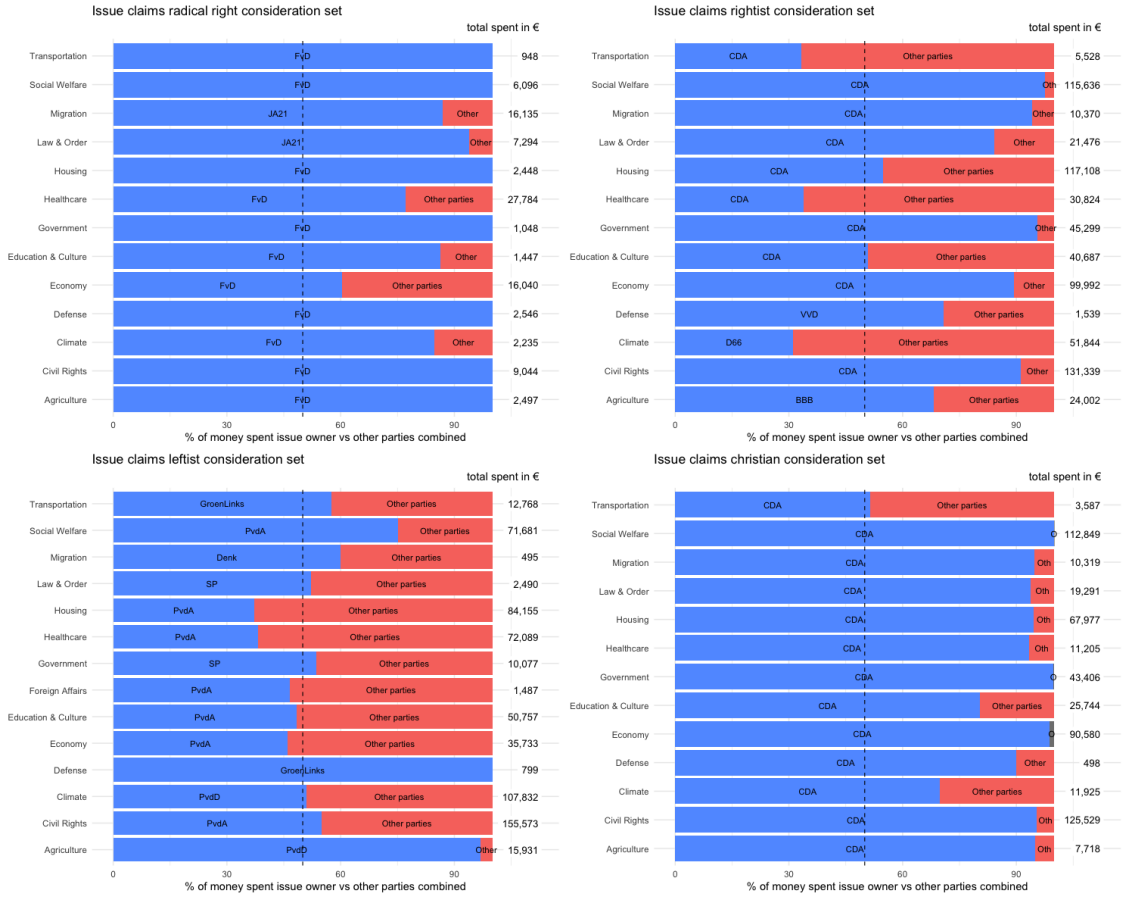


Figure 6. Issue claims in terms of money spent (in EUR) per consideration set

5. Discussion

In this study we explored which issues Dutch political parties advertised on Meta in the run-up to the 2021 national election. Interpreting the findings through the lens of issue ownership theory (Petrocik, 1996), we see that the affordances of online advertising indeed drive issue trespassing as well as issue competition. The owned issue economy (owned by VVD) was claimed by CDA, who spent most money

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on this issue and reached most impressions. Similarly, the owned issue climate (owned by GroenLinks) was claimed by Partij voor de Dieren, who spent most money on this issue and reached most impressions.

In terms of competition, we see that political parties do not limit their communication to only a few salient issues since each issue was contested by a number of parties (see Figure 5). Hence, this study suggests that political parties use online advertising to appeal to voters in a differentiated way. Where traditional advertising confines parties to only the salient issues, online advertising affords parties the opportunity to reach out to voters on less salient issues.

We found that social welfare, housing, healthcare, economy and climate were the most hotly debated issues in the online campaign on Meta. Since the data pertain to the 2021 election, when covid19 was still prominent, it is not surprising the health care was among the top-debated issues in this campaign. However, in the 2023 election campaign, healthcare is still a salient issue in the minds of the aging Dutch population (Kanne & Van de Koppel, 2023).

We approached this study through the lens of issue ownership theory and found that the issue owner regarding economy, the VVD, was strongly outspent by CDA and 7 other parties. The issue owner of climate, GroenLinks, was strongly outspent by small party PvdD. This is striking because when Dutch citizens were asked about important societal problems, there was most agreement about climate change being an important problem (Van der Meer & Damstra, 2022).

The fact that both issue owners were outspent on their owned issues can be partly explained by the impact of individual benefactors on the relatively underfunded Dutch election campaigns. In the run-up to the 2021 campaign, CDA received a gift of 1 million euro from one entrepreneur (NOS, 2021). Similarly, D66 received 1 million euro and PvdD received 350,000 euro as a gift from an entrepreneur (Parool, 2021). Dutch election campaigns are underfunded in comparison with similar European campaigns (Andeweg et al., 2008). For example, the largest party VVD spent 2,718,325 euro on their entire campaign for the 2021 national election (NPO Radio 1, 2021). Therefore, such large gifts can tilt the playing field toward receiving parties. Parties reassure that benefactors do not buy political influence (e.g., NOS, 2021). Nevertheless, one can question whether such large gifts do not give the donor too much influence.

The Dutch government has recently adopted a law on party finance (Rijksoverheid, 2022). Individuals are no longer allowed to give more than 100,000 euro a year to one political party. As an electoral cycle takes four years, this culminates in 400,000 euro a year. Moreover, a benefactor seems to be able to give 200,000 to two parties annually. Such gifts can happen; for instance, D66 and PvdD received their gift from the same entrepreneur (Parool, 2021).

The data show that new parties were able to claim certain issues. Farmers' party BBB claimed agriculture, and spent more on this topic than the CDA, which is traditionally popular among farmers. Radical rightwing party JA21 claimed the issue of migration, largely because issue owner PVV does not buy many online advertisements. Finally, the new VOLT party was less successful in claiming issues. Volt was the fifth biggest spender on ads about climate. In line with Dobber et al. (2017), the data show how social media advertising can play an empowering role for smaller parties that struggle to get visibility through the traditional media. For example, smaller parties often struggle to get attention on TV in The Netherlands. Smaller parties are rarely invited for debates on national television. In some cases, smaller parties were ignored, and in other cases smaller parties had their own debates. However, new parties were not invited to these smaller party debates. Moreover, research has shown that news coverage favors the larger parties (Kostadinova, 2017), and is subject to horse race, conflict and campaign strategy news (Ergün and Karsten, 2019). New parties thus partly rely on social media advertising for visibility, however our data do not allow us to interpret the exact objectives for why parties advertise on these issues.

When we zoom in to the level of consideration set our data suggest that there are few contested issues: parties within such sets rarely aim to distinguish themselves from the other parties in the set. In the radical right consideration set, there are no contested issues. In the rightist consideration set, only climate, healthcare and transportation are contested. In the Christian consideration set, CDA owns each issue. In

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the leftist consideration set, finally, housing and healthcare are clearly contested. Economy, education and foreign affairs are contested to a lesser extent. Remarkably, where social democrat party PvdA claims no issue on the national stage, it is relatively unchallenged on issues of civil rights and social welfare in the leftist consideration set.

Research has shown that on the national level, Dutch citizens perceive housing and healthcare as two of the most important societal problems (only trumped by climate; Van der Meer & Damstra, 2022). Moreover, Dutch citizens rarely associate housing, and to a lesser degree healthcare, with any party (Van der Meer & Damstra, 2022). Indeed, our study shows that housing is one of the most prominent issues in terms of spending, but no party was able to claim that issue on the national level.

Lastly, we give some suggestions for further research. This study is limited in scope, as it focuses only on advertisements about one or multiple issues. Political parties also bought ads on Meta that were not about an issue. Thus, the results of this study cannot be used to make inferences about the general campaign. Moreover, as this study focuses on Meta, it does not discuss potential issue ads on other social media platforms. Future research might want to include other online platforms that enable political advertising. Moreover, online advertising does not occur in a vacuum: campaigns also advertise via traditional channels, and news media report on political parties and their issues throughout the campaign.

In addition, future studies could research issue ads while also researching the targeting strategies of the parties. As Meta (and to a lesser degree Google) provides political advertising with far-reaching targeting options, combining information about the issues advertised with the people targeted (i.e. gender, age brackets and geographical region) could present insights not only into what parties are communicating about, but also to whom. Future research could also investigate the issues of political ads further by looking at how political parties frame issues in their ads, in relation to their issue ownership. Such insights help us understand the online campaign, and monitor and flag potential undue influence, such as the influence of rich benefactors on the Dutch national election campaign. Finally, since the findings of this study suggest that political campaigns have different strategies for online advertising than traditional advertising, future research could compare traditional advertising with online advertising through the lens of issue ownership theory.

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Appendix A. Party Information

Table 3. List of Dutch Political Parties that gained at least one seat in the 2021 Dutch general election

Party	**Ideology**	**Political leader**[5]	**Website**
50+	Pensioners' interests	Liane den Haan	https://50pluspartij.nl/
BBB	Agrarianism	Caroline van der Plas	https://boerburgerbeweging.nl/
BIJ1	Intersectionality	Sylvana Simons	https://bij1.org/
CDA	Christian democracy	Wopke Hoekstra	https://www.cda.nl/
ChristenUnie	Christian democracy	Gert-Jan Segers	https://www.christenunie.nl/
D66	Progressive liberalism	Sigrid Kaag	https://d66.nl/
DENK	Multiculturalism	Farid Azarkan	https://www.bewegingdenk.nl/
FvD	National conservatism	Thierry Baudet	https://fvd.nl/
GroenLinks	Green politics	Jesse Klaver	https://www.groenlinks.nl/
JA21	Conservative liberalism	Joost Eerdmans	https://ja21.nl/
PvdA	Social democracy	Lilianne Ploumen	https://www.pvda.nl/
PvdD	Animal rights	Esther Ouwehand	https://www.partijvoordedieren.nl/
PVV	Right-wing populism	Geert Wilders	https://pvv.nl/
SGP	Conservative Calvinism	Kees van der Staaij	https://sgp.nl/
SP	Socialism	Lilian Marijnissen	https://www.sp.nl/
Volt	Progressive liberalism	Laurens Dassen	https://voltnederland.org/
VVD	Conservative liberalism	Mark Rutte	https://www.vvd.nl/

5 During the 2021 Dutch general election.

Table 4. Issues and impressions per party

	50+	BBB	BIJ1	CDA	CU	D66
Agriculture	0	4024982	0	886472	0	9500
Civil Rights	0	172498	753984	9749245	400992	870982
Climate	0	1927494	112498	716935	247994	4599916
Defense	0	0	0	187498	500	0
Economy	188996	1109998	0	7999384	44998	57498
Education & Culture	0	65000	251498	2410852	463494	3707892
Foreign Affairs	17500	0	0	0	6498	0
Government	0	89999	5500	3678758	61997	35998
Healthcare	514991	42500	82997	1098908	275494	2346452
Housing	920484	3345482	57997	6318088	34996	1491480
Law & Order	17500	75000	44999	1558848	91499	43998
Migration	0	137500	0	835420	5999	0
Social Welfare	1627482	264998	25999	10652300	182994	129494
Transportation	0	314998	0	161494	11494	197496
Total	3286953	11570449	1335472	46254202	1828949	13490706

	DENK	FvD	GL	JA21	PVV	PvdA
Agriculture	0	678497	117999	0	0	8498
Civil Rights	494484	1913494	1098982	0	0	7699250
Climate	0	691494	3965967	139999	2500	210486
Defense	0	1216996	226499	0	0	0
Economy	147991	2027496	1318494	2117994	0	3961372
Education & Culture	184984	438998	582492	30999	0	2121796
Foreign Affairs	48494	0	42500	0	0	145993
Government	0	384998	537996	0	0	275990
Healthcare	111994	5412490	2163490	2117994	0	3565773
Housing	128991	889998	1090988	0	0	3889239
Law & Order	0	244998	500	2123496	0	17496
Migration	45997	769997	9498	4361488	0	8500
Social Welfare	16997	1539996	1029491	0	0	5341562
Transportation	51494	342498	914994	0	0	76993
Total	1231426	16551950	13099890	10891970	2500	27322948

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	PvdD	**SGP**	**SP**	**VOLT**	**VVD**
Agriculture	2353484	68996	0	0	49498
Civil Rights	878994	84992	5833476	159980	2336984
Climate	5534443	128996	162993	1564479	2088470
Defense	0	0	0	0	173991
Economy	427492	69998	777986	0	494962
Education & Culture	52498	59498	6498	9999	31994
Foreign Affairs	0	0	0	0	0
Government	3498	27500	1064496	0	115994
Healthcare	1364992	73995	1919991	0	1867464
Housing	686984	66997	3597976	2500	2538408
Law & Order	0	17500	446497	0	618980
Migration	0	8500	0	0	1500
Social Welfare	17500	4999	1267488	0	227494
Transportation	256992	32500	242499	0	70990
Total	11576877	644471	15319900	1736958	10616729

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Appendix B. Money pent per issue

Table 5. Money spent per issue per party (in EUR)

	50+	BBB	BIJ1	CDA	CU	D66	DENK	FvD	GL
Agriculture	0,00	16.382,00	0,00	7.322,00	0,00	50,00	0,00	2.497,00	299,00
Civil Rights	0,00	848,00	5.634,00	119.745,00	4.592,00	3.232,00	2.734,00	9.044,00	7.932,00
Climate	0,00	8.744,00	148,00	8.335,00	2.744,00	16.066,00	0,00	1.894,00	24.467,00
Defense	0,00	0,00	0,00	448,00	50,00	0,00	0,00	2.546,00	799,00
Economy	846,00	5.798,00	0,00	89.434,00	898,00	448,00	891,00	9.696,00	8.894,00
Education & Culture	0,00	250,00	948,00	20.702,00	4.594,00	19.042,00	1.584,00	1.248,00	3.742,00
Foreign Affairs	150,00	0,00	0,00	0,00	148,00	0,00	544,00	0,00	250,00
Government	0,00	599,00	50,00	43.258,00	497,00	198,00	0,00	1.048,00	2.846,00
Healthcare	1.791,00	250,00	797,00	10.458,00	3.044,00	12.452,00	594,00	21.440,00	10.290,00
Housing	3.234,00	14.382,00	597,00	64.238,00	596,00	16.480,00	1.091,00	2.448,00	6.838,00
Law & Order	150,00	550,00	399,00	18.098,00	499,00	398,00	0,00	448,00	50,00
Migration	0,00	550,00	0,00	9.770,00	99,00	0,00	297,00	2.097,00	148,00
Social Welfare	5.932,00	848,00	99,00	112.700,00	1.644,00	1.044,00	297,00	6.096,00	5.491,00
Transportation	0,00	1.348,00	0,00	1.844,00	644,00	1.346,00	644,00	948,00	7.344,00

	JA21	PVV	PvdA	PvdD	SGP	SP	VOLT	VVD
Agriculture	0,00	0,00	148,00	15.434,00	396,00	0,00	0,00	248,00
Civil Rights	0,00	0,00	85.442,00	7.194,00	1.192,00	41.275,00	2.130,00	5.384,00
Climate	299,00	42,00	1.636,00	54.943,00	846,00	1.393,00	9.179,00	9.520,00
Defense	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1.091,00
Economy	6.344,00	0,00	16.422,00	3.842,00	248,00	5.236,00	0,00	4.312,00
Education & Culture	199,00	0,00	24.546,00	548,00	448,00	248,00	99,00	594,00
Foreign Affairs	0,00	0,00	693,00	0,00	0,00	0,00	0,00	0,00
Government	0,00	0,00	1.440,00	148,00	250,00	5.395,00	0,00	1.244,00
Healthcare	6.344,00	0,00	27.473,00	11.792,00	695,00	8.691,00	0,00	7.664,00
Housing	0,00	0,00	31.339,00	4.634,00	597,00	23.126,00	50,00	21.958,00
Law & Order	6.846,00	0,00	346,00	0,00	50,00	1.297,00	0,00	2.430,00
Migration	14.038,00	0,00	50,00	0,00	50,00	0,00	0,00	50,00
Social Welfare	0,00	0,00	53.812,00	150,00	99,00	10.788,00	0,00	1.044,00
Transportation	0,00	0,00	893,00	1.742,00	250,00	799,00	0,00	990,00

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Appendix C. Issue word lists

Table 6. Issue word lists

Agriculture	**Civil Rights**	
platteland	eerlijk	genderidentiteit
boer	samenleving	grondrecht
landbouw	gelijk	journalist
bos	waarde	religieus
voedsel	norm	islam
boerenbedrijf	vrouw	integratie
veehouderij	burger	meningsuiting
agrarisch	vrijheid	mensenrechten
koe	fatsoen	geestelijk
wei	recht	queer
bestrijding	ongelijkheid	seks
boerennatuur	rechtvaardig	nationaliteit
visser	openbaar	trans
noaberschap	kansengelijkheid	etnisch
product	leeftijd	minderheid
weer	intimidatie	stemrecht
voeding	discriminatie	non-binair
landbouwgrond	traditie	antisemitisme
visserij	behandeling	transgender
vlees	racisme	zelfbeschikkingsrecht
dierenwelzijn	afkomst	kiesrecht
halal	religie	regenboogvlag
kip	toeslagenaffaire	gehandicapt
bestemmingsplan	gelijkwaardigheid	antiracisme
transport	seksueel	menswaardig
intensief	geaardheid	godsdienst
verkoop	emancipatie	seksualiteit
milieuvriendelijk	diversiteit	extremisme
oogst	cultureel	vrouwenemancipatie
stal	islamitisch	oeigoeren
voedselproductie	commercieel	gendergerelateerd
appel	rechtvaardigheid	lhbtqia+-gemeenschap
boerin	taal	lhbtqia+-kwestie
melkveehouderij	medisch	blind
veestapel	vrouwendag	openbaarheid
stankoverlast		privacy
varken		
biologisch		
import		
ingredient		
keurmerk		
plattelandsbeleid		
plattelandspartij		
voedselproducent		
boerenfamilie		
boerenkeukentafel		
boerenpartij		
koeienboer		
landbouwbeleid		
slachterij		
vee		

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Climate			Defense
duurzaam	luchtkwaliteit	milieuprobleem	defensie
groen	plastic	gas	vrede
klimaat	vervuilende		dreiging
wereld	transport		landmacht
natuur	klimaatdoelstelling		oud-commandant
klimaatverandering	klimaatbedrog		oorlog
energie	stikstofwet		aanval
schoon	otter		missie
gebied	stroom		militair
kernenergie	klimaatvriendelijk		kernwapen
omgeving	windmolenpark		leger
planeet	klimaataanpak		conflict
duurzaamheid	droogte		materieel
klimaatakkoord	brandstof		kazerne
windmolen	zonne-energie		bondgenoot
milieu	klimaatproblem		krijgsmacht
klimaatcrisi	stikstofuitstoot		vn
leefomgeving	vergroening		veteraan
grond	chemisch		soldaat
boom	klimaatplan		afghanistan
bodem	energieopwekking		uitrusting
klimaatbeleid	kust		wereldoorlog
lucht	elektriciteit		libie
zee	zoutkoepel		Wapen
landschap	fijnstof		herbewapening
biomassa	natuurbeheer		ontwapening
energietransitie	kernafval		wapenwedloop
water	nucleair		ontwapening
park	stikstofdebat		kernbom
klimaatactie	beschermen		agressor
afval	olie		joegoslavie
verkeer	stikstofregel		irak
bescherming	alcohol		defensie-industrie
zonnepaneel	energievoorziening		officierenvereniging
mega-zonnepark	gaswinning		wapenembargo
ruimtelijk	radioactief		vn-raad
natuurgebied	energiebesparing		vliegbasis
beek	groenstrook		alliantie
zonnepark	milieubeleid		corps
plant	milieuvervuiling		infiltratie
energiemix	onbewoonbaar		jihadistenstrijder
controle	overstroming		navo-bondgenoot
windpark	stikstofdiscussie		veiligheidssector
klimaatalarm	duurzaamheidsagenda		veteranendag
energiebron	uranium		somalie
klimaatwet	luchtvervuiling		knil-militair
terrein	bestrijdingsmiddel		defensieplek
co2	broeikasgas		
vervuiling	carpool		
waterschap	energiebehoefte		
klimaatverkiezing	grondwater		
stikstof	habitat		
klimaatoplossing	leefklimaat		
uitstoot	mega0zonnepark		
rivm	milieubeweging		
klimaatneutraal	ontbossing		
experiment	recycling		
diersoort	regen		
stof	watervoorziening		
klimaatplann	co2-probleem		
windenergie	klimaatdoemdenker		
bestemmingsplan	energiebeleid		

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Economy		Education & Culture	
betaalbaar	bank	onderwijs	museum
economie	industrie	leenstelsel	erfgoed
ondernemer	werkloosheidsuitkering	school	radio
salaris	verlies	basisbeurs	vmbo
belasting	sluiting	cultuur	kunstenaar
baan	bedrijventerrein	student	basisonderwijs
geld	ozb	openbaar	cursus
minimumloon	zzp'er	studieschuld	techniek
loon	handel	technologie	schooljaar
bedrijf	investeerder	onderzoek	onderwijshuisvesting
armoede	winkelier	docent	televisie
investering	eigendom	leerling	communicatie
ontwikkeling	bedrijfsleven	media	scholier
economisch	zzp	kerk	immigrant
middeninkomen	werkloosheid	innovatie	ek
kost	winkelstraat	stage	sportvereniging
arbeidsmarkt	klant	internet	collegegeld
schuld	ondernemersklimaat	leerkracht	pers
herstel	kleinbedrijf	sport	middelbaar
winkel	commerciel	studie	lerarentekort
goedkoop	retail	ondersteuning	mobiel
werknemer	aandeelhouder	god	onderwijsplann
begroting	aandeel	krant	cultuursector
speculant	onderneming	religie	beroepsonderwijs
financiel	toezicht	geloof	eindexamen
portemonnee	ondernemend	moslim	schoolbestuur
markt	verkoop	basisschool	universitair
groeifonds	vastgoed	kerst	klaslokaal
schuldenvrij	dividend	universiteit	examenleerling
mkb	btw	christen	joods
financieel	faillissement	bibliotheek	scholing
belegger	onderneemster	klas	godsdienst
hypotheek	consument	mbo	cultuurbeleid
belastinggeld	fraude	opleiding	technologisch
werkgarantie	ondernemersspreekuur	cultureel	digitalisering
groei	accijns	moslimhaat	glasvezel
belastingverlaging	bv	islamitisch	expertise
last	btw-verhoging	kunst	vwo
staatsschuld	klantenkring	taal	cbs
bezuiniging	koopkracht	theater	ict
winst	verzekeraar	oranje	wetenschappelijk
werkgelegenheid	ondernemersprij	wetenschapper	duo
marktwerking	krediet	christelijk	allochtoon
budget	vestigingsklimaat	katholiek	cijferlijst
werkgever	fiscaal	voetbal	collecte
krimpgebied	investeringsruimte	hbo	computer
eigenaar	overheidssteun	religieus	cultuuraanbod
toerisme	overname	instelling	cultuurhistorisch
ondernemerschap	groeiregio	islam	havo
		kerstdag	kersttoespraak
		kerstboodschap	loting
		asielzoeker	ruimtevaart
		les	sportbeleid

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Foreign Affairs	Government
europees	overheid
vluchteling	burger
internationaal	minister
trump	rechtsstaat
terrorisme	regering
amerikaans	provincie
donald	rijk
eu	referendum
ontwikkelingsland	grondwet
diplomaat	burgemeester
zuid-europa	bestuur
turkije	parlement
midden-oosten	bestuurlijk
rusland	transparantie
azerbeidzjan	publiek
joe	stadsbestuur
biden	bezuiniging
buitenlands	bestuurder
brussel	feestdag
oorlog	bureaucratie
armenie	stemadvies
onderdrukking	verkiezingstijd
armeens	grondrecht
europarlementarier	minister-president
humanitair	brandweer
us	staatssecretaris
israel	koning
handel	ambtenaar
ontwikkelingssamenwerking	kandidaatstelling
mensenrechten	koninklijk
conflict	ramp
duitsland	koningsdag
griekenland	koninkrijk
buitenland	grondwettelijk
oost-europa	overheidsdienst
kruis	commissaris
ambassadeur	kamerkandidat
afrika	gemeentewet
turks	begrafenis
diplomatie	bestuurslaag
erdogan	koningin
sanctie	decentralisatie
chinees	gemeentefonds
syrie	rampenbestrijding
japan	staatkundig
kanaalzone	staking
presidentsverkiezing	
koninkrijksrelaties	
import	
eu-lidmaatschap	
groot-brittannie	
dictatuur	
handelsakkoord	
israelisch	
ontwikkelingshulp	
ambassade	

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Healthcare		Housing	
crisis	experiment	woning	huurcrisi
zorg	arbeidsvoorwaarde	huis	wooncorporatie
kind	covid	betaalbaar	huurstijging
coronacrisi	coronaregel	straat	dakloos
corona	drug	regio	woonplicht
voorziening	medicijn	volkshuisvesting	kantoor
zorgpremie	vaccinatiestrategie	stad	ozb
gezond	lichamelijk	inwoner	huurbevriezing
lockdown	familielid	belasting	leegstand
kwetsbaar	verpleeghuis	wijk	woningbouwplan
abortus	langdurig	ruimte	woonlast
gezondheidszorg	zorgkosten	bouw	woningcrisi
mantelzorger	corona-herstelfonds	starter	bestemmingsplan
bijdrage	geboorte	dorp	verzorgingstehuis
behandeling	gehandicapt	platteland	dakloosheid
sport	coronafonds	gebied	verhuizing
gezondheid	vaccinatiepaspoort	woningmarkt	flat
ziekenhuis	vaccinatieplicht	huisjesmelker	huurhuis
volksgezondheid	specialist	wooncrisi	kamerverhuur
seksueel	overgewicht	omgeving	brandveilig
coronaviru	avondklokrell	bewoner	elektriciteit
vaccinatie	psychiatrisch	woningnood	vestiging
zorgverlener	who	huur	woningprijz
versoepeling	alcohol	prijs	verpaupering
patient	zorgverzekeraar	huurwoning	huurteam
preventie	aandoening	woningbouw	appartementengebouw
besmetting	ambulancepost	huurder	onleefbaarheid
ambulance	zorgtoeslag	leefomgeving	registratie
vaccin	ggd	randstad	stedeling
medisch	ic-capaciteit	leefbaarheid	verhuurdersvergunning
huisarts	operatie	gemeenschap	huurcontract
zorgmedewerker	verslaving	woningtekort	huurdersraadpleging
welzijn	verwijzing	hypotheek	binnenstedelijk
ziekte	verzekeraar	koopwoning	verhuurgedrag
wachtlijst	zorginstelling	nieuwbouwwoning	bejaardenhuis
persconferentie	intensive	premie	huisvestingsbeleid
personeel	thuiszorg	huisvesting	huurbescherming
psychisch	tandarts	binnenstad	huurdersbescherming
test	ambulancestandplaats	huurverhoging	huurplafond
vaccinatieprogramma	ambulancezorg	gebouw	middenhuurwoning
voeding	bloeddonatie	huurprijs	premiewoning
donatie	dienstverlening	woonplaats	stadsvernieuwing
mondkap	reikwijdte	dakloze	studentenwoning
voorlichting	revalidatie	starterswoning	woningvoorraad
coronacrisis	schadevergoeding	stedelijk	
abortuskliniek	hygiene		
rivm	vergoeding		
drank	virus		

Law & Order		Migration
drugscriminaliteit	drug	migratie
rechtsstaat	juridisch	grens
geweld	justitie	asiel
criminaliteit	onveiligheid	arbeidsmigratie
rechtvaardig	verkrachting	immigratie
veiligheid	drugsproductie	asielbeleid
vernieling	gerechtshof	immigratiebeleid
intimidatie	misbruik	integratie
geweldsincident	rechtszaak	asielzoeker
grondwet	om	migratieachtergrond
drugsafval	legaal	marrakesh
liquidatie	huwelijk	immigrant
steekpartij	cel	inburgering
terrorisme	misleiding	vreemdelingenzaak
overlast	fraude	asielsysteem
boete	loverboy	asielzoekerscentrum
politie	radicalisering	allochtoon
jeugdzorg	rechterlijk	remigratie
straatintimidatie	awb	niet-westers
preventie	advocatuur	immigratiepact
speed	bodycam	polen
xtc	bevoegdheid	midden-oosten
kraker	rechtspraak	afrika
rechtvaardigheid	wapenstok	moria
dreiging	wijkagent	vluchtelingenkamp
prostitutie	draagmoederschap	vluchteling
crimineel	gevangenis	pardon
straf	vrijlating	instroom
grondrecht	bordeel	migratiecrisis
uitbuiting	burgerlijk	moria-deal
kraak	drugsgeld	migratiepact
coffeeshop	drugshandel	selectiecentrum
onveilig	jeugdgevangenis	asielbelofte
inbreker	opsporing	libie
illegaal	taakstraf	turkije
extreem	veelpleger	azc
diefstal	wapenbezit	opvangplek
woningoverlast	wetboek	
agent	strafblad	
bedreiging	tuig	
cameratoezicht	gevangenisstraf	
camera	gebiedsverbod	

Social Welfare		Transportation	
samenleving	ziekte	weg	parkeerbeleid
werk	opvang	bereikbaar	verkeersprobleem
salaris	multinational	openbaar	randweg
sociaal	voedselbank	vervoer	rotonde
contract	werkloosheidsuitkering	verbinding	verkeersplan
minimumloon	vakbond	snelweg	buslijn
loon	armoedebestrijding	zee	verkeersdeelnemer
bedrijf	arbeidsvoorwaarde	lijn	fietsenstalling
armoede	werkloosheid	auto	tram
pensioen	verzorgingstehuis	trein	oversteekplaats
middenklasse	thuiswerk	luchtvaart	waterstaat
voorziening	vrijwilligerswerk	verkeer	dienstregeling
arbeid	bonus	bereikbaarheid	luchthaven
hulp	onderneming	ov	truckchauffeur
middeninkomen	basisinkomen	binnenstad	jachthaven
inkomen	samenhang	haven	verkeershufter
handicap	gehandicapt	kilometer	a27
compensatie	loopbaan	omwonende	hogesnelheidstrein
arbeidsmarkt	werkloos	fiets	infrastructureel
schuld	bijbaan	station	metro
leeftijd	pensioenfonds	mobiliteit	vertraging
aow	vrijwilligersorganisatie	knelpunt	scooter
tekort	tolerant	verkeersveiligheid	parkeerproblematiek
flexcontract	zieken	tarief	sneltrein
arbeidsmigratie	jeugdloon	infrastructuur	verkeersdrukte
vaardigheid	nabestaande	snelheid	verkeersstroom
stage	omscholing	maximumsnelheid	voertuig
werknemer	vergrijzing	km	vrachtwagen
zelfstandig	werkplek	verbindingsweg	sanering
financiel	ouderenbeleid	rondweg	scheepvaart
pensioenstelsel	zomerkamp	vliegtuig	intercity
ww	allochtoon	bus	130km/u
ondersteuning	bedrijfstak	reiziger	a35
maatschappelijk	beschuldiging	vliegveld	apk
arbeidsongeschiktheid	bouwwerkzaamheid	brug	autoparkeerplaats
uitkering	cao	schip	busdienst
schuldenvrij	huishouding	fietser	busmaatschappij
loonkloof	jeugdwerkloosheid	tunnel	dienstverlening
kinderopvang	overwerk	voetganger	foutparkerend
bijstand	schuldsanering	parkeerplaats	n209
jeugd	seizoensarbeid	vervoersteun	parkeermogelijkheid
jeugdzorg	staking	automobilist	parkeerruimte
topinkomen	werkomstandigheid	verkeersslachtoffer	perron
fnv	ziektekosten	verbreding	sneltram
subsidie	zwangerschapsverlof	fusie	tolheffing
werkgelegenheid	sollicitatie	ov-idee	verkeerschaos
premie	werkvloer	transport	verkeersveiligheidsoogp
werkgever	weeskind	parkeergarage	unt
welzijn		ontsluitingsweg	verkeersveiligheidsprobl
		ramp	em
		ongeluk	busvervoer
		parkeerplek	parkeerbelasting
		file	spoortunnel
		asfalt	garage
			parkeergeld

Appendix D. Krippendorff's Alpha for each theme

In the method section, we discussed the validation of the model. We computed the multi-label Krippendorff's alpha to measure the inter-coder reliability. In this appendix, we provide an inter-coder reliability measurement for each individual issue.

For each issue, we computed the Krippendorff's alpha (using a nominal distance function).

As not all issues were significantly represented in the random sample of 300 ads used for validation, we only computed the Krippendorff's alpha for an issue if at least 15 ads (i.e. 5% of the sample) were considered to be about the issue by either coder (the total is provided in the "# ads" column).

Issue	# ads	Krippendorff's Alpha
Agriculture	10	-
Civil Rights	101	0.9
Climate	21	0.88
Defense	1	-
Economy	46	0.85
Education & Culture	20	0.84
Foreign Affairs	1	-
Government	17	0.82
Healthcare	35	0.83
Housing	54	0.76
Law & Order	12	-
Migration	2	-
Social Welfare	58	0.83
Transportation	7	-

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Appendix E. Spending per Issue per Party

Figure 7. Spending per Issue by CDA & 50Plus (in EUR)

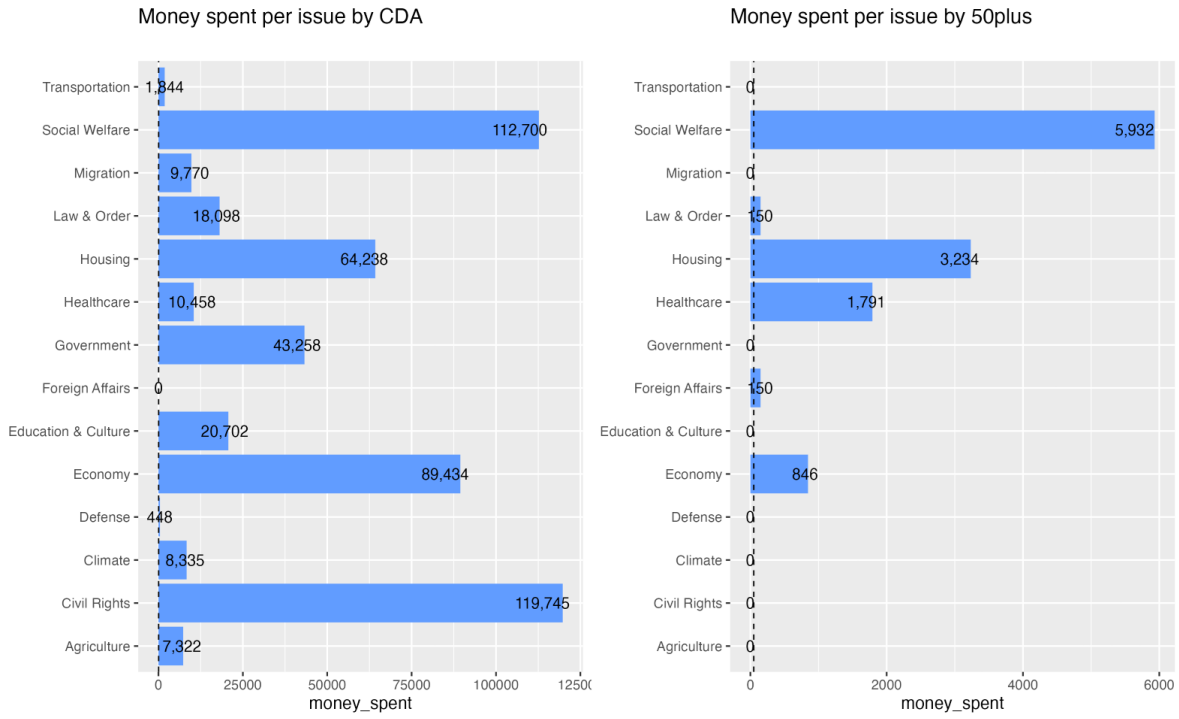


Figure 8. Spending per Issue by BBB & Bij1 (in EUR)

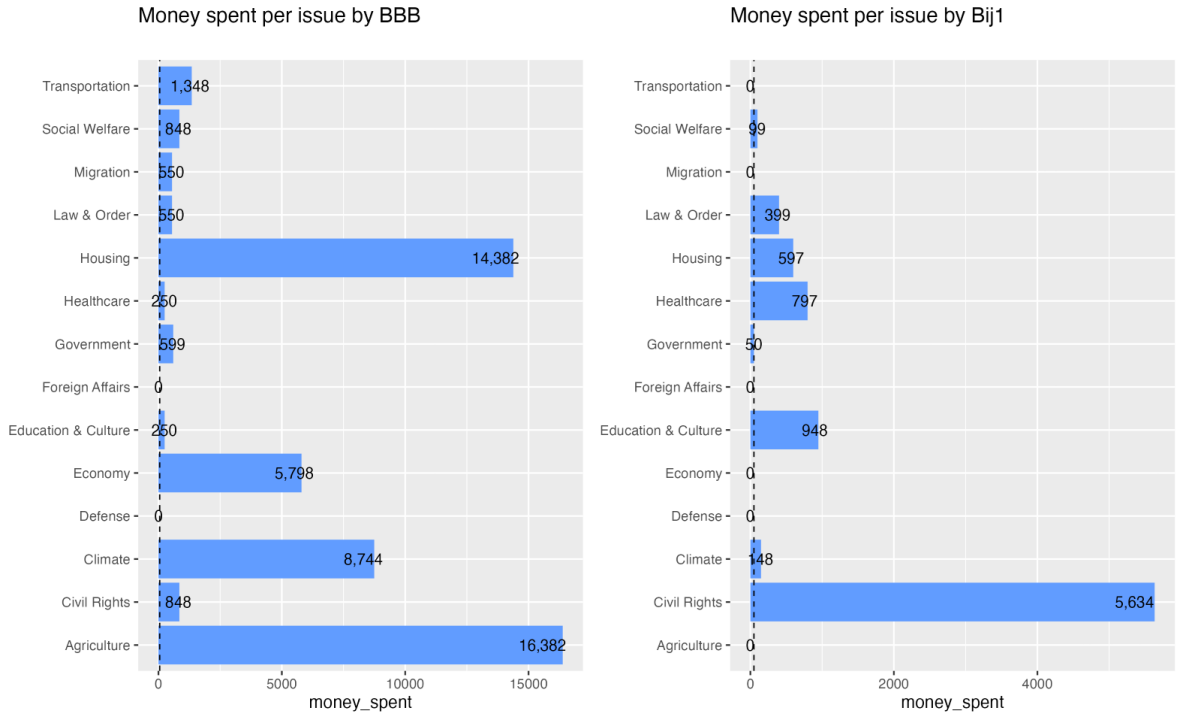


Figure 9. Spending per Issue by ChristenUnie & D66 (in EUR)

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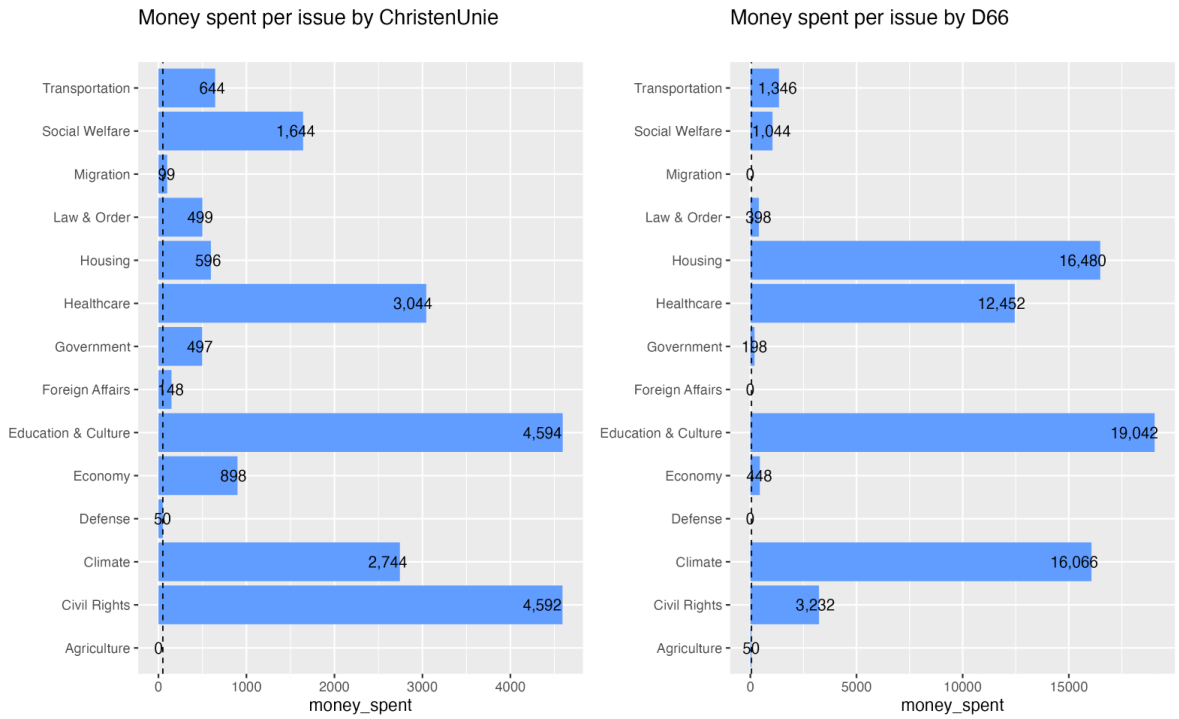
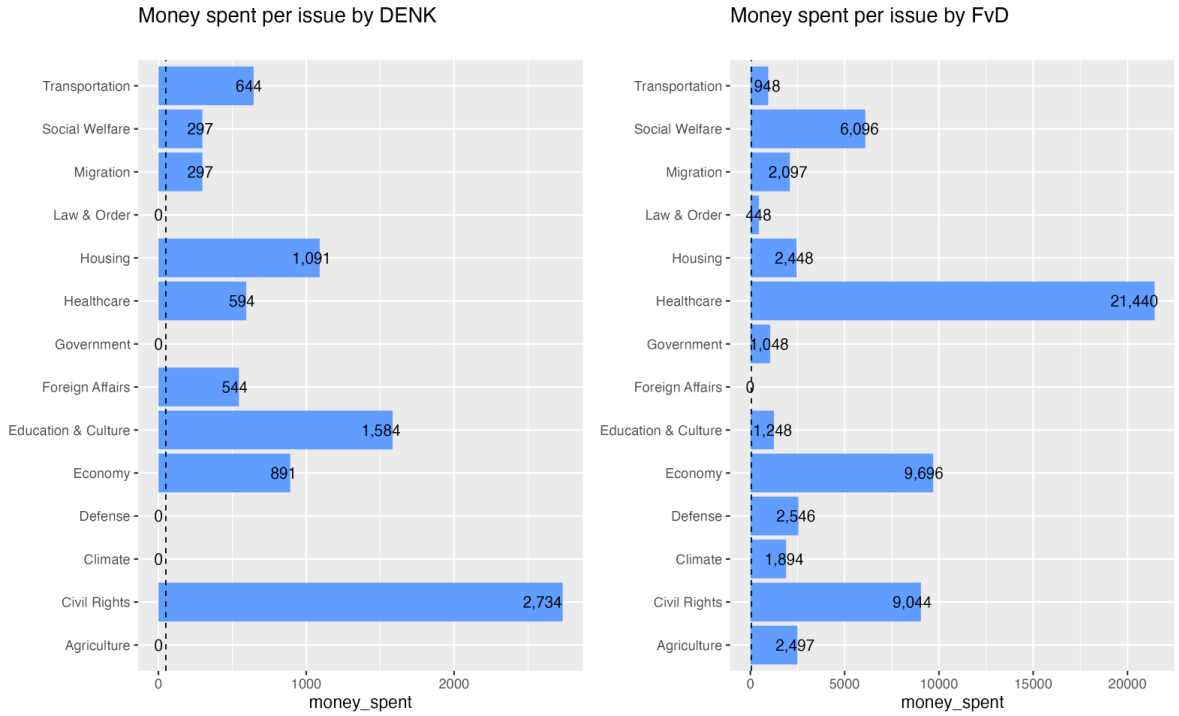


Figure 10. Spending per Issue by Denk & FvD (in EUR)



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Figure 11. Spending per Issue by JA21 & PvdA (in EUR)

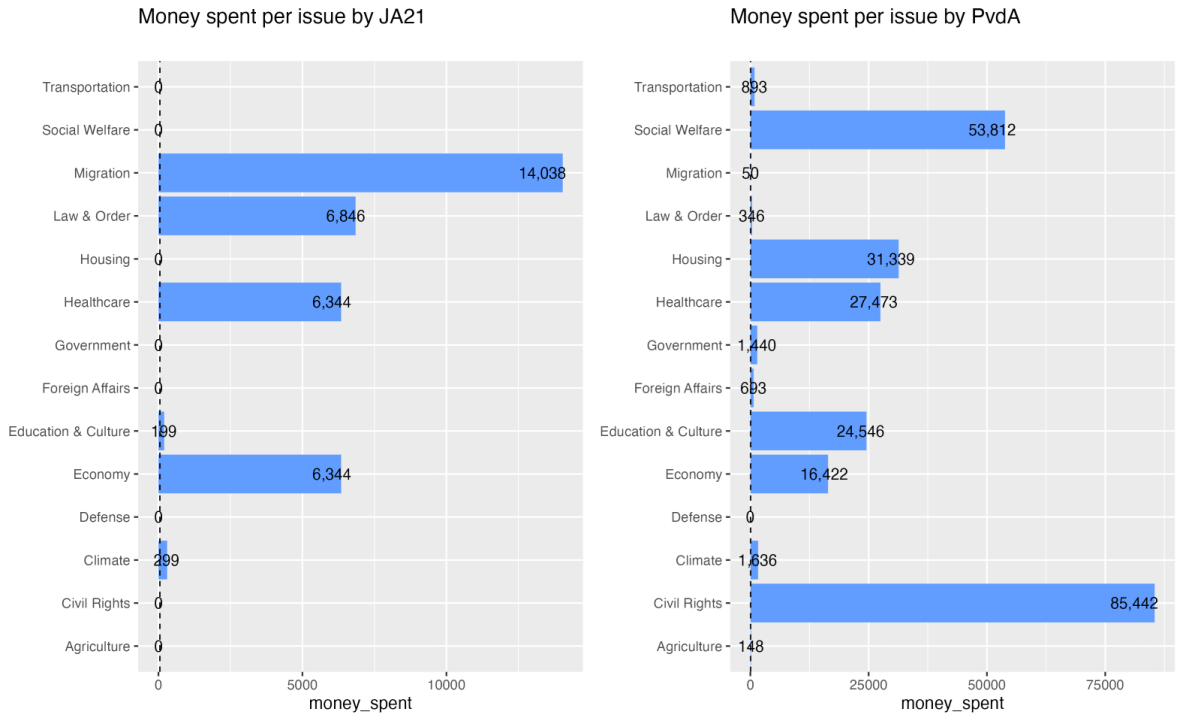


Figure 12. Spending per Issue by PvdD & SGP (in EUR)

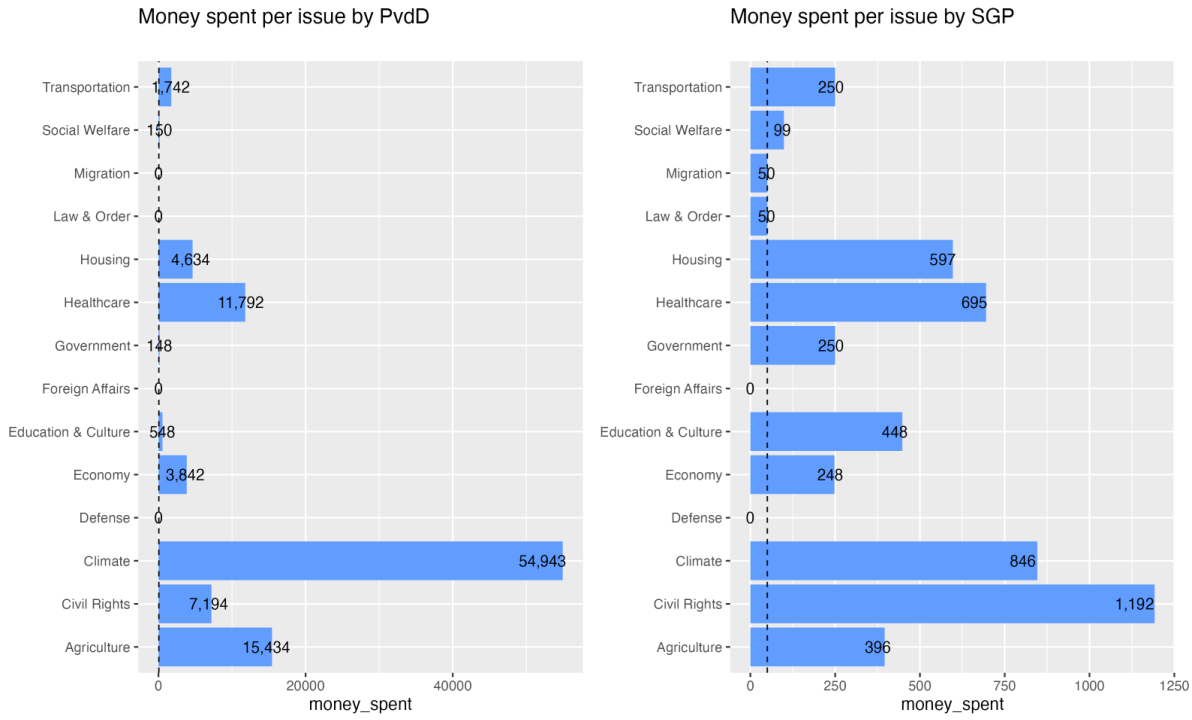


Figure 13. Spending per Issue by SP & Volt (in EUR)

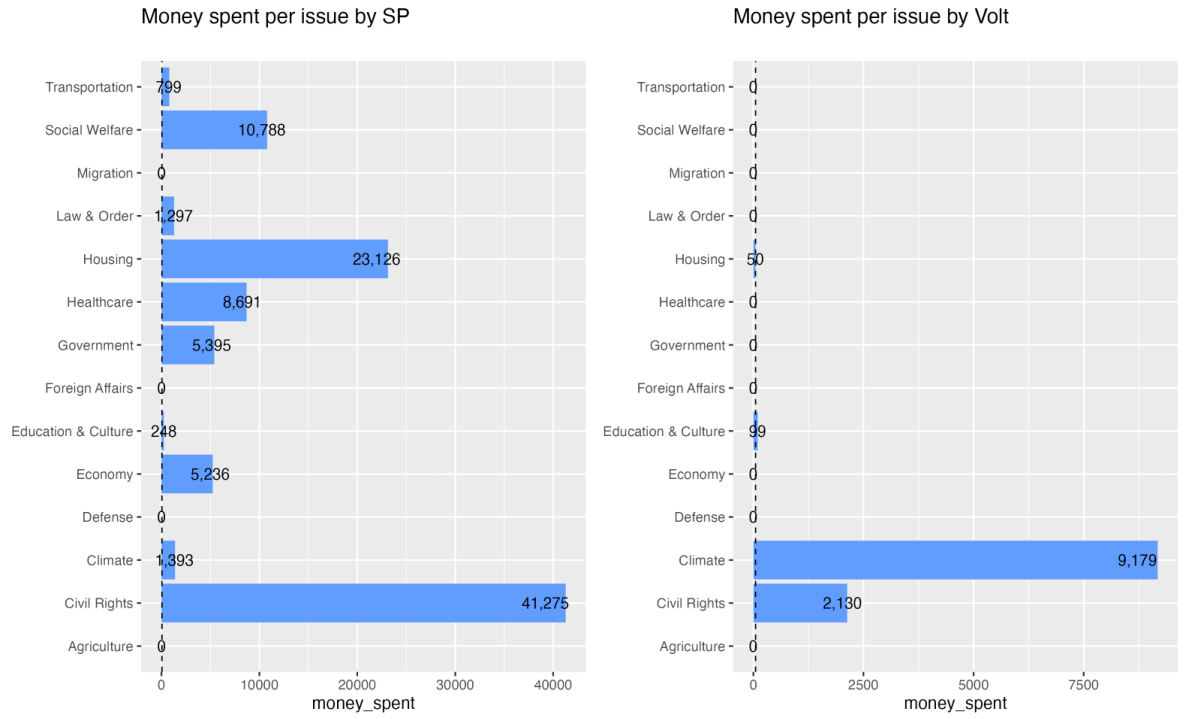
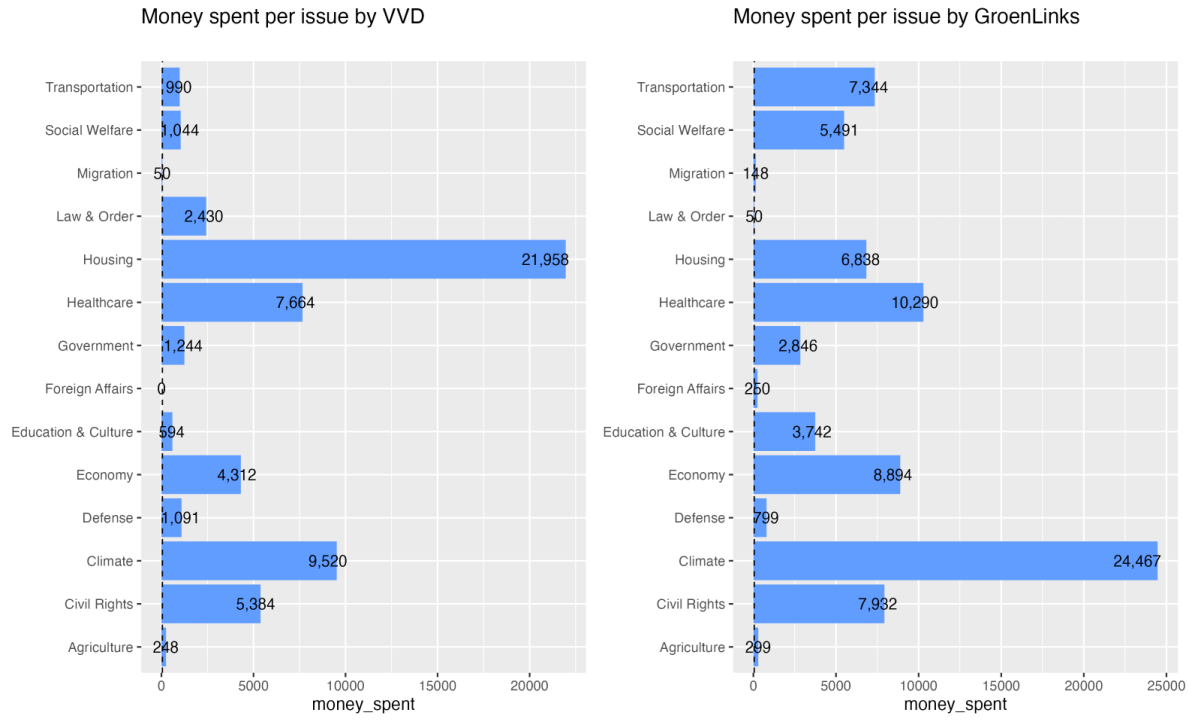


Figure 14. Spending per Issue by VVD & GroenLinks (in EUR)



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Appendix F. The number of matched ads per party

Table 7. The number of matched ads per party

Party	# of matched	# of unmatched
50+	96 (59.26%)	66 (40.74%)
BBB	51 (85.00%)	9 (15.00%)
BIJ1	51 (27.42%)	135 (72.58%)
CDA	5,631 (49.12%)	5,832 (50.88%)
CU	83 (36.40%)	145 (63.60%)
D66	558 (36.54%)	969 (63.46%)
DENK	109 (26.33%)	305 (73.67%)
FvD	90 (31.80%)	193 (68.20%)
GroenLinks	174 (39.19%)	270 (60.81%)
JA21	47 (40.87%)	68 (59.13%)
PVV	1 (11.11%)	8 (88.89%)
PvdA	3,455 (78.08%)	970 (21.92%)
PvdD	201 (72.83%)	75 (27.17%)
SGP	54 (51.92%)	50 (48.08%)
SP	165 (38.92%)	259 (61.08%)
VOLT	84 (7.12%)	1,096 (92.88%)
VVD	486 (10.89%)	3,975 (89.11%)
Total	11,336 (44.00%)	14,425 (56.00%)

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Appendix G. The number of ads per issue per party

Table 8. The number of ads per issue per party

Party	Ag	CV	Cl	De	Ec	EC	FA	Go	He	Ho	LA	Mi	SW	Ta
50+	0	0	0	0	9	0	1	0	18	31	1	0	37	0
BBB	36	3	11	0	4	1	0	2	1	36	1	1	3	3
BIJ1	0	31	3	0	0	3	0	1	6	6	2	0	2	0
CDA	57	1510	130	3	1231	297	0	484	185	823	305	161	1400	11
CU	0	26	13	1	4	12	3	6	11	8	2	2	11	13
D66	1	35	167	0	5	217	0	4	96	41	4	0	13	7
DENK	0	33	0	0	18	32	11	0	12	18	0	6	6	13
FvD	6	11	12	9	7	5	0	3	21	5	3	6	8	3
GL	2	35	66	2	12	17	1	7	20	23	1	3	18	11
JA21	0	0	2	0	11	2	0	0	11	0	7	25	0	0
PVV	0	0	1	0	0	0	0	0	0	0	0	0	0	0
PvdA	3	1500	29	0	255	407	14	19	454	522	7	1	876	14
PvdD	33	12	114	0	17	5	0	3	16	31	0	0	1	15
SGP	8	16	7	0	3	5	0	1	10	6	1	1	2	1
SP	0	50	14	0	27	5	0	10	18	48	6	0	25	2
VOLT	0	39	42	0	0	2	0	0	0	1	0	0	0	0
VVD	3	32	60	18	75	12	0	11	72	183	39	1	13	20
Total	149	3323	671	33	1678	1022	30	551	951	1782	379	207	2415	113

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