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Reciprocity in information exchange: how social exchange enriches collaborative research partnerships

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Abstract

Introduction. This paper explores the information behaviour of researchers engaging with industry, community and government stakeholders. It examines the interplay between information sharing, seeking, encountering and use, and the role of reciprocity in social exchange.

Research design. This qualitative study involved semi-structured interviews with 27 academics in Australia using a constructivist grounded theory methodology, and Molm's reciprocity theory of social exchange as a framework for analysis

Theoretical framework. Savolainen's characterisation of information exchange as the intersection of seeking and sharing (2019) and Molm's (2010) reciprocity theory of social exchange.

Findings. The findings indicate that researchers' information behaviour in relationships with stakeholders involved information reciprocity in the interaction of information seeking, sharing, encountering and use. Researchers engaged in interactive and interwoven processes of seeking, sharing, encountering and using information that involved mutual benefits for each party.

Conclusion. The paper presents a Model of Information Reciprocity for Social Exchange that identifies the information behaviours and modes of reciprocity that underpin researcher-stakeholder relationships. Information sharing, seeking, encountering and use are the mechanisms enabling reciprocity and occur interactively and iteratively.

Introduction

While information sharing is an integral element of information behaviour for individuals and groups, it is an underexplored area in information behaviour research (Savolainen, 2017; Wilson, 2010a). Models of information behaviour tend to focus on the components of information exchange processes, without addressing the interactions or nexus of activities (Savolainen, 2019; Huvila, 2022). For example, Wilson's (1999) model identifies information exchange and interaction with other people as a source of information but does not represent the dynamics involved. To develop a more holistic representation of information behaviour it is important to look at the '*transitions or trading zones between different types of information activities*' (Huvila, 2022, p. 529). The exploration of mutual exchange activities and interactions between information sharing and seeking is one of these zones (Savolainen, 2017, 2019).

Studies of information behaviours between individuals, particularly in collaborative environments, indicate that information sharing involves mutual exchange and reciprocity (Du and Chu, 2022; Given and Kelly, 2016). Social capital and social exchange theories have influenced the examination of information interactions (Wilson, 2010b), providing ways of exploring the patterns involved in information exchange. For example, Huvila et al., (2014) explored social capital and information sharing in virtual worlds and identified that emotional intelligence influenced the success of social interactions and information exchange. Earlier, Totterman and Widén-Wulff (2007) used a social capital framework to explore information sharing within a university. Across the literature the concept of information sharing is used to 'house' exchange and reciprocity (Pilerot, 2012, p. 568); however there have been limited studies exploring these nuances.

This paper explores the nexus of sharing, seeking, encountering and using information, through findings from a study of researchers engaging with industry, community and government stakeholders. This study explores the experiences and information behaviours of academic and professional staff undertaking the work involved in enabling societal impact of research (referred to as impact work). This paper reports on findings relating to one of the study's research questions: What are the information behaviours associated with impact work for academics? The results extend understanding of mutuality and reciprocity in information sharing by applying social exchange theory to Savolainen's (2019) modelling of the interplay of seeking and sharing, which identified interactive seeking and sharing as an area for further exploration.

Literature and context

Information behaviour exploring information exchange

Information behaviour is represented in numerous models that seek to simplify the complexities of how people engage with information across diverse contexts (Wilson, 2010b; Given et al., 2023). While most information behaviour research focuses on individual elements of these models, such as information seeking, there has been increasing attention paid to the interplay between elements. Savolainen's (2019, p. 522) exploration of the links between seeking and sharing of information identified three main approaches to representing how these elements connect: indirectly, sequentially and interactively. Similarly, Huvila (2022) looked at the nexus of information making and taking as a '*conceptual apparatus*' (p. 533) to address the underexplored '*junctures between behaviours that account for the manipulation of information, for instance, by creation, organizing and managing, and its use*' (p. 528). Ruthven (2024) proposed information shaping to extend understanding of making and using information.

Studies of collaborative information behaviours in groups or communities have also identified practices that integrate information behaviours. In these studies, the importance of reciprocity in information exchange is identified as an important aspect of information seeking and sharing. For example, Du and Chu (2022) identified that the principle of reciprocity enables researchers and communities to negotiate shared understanding and trust. Given and Kelly (2016, p. 1) found

'Interdependency and reciprocity are shown to play key roles in motivating individual group members to share information with their peers'. Goh et al (2019, p. 1139) looked at exchange of news on social media and found people consider both the *'instrumental and symbolic value of sharing'*. These studies indicate that exchange of information and a measure of reciprocity supports access to information and the sustaining of relationships over time. Huotari and Chatman (2001) identified the importance of reciprocity and trust in effective information sharing and value creation within an organisation. Reciprocal exchange of information also appears in Wilson's (1999) model of information behaviour as a variable in relationships affecting the activities of sharing, such as risk, reward and trust. However, the role of reciprocity is not explored in depth in these works and remains an underexplored aspect of information behaviour models and interactions between seeking and sharing.

Social exchange theory

Social exchange theory provides a range of approaches for exploring exchanges within social and organisational groups (Davlembayeva and Alamanos, 2023). However, it tends to overlook the importance of reciprocal exchange, positioning this as less important than contractual or negotiated relationships (Ahmad et al., 2023; Molm, 2010). Reciprocity has been considered part of the rules and principles of exchange and is characterised as a folk belief, a social norm, or an individual orientation (Cropanzano and Mitchell, 2005; Ahmad et al., 2023). There is evidence that social cohesion, interpersonal bonds and positive feelings generated by reciprocity are more important than the tangible economic benefits (Molm, 2010).

Collaborative research practices

Researchers are increasingly encouraged to engage in collaborative relationships with stakeholders outside universities to develop and conduct research to generate positive societal impact. It is widely accepted that building trusting and engaged relationships supports societal impact of research (Aiello et. al, 2021) by facilitating exchange of ideas, knowledge and perspectives (Morton, 2015; Spaapen and van Drooge, 2011). This involves researchers accessing information about stakeholders' needs, interests and practices, as well as researchers informing stakeholders about their own practices, expertise and findings. Relationships between researchers and stakeholders provide rich information environments where the iterative exchange of information builds mutual understanding and trust (see Cattlin and Given, 2024). One element of these relationships is the reciprocal exchange of information, which provides mutual benefits and rewards to all parties and underpins the effectiveness of collaborative relationships. However, there is limited research on the specific mechanisms, behaviours and outcomes of this information exchange and how it contributes to societal impact of research.

The activities researchers undertake in collaboration with external stakeholders provides a context for exploring the interplay of information seeking and sharing. The literature exploring collaborative research practices indicates that regular interactions that facilitate exchange of ideas and development of shared understandings are critical to partnership success (e.g., Boaz et al., 2021; Morton, 2015). This includes practices of coproduction, research partnerships and boundary spanning (Clark et al., 2017), as well as engaged scholarship, knowledge translation and participatory research practices (Collie et al., 2016; Kelly, 2019; Higginbottom and Liamputtong, 2015). The exchange of both explicit and tacit information (Knight and Mitchell, 2022) plays a key role in both the development of these relationships and the work conducted within them. This work can include, for example, creating targeted information resources (O'Connell, 2019), regular meetings (Rybníček and Königsguber, 2019), informal interactions (Dewaele et al., 2021), public engagement activities (Watermeyer, 2012), and social media (Jordan, 2023). While information exchange is implied in interactions, it is seldom the focus of discussion in exploring how effective collaboration happens and contributors to societal impact of research.

Some studies have also identified that researchers face challenges in accessing information to support research activities involving engagement with stakeholders (Miller, 2015; Steinerová, 2019; Willson, 2018; Willson and Given, 2020). A few studies have identified the importance of interactions with colleagues and the development of relationships with stakeholders as providing access to information that informs both their research practice and the generation of new knowledge (Kelly, 2019; Miller, 2015; Willson, 2022). Zheng and Pee (2022) identified the importance of social context and dialogue in providing access to information within organisations.

A more holistic model of information behaviour that explores the nexus between sharing, seeking, encountering and use, and represents the role of reciprocity would provide a mechanism for exploring complex interactions such as researcher collaborations with stakeholders.

Theoretical framework

This paper brings together Savolainen's characterisation of information exchange as the intersection of seeking and sharing (2019) and Molm's (2010) reciprocity theory of social exchange. The information behaviours involved in sharing, seeking, encountering and using information were analysed as mechanisms for development and sharing of social capital.

The interplay between seeking and sharing has been represented in information behaviour research in three ways:

- Seeking and sharing as discrete activities connected by intermediary factors (e.g., information use);
- Sequential seeking followed by sharing;
- Interactive connections, where seeking and sharing affect each other, while simultaneously seeing these as distinct activities (Savolainen 2019, p. 522).

Savolainen (2019) indicates that further research is needed to explore how interaction between seeking and sharing occurs in different contexts.

Molm (2010) differentiates between negotiated exchange and reciprocal exchange where individuals give to others, through acts of service or advice, without formal negotiation and without knowing if a benefit will be provided in return. Her work identifies the importance of reciprocal exchange in building trust and affective bonds without the need for close or formalised relationships. She found that *'social support, information about opportunities, informal kinds of assistance-are most typically acquired, in natural settings, through reciprocal or generalised forms of exchange, not negotiated exchange'* (Molm, 2010, p. 126).

Molm's (2010) model of reciprocity theory of social exchange identifies a structure of reciprocity, causal mechanisms and integrative bonds (p. 124). The key elements of the model are:

- Structure of Reciprocity where benefits are exchanged:
 - Unilaterally or bilaterally
 - Indirectly or directly
- Causal mechanisms that influence the outcomes
 - Risk of non-reciprocity in an exchange
 - Expressive value of an exchange
 - Presence of conflict in exchanges
- Resulting integrative bonds enabled by reciprocity
 - Trust
 - Affective regard
 - Solidarity (Molm, 2010, p. 124).

Reciprocity is a form of social capital that involves an exchange for mutual benefit between parties (Stevenson, 2010). This can include the give and take of objects or services to build and confirm social relationships (Vivanco, 2018) or a benefit or harm received from another person (Blackburn, 2016). Sahlins (1972) differentiated types of reciprocity as generalised, balanced and negative, in the context of social boundaries. Social network analysis uses reciprocity as a measure of strength of relationships and information exchange as a commodity (Granovetter, 1973; Haythornthwaite, 1996). Theoretical explorations and empirical investigations of reciprocity have either focused on strategic, transactional behaviour (Perugini, 2003), or generalised exchanges (Molm, 2010, 2012; Torche and Valenzuela, 2011).

Following from the analysis, the paper presents a model of information reciprocity that illustrates how researchers use generalised and direct information sharing, seeking, encountering and use as integrated information behaviours when engaging in impact work.

Research design

This paper reports on one aspect of a larger, exploratory study involving semi-structured interviews with 27 research active academics in Australian universities, from social sciences, sciences, humanities and creative arts, at different career stages. Constructivist grounded theory was used to guide research design, data collection and analysis (Charmaz, 2014), with interview questions piloted at the start of the project. Following institutional ethics approval, participants were recruited through personal and professional networks, via advertising on social media, and using snowball sampling. This provided a maximum variation sample reflecting a diversity of career stage, gender and location. Interviews were conducted using Microsoft Teams (24) and in person (3) with audio recording and full transcription. Initial analysis commenced following each interview to identify potential codes and themes, which guided subsequent interviews and participant recruitment (Charmaz, 2014). All participants were assigned pseudonyms for use in reporting.

Initial coding to identify researchers' information behaviours demonstrated the significance of relationships to information environments. Focused coding identified relationships as sites of information exchange and specific elements that facilitated this (Cattlin and Given, 2024). One of these elements was the nature of the reciprocity inherent in the sharing and receiving of information between researchers and stakeholders. Using Savolainen's characterisation of information exchange as a starting point, Molm's model (2010) was used as a lens for analysing researchers' activities. This paper addresses 20 of the 27 interviews where information reciprocity was identified as an important aspect of information behaviour, where researchers shared, sought and encountered information in their interactions with stakeholders.

Findings and discussion

The findings indicate that researchers' information behaviours in relationships with stakeholders involved information reciprocity. Information reciprocity is defined as the intentional sharing of information with anticipated receipt of information in exchange. Information reciprocity brings mutual benefit or value to both parties in an iterative and interwoven process where seeking, sharing, encountering and using information occur in close proximity. Information reciprocity is an intentional activity where sharing information facilitates access to information in return. The findings show that information reciprocity intentions occurred on a spectrum, from altruistic to meeting formalised obligations, as follows:

1. Information reciprocity for social good
2. Information reciprocity for relationship development
3. Information reciprocity for speculative reward
4. Information reciprocity for mutual understanding
5. Information reciprocity for mutual reward

6. Information reciprocity for negotiated obligations.

Researchers engaged in interactive and interwoven processes of seeking, sharing, encountering and using information, with mutual benefits for each party. Information reciprocity involved exchanges of knowledge through affective experiences, tacit sharing, networked information and documented knowledge pathways. Researchers conceived of reciprocity in interactions where the other party may or may not have been aware of returned reward, including those where reciprocity emerged over time, and those where reciprocity was codified in partnership agreements.

Information reciprocity for social good

The majority of researchers shared information with the aim of providing broad social benefit, such as raising awareness of a problem and potential solutions, educating the public, or providing expert commentary to a group with a special interest. The mechanisms for sharing this information included mainstream or social media, such as radio interviews, social media, blogs and in-person events such as non-academic conferences or art gallery talks. Interviewees shared this information through a sense of intellectual and public generosity, fulfilling what they believed was their responsibility as an academic to provide social good. They were also aware of the information needs of others and the barriers to accessing academic expertise and research knowledge.

While motivated by altruism, researchers identified that they accrued reciprocal benefits through sharing information for public good. Some of these benefits were immediate and purely affective, while others were serendipitous, with various benefits accrued over time. Interviewees acknowledged their own pleasure in these interactions, providing a sense of purpose and validation. Angela (Associate Professor, art) expressed their 'love' for giving presentations in galleries because *'you can get feedback ... you can read the room, see how people have responded to something. There's a genuine interest ... and often leads to very stimulating conversation.'*

Others recognised that sharing for social good over time accumulated value in providing them with a network of contacts, which increased opportunities for serendipity. Shannon (Senior lecturer, humanities) was comfortable with the intangible quality of *'passive networking in ways that can't be quantified'* and recognised that *'people know me because of the blog, and they wouldn't have known me otherwise'*. Sharing information also established researchers' credibility with different groups, through giving them 'visibility' as an expert in their field. For example, Kate's (Full Professor, cultural studies) sharing of a *'report and the public speaking'* provided evidence of her expertise so that stakeholders *'knew that [she] could work in that kind of space'*. This visibility resulted in further opportunities to present in public and in the media, as well as such tangible benefits as new research partnerships, consulting opportunities and government advisory roles.

Information sharing for social good reflects Savolainen's (2019) integrated sharing and seeking, where the practice of sharing results in realisation of information needs, active seeking and serendipitous encountering of information. This realisation of the value of generalised reciprocity is central to Molm's theory that *'acts of indirect reciprocity convey even greater expressive value, because they benefit another to whom the giver owes no direct debt and at the same time contribute to maintaining a collective enterprise that benefits the network as a whole'* (2010, p. 124). In sharing information for social good researchers are developing their own and stakeholders' social capital through mutually beneficial networking.

Information reciprocity for relationship development

Researchers shared information within the context of both nascent and established relationships, with individuals, communities and networks, in anticipation of receiving unspecified benefits through creating or maintaining connections. The sharing of information provided a means of establishing or maintaining open communication channels over time, ensuring that stakeholders knew they could engage, and seek or share information, despite there being no formal project

activity or joint enterprise. The anticipated reciprocal benefit could be affective, where the act of sharing, or the reaction from stakeholders provides validation and enjoyment, or tangible, such as access to knowledge on an issue or development of a collaborative project.

As with sharing for social good, information sharing for relationship development was motivated by a researcher's sense of responsibility to provide benefit to others. However, there was also the addition of a sense of generalised or specific obligation to share information to maintain access to networks and contacts. For example, the act of sharing a paper or providing an introduction to another researcher was altruistic in one sense, but researchers were also mindful of the value in maintaining connections by sharing this information. Bridget (Senior lecturer, education) reflected on the experiences of several others where she *'shared a paper'* or gave a *'free workshop'* with stakeholders she had previously collaborated with as a way of sustaining relationships by *'keeping those people on the boil and offering them things for free'*. Molm characterises these as *'mixed motive'* exchanges, involving both indirect and direct reciprocity to strengthen relationships (2010, p. 124).

Information reciprocity was closely associated with building and maintaining trust. As Melanie (Full Professor, design) found, exchanging information informally by text with a research partner helped *'build that personal relationship where you can complain about things'*. Laura (Associate Professor, information science) reflected on being *'invited to give a talk'* to a community group, which enabled her to build a research partnership because they *'knew my work and [they] trusted me'*. There was also an understanding that a return benefit may not materialise or may be delayed. Wendy (Full Professor, business) recognised, in hindsight, how sharing information had resulted in a collaborative research project with a stakeholder, because she had *'made time, over years to be available and answer his phone calls and ... didn't get paid for any of that stuff'*. Molm identifies that the presence of risk in indirect reciprocity, where the giver may not receive any benefit, creates a greater *'trust and affective regard'* between parties (2010, p. 125). Trust is also an important factor in enabling information sharing, generally (Chatman, 1987; Wilson, 2010a).

The value of sharing was also realised in reflexive practices that benefited the researcher and enabled future interactions by improving sharing practices. For example, researchers received direct responses and feedback to some information sharing, such as when writing blog posts or giving public presentations. Olivia (Senior Research Fellow, cultural studies) valued the feedback and validation she received from writing blog posts about her research because it *'taught [her] to write and it gave [her] the opportunity to try things out, to slowly connect with community, to make mistakes too'*. Similarly, Erin (Research Fellow, biology) used the feedback on her public presentations to community groups to develop her own skills and approach by *'realising how they respond to that and going back the next time ... slightly tweaking it'*.

This form of information reciprocity illustrates Molm's finding that the *'act of reciprocity itself has value'* (2010, p. 129) and provides benefit even when no direct benefit is received. This confirms findings in other projects relating to the importance of building trust in collaborative research relationships (Du and Chu, 2022) and relationships between people within organisations (Miller, 2015).

Information reciprocity for speculative reward

Researchers shared information that they hoped would be of interest or of use to others in anticipation of receiving rewards, but they understood there was a risk and unpredictability in the form, timing and value of the return. Researchers accepted and calculated both the opportunity of serendipity and the risk of limited returns when deciding to spend time and resources to share information. This approach extends on the concept of information reciprocity for relationship development, with a more focused expectation of reciprocal value. Yet, speculative reward also includes the underlying motivations of information reciprocity for social good, such as acceptance

that being accessible and visible is part of a researcher's role. Talja (2002) identifies this form of strategic information sharing among academics and development of peer relationships.

Keith (Full Professor, design) accepted that he was expected in his role to spend time engaging with stakeholders and developing proposals, but then not *'hear[ing] anything [immediately, as] that's how I get projects. It's being visible and always being out there'*. Other researchers were also aware that some opportunities for sharing information may appear, at first to be altruistic, such as giving public presentations, but that these could also offer tangible benefits. Angela (Associate Professor, art), for example, approached public presentations with awareness that *'there's probably some funders in there ... [and] potentially some buyers'*. Similarly, Paul (Full professor, political science) had learnt the value of giving regular media interviews; these could result *'by chance'* in later being *'invited to join an expert working group'* because someone saw the media engagement.

The concept of value also varied, with some researchers sharing information designed to provoke or challenge widely held views; they received negative reactions and hostility, as well as positive value. The reward in this case was to advance activist perspectives, such as advancing feminism or challenging entrenched power structures. Olivia (Senior Research Fellow, cultural studies) saw *'mak[ing] yourself vulnerable to attack'* through sharing information in public forums at events and online as part of her role as a researcher in her field. The negative responses sat alongside evidence of positive change, where information shared by Olivia was a *'really big influence'* on community members and *'really changed'* how they thought about an issue.

One researcher, Cameron (Full Professor, design) had refined their approach to information sharing into a specific strategy of creating a *'gift'* for a stakeholder, such as an interpretation of their data, at no costs to them, to demonstrate what was possible. This researcher built on the concept of a pitch, by creating something bespoke and tangible that demonstrated how the stakeholder might benefit from a collaboration. The interaction of sharing and receiving information in this example shows how intertwined the activities are, where the sharing and receiving is iterative and elaborative:

So there's a thing ... a protocol that is sometimes called the gift ... it started with something completely speculative, but basically coming out of my motivation that I want to do work in this area. So I ... cold called the person who was working in that area, and it turned out that that she was willing to engage. I can produce these outcomes that are ... real. They're digital outcomes, where people can see it's not only hearing about the possibilities it's seeing and experiencing the possibilities.

Researchers in this study often took calculated risks in sharing information where returns were ill-defined or delayed. Yet, Molm (2010, p. 128) identifies that *'risk avoidance dominates behaviour in reciprocal exchange,'* where individuals typically give to those who provide something in return. While these findings indicate that many researchers are willing to accept a level of unreciprocated activity, by averaging gains over time, this may depend on individual circumstances; researchers in full-time, continuing employment, particularly in later stages of their career, may be more willing to take risks than those in precarious employment or who must rely on reciprocal exchange to develop their careers.

Information reciprocity for mutual understanding

Researchers often exchanged information with stakeholders to develop mutual and shared understandings within a collaborative project or long-term partnership, such as a funded research project. Sharing and receiving information was established as a practice and expectation, but not formalised in the sense of contractual obligations. Instead, researchers instigated routines of information exchange that aimed to create bonds, trust and a sense of shared endeavour between the researcher and their partner(s). This was often an incremental process developed from the

beginning of a relationship, where the researcher established sharing practices, similar to those found when sharing information for relationship development. However, when sharing for mutual understanding, researchers were more focused on establishing patterns of mutual exchange to underpin collaboration. This approach recognises the importance of establishing patterns of information reciprocity within a relationship through deliberate activities of information sharing, seeking, encountering and use.

Most researchers recognised the need to gain information about their partners to develop mutual understanding. For example Baden, (Full Professor, environmental science) approached interactions with *'a genuine interest in understanding other people and what their needs are'*. Researchers also expected their partners to reciprocate this consideration and interest by showing an equal interest in the researchers' expertise. As Keith (Full Professor, design) explained that businesses felt *'this guy knows what we've got. Now let's listen.'* Keith approached building trust and understanding through the collaborative process of information exchange that integrates seeking, sharing, encountering and using. In this way, partners are *'not just surprised when we deliver something at the end of it. They actually feel quite genuinely proud, because they know they've had a major say in how that product has come to life.'* This meant having partners *'involved all the way along'* through regular interactions, such as an *'ongoing feedback cycle throughout'* (Bridget), a genuine collaboration *'to build ideas together'* (Carrie, Associate Professor, education), and allowing ideas to be *'teased out and understood'* (Heather, Research Fellow, sociology).

Some researchers acknowledged the challenges of this level of engagement, but found that the regularity of interactions and building of trust meant that agreement on differences was possible. While these researchers may have been in a partnership involving contractual obligations, they felt that information exchange created a deeper relationship where reciprocity was organic, rather than contractually required. Renee (Full Professor, biology) reflected on the processes of information exchange as: *'We just went back and forth ... organically, we never said "ohh, you're my partner. You have to do this, this, this".'*

Sometimes finding mutual understandings was unexpected, but demonstrated that reciprocal exchange of information could foster trust and relationships, even when unintended. For example, Curtis (Lecturer, art) built a relationship with a local community through a gallery exhibition where the experience of participating in portrait creation involved an exchange between the artist, the sitter and the community. In the exchange of tangible and intangible information in the act of sitting for a portrait, the interpretation by the artist, the sharing of the finished painting, and the public response Curtis explained that *'everyone had buy-in' and the resulting relationship fuelled a productive collaboration'*.

This approach to reciprocity reflects the integrative bonds produced by generalised reciprocity in Molm's (2010) model. In creating activities, purposefully, that encourage the exchange of information, researchers are drawing on the benefits of reciprocal exchange Molm (2010) identified. This extends existing understandings of the exact mechanisms that support effective research collaborations (Dewaele et al., 2021).

Information reciprocity for negotiated obligations

Information exchange forms part of obligations negotiated in contracts with funders and research partners. This requires a clear understanding for both parties of mutual expectations and obligations. The agreed terms of exchange provide a baseline of information exchange, including the format, regularity, and type of information shared. Researchers were conscious of providing the information that was stipulated in contractual agreements with partners, which was often expressed as an obligation or something to complete, such as a written report or presentation at a meeting. Researchers drew on their practices in information sharing for mutual understanding to meet formalised requirements. It is notable that information reciprocity related to negotiated

obligations was the least mentioned experience by researchers; those who did raise it, often did so as an aside when discussing information sharing to support relationship development or mutual understanding.

Researchers acknowledged that while collaborations worked best when founded on trust, generosity of spirit and informality, they also needed to *'dance with the one who brung you'* (Melanie, Full Professor, design) by addressing the formal requirements in ways that met partners' needs. In the early stages of a partnership Melanie explained this involved *'list[ing] [deliverables] for them so they know what they're going to get'*. In later stages, sharing tangible information sources, such as reports, was used to evidence *'goals that need to be ticked off'* and to make visible the *'value proposition'* or return on the partner's investment in explicit ways.

Meeting a negotiated obligation also involved conducting research in ways that met partners' needs, such as working with an Indigenous community where researchers *'engaged with [the community] on a daily basis [as] it is demand led'* (Ryan, Full Professor, international development). The reciprocal exchange of information relied on trust built with the community through adhering to negotiated requirements.

The dominance of forms of information reciprocity beyond those involved in formalised partner agreements affirms Molm's (2010) theory that social capital and resources within networks and relationships are accessed primarily through generalised forms of reciprocity, rather than negotiated exchanges.

Model for information reciprocity for social exchange

These findings informed the development of the Model of Information Reciprocity for Social Exchange (Figure 1). This model elaborates Savolainen's (2019) framing of the interplay between seeking and sharing by documenting, in detail, the ways that intentions of reciprocity are interwoven with researchers' information behaviours when engaging with stakeholders. Using Molm's (2010) framing of reciprocity theory of social exchange as a sensitising lens for analysis, specific patterns of reciprocity are illuminated that relied on information exchange.

The model identifies the five types of information reciprocity, which occur on a spectrum of intentionality from altruism to obligation. This spectrum is not linear, and modes are inter-related and can occur simultaneously or evolve overtime. Researchers engaged in some or all of the five modes of reciprocity in their interactions with stakeholders to use, develop and extend their social capital as part of their research practice. This model represents the connections between intentionality, information behaviours and reciprocity in developing and extending social capital. It provides an explication of the mechanisms that enable trust, mutual understanding and navigation of risk when researchers engage with stakeholders for impact work.

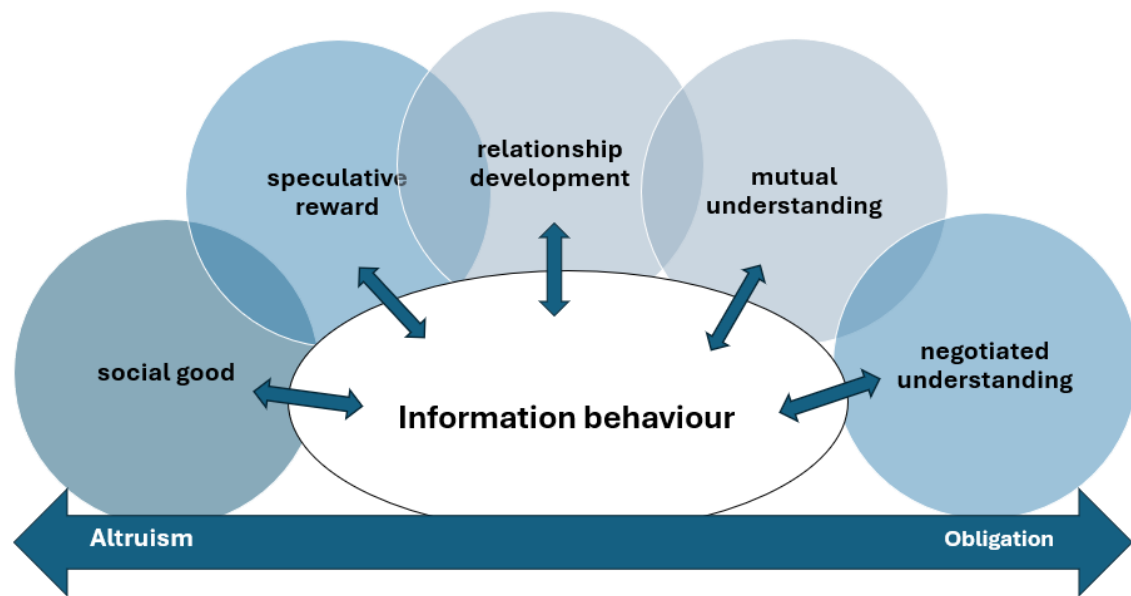


Figure 1. Model of Information Reciprocity for Social Exchange.

Conclusion

This study's findings demonstrate that the information behaviours of academics associated with impact work involve reciprocal information exchange in building and sustaining collaborative research relationships. The study explicates the dynamics of interactive information seeking and sharing (Savolainen, 2019) by identifying a spectrum of information reciprocity intentions, extending Molm's (2010) earlier model. The importance of reciprocity, trust and information exchange in establishing and maintaining relationships has been noted by studies in information behaviour (Du and Chu, 2022), and collaborative research practices (Morton 2015; Spaapen and van Drooge, 2011). However, the findings reported here show that information reciprocity is also a key component of social exchange and social network analysis, aspects that are rarely the focus of theoretical or empirical studies. This paper draws these elements together by documenting how information reciprocity underpins collaborative relationships between researchers and stakeholders engaged in impact work, showing that the information behaviours involved are interwoven and iterative.

Our findings show how researchers develop and maintain social capital through information reciprocity. The importance of information reciprocity in the development and maintenance of effective research collaborations contributes new insights on research practice. Guidance and supports provided to researchers in universities often represent research collaborations as transactional and primarily negotiated arrangements. Our model provides a way of approaching research collaborations from the perspective of social exchange that prioritises reciprocity and illuminates intentionality as a critical driver in researchers' decisions to share information with stakeholders.

This study explored the information behaviours of researchers undertaking collaborative research activities in universities, with the findings and model limited to understanding the research and community-engagement aspects of their work. Further research could explore the role of academics holistically to identify the interplay of information behaviours across other job requirements, such as teaching and administrative roles. This study is also limited to researchers'

perspectives on engagement with their stakeholders. There is potential to explore stakeholders' perspectives of information reciprocity to understand their views on this type of research engagement. This research provides a valuable perspective on research collaboration practices and social exchange, with great potential to inform policy and practice within universities.

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