
Lending a helping hand: voluntary engagement in knowledge sharing

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Abstract: Knowledge is essential for the functioning of every social system, especially for professionals in knowledge-intensive organisations. Since individuals do not possess all the work-related knowledge that they require, they turn to others in search for that knowledge. While prior research has mainly focused on antecedents and consequences of knowledge sharing and understanding why people do not share knowledge, less is known why people provide knowledge, and what conditions trigger voluntary engagement in knowledge sharing. Our article addresses this gap by proposing a multi-level framework for voluntary engagement in knowledge sharing: individual, relational, group, and informational. We provide illustrations from a particular knowledge-intensive community, DNA forensic scientists who work at public laboratories.

Keywords: knowledge sharing; network of professionals; voluntary engagement.

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1 Introduction

Why do people share their knowledge? This is an important question, because sharing knowledge is essential to the functioning of every social system. It is also a potential collective dilemma (Bonacich, 1972; Alcock and Mansell, 1977) because there are obvious and fairly general reasons why people might not share knowledge, even when the benefits to potential targets are considerable. Sharing knowledge takes time, and sometimes can undermine the source's competitive position. Further, it is patently obvious that not everyone in every situation is willing to share their knowledge. Consider the case of a list server: an individual posts a query, and later receives several replies from list members. Why do some people with the expertise answer that query and others not?

Prior research has mainly focused on processes and techniques of knowledge sharing (Hansen, 1999, 2002) but less research has been done so far on the individual behavioural patterns and incentives that trigger knowledge sharing activities. Most studies in the latter vein focus on the antecedents and consequences of knowledge sharing and lay out reasons that prevent people from engaging in knowledge sharing activities, hoard their knowledge, or lurk instead of contributing. Our goal is to understand the reasons why people are willing to help others by sharing their knowledge within a network of professionals. We then apply these ideas to a particular case of knowledge sharing in an informal network of geographically distributed government organisations: forensic scientists involved in DNA analysis. This is a rapidly changing, multi-dimensional knowledge-intensive domain, where effective knowledge sharing is essential to the functioning of the overall system.

Our findings show that forensic scientists are motivated to share knowledge with their colleagues beyond their laboratory, based on their position within the overall community of professionals, their experience with reciprocity, and the overall community goal. We found that relational factors, like the type of connection to the person asking for help, are an important driver to sharing knowledge.

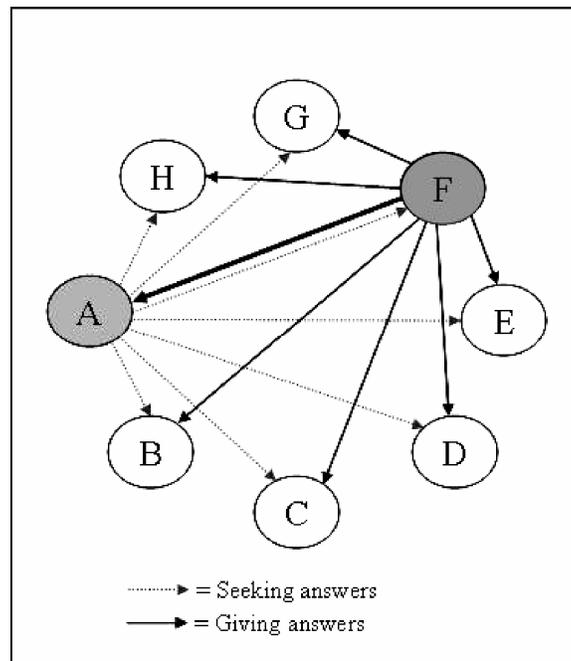
The article is organised as follows: first, we give an overview of our core construct, voluntary engagement based on the existing literature on altruism and prosocial behaviour. We describe our methodology aimed at building theory grounded in case study data. We present the findings of a case study of DNA forensic scientists. We conclude by synthesising the phenomena we have found into three distinct drivers of knowledge sharing: cost, outcome and reputation.

2 Understanding voluntary engagement in knowledge sharing

Knowledge-intensive organisations heavily rely on those individuals who go beyond the call of duty and invest time and effort into sharing work-related knowledge with their peers. The key question is: Why would anybody do that? What pushes individuals to

engage in the deliberate process of answering queries or offering advice on a topic when the task is not part of their job description? Consider the example in the picture below, where person A poses a question to a list server. Why person A might ask the question is clear – they are aware that some bit of knowledge might assist them to better achieve their objectives. The core question we focus on is why would person F, in turn, answer person A's query? For the purpose of this article, we refer to F's behaviour as voluntary engagement in knowledge sharing (Figure 1).

Figure 1 Knowledge sharing context



Voluntary engagement more generally is a frequently discussed phenomenon in the organisational behaviour, organisational psychology and economics literatures. Several other expressions are used throughout these literatures to describe voluntary engagement, such as extra role behaviour (Van Dyne and LePine, 1998; Flynn, 2003) off-task behaviour, non-task behaviour and organisational citizenship behaviour (Ilies, Scott and Judge, 2006). All these constructs have one attribute in common: they refer to a behaviour that goes beyond expected (or role specific) behaviour, as well as actions that are neither required by the job description nor by the organisational culture. Based on the expectations and norms within the focal organisation people expect that one's given favour will be returned in the future (Gouldner, 1960; Nowak and Sigmund, 2005). This type of generalised reciprocity might also lead to an increased willingness to share knowledge.

One possible (and wide-spread) explanation for voluntary engagement in social psychology is that an individual who acts that way possesses altruistic traits. In their seminal review of the literature on altruism and prosocial behaviour, Piliavin and Charng (1990) show different and sometimes contrasting findings when it comes to explaining

helping behaviour. Altruism is defined as a behaviour that is mainly conducted with the goal of benefiting the needs of others. In addition, it must be performed voluntarily, intentionally and without the expectation of any external rewards, therefore being costly for the altruistic individual. In contrast, helping someone to get work-related information, or sharing insights from one's own experiences is oftentimes triggered by the organisational context, such as hierarchies, or the type of relationships, rather than altruistic intentions (Hansen, 1999; Tsai, 2002). Here, we do not consider the conscious formulation of an altruistic intention to be an important building block for justifying altruistic behaviour. Instead, our definition of voluntary engagement is broader and motive-based: we treat any kind of behaviour that appears to be mainly motivated out of the consideration for the needs of others instead of one's own needs as voluntary engagement.

Extending this construct to the knowledge sharing context, respondents to inquiries posed may be acting altruistically without considering the 'dark side' of knowledge sharing. Altruistic helpers focus on the knowledge needs and benefits of others instead of their own motives or expectations of any kind of external rewards. Alternatively, helping others may be motivated by more selfish motivations, e.g. a calculated interest in replying to a post on a list server in hope of gaining positive reputation.

Knowledge sharing is a process that can take place in multiple ways. Often, the process starts with an individual realising a deficit in her knowledge level, which makes it impossible for her to solve a certain task she is working on (Hansen, 1999; Borgatti and Cross, 2003). The individual might have a sense of where the right knowledge is located among her human and/or non-human sources (Ancona and Caldwell, 1992). Alternatively, an individual might engage in voluntary knowledge sharing by providing unsolicited information and advice to colleagues.

In this article, we use the term 'knowledge' in a broad sense, including both the tacit and the explicit dimensions (Polyani, 1966; Nonaka and Takeuchi, 1995). Expert knowledge is often characterised by its tacitness (Nonaka and Takeuchi, 1995) and consists of prior experiences or the ability to interpret knowledge given a specific context. Expertise and experience are usually embedded within a specific organisational or social context and therefore conveying knowledge across contexts can increase the transfer costs (Hansen, 1999, 2002). Further, sometimes the complexity of the required knowledge can make it difficult for the knowledge seeker to articulate her need in a way that experts

- 1 understand the request and
- 2 recognise that they possess what is being asked for.

Depending upon how complex and difficult it is to share knowledge, the cost for the actual sharing activity varies greatly.

The question why individuals voluntarily engage in knowledge sharing, while clearly important, has not been directly addressed in geographically dispersed organisations. Wasko and Faraj (2000, 2005) looked at a similar question in the narrower context of online communities and found that contributions in the form of knowledge sharing are not occurring based on expectations of reciprocity. To a certain extent, the recent work on organisational social capital has grazed this issue, e.g. asserting that one of the advantages of the organisational form is that it facilitates knowledge sharing (Nahapiet and Ghoshal, 1998). But knowledge sharing also takes place between individuals not in the

same organisation (Powell, 1990). Indeed, one of the major trends in thinking about knowledge sharing has been in communities of practice (Lave and Wenger, 1999; Barab and Duffy, 2000; Wenger and Snyder, 2000) where the idea is that knowledge sharing might take place among people with shared interests, and not necessarily shared affiliations.

3 Methodology

Our aim in this article is to bridge the conceptual gap in the literature between voluntary engagement in general and voluntary engagement in knowledge sharing in particular. When the subject of enquiry is a social phenomenon for which little theory exists, one way to cover that ground is to inductively generate new theory (Glaser and Strauss, 1967). A characteristic feature of the grounded theory approach is a concurrent analysis of the growing data pool and relevant literatures, which requires constantly going back and forth between the literature and data. This approach seems particularly appropriate for understanding emerging processes and mechanisms of knowledge transfer among organisational members within and across knowledge-intensive organisations. Therefore, we chose to conduct a qualitative study aiming at generating theory that grows out of the knowledge sharing activities occurring in the empirical setting under enquiry (Emerson, Fretz and Shaw, 1995).

3.1 Case study

We studied a community of geographically dispersed professionals who are each formally affiliated with a specific government crime laboratory anywhere in the USA. These professionals are all involved in forensic DNA analysis, which comprises tasks such as determining the usefulness of a DNA sample provided by crime scene investigators, the preparation of a sample for analysis, the interpretation of DNA mixtures (e.g. when the DNA of two or more individuals is present in a sample), and uploading the created DNA profile into a database. The minimum educational requirement for forensic scientists is a Bachelor of Science, most commonly in chemistry or biology. Many DNA analysts also have a Master of Science (often mandatory for supervisory positions) in chemistry, biology, or forensic science and several among them have a PhD in these or related disciplines. The work of forensic scientists is knowledge-intensive, specialised, and highly complex, and it is subject to constantly changing technology (Lazer, 2004). The nature of their work, as well as the fairly small number of forensic scientists involved in DNA analysis in government laboratories (there are about 180 such labs across the country, where the typical lab might employ a handful or so of analysts, with a small number of labs which exceed 100 in size), has led many DNA forensic scientists to share the mutual feeling of being part of an informal network of professionals. Within this community, knowledge is shared across geographical as well as organisational boundaries on issues of varying complexity, such as the discussion of innovative techniques or interpretations of mixtures based on prior experience.

A particularly well-connected subset of DNA professionals is that of the so-called 'CODIS administrators'. Each state government laboratory employs one individual who is responsible for the state DNA database, a system provided by the FBI called COmbined DNA Index System (CODIS). The database contains the DNA profiles of

qualified offenders (in most states, convicted felons) and profiles from crime scenes. The objective of the database is to link known individuals to crimes, as well as crimes to each other. However, only certain profiles are uploaded into the national system, which is governed by a complex and ever-changing web of rules and regulations set by the FBI. The CODIS administrator thus serves as gatekeeper for the database as well as liaison to the FBI for the laboratory. In addition, local laboratories within the same state submit their profiles to the state CODIS administrator for approval.

3.2 *Data collection*

We selected the respondents for this study through purposeful sampling (Yin, 1994) according to the professional roles held by members of the community in a single case study design with multiple sites. All our respondents have similar skills, training, tasks and occupational positions within their organisational settings. Our initial choices of interviewees led us sequentially to additional important respondents within the community (Miles and Huberman, 1994).¹ This method of sampling allows for comparability between the respondents, and at the same time incorporates the range of different realities that characterise the various US state governments. Our goal was to compile a comprehensive sample of individuals with the most common professional roles that reflects behaviour across different types and sizes of state labs. We stopped recruiting additional respondents when we started getting very similar responses and therefore had reached saturation in our sample. Our final pool of respondents consisted of 28 individuals.

We conducted semi-structured, open-ended interviews with these individuals lasting between 30 min and two hours each. The interviews covered the following topics:

- *Description of work function and work environment.* The hierarchical relationships the respondent is embedded in and the proximity to peers within the lab.
- *Description of knowledge required for the job.* The areas of expertise and the types of knowledge the interviewee required, such as technical or legal knowledge, advice, or opinions.
- *Habitual knowledge sources.* The most commonly used knowledge sources for the identified types of required knowledge, media and venues used, and difficulties in retrieving knowledge from these specific sources.
- *Engagement in the community.* The behaviour of interviewees when approached with a question, in particular regarding their motivation to set aside time to answer questions from colleagues and peers, the content of questions, and reasons for answering certain questions rather than others.

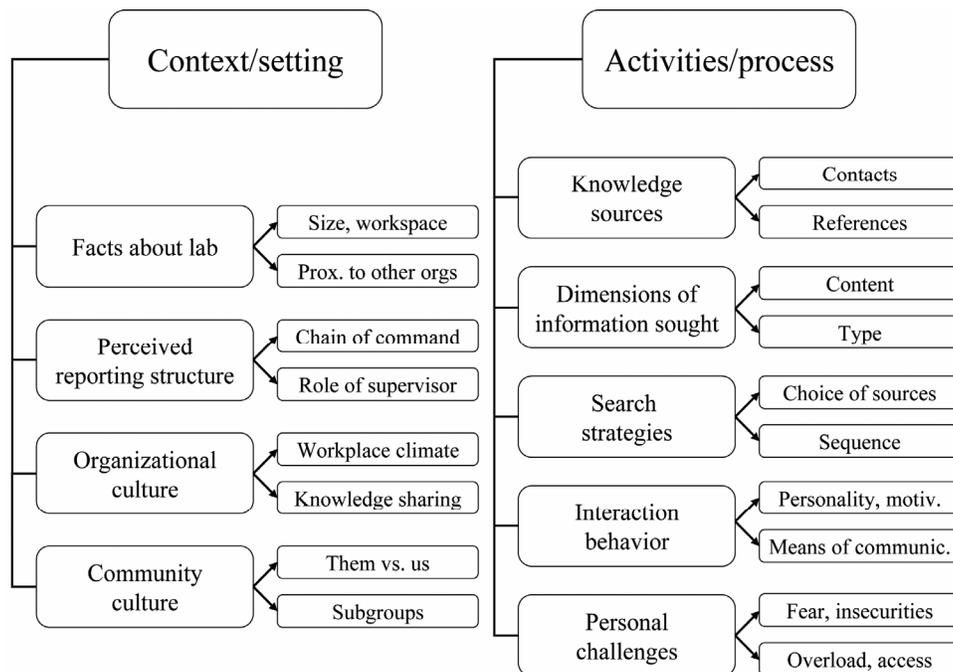
3.3 *Data analysis*

We transcribed and content analysed all interviews using the qualitative research software package NUD*IST (2002). Miles and Huberman (1994) point to two methods of creating codes. The first one mirrors essentially the grounded theory approach originally advocated by Strauss and Corbin (1990). The second method is to create a provisional start list of codes in the very early stages of the fieldwork (Glaser and Strauss, 1967). That list comes from the conceptual framework, list of research questions, hypotheses,

problem areas and/or key variables that the researcher brings to the study. The latter method, which we chose to use in this study, has the advantage of bringing some structure into the coding process, as opposed to the completely unstructured (and consequently time-consuming and error-prone) process described by Glaser and Strauss.

Figure 2 shows a simplified version of our coding scheme. At the top level of the coding hierarchy are setting/context and activities/process. The setting/context category captures accounts of the perceived reporting structure in the laboratories e.g. whether individuals in the laboratories respect or bypass the chain of command, and what the role of the supervisor in the decision-making process is. The core subcategories of setting/context address aspects of culture, including the general workplace climate (open or closed doors? nice colleagues?), the predominant knowledge sharing practices at the organisational level, and the sense of belonging to a group as well as the perception of boundaries ('them vs. us') at the community level. The category also covers facts about the laboratory, such as size, location, workspace, and general office characteristics.

Figure 2 Simplified coding scheme



The activities/process category captures how and why individuals share knowledge. This category includes references to interaction behaviour, aimed at capturing aspects such as the individual's personality, motivation and willingness to share knowledge with others, and the means of communication employed in the interaction. Finally, we coded for personal challenges relating to the helping process, e.g. source of helping request, type of knowledge shared, prior experience and level of knowledge, and relationship to the knowledge seeker.

4 Findings

Based on our concurrent analysis of case study data and relevant literatures, we identified four different sets of factors that influence voluntary engagement in knowledge sharing:

- 1 *Individual level factors*. Why are some individuals more willing to share their knowledge and help others?
- 2 *Relational level factors*. How does the pattern of relationships at the dyadic, triadic and group level influence voluntary engagement in knowledge sharing?
- 3 *Informational factors*. How does the complexity and type of knowledge influence the willingness of the individual to share?
- 4 *Group level factors*. How does the feeling of belonging to a specific group of professional's affect voluntary knowledge sharing activities?

We discuss each of these sets of factors below.

4.1 Individual factors

Individuals may vary in the pleasure they receive from voluntarily helping others, which, in turn, may affect how helpful they are (Harbaugh, Mayr and Burghart 2007). Individuals who are helpful may receive intrinsic satisfaction from certain types of helping behaviour, as research on contributors to open source software projects illustrates (Lakhani and Von Hippel, 2003). Lakhani and Wolf's (2003) work shows that programmers voluntarily participate based on fun-driven or emotional incentives. They support the 'higher' goal of the project itself and are therefore willing to contribute their intellectual capacity and resources. In our research setting, behaviour has a similar potential to be mission driven. These professionals are at the cutting edge of the justice system, and many see as their goal to transform that system. Many interviewees referred to their shared mission as a reason why they share knowledge. The quote below from a long standing and important member of the system offers a particularly dramatic example of this 'missionary' motivation to share knowledge.

“We developed some statistical models that demonstrated the efficacy, for example, of collecting samples from property crimes. And doing property crimes. You know, laboratories, they weren't doing a lot of them said, well, we got limited capabilities, we're not going to do property crimes. And... I'd point out, for one thing, they are a lot easier cases to do than violent crimes... Usually you got a... tissue or a little blood stain, or a saliva on a beer bottle, and... then you can identify somebody.... But it's... our statistical information on our database hits, very early became a major tool for states seeking to expand their statutes. And even on the federal level.”

This laboratory, in part due to this individual, in essence, created and disseminated knowledge about the use of DNA analysis in property crimes. Further, the interviewee is clearly proud about the impact of this information – because he views a key part of his mission as bringing about change in the world beyond his particular organisation.

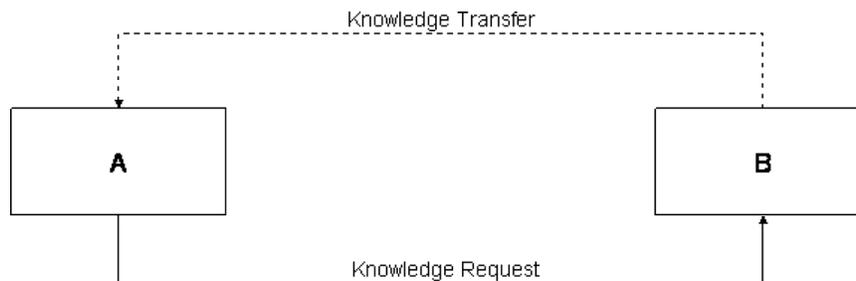
4.2 Relational factors

Knowledge sharing takes place within a social context. How knowledge is shared is going to be affected in part by the web of connections between and among the individuals sharing and receiving knowledge. A considerable amount of research has already been conducted in the social networks literature specifically focused on advice networks (e.g. Constant, Sproull and Kiesler, 1996; Cross et al., 2001). Individuals tend to turn to those actors in their network they trust, are friends with or who are their peers (Krackhardt, 1999). While these findings point to certain structural antecedents of advice giving, the question we focus on here is how the structure of the network encourages the potential advice giver to be helpful. We focus on two dimensions of the relational level of analysis: dyadic and triadic. Dyadic refers to factors that exist exclusively between two individuals. Triadic refers to the pattern of relationships the pair have with the rest of the system.

4.2.1 Dyadic level factors

The dyadic level of knowledge sharing focuses on factors that are present between a pair of actors (see Figure 3 for an illustration of the direction of knowledge sharing in a dyadic relationship).

Figure 3 Dyadic level knowledge sharing



There is extensive research on the foundations of helpfulness at the dyadic level. Reciprocity is a strong driver of cooperation (Axelrod, 1984) where, in this context, a request for assistance today from someone you know may be followed by a request for assistance to that individual tomorrow (see also Berkowitz and Daniels, 1964; Amato, 1990). Relational embeddedness – the presence of overlapping types of relationships between two individuals – reinforces the power of reciprocity (Uzzi, 1997). Friendship, in particular, may be viewed as an embodiment of these reciprocal obligations, reflecting and enhancing voluntary knowledge sharing (Krackhardt and Kilduff, 1999). Further, symbolic rewards, such as honour or praise, when helping a friend (Constant, Sproull and Kiesler, 1996; Krackhardt and Kilduff, 1999). Further, an extended relationship builds transactive knowledge between individuals, e.g. making clear what each party does and does not know (Wenger and Snyder, 2000). Spatial proximity and role homogeneity can be indicators to identify the motives of knowledge providers or experts in a specific knowledge domain (Constant, Sproull and Kiesler, 1996). More generally, similarity between the knowledge seeker and the knowledge holder generally facilitates communication: people tend to understand each others' questions better, when they have

a similar education, shared experiences, come from the same organisational context or speak the same language (Ibarra, 1992; McPherson, Popielarz and Drobnic, 1992; McPherson, Smith-Lovin and Cook, 2001).

The following account illuminates many of these factors:

“Within our community, we have a private laboratory, just up the street, a big one – [name of lab]. We use them a lot for technical knowledge. They are brilliant people up there. It’s because we’ve faced the same challenges, basically. And sometimes they ask us, “How would you do this sample? Could we look at your protocol for this particular type of sample?” And we’ll say, “Absolutely. Come up. We’ll show you how we do it.” And the reason being that they are truly intertwined in the same battle we are, trying to get DNA from crime scene samples. Trying to get DNA profiles published that meet the quality assurance criteria. So we sometimes interact with them, and sometimes we interact with the neighbouring states. It’s easiest to call [state A], because they’re our close neighbour.”

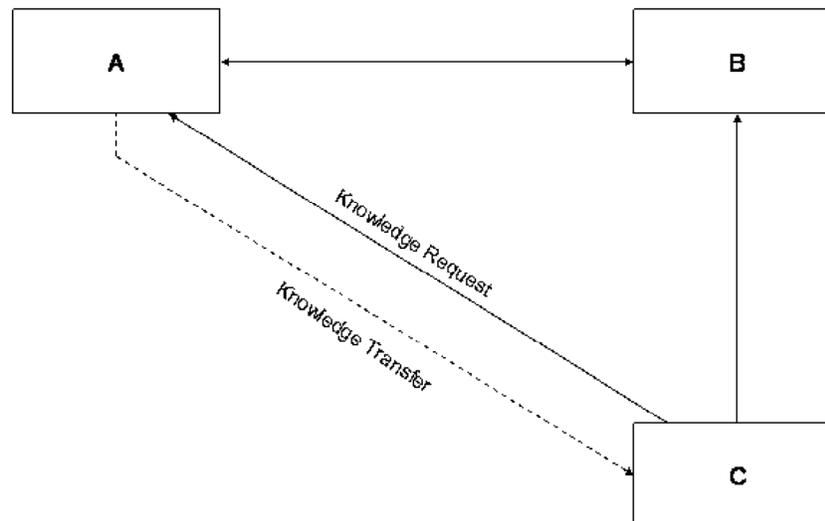
Clearly, these two labs are engaged in a reciprocal and mutually beneficial process of knowledge sharing. This reciprocity is enhanced due to shared mission (see discussion above), and spatial proximity. Further, it is clear that the interviewee has developed a sense of the distinct competencies of this other laboratory (i.e. transactive knowledge).

4.2.2 Triadic level factors

The position within the broader network can affect access to the knowledge of others (Uzzi and Lancaster, 2003). Much as directly knowing someone allows you to know about what they know, having mutual third party relationships with a specific other person increases the probability that you will learn about what they know (Cross and Cummings, 2004). Further, this type of referral then lends the questioner some of the credibility of the intermediary, as well as some social pressure on the target to be responsive. That is, we may be far more likely to answer questions to a stranger that was referred by a mutual friend. This type of referral system was clearly important in the population we have examined. As one respondent states:

“[A] lot of times that person may not be able to help me, but he or she may be able to tell me, ‘Go try – talk to this person’. ‘They may be able to help you.’ And it’s that way that the answer may come. [...]”

That is, in short, there will be a dynamic tendency for triads to close through referral processes (see Figure 4).

Figure 4 Triadic level knowledge sharing

4.3 Group level factors

Social identity theory (Tajfel, 1982) asserts that individuals are intrinsically susceptible to suggestions of group identity, both for themselves and others. These categorisations, in turn drive in-group favouritism. This is, in part, an individual-level process: individuals will vary in how they construct group boundaries, where they place themselves with respect to those boundaries, and the relevance of a particular group affiliation. However, while accepting the inherent fuzziness of group boundaries, we would view group identity as primarily something that is largely collectively learned and constructed, and thus usually more meaningful to examine at the group level. In this particular context, we found quite a bit of evidence of group identity around the shared mission. As one interviewee stated, in explaining why she would be helpful when approached with questions: ‘we are all in it together; we all help each other out’ Shared mission thus plays two key roles. As noted above, if two individuals have a shared mission, it means that if A approaches B, it is mission compatible to B if he helps A. Here, we identify a second causal path. To the extent that B feels that A is the same type of person as B, B is more likely to share knowledge with A.

We also found evidence for collective social learning supporting knowledge sharing. Altruism may be learned behaviour (Simon, 1990) where individuals observe the actions of others helping, and this in turn leads the observers to be helpful. Again, this learned behaviour will vary from individual to individual, but the communal lesson conveyed is clearly a group level phenomenon, where those group norms have a powerful impact on helping behaviour (Nahapiet and Goshal, 1998). Helping behaviour is particularly likely to emerge where there is some collective recognition of its value (Nowak and Sigmund, 2005). More generally, we observed that individuals expected to have their questions answered, and felt a reciprocal and collective obligation to answer questions. The golden rule of knowledge sharing ‘Answer others as you would have them answer you’, captures

many of the interviewees' understanding of why they answered questions. As one of the interviewees explains why they answer requests on a list server: "Someday I will have a question. And I would hope somebody would be able to help me."

Notably, there is the potential for such behaviour to be self-reinforcing – because an act of helping conveys a norm of helping. Thus, one can conceive of a generational cycle of new individuals in a system requesting help, receiving help and at the same time being socialised into being helpful (Blau and Scott, 1962).

System-wide incentives, of course, also play an important role, both in shaping norms and in directly determining behaviour. DNA crime labs, as noted above, have a shared mission; and the success of one in no way impinges on the success of others. In competitive social systems, these conditions may not apply. The following individual compares her experience in a crime lab with her previous experience in an academic context:

"[Academic] researchers tend to be a little bit protective of their research, in that they don't want someone to come in and scoop them. I was warned at one point to not say a whole lot about why what I was doing was so neat, because then you don't want other people to start working on the exact same thing and get grant funding, or do the exact same thing you're doing and publish it first... And in this community, everybody in the community is very open with each other and is very willing to help each other, which is very nice."

In short, the academic context specifically discouraged the sharing of knowledge because researchers were in competition with each other. The causal path runs directly from the structure of incentives to behaviour, as well as a path mediated by the inculcation of norms.

Boundaries can also play an important role in shaping helping behaviour. The early work by Bourdieu (1985) on social capital highlights the importance of boundaries in fostering mutually helpful behaviour. The more recent strand of work on organisational social capital (Nahapiet and Ghoshal, 1998) highlights that the boundaries that organisations construct around themselves are essential to building relational capital. Boundaries, as the preceding highlights, also exist across organisations. Within academia, for example, individuals simultaneously belong to a university and a discipline, and both have a substantial pull. Within the population we study, individuals belong both to their lab and to a profession. Our research highlighted the importance of the permeability of these boundaries in driving knowledge sharing. In particular, some media of communication are more permeable than others. List servers are particularly permeable, both because one does not know who is on the list and because electronic communications are easily replicated and distributed. The use of list servers in this community has an interesting history, where originally a particular, open, list server was widely utilised by the community. However, the openness of this list was seen by some (in particular, this individual) as a problem:

"I felt like we needed a closed group because I wanted to discuss issues candidly and without intrusion or the feeling that you were being spied upon by all of these attorneys... we wanted a closed group, where we weren't going to have to eat our words on the witness stand, or eat somebody else's words or opinion. And this closed group I started with ten or fifteen, twenty people and now it has reached about three hundred and fifty."

This need for closure in part reflects the adversarial nature of the criminal justice system – where a statement on the list server could come back to haunt you later if the wrong people were watching. Interestingly, many (but far from all) individuals still expressed a concern about sharing information on list servers, as this interviewee conveys:

“So the interesting thing is that list serve evolved, and it evolved to include people who are non-forensic people. There were people on that list that were looking to overturn their convictions. There were people on that list that were just plain attorneys with really no forensic experience except for they had tried one or two cases where they disagreed with the evidence and they were shopping for experts. There were people there with really no forensic expertise whatsoever. Just a soap box that would get on there and post five or six, seven messages a day. [...] And I scratched my head and I said, ‘This has disaster written all over it’. And the reason why is first of all, it wasn’t a peer moderated forum, and so one guy could say, ‘You know I really don’t like this technology’. Boom. He’s quoted in court as an expert that disagrees with this technology.”

There is an intrinsic concern about the use of a list server for sharing information – because you cannot see the group that you are presenting your response to. This is likely accentuated by the very growth of the list server and the lack of manageability of membership (e.g. were members of the list removed when they changed jobs? Consulted for the defence?). The net result, however, is that less information is shared on the list server.

4.4 Informational factors

The form of the information requested, the degree of complexity, and the type of knowledge have an impact on how costly it is for the provider to articulate the information and transfer it to the knowledge requestor. This in turn may have an influence on the willingness to share it

- 1 with the individual requestor
- 2 with a wider community (Nonaka and Takeuchi, 1995).

Hansen (1999) found that the degree of complexity and codification influences the transfer costs, as well as the ability and willingness to share knowledge significantly. We found that these transfer costs were quite important to the willingness to share knowledge. The following is in response to a query about what types of questions an individual responds to on a list server (presumably generally to people this individual does not have a close relationship with):

“I will never answer those really long questions... some people... need a real elaborate answer. Mine are usually very short and sweet. You know, if I can answer it in two or three sentences, we’re finished, you know.”

In short, this individual replies to questions that do not require extended responses, or engagement with the questioner, as would often be the case with tacit knowledge.

Fully codified (explicit) knowledge, because it is available in form of files, documents, reports, etc. is relatively easy to communicate, as this respondent conveys:

“So sometimes it’s like, I’m looking for this article, does anybody have it? Yes, I got it. I’ll fax it to you, you know. [...] I answer them all the time.”

More generally, while many of the individuals were frequent users of list servers, the willingness to invest a lot to answer questions to individuals on a list server was limited:

“Online I will... only answer those questions that are really cut and dry. You know: we’re trying to get more money for our analysts. Can people tell me how many analysts they have in their lab, and how many hours a week do they work, and how much do we pay them.”

On the other hand, consistent with Nelson (2001) we also found evidence that specialised requests for information increased the probability that the (fewer) people who could reply would reply. This is consistent with the ‘bystander effect’, which highlights that seeking help from a crowd may sometimes be less effective than asking for help from a single individual (Latané and Darley, 1970). As one interviewee, a highly regarded expert in his field, mentioned: “I just feel like if I don’t have an original contribution I wouldn’t answer on a chat group.”

The content of the question also interplays with the boundary issue referred to above. For certain types of questions, security is especially important – such as controversial questions:

“[I]f I think it’s a controversy, I’ll do it offline. You know, I’ll go write to the person asking the question.”

In short, individuals strategically manage the boundaries of their knowledge sharing, where for certain types of information, leakage beyond those boundaries are not a problem, and for other types of information, it is potentially catastrophic.

5 Discussion

Our analysis confirmed the importance of knowledge sharing within this particular community. Forensic scientists clearly rely heavily on each other for advice and expertise to properly perform their jobs. Our focus in this article was on knowledge sharing as a particular form of prosocial behaviour. Sharing knowledge is a distinctive form of helping behaviour, as compared to other types of prosocial behaviour, because:

- 1 it may have important implications for the beliefs people have about the potential helper (beyond their helpfulness, e.g. regarding expertise)
- 2 the potential knowledge sharer might value the opportunity to influence the knowledge of other people (e.g. because they adopt the sharer’s preferred policy);
and
- 3 the sharing of knowledge is necessarily embedded in a relational and social context, thus limiting the applicability of laboratory research findings to this arena.

Our study highlights a series of factors at multiple levels that affect whether and how people share knowledge. At the individual level, we have identified as a key driver of knowledge sharing, but also other factors that our study was not designed to capture (such as personality or attributes). At the relational level, both dyadic (e.g. similarity, familiarity and proximity) and triadic (shared friends leading to referrals) factors were important drivers of the willingness to share knowledge. We also identified a series of group level variables: e.g. the socialisation into norms encouraging generalised reciprocity, the presence/absence of solid group boundaries in the context/setting

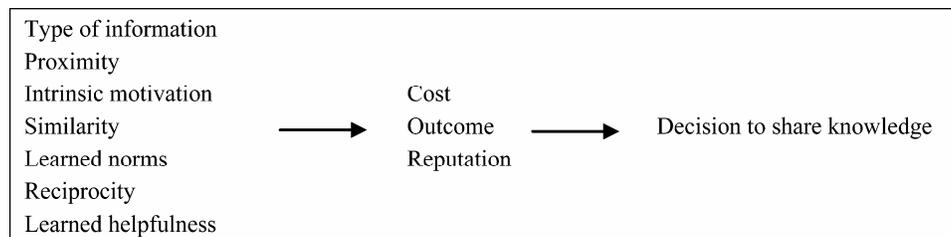
category. Finally, for a given potential knowledge exchange, the nature of the knowledge is important: Is it complex or simple? Is it tacit or explicit? Is it public or confidential?

These factors, we should note, interplay across levels of analysis. Thus, for example, norms are inherently a multi-level construct. Individuals entering a system where answering questions is the norm will tend to internalise those norms (hence, the utility of thinking of norms as a system level construct), but there may be substantial variation in that internalisation (hence the utility of thinking of norms as an individual level construct). Similarly, relational behaviour – e.g. what one does for friends – varies at the system and individual level. As a point of illustration, friends in graduate school may ask each other for help moving from one location to another, whereas friends later in life may not ask each other for help moving, but for help watching each other’s kids. In the case of knowledge sharing, norms around senior mentorship of junior members of a community may be critical. In any case, our objective here is not to explore all permutations of how these factors interplay, but to highlight that the factors we have identified reside at many different levels.

Our findings here, have several limitations. We chose a domain because of the obvious functional needs to share knowledge. It involves an area where shared mission is especially important (e.g. perhaps similar to the involvement in open source software projects, but a contrast to knowledge sharing across firm boundaries). It is a fairly small and well bound community, involving professionals who have a long anticipated membership in that community. Thus, the role of mission, norms, relationships are all more likely to be important in this domain than many others. Further, the qualitative methodology we used here is particularly powerful at sorting through heterogeneous phenomena such as knowledge sharing (because knowledge itself is such a contextual and heterogeneous construct), but less useful for rigorous hypothesis testing.

Our analysis points to three variables that mediate the relationship between factors that we have identified and the decision to share knowledge: cost, outcome, and reputation. Cost is simply the actual cost in terms of resources and time of sharing knowledge – for example, one is more likely to reply to a listserver query that takes five minutes to compose than one that takes an hour to compose. By outcome, we mean the tangible impact of the changed behaviour of the knowledge recipient – does one intrinsically value, for example, the more effective statistical interpretation of DNA evidence (which in turn, might lead to apprehension of a criminal). By reputation, we mean the view that other people will have of a certain individual. Reputation may refer to the beliefs that people have about the individual: of her expertise; of her willingness to be helpful; of her bank of ‘favours’ with them. We summarise the relationship between these variables, the influencing factors, and the decision to share knowledge in the framework below (Figure 5).

Figure 5 Voluntary engagement in knowledge sharing framework



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Note

- ¹The main reason for this approach is that there are no publicly available records with conclusive information about the positions, names and functions of each government crime laboratory.