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## MEME-IFYING DATA: THE RISE OF PUBLIC HEALTH INFLUENCERS ON INSTAGRAM, TIKTOK, AND TWITTER DURING COVID-19

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### ABSTRACT

This article argues for the importance of the memetic tactic of bricolage within contemporary social media science communication for its capacity to curate and distill approachable, accessible, and shareable Covid-19 content. We suggest that the social media communication practices of what we call ‘public health influencers’ (PHIs) on Instagram, Tik Tok, and Twitter make use of memetic bricolage techniques of stop motion, collage, infographics, and placarding, coupled with an ethos of ‘micro-celebrity,’ in order to advance stalled public conversations and to reorient the spread of disinformation back to evidence-based facts. To make this argument, we analyze the cross-platform social media work of three key PHIs during the pediatric vaccination campaigns of late 2021 within our local context of Ontario, Canada to reflect on the effectiveness of social media presence, communication, and advocacy. Through memetic tactics, we argue that PHIs’ efforts to engage the public are driven by a larger impulse to combat health inequities that are exacerbated by the different forms of disinformation circulating on social media. Ultimately, this article illustrates how the concerted effort against disinformation by PHIs on social media via memes contributes to advocacy for more accessible, just, and equitable health care for Ontarians.

Keywords: Covid-19, misinformation, social media influencer, public health, memes.

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## 1 INTRODUCTION

This article examines the emerging use of meme-based communication practices by what we call ‘public health influencers’ (PHIs). We define PHIs as public health experts who use social media to engage non-expert audiences in health-related conversations that greatly impact them but are often not made accessible for broader understanding, acceptance, and implementation. As emerging figures in the social media playing field, we frame PHIs as a subset of healthcare and medical experts and will explore in what follows how, as a developing form of micro-celebrity, they used social media messaging during the beginning days of the pandemic. We argue that, in the context of the pandemic, PHIs surfaced as key communication figures dedicated to public health messaging and the combatting of disinformation,<sup>1</sup> and their memetic practices matter for the ways that they distilled technical scientific Covid-19 messaging from government officials to the public. To reflect on the effectiveness of PHI social media presence, communication, and advocacy, we analyze the evidence-based Covid-19 messaging of three PHIs during the pediatric vaccination campaigns across three popular social media platforms (Twitter, Instagram, and TikTok) in our local context of Ontario, Canada. We focus on the social media work of Naheed Dosani (MD), Sabina Vohra-Miller (MSc, Pharmacology; Doctor of Public Health student), and Samantha Yammine (PhD, Cell and Molecular Biology and Neuroscience). Expanding MacDonald’s discussion of ‘science influencers’ with Melissa Couto Zuber in the *Toronto Star* in 2021, we look specifically to how these three PHIs have curated meme-based practices of bricolage to share accessible health messaging amidst the fear, anxiety, and disinformation<sup>2</sup> circulating around the approval of the pediatric vaccine in Canada for children ages five to eleven in November 2021.

Analyzing how PHIs translate public health data into memeified messaging helps us understand how their social media posts operate as “lively data” (Luka and Millette, 2018) insofar as what they post shifts and transforms within the flows and demands of the ever-changing landscape of digital discourse. Drawing on Lisa

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<sup>1</sup> We define PHIs as medical experts who have: (1) embraced their roles as public figures with pandemic-related medical and science expertise, and (2) developed digital communication strategies. In some cases, the strength and popularity of PHIs have impacted the direction of public conversations and helped build back public trust. The value of PHIs is found in their function as a mediating force, translating expert knowledge, government policy, and public health measures, to broad audiences. PHIs in Southern Ontario include, but are not limited to, Isaac Bogoch (MD, @BogochIsaac); Andrew Baback Boozary (MD, @drandrewb); Naheed Dosani (MD, @NaheedD); Kelly Grindrod (PharmD, @kgrindrod), Jennifer Kwan (MD, @jkwan\_md); Sabina Vohra-Miller (Msc, @SabiVM), Lisa Richardson (MD, @RicharLisa); Krishana Sankar (MD, @KrishanaSankar); Abdu Sharkawy (MD, SharkawyMD); Birgit Umaigba (RN, MEd, @birgitomo); Michael Warner (MD, @drmwarner); Samantha Yammine (PhD, @heysciencesam); as well as science communication accounts such as Science Up First (@ScienceUpFirst), Pandemic Pregnancy Guide (@PandemicPreg), and 19toZero (@19tozero).

<sup>2</sup> We define disinformation as an intentional spread of false information, misinformation as the unintentional spread of false information, and malinformation as the spread of false information to deliberately enact harm (Phillips and Milner 2021, p. 4). In this paper, we use disinformation as an umbrella term for all three.

Gitlemen (2013) and Debora Lupton's (2015) work on everyday data, Luka and Millette (2018) describe lively data as centering on "life itself," which, three years into a global pandemic, very much includes health. Content posted and circulated online should thus be understood as largely "intertwined with other daily and historically shaped social relations, activities, and realities," which become "dynamic, influential, and reciprocal" (Luka and Millette, 2018, p. 2). This is key because, over the course of the pandemic, PHIs like Vohra-Miller, Yamminie, and Dosani, among others, have adapted their communication approaches in response to public engagement and reaction, marking them as leaders in building and centering public trust. As Elisa Sobo (2021) points out in her studies on conspiracy theories in pediatric vaccine discourse, such theories themselves "are never finished" and always evolving, as such we need to "develop culturally relevant messaging to encourage a shift away from dangerous propositions over time" (p. 62). In focusing conversation on accessible evidence-based, actionable discussions to encourage public faith in masking mandates, vaccination, social distancing, and testing measures, PHI's use of social media illustrates an approach to such messaging via the tools of social media. A further benefit is how it demonstrates the ways non-government actors can inform how public health policy takes shape at the level of the government; PHIs are of course both citizens as well as experts who can model productively ways of agitating for change. This can be seen in Ontario where citizen-backed pressure, including PHIs, demanded that provincial governments release rapid antigen tests to the general public in grocery stores and liquor stores when the first Omicron variant spread throughout the province in December 2021 (Dosani, 2021b; Wilson, 2021).

On November 19, 2021, amid the rapidly rising Omicron (BA.1) cases, Canada announced the authorized use of Pfizer-BioNTech's two-dose vaccine for five- to eleven-year-olds. The announcement came one week in advance of its availability across most public health units across the country. Because the United States had started vaccinating the same age group a month prior, this announcement had been highly anticipated for Canadians—Health Canada approvals often follow a similar path to the neighboring U.S. Shortly after the announcement, various press conferences were held by the federal, provincial, and municipal government officials (Health Canada, 2021). In the Greater Toronto Area (GTA) and surrounding regions, however, these press conferences were held not by Premier Doug Ford but by public health units. While mayors and leaders at the municipal level were actively communicating in support of pediatric vaccines, and while the Minister of Health tweeted a press release about pediatric vaccines at 11:30 am that day, Premier Ford did not comment until November 23, 2021, when the pediatric vaccine booking systems had already been officially opened.

This lack of direct communication from the highest provincial official has been consistent with public perceptions of how Covid-19 communication was handled by the Ontario government, including its apparent lack of awareness of how the pandemic has been affecting provincial citizens, and, specifically, the most

vulnerable among us not only in terms of health but also in social, cultural, and economic terms. The provincial government's consistently indirect and vague approach to public communication resulted in a loss of public trust in government responses to the ongoing needs of the pandemic: a fact bolstered by additional recent funding cuts to education, legal aid, and children's aid, among others (Dhanraj, 2021; Jeffords, 2021; PressProgress, 2021; Rozdilsky, 2021). This tension between the provincial government and the public offers important context for why PHIs sought new ways to circulate public health messages to wider populations on their social media channels. If the provincial government could not be relied upon, then keeping the diverse Ontario public updated and engaged, and to attempt to build—and maintain—trust, became a key goal for PHIs and helps to explain their emergence and popular followings at this time. Because the PHIs we examine here were already daily social media users with various forms of publicity, larger followings, and expertise in their respective area, social media became the obvious tool in this moment to advance public conversations that had been stalled or to reorient spreading misinformation back to evidence-based facts. PHIs are thus an important area of research in the ongoing conversation around pandemics, disinformation, social media, and influencer culture, but not one that is yet well studied.

We argue that the cross-platform approach used by Vohra-Miller, Yammine, and Dosani was successful because of its reliance on the meme-based tactic of bricolage, which makes their information-sharing approachable, accessible, and shareable. The term 'meme' itself, coined by Richard Dawkins in 1976, refers to aspects of culture or language that replicate and spread broadly across populations. Within the context of meme culture, 'bricolage' suggests both a DIY aesthetic and practice of media, art, and knowledge remixing or mash-up to invite new meanings to arise from these previously separate parts (Evnine, 2022; Markham, 2018; Schmidt and de Kloet, 2017, all drawing on Lévi-Strauss, 1962). On the Internet, memes can take many forms. We include the standard 'image-macro' memes, which combine image with text, alongside broader practices like hashtags, TikTok videos, Instagram posts and reels, and any other digital content that has the possibility of broader circulation. As Limor Shifman (2014) argues, memes encapsulate "some of the most fundamental aspects of contemporary digital culture" (p. 4). Because they are easily shared, parodied, and remixed, memes bring together "popular culture, politics, and participation in unexpected ways" (Shifman 2014, p. 4). In this way, they encourage important forms of intertextuality and public engagement through their circulation. This broader focus on meme culture is thus crucial for tracking how complex conversations, such as those surrounding Covid-19 and vaccinations, are unfolding online. This, we suggest, is how PHIs can reach larger audiences in ways that respect and work with the vernacular of different social media subcultural spaces. Memes are clearly a central driving force of our networked digital culture with "significant social, cultural and political merit," insofar as they function as "effective communicative devices for alignment building and for stimulating socio-

political discussion” (Zeng and Abidin, 2021, p. 4). This is useful in the case of PHIs, given their roles as both experts and public participants.

Within platform capitalism (Srnicsek 2017), what distinguishes Public Health Influencers from other mirco-celebrity social media influences in the popular alternative health and wellness industry is that, first, they are part of recognized science-based institutions; the information they circulate comes from their embedded experience and expertise within these scholarly and cultural community spaces. Yammine, for instance, is on the board of trustees for the Royal Canadian Institute for Science and, alongside Dosani and Vohra-Miller, is part of ScienceUp First, an anti-misinformation organization that includes a “collective of independent scientists, researchers, health care experts and science communicators” devoted to sharing “the best available science in creative ways to stop the spread of misinformation.”<sup>3</sup> Participation in these national organizations means all three PHIs are in dialogue with a variety of experts dedicated to the public communication of evidence based science for the public good. Second, the intent of PHIs is not to generate income from their social media publics, but to instead create spaces for conversations around more transparent, equitable, and accessible public health measures and practices. This is explicitly different from wellness influencer culture. Here, PHIs do not offer a lifestyle and they do not criticize audiences in order to offer solutions to their failings; they are not selling supplements, vitamin drips, or branded wellness programs. Rather, they point to larger structural problems, rather than individual failings, as the source of our health inequities and they advocate for great Covid-19 vaccine uptake to advance greater public safety. PHIs resist the larger tendency within scholarship to collapse wellness and health social media communities into conspiracy-laden spaces of the internet.<sup>4</sup>

The value of these distinctions is articulated by Carlos Andrea and Veronica Costa’s assessment, found in this special issue, that the forms of distrust that arose in the pandemic “culminated in an intense search for people or institutions that could be recognized as up-to-date and well-informed sources on the ongoing crisis” (2023). What PHI’s work reveals is a necessary and productive “entanglement between social expertise and science communication” (Andrea and Costas 2023, p.18). As humanities-based feminist media scholars, we are drawn to the forms of relationality that PHIs have infused into their social media practices as they intervene into the space, circulating meme-ified science-based Covid-19 information and to, as the term suggests, influence the public. While we do not mean to suggest that PHIs offer a purely utopic space within these network ecologies (we recognize far too well the constraints of capitalism, platform affordances, and media saturation), like other feminist media scholarship (e.g., Baer 2016, 2021; Conley 2017, 2022; MacDonald et al. 2021; Sharma and Singh 2022;

<sup>3</sup> See <https://www.scienceupfirst.com/>

<sup>4</sup> This collapsing is a process that Eva Wiseman (2021) attributes to Charlotte Ward and David Voas who use the term “conspirituality” or the “sticky intersection” of these “two worlds: wellness and alternative medicine and alt-right conspiracy”.

Wiens et al. 2023) we seek to map the possibilities that emerge from those who refuse the toxicity of our current media systems and take up instead the hopeful discourses that can and must circulate in such spaces—in this case, that of a meme, grounded in evidence-based scientific fact, that simultaneously communicates compassion, enthusiasm, and urgency.

## 2 DISINFORMATION, ONLINE HATE, AND MEME-IFIED DATA

Since the early days of the Covid-19 pandemic, memes and other forms of viral communication have been central to the circulation of information around the virus. Within this context the term ‘infodemic’ has also emerged to describe the forms of Covid-19 disinformation that run rampant on social media (Zarocostas, 2020). Or, as Tarun Kattumana (2023) notes in this special issue, the notion of a pandemic that circulated early on “was a strategically viral phenomenon”. Alongside the virus’ global reach and the related social, political, and economic consequences, pandemic related disinformation has weakened trust in governments and health systems, fracturing already precarious relationships. Scholars, politicians, and news media have raised the alarm time and time again on the infodemic spreading across social media platforms (Islam et al., 2020; Lovari, 2020; Mheidly and Fares, 2020), highlighting its negative impacts on Covid-19’s spread. In some cases, this has directly informed how different geographic regions respond to the threat of the virus and the degree to which citizens comply with lockdown and masking measures, as well as vaccination efforts (Desmon, 2021; WHO, 2021). The pandemic has brought to the fore the already existing consequences of disinformation within our social and political landscapes (Bennet and Livingston, 2018; Chun, 2021; Donovan and Friedberg, 2019; Guess and Lyons, 2020). What remains clear from the persistence of disinformation throughout the Covid-19 pandemic, and the diligent counter-responses to it by PHIs and other public figures, is the crucial role of communication in facilitating public (dis)trust in science, particularly on social media platforms, whose affordances play a key role in sustaining the public spread of, and engagement with disinformation campaigns.

Anti-vaccine rhetoric has greatly benefited from how blogging culture, Web 2.0, smartphones, and social media platforms have been previously employed in the targeted spread of medical disinformation (Bettens, 2021; Maloy and De Vynck, 2021; Tangherlini, 2016). As Whitney Phillips and Ryan M. Milner (2021) point out that disinformation is part of a larger “network crisis” wherein a demonstrably “hardening polarization” of positions in our “information ecosystem...have asymmetrically pushed the right to more extreme ideological temperatures” in such a way that “the left and the right increasingly struggle to agree on even basic facts” (p. 3). Through this, disinformation spreads diffusely across global borders ensuring a “hypernetworked reach of information” (Phillips and Milner 2021, p. 5). Many within public health communication have blamed the wide-spread access to anti-

vaccine disinformation on the plateauing of vaccination uptake, especially regarding the pediatric vaccines that became largely available in North America in the Fall of 2021, right before the surge in BA.1 infections. Within this context, Covid-19 disinformation is part of a larger history of online conversations and hate campaigns that fuel racist, sexist, colonial, queer and transphobic, and ableist politicized spaces—an issue that requires further scholarly attention. Rachel Kuo and Alice Marwick (2021) note that “disinformation is a primary media strategy that has been used in the U.S. to reproduce and reinforce white supremacy and hierarchies of power at the expense of populations that lack social, cultural, political, or economic power.” Covid-19 disinformation and anti-vaccine messaging have given more media traffic and attention to catch-all conspiracies like those advanced by the alt-right and QAnon (Bloom and Moskalenko, 2021), which continue to destabilize the functions of democratic institutions (Chun, 2021, pp. 30-31).

Given these narratives, rife with disinformation, Phillips and Milner suggest, “we need new stories” and ways of addressing these imbalances in ways that “foreground interconnection and interdependence” (2021, p. 6). One way to circulate these much-needed new stories is through the memetic forms of social media communication used by PHIs as they work to offer a mediating middle ground for public engagement. PHIs’ efforts to engage the public are often informed by a larger impulse to combat health inequities that are exacerbated by the different forms of disinformation circulating on social media; their concerted push against virulent misinformation, while also applying political pressure in ways that have corresponded with meaningful shifts in direction and policy by the local Ontario government, demonstrate an ethos of intersectional justice and a push for health equity. Against this backdrop, in what follows we think with Wendy Chun’s question posed in *Discriminating Data* (2021) of “[w]hy and how... people come to trust any form of media?” (p. 33). We approach Chun’s question from the position of those actively countering disinformation through local, context-specific practices to (a) rebuild public trust in evidence-based medical and science information and (b) generate community compassion for people who have been disproportionately affected by both disinformation and the pandemic. Critical assessments of digital networked cultures have outlined that our daily technologies, including social networking sites, are responsible for circulating mediated forms of power (Benjamin, 2019; D’Ignazio and Klein, 2020; Noble, 2018; Sharma and Singh, 2022), and that, in doing so, they operate just as they were meant to (Chun, 2021). On social media sites like YouTube, TikTok, Twitter, and Instagram, platform affordances (or, what the design features of a platform allow us as participants to do with them) are crucial for the circulation of viral information (Alves des Santos Jr, Lycardiao, and A de Aquino, 2019; Anable, 2018; Copland, 2020; Bucher and Helmond, 2018), including that which supports Covid public health initiatives and those that further distrust in them.

### 3 METHOD AND RATIONALE

Our guiding research question for data collection centered around the relationship between Public Health of Canada pediatric vaccine messaging, PHI translations of this messaging, and the public reception of the messages. To approach this question, we collected social media data over a two-week period in November 2021 during the roll out of pediatric vaccines for children ages five to eleven in Canada. This moment for collection and analysis was key given that pediatric vaccines have been at the core of anti-vaccine and vaccine hesitancy conversations since the early 2000s. From a public health perspective however, vaccines in this age group were deemed crucial for suppressing further variants and waves, while also ensuring schools could remain open and learning could continue in-person (*Coronavirus outbreak and kids*, 2021). Within Ontario, pediatric vaccination was especially pressing given the fact that our primary and high school students experienced the longest period of lockdown-mandated online school of any group of students in North America (Gallagher-Mackay et al., 2021). Given this context, the availability of Covid-19 vaccinations for children quickly became a fraught discursive media space as well as a crucial site of prevention in the fight against the virus.

Since, in North America, pediatric vaccines became available six to ten months after adult vaccinations, there was a good sense of the shape and scope of anti-vaccine and vaccine hesitant discourse, how it circulated, and how to counter it in public space. As such, much care was given by public health units, public science communicators, and researchers to ensure the messaging for pediatric vaccines was effective and productive. Together, these reasons make pediatric vaccine discourse, which includes official government messaging, PHI tactics, and public response, an especially good case study for how the interplay between these different social actors shaped this later, but crucial, phase of the pandemic. In this article, we argue there is a need to pay greater attention to the representational aspects of digital and social media cultural production—what has been called the meme-ification of the Internet (Milner, 2016; Zeng and Abidin, 2021), through the expansive creative mode of bricolage. This requires a need to move away from single-platform analysis of social media discourse on a text-based platform like Twitter and towards an examination of visual textual interplay of still and moving images and audio on Instagram and TikTok.

During data collection, we employed a team of six researchers to manually gather social media communication posts from Twitter, Instagram, and TikTok beginning on November 19, 2021, the day the announcement of pediatric vaccine availability was made in Canada. We started with a focus on official government accounts, the Public Health of Canada account, and well-known local PHI accounts. We then manually collected from public accounts responding to the announcement using snowball sampling using the hashtag #CovidVaccine which was trending locally. We further collected posts for two weeks with the same hashtag; this timeline included the initial days of vaccine distribution to children



that began on November 26, 2021. In total we created a coded data set with 150 individual posts from across all three platforms. Alongside the posts themselves, we collected and analyzed audience engagement by manually sorting through and examining comments on each post. To contextualize these posts, we collected and analyzed news media articles on our spotlighted PHIs to include a detailed sense of various aspects of public perception of PHIs alongside the ongoing news media focus on the growth of public distrust in more official government messaging. The collected data was coded and compiled into a spreadsheet including metadata on the post date, a link to the original post for later cross referencing, a short summary of post, platform and media type of post, hashtags used, tags and keywords, and any additional comments.

For data analysis, we first focused on patterns in the gathered posts and before engaging in close-textual readings of our specific PHIs and their cross-platform posts for the form, content, and meme-based tactics each employed. The posts were then analyzed for their paratextual interactions and outcomes to determine the ways that different PHIs engaged with public audience questions and comments. Next, we revisited the entire scope of Covid related posts from our select group of PHIs across their different social media accounts to watch the development of tactics not only in the two weeks of data collection but also in their content production periods over the 20 months leading up to this pediatric vaccine announcement to determine how their tactics shifted between different platform media over time. From this two-part analysis, we then mapped PHIs' use of meme-based communication practices assessing their effective use of relationality, adaptiveness, and using the tools available to translate difficult concepts into sharable and accessible bits of information.

#### **4 PHI MEMETIC RESPONSES TO THE PEDIATRIC VACCINE ANNOUNCEMENT: ANALYSIS AND EXPLORATION**

Between November 19, 2021, and December 3, 2021, pediatric vaccine information could be found circulating in earnest across Twitter, Instagram, and TikTok in advance of the vaccine administration date. Naheed Dosani, Samantha Yammine, and Sabina Vohra-Miller (alongside a larger group of Ontario PHIs outlined in footnote 2) began the task of distilling and amplifying the Health Canada information on pediatric vaccines to their followers.<sup>5</sup> During this week, however, Yammine, Vohra-Miller, and Dosani's Twitter accounts were active with not only pediatric vaccine information but a range of related health equity concerns. Dosani, for example, tweeted about the need for paid sick days in Ontario, concerns around the slow government response to Omicron (BA.1) and its effects on already

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<sup>5</sup> On November 23, 2021, booking systems opened in Ontario for the pediatric vaccine, prompting another set of messaging. A third and crucial moment in the rollout was three days later on November 26, 2021, when most regions opened their pediatric vaccine clinics.

marginalized and vulnerable people, his experiences of racism and xenophobia, advocacy for housing as a healthcare right, and critiques of global vaccine distribution inequity, among others. Vohra-Miller’s Twitter included infographics on vaccine efficacy, examples of the online hate she receives, pushback and call outs against anti-vaccine disinformation circulating online, a flow chart with advice on how to safely gather over the holiday season, and explicit critiques of the Ontario government’s lack of access to rapid tests and boosters for the general population, noting that this is very much a health equity issue. Yammine, similarly, tweeted about global vaccine inequity and STEM education outreach, offering a sixty second primer on Omicron (BA.1) and amplifying the accounts of vaccine experts that she follows, as well as details about a talk she had recently moderated on public health journalism in the era of fake news.

This extensive list of healthcare issues foregrounded by all three PHIs demonstrates the different areas of healthcare activism they consistently bring awareness to with their public content. Further, it suggests that each of the PHIs is building a brand-specific form of influence that incorporates vaccine promotion in a larger set of public health concerns. As mentioned in the introduction, while PHIs employ similar strategies to other genres of wellness influencers, Dosani, Yammine, and Vohra-Miller do not sell or advertise health products as a revenue stream. Dosani is a palliative care physician at St. Michael’s Hospital, Toronto. Yammine works with established Canadian communication entities such as Science Up First and the National Speakers Bureau as a consultant, digital media producer, and science communicator with regular public speaking engagements. Vohra-Miller is co-founder of the Vohra-Miller Foundation whose stated focus is to “improve the health of the planet and its people”.<sup>6</sup> In this way, the content they produce on vaccines is not monetized within the platform but does further their brand as experts in public health messaging and activism. To demonstrate how each leverages their micro-celebrity to inform public opinion on the vaccine via meme tactics of bricolage, below we explore PHIs posts around the pediatric vaccine to highlight the ethos and creative collaging they each bring.

## 5 SAMANTHA YAMMINE, AKA, SCIENCE SAM: STOP MOTION MEME TACTICS AND INVITATIONS OF INTERPERSONAL CONNECTION

Dr. Samantha Yammine (PhD, Cell and Molecular Biology and Neuroscience) is the founder of Science Sam Media, a digital media production center for science communication and was named one of the top fifty influential people in Toronto for 2021 (Toronto Life, 2021). Her Instagram has 132k followers, Twitter has 32K followers, and her TikTok has 8769 followers at the time of writing in April 2023. Described on the *Toronto Life* list as “the Covid Queen of TikTok,” the feature

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<sup>6</sup> See <https://www.vohramillerfoundation.ca/>

notes that “where public health has failed to reach the 16- to 24-year-old demographic with their coronavirus messaging, Science Sam bridges the gap” (2021). Yammine’s approach uses stop motion video, both in her Instagram reels and TikToks, and includes an open invitation for followers to message her personally via DM for one-on-one conversations about science questions. This offers a mode of relationality and accessibility to her role as an influencer. As the Toronto Life profile on Yammine notes, “[w]hat followers don’t see are conversations she’s having with people via DM—anti-vaxxers who curse at her, vaccine-hesitant pregnant women, and those who beg her to debunk Covid propaganda. The majority though, she says, are just people who need someone to explain the science without being condescending” (2021). This communicative focus on compassion and accessibility is key and much needed for fostering trust in science and medical experts in a time of deep pandemic malaise, exhaustion, and uncertainty for so many.

On the day of the pediatric vaccine announcement, Yammine shared one of her signature sixty-second summary videos across her TikTok, Twitter, and Instagram accounts less than an hour after Health Canada’s approval announcement (Fig 1). The video frames Yammine in the center-left section of the frame, giving for closed captioning of her talking points and an image of the Health Canada Twitter announcement (@GovCanHealth) on the right side. The short video covers key points, including the announcement itself, the volume of children’s doses, its efficacy in trials, and the National Advisory Committee on Immunization’s (NACI) recommendation for an eight-week interval between doses to reduce the risk of myocarditis (MIS-C). She also addresses key vaccine-hesitant talking points directly, noting that vaccines help to ensure that kids have a lower risk of virus severity, reduce transmission overall, and strengthen greater household safety, while avoiding the concerning potential for MIS-C and long Covid in children. On TikTok, the video has 2000 views, 15 shares, and almost 300 likes (Yammine, 2021a). On Twitter, the video has 16,000 views, 279 likes, 85 retweets, and a small series of comments that Yammine responds to directly. On Instagram, the comment section was the most active, informed by reassurance from Yammine that “this is a judgment-free space to ask questions.” Here, she also outlined a code of conduct,<sup>7</sup> emphasizing that “this is a place for learning, not harassing already stressed-out parents” (Yammine, 2021b). She then replies in detail to many of the questions asked in the comments and directs audiences to her ‘Kids FAQ’ story highlights section, which includes reposted memes from Vohra-Miller’s account (@unambignousscience) as well as infographics from Focused Covid Communication and Science Up First<sup>8</sup> with links to their downloadable content

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<sup>7</sup> The full statement in the comment section just below the video post notes: “You can comment whatever you want as its own separate comment, but if you reply to another parent harassing them about their choice one way or another, I am deleting your comment. Leave other parents alone while they decide. This is a place for learning, not harassing already stressed-out parents.”

<sup>8</sup> Yammine is involved directly as an expert advisor on science communication for both groups.

and additional text overlaid on the original posts to support them. Yammine uses the reposting function on Instagram stories to provide accessible translations of complex science information, leveraging content by her peers to reinforce their overall shared messaging. She also includes snapshots of Q&As from her DMs and offers links to public media and news appearances where she is answering questions on pediatric vaccines. All these tactics are saved in her ‘Kids FAQ’ stories highlights offering an array of approaches to disseminating and archiving key resources and knowledge mobilization. Here, layering different elements of information via the platform’s story feature helps to foster public buy-in on a platform that is less fictitious and divisive given the nature of its affordances and how audiences consume content. Similarly, Yammine uses the tagging function (@) to draw awareness to different accounts that share the same messaging thus establishing for audiences a larger connected network of engaged science communicators. Bringing together these various points of knowledge, art, and media to create her stop motion reels and TikToks demonstrates an adaptive use of social media features to build a model of evidence-based discourse as a form of community conversation among experts and their publics.

## **6 NAHEED DOSANI, AKA, NAHEED D: PLACARD MEME AESTHETICS, AMPLIFICATION, AND AFFECTIVE PERSONA**

In addition to being a palliative care physician, Dr. Naheed Dosani (MD) is the founder of the Palliative Education and Care for the Homeless. He is also the Medical Director of the Covid-19 Isolation/Housing Program for the Region of Peel and a recipient of the Governor General’s Service award from Humanitarianism (Dosani, 2022a). He has 38.5K followers on Instagram, 89.5K followers on Twitter, and 12.1K followers on TikTok as of April 2023. Dosani is most active on Twitter, where he shares information and develops his critique of government policy through healthcare activism and advocacy. His Instagram profile serves as a space to re-post select tweets interspersed with photos that are used to address issues of social justice and anti-racist and anti-colonial activism in healthcare, including affordable housing and medical outreach for people who are currently unhoused. This messaging is displayed on Instagram as white text against a black background, employing a simple placard aesthetic. His TikTok account mixes Covid-19 messaging with equity activism, as well as advocacy for palliative care as an essential right.

Dosani’s approach to communicating about the pediatric vaccine differed from Yammine’s, as he does not delve into communicating the science behind the announcement. Rather, true to his brand on both TikTok and Twitter, he shared the news of the vaccination’s approval and availability in a celebratory, enthusiastic manner, relying on his appeal and personal relatability as a physician to his audience

for the impact of his delivery. Taking to Twitter on November 18, 2021, the evening before the pediatric vaccine approval announcement, Dosani tweeted:

@NaheedD: Few things lift my spirits more than the thought of children having the safety & protection they deserve from Covid. With Health Canada set to likely approve vaccines for children 5 to 11 tomorrow, that “thought” has become a reality...How awesome is that? (2021a).

The tweet garnered 1200 likes, 67 quotes and retweets, and 49 comments, with comments including users sharing a sense of relief, hopefulness, and excitement, as seen through a range of emojis and GIFs. Other comments shared worries about the Ontario government’s ability to smoothly roll out pediatric vaccines and that pediatric vaccine rates would not be high. Some commenters asked questions about when the vaccine for children under five years of age would be available, and a small number of anti-vaccine comments made their way into the thread. Overall, though, most responses to Dosani’s tweet were sympathetic, supportive, and celebratory.

On November 19, 2021, twenty minutes after the official announcement was made, Dosani tweeted:

@NaheedD: JUST IN: Hey Canada...it’s official! Health Canada has just approved Pfizer’s Covid-19 vaccine for children aged 5-11. Now let’s get out there & get our kids vaccinated so they can get the protection & safety they deserve (2021c).

This tweet amassed over 6100 likes, 1100 retweets, and 513 comments (Fig 2). The first comment underneath it was a link shared by another account to a confidential Covid-19 Q&A service (@Covid\_19\_Canada). In this tweet, the ratio of responses between those happy with the announcement and those sharing anti-vaccine sentiments was more equally split. For every parent sharing excitement (largely via GIFs and emojis) there were as many replies with Covid-19 vaccine misinformation talking points. Beyond the initial tweet itself, Dosani did not weigh into public debates unfolding in the comments, which keeps with his practices across his social media accounts. Dosani did, however, share a screenshot of the tweet to his Instagram account where he has almost 22,000 followers to bring attention to what kinds of disinformation his audience should expect in the coming days. Like the post on Twitter, the comment section was split between those celebrating the availability of the pediatric vaccine and anti-vaccine pushback, to which Dosani did not intervene. And, while Dosani is quite active on TikTok, he did not post about the pediatric vaccine announcement there. This makes sense as TikTok was not a useful venue as it requires time to produce videos and Dosani worked with speed of response on Twitter.

Using Twitter as a main stage for information circulation makes a good deal of sense for Dosani due to his dedicated following. Relying heavily on his established Twitter persona and expertise as a healthcare worker tied to issues of activism, advocacy, and equity, the posts have an earnest tone, easily share emotion, and direct conversation on vaccination around safety and hope for the future in

context of vaccine efforts. Taking up a meme tactic of narrative or narrator address, which is familiar and easily engaged with by social media users, Dosani's posts are direct and to the point, but they also offer a picture of a brighter future: of hope and of praise. They are a feel-good celebration added to what often seems like a dark and uncertain conversation from a knowledgeable, dependable, and equity-focused figure with action-oriented responses and a range of helpful resources.

Dosani brings attention to issues for his followers while amplifying the work of other PHIs who are also experts in the field. For example, Dosani often re-posts Sabina Vohra-Miller's work for greater views and to circulate the important work she is doing. In this way he relies on his micro-celebrity status to model support of vaccines and influence greater enthusiastic support, bringing a positive persona to it. Notably, this differs from his critical stance on government policies from the current conservative Ford government in Ontario; as such, the celebratory manner with which he engages with and amplifies messaging around the announcement of the pediatric vaccine sets an important tone with followers. These text-based placard-like posts from Dosani are, in contrast to Yammine, short and tied to emotion, and do not set out to foster a space for answering questions one-on-one. As we will see Vohra-Miller, below, they are instead focused on creating sound bites, memes for people to quickly glance at, understand, and repost. Given the format of Twitter, this makes a great deal of sense, and responses reflect the platform affordances and format of his content. The result is a group of followers sharing their emotions via gifs and emojis in the comments: stand-ins not for information on the science of vaccines but on affective states and attitudinal positions.

## **7 SABINA VOHRA-MILLER, AKA, UNAMBIGUOUS SCIENCE: COLLAGED MEMES, INFOGRAPHICS, AND PARENTAL GUIDANCE**

Whereas Yammine and Dosani shared between one and three posts on pediatric vaccines in the period of data collection, Sabina Vohra-Miller's (MSc Pharmacology) social media accounts consistently post more frequently on the issue. This is, perhaps, because of her established role as an advocate for evidence-based science around parenting, pediatric health, and childhood vaccines more broadly. In addition to her role as co-founder of the Vohra-Miller Foundation, she is also the founder of Unambiguous Science, a digital platform for evidence-based scientific information to combat disinformation, and the South Asian Health Network that aims to enhance the health and well-being of South Asian and racialized communities in Canada (Vohra-Miller, 2022). As of April 2023, she has 22.1k followers on Instagram, 26.6k followers on Twitter, and is the only one of the three who does not publicly use TikTok. Vohra-Miller began actively circulating content on the pending pediatric vaccine in advance of the announcement, beginning with a multiple-slide post on Instagram titled "Six reasons for getting

kids 5-11 vaccinated” that was published to her media accounts on October 30, 2021 (Vohra-Miller, 2021a). In the days leading up to the approval announcement, Vohra-Miller shared resources on Twitter from other public health oriented medical professionals, as well as offered direct pushback to anti-vaccine posts circulating around that time. On November 23, 2021, she retweeted the Health Canada announcement of the official pediatric vaccine approval, retweeting her October 30 infographics to clarify key information that might be confusing or convoluted to the public. Additionally, Vohra-Miller shared a four-part Twitter thread with infographics (Vohra-Miller, 2021b) prepared by the Focus Covid Communications group where she, like Yammine, is a core member. That same day, Vohra-Miller shared links on Twitter to media interviews she had participated in alongside other leading public health figures in the region to fortify the resources already shared among her social media accounts and to provide answers to questions that many Canadians were asking. This cross-platform approach takes advantage of various forms of media, not just what we think of as “social media,” to spread her messaging, engaging with a technique of bricolage to do so.

This is clearly seen on Instagram where Vohra-Miller shared a combination of infographics, information carousels, and select reposts from her Twitter account. The carousels posted on November 19, 2021, included key take-aways on recommended dosage and intervals for this age group, spacing of other vaccinations around the Covid-19 vaccine, and guidance around myocarditis (Fig 3). The Focused Covid Communication posts shared by Vohra-Miller over the following three days include risk to benefit analysis with child-friendly aesthetics (enjoyable for both children and adults) and a downloadable copy of a “vaccinated superhero” certificate that she created to distribute to kids when after they received their first dose (Vohra-Miller, 2021c). Each of these actions explicitly sought to engage children and their caregivers. Throughout her posts, Vohra-Miller uses the memetic tactic of text overlay on solid colour-block backgrounds with abstract images. Because this kind of collage technique is the most recognizable form of image-text Internet meme used on Instagram, it signals to the user a set of information in a visually pleasing way that reflects the primacy of visual content on the platform. Through the use of overlay, Vohra-Miller works with the platform affordances to ensure information is circulated and received by viewers scrolling through content on their feed. Using a carousel of various slides with the same or similar background image and different text is a memetic practice that allows the creator to include a large amount of information in one post without overwhelming the audience. Importantly, it is not just the accessibility of these images and posts that makes them effective, but it is Vohra-Miller’s willingness to engage with her audience in the comments and answer questions that makes them so successful. Indeed, in her comment section on Instagram, there was little vitriol, and, from a textual analysis of such comments, the comments appear to be a space of information gathering by self-identified caregivers. If any common anti-vaccine

questions arose, Vohra-Miller expertly directed audiences to official public health channels for their inquiries.

The most significant public appearance by Vohra-Miller came on December 3, 2021, two weeks after the approval announcement, when she hosted a Live Q&A with the Prime Minister of Canada and her colleague, Dr. Sharkawy, on Twitter (Fig 4). The trio answered live questions from children and parents across the country, often drawing from their own experiences and stories. In the introduction to the event, Vohra-Miller noted that from her position as head of the Vohra-Miller Foundation and Unambiguous Science she “believes in having open, honest, and compassionate discussions to build confidence and empower people” (Vohra-Miller, 2021d). The Q&A covered central themes of vaccine benefits, risks of Covid-19, and the need for all citizens to do their part and ensure our most vulnerable are protected. It offered an example of the different kind of publicity that PHIs like Yammine, Vohra-Miller, and Dosani bring to a broad audience, in contrast to government leaders like Prime Minister Trudeau, to help steer the conversation back toward clear imperatives for getting through the pandemic based on scientific recommendations. Overall, Vohra-Miller bricolages using a multi-pronged that blends the memetic approach of collages, infographics, and reels with high-profile public appearances and consistent messaging.

## 8 MEME TACTICS: THE BRICOLAGING ETHOS OF YAMMINE, DOSANI, AND VOHRA-MILLER

Across Yammine, Dosani, and Vohra-Miller’s memes, a clear use of bricolage (Deuze, 2006; Johnson, 2012; Markham, 2018) is used to draw together and remix various media—often those that are popular in the moment, like voice overs, simple text on background, overlay, moving image, collage—in order to instill and communicate a simultaneous sense of urgency, enthusiasm, and celebration. Bricolage here suggests using “any available means or whatever is at hand” alongside “a critically oriented, multiperspectival, and reflexive” frame to “make sense of a situation or solve a problem” (Markham, 2018, p. 43-47). Just as they bricolage memes, the success of this creative technique lies in the bricolage ethos that each PHI brings as they offer stop motion memes and invitations of interpersonal connection (Yammine), placard memes and an affective persona in service of activism and amplification (Dosani), and collaged memes and infographics that support parents and others looking for vaccine and Covid-19 related advice (Vohra-Miller). This bricolage ethos, alongside the material bricolage of digital content, is what “allows researchers” and, we would add PHIs, “to acknowledge and work within situations and relations of complexity” (Markham, 2018, p. 46). The rise of PHIs on Twitter, Instagram, and TikTok over the course of the pandemic offers a clear example of employing the memeification of knowledge for wide-spread distribution. Like the infodemic itself, much Covid-19 discourse is memetic in the traditional use of the term: memes are understood as the circulation or viral spread



of a concept, idea, or practice across people within a culture. As many have witnessed, Covid-19 discourse is memetic insofar as “individual participatory media texts...intertwine into threads of interaction, eventually forming whole tapestries of public conversation” (Milner, 2016, p. 2). It makes a great deal of sense, then, that PHIs like Dosani, Vohra-Miller, and Yammine would use platform affordances and the meme-ification of evidence-based information about the pandemic and vaccines to counter such narratives. What they offer then is precisely what scholars like Sobo (2021) have called for: actions that allow “core concerns” of vaccine hesitancy or distrust “visible” by those best suited to “address them” and they do so through as she suggests “creative acts of translation” (p. 65). Their work during the pandemic shows such creative acts, using social media tools for an adaptive, dynamic, responsive approach to disseminating clear science messaging and opening up communicative networks as a response to the complex media ecology that has developed around Covid-19.

Looking at the trajectory of Dosani, Yammine, and Vohra-Miller’s social media presence throughout the pandemic, each PHI refined and shifted their approaches and tactics in tandem with the shifts in the scientific and public conversation. Each gained larger followings and became quickly recognized locally as part of a group of medical experts that were widely featured in news media and engaged with by public social media audiences. In this way, they became part of a cohort of PHIs who informed approaches to public communication and public health practice at local and national levels. What the examples from each PHI above show is a set of internet micro-celebrity practices that use meme-based information sharing tactics that diverge from institutional forms of communication. In doing so they are “adapting the logic and dynamics of social media” to restore some public trust in “institutional authority” (Van Dijck and Alinejad, 2020, p. 2). As scientific experts in their respective fields, Yammine, Dosani, and Vohra-Miller draw on their knowledges to translate medical jargon from scientific journals into everyday language that can be easily understood by the public: a crucial way that they use their status to mediate and circulate information to followers.

What is most compelling in these examples is how this networked form of communication had such a significant impact on not only public opinion but also government responses and policy. For instance, the *Toronto Star* hailed Vohra-Miller as the “misinformation fighter” noting how her outreach work at one health center with a fifty percent vaccination rate ensured an “uptake [in the] shot of up to 90 per cent.” Further, “after she spoke one-on-one to several individuals, uptake then rose to 100 per cent” (Ogilvie et al., 2021). Such work has paid off, and in the greater Toronto region where all three PHIs are located the average vaccination rate is 91% for those eighteen and older, 92% for those 12 and older, and 89% for those five and older (City of Toronto, 2022). What is shared among all three PHIs in their strategic approaches is an invitation for social media audiences to interact or engage with them in open and non-threatening ways. While this looks different in each example, the core principle of interaction is present among all three

approaches. This is a crucial development in science communication by PHIs; in the shift “from an institutional model towards a networked model,” PHIs’ use social media platforms as “propellers of networked information flows” that circumvent “top-down information transmission” (Van Dijk and Alinejad, 2020, p. 26). The result can be seen in the work described above which uses the creative memetic tactics of bricolage to bring together a variety of aesthetics, communities, and facts to build greater public trust.

In this way, there is not just the one-way communication and parasocial relationships that social media has been stereotyped as cultivating, but a “*translation*” where PHIs act as a mediator for the “constant interaction and adjustment between health experts, government officials, mass media, and citizens” (Van Dijk and Alinejad, 2020, p. 36). Vohra-Miller, Yammine, and Dosani’s work, as it relates specifically to the context of vaccine hesitancy, offers an example of the imperative for “new stories” (Phillips and Milner 2021, p. 6). What we bring out in their work on vaccine hesitancy is a new story: one that highlights social media specific communication models and practices for re-gaining public trust in science through the memetic practice of bricolage. In the face of disinformation and political radicalization in online spaces, the use of an affective bricolage via overlay and collage, voice over videos and the invitation to DM one-on-one, and simple text on a background, used respectively by PHIs Vohra-Miller, Yammine, and Dosani in their reliance on the meme-ification of scientific data, offer creative ways into these questions of public trust in media by offering alternative narratives directed toward greater social and public health equity.

## 9 CONCLUSION

While the role of social media platforms in facilitating the circulation of both evidence-based medical information and falsehoods cannot be overstated, we must also acknowledge the problem of our oversaturated mediascapes. We, like Van Dijk and Alinejad (2020), are concerned with the ways that “nonexpert emotions, experience, sentiments, feelings, and trends are distributed through social media and are processed algorithmically, affecting the information cycle in real time” by “deploying text, context, and logic to convince recipients, and more on a many-to-many style of communication that utilizes opinions, visuals, memes, and short clips to mobilize crowds (p. 3). Scholarship thus needs to attend to the complex configurations of information brought forth by this pandemic, including the growing cultural distrust of science and government; a neoliberal world forced to work, communicate, and connect online; and a global network of citizens tending to very personal forms of grief, trauma, precarity, and loss.

Considering these concerns, this article has sought to extend existing studies of Covid-19 communication practices (Back, Tulsy and Arnold, 2020; Malecki, Keating, and Safdar, 2020; Mheidly and Fares, 2020; Reddy and Gupta, 2020) by exploring and, indeed, celebrating the memetic practices of PHIs that make use of

their micro-celebrity status to engage followers based on the pillars of Internet credibility: “relatability, authenticity, and accountability” (Lewis, 2019, p. 214). Here, we see PHIs as independent mediating figures in the flow of information between governments, public health units, and public citizen audiences. While PHIs are public citizens, they are also medical and scientific experts as well as members of their own cultural communities and they offer important mediating perspectives that are both more accessible and disarming to an overwhelmed and distrustful public as the pandemic wears on. Through highlighting the importance of PHIs within the tumult of the pandemic, we suggest that an analysis of Covid-19 science communication necessarily must look to multiple platforms to better understand the kinds of memetic practices of bricolage (stop motion, placard, collaged, and infographic memes) employed by different pandemic influencers and how these shift depending on both platform affordances and the audiences that employ different platforms. Across these tactics, interpersonal affects of compassion, enthusiasm, and urgency are grounded in evidence-based scientific facts in pursuit of health equity and greater public understanding. And we are not alone in emphasizing the importance of such affects—these affects reflect the conclusions of Harambam’s (2023) paper in this special issue that highlight the need for novel and multiple forms of science communication that better align with the cultural worldviews of the various communities that make up our societies. The PHI messaging considered here shows explicitly the value of offering different approaches and communication styles to disseminating messaging as Harambam suggests is needed. As we have demonstrated, across the work of Yamine, Dosani, and Vohra-Miller, there is no “one communicative paradigm” being used, but rather a bricolage of ways of making do with the material potential of social media platforms to disseminate a diverse set of practices to communicating a positive message around pediatric vaccines.

In focusing on the role that memes practices and aesthetics play in conveying information in accessible ways, comments on posts indicate that they are more readily circulated by publics in ways that positively convey evidence-based information. As Milner (2016) argues, “[o]ur cultural tapestry is more vibrant...[o]ur public conversations are bigger and louder than they’ve ever been,” largely because “memetic media...push us further away from simple ‘top down’ understandings of media influence” (p. 2). Meme-based communication offers us a clearer illustration of the role participatory media has in ensuring a greater connection between “individual citizens and broader cultural discourses” (Milner 2016, p. 2). PHI figures like Yamine, Vorha-Miller, and Dosani have taken up the memetic practices of different platforms to meet everyday citizens where they are, countering the virulent forms of disinformation we can encounter on a day-to-day basis on social media. To these points, the rise of PHI figures, specifically on Instagram, Twitter, and TikTok, has offered significant gains in re-engaging the Ontario public at crucial moments in the pandemic, and, in doing so, have provided

a venue for reaching social media users and demographics not tied solely to one social media platform.

Through advancing an ethos of equity, compassion, and enthusiasm grounded in evidence-based scientific facts, PHI posts from Dosani, Vohra-Miller, and Yammine have brought clarity to public discussions, mirroring efforts by news media to recenter expert messaging at crucial junctures in pandemic vaccine rollouts. They did so by translating often inaccessible scientific language into publicly recognizable forms of social media communication. Operationalizing genres and modes of communication familiar to their audiences, these PHIs worked the affordances of the various platforms they use and the memetic conventions they uphold to broadcast their message to larger audiences. Their specific influencer personas on social media gathered attention around issues many were experiencing confusion and fatigue around, giving voice to their concerns. They thus amplified and made more accessible institutionally framed information, ensuring that it has been circulated broadly to populations not engaged with traditional news sources or press conferences, or who may be wary of government communications. Because of their popularity on Instagram, Twitter, and TikTok, Dosani, Vohra-Miller, Yammine, and other PHIs have been able to engage in direct and meaningful critique of governmental public health measures and actions. These posts have circulated not only in dynamic flows to their respective audiences, combating disinformation, but also to news media outlets, shifting public conversations to government accountability and leadership, which has, indeed, impacted the Ontario government's course of action on several key issues.

Within such overloaded media systems, it becomes increasingly important to commit to the work of distinguishing between forms of false information for unpacking, as Sarah Sharma articulates, the “medium-specific techno-logics of how power operates in culture” (Sharma in Sharma and Singh 2022, p. 8). Unpacking how disinformation operates in networked spaces is one way of locating the circulation of power in culture. If nothing else, this article has demonstrated the importance of Public Health Influencers' social media advocacy through meme-based communication as a mediating presence between institutions and the public, building stronger discursive relationships for multi-directional communication and more transparency around science information as we continue to navigate the challenges of not only an ongoing pandemic, but an infodemic.

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