

# Social Media as Social Lubricant: How Ambient Awareness Eases Knowledge Transfer

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## Abstract

Knowledge stickiness often impedes knowledge transfer. When knowledge is complex and the knowledge seeker lacks intimacy with the knowledge source, knowledge sticks in its point of origin because the knowledge seeker faces ambiguity about the best way to acquire the needed knowledge. We theorize that, given the extent of that ambiguity, knowledge seekers will make a choice to either ask for needed knowledge immediately after deciding it is needed, or wait and ask for it at a later date. We hypothesize that when knowledge is sticky, knowledge seekers will delay asking for knowledge and, in the interim period, use an enterprise social networking site to gather information that can lubricate stuck knowledge, such as how, when, and in what way to ask for the desired knowledge. We propose that by doing this, knowledge seekers can increase their ultimate satisfaction with the knowledge once they ask for it. Data describing specific instances of knowledge transfer occurring in a large telecommunications firm supported these hypotheses, showing that knowledge transfer is made easier by the fact that enterprise social networking sites make other peoples' communications visible to casual observers such that knowledge seekers can gather information about the knowledge and its source simply by watching his or her actions through the technology, even if they never interacted with the source directly themselves. The findings show that simple awareness of others' communications (what we call *ambient awareness*) played a pivotal role in helping knowledge seekers to obtain interpersonal and knowledge-related material with which to lubricate their interactions with knowledge sources.

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Today, it is all but taken as fact that internal knowledge transfer is good for organizations. Research shows that when workers within an organization share knowledge, they are more efficient (Grant, 1996), are more innovative (Hargadon & Sutton, 1997), and make fewer mistakes (Argote, Ingram, Levine, & Moreland, 2000), and the organization, as a whole, is more competitive (Kogut & Zander, 1996). But internal knowledge transfer is often difficult because knowledge is “sticky” (Szulanski, 1996, 2003). That is, knowledge often adheres to particular people and is hard to move to another location without a great deal of effort. Knowledge is sticky because the person who holds the knowledge may be unmotivated to do the work to transfer it to someone he or she does not know well (Hollingshead, Fulk, & Monge, 2002), or may explicitly decide not to transfer it for fear of losing power or status (Brown & Duguid, 2001), or the complexity of the knowledge can simply make it difficult to transfer (Kogut & Zander, 1992). The organization can also unwittingly impede knowledge transfer by making it difficult for individuals to find knowledgeable others (Zack, 2002) or by creating environments that encourage competition among individuals and groups that leads to devaluation of knowledge coming from other parts of the organization (Hansen, 2009). For these reasons, research suggests that knowledge often becomes stuck in a particular place or with a particular person, even when it is in the organization’s best interest for it to move freely.

In this article, we contend that when stickiness exists, knowledge transfer may be made more successful with better social lubrication. If knowledge seekers were more certain about the best way to ask for the needed knowledge, then knowledge might flow more easily among people. We propose that by virtue of helping individuals to access information about how their coworkers understand the knowledge they seek, what projects they are engaged in, and with whom they communicate in the organization, awareness may be increased, and ambiguity created by knowledge stickiness may be reduced, through the use of enterprise social media generally and enterprise social networking sites more specifically. Such awareness may provide just the social lubricant—conversational material about the knowledge source and the knowledge itself—necessary to ease knowledge transfer.

We explore this broad proposition through specific hypotheses that predict how knowledge seekers react when ambiguity surrounds knowledge transfer because knowledge is stuck. First, we explore how ambiguity affects a knowledge seeker’s decision to ask for knowledge right away (immediately after the knowledge seeker decides he or she needs the knowledge) or to delay and ask for it at a later point in time. We theorize that when ambiguity is high, delaying knowledge transfer—not asking for it right away—allows knowledge seekers to avoid potentially unsatisfactory knowledge transfer by giving them time to take action that reduces ambiguity. Specifically, we propose

that if a knowledge seeker uses an enterprise social networking site during the time between when he or she identifies the knowledge source and when he or she asks for the knowledge, the individual can increase awareness and thus reduce ambiguity to ultimately increase satisfaction with knowledge transfer. We test these hypotheses on data about specific instances of knowledge transfer obtained from employees at a large telecommunications firm at which individuals used a commercially available enterprise social networking site for internal workplace communication.

## Theoretical Framework

### *Knowledge Stickiness and Ambiguity Surrounding Knowledge Transfer*

Knowledge stickiness, as identified by prior studies (Brown & Duguid, 2001; Szulanski, 2003), exists along two dimensions. The first dimension concerns the interpersonal relationship between the knowledge seeker and the knowledge source. The second dimension concerns the knowledge seeker's ability to identify, understand, and ask for the knowledge he or she needs. When the interpersonal relationship is strong, and the knowledge is well understood, the knowledge seeker is aware of how to get the knowledge he or she desires, and knowledge flows freely. Yet when these conditions are unfavorable—relationships are weak, and the knowledge is complex—high levels of uncertainty, or ambiguity, exist for the knowledge seeker. Thus, tie strength between the knowledge seeker and knowledge source (a source of interpersonal stickiness) and the complexity of knowledge sought (a source of knowledge-related stickiness) influence a knowledge seeker's decision about whether to ask for knowledge right away or wait to ask for it at a later time and do the work necessary in the intervening period to reduce stickiness.

The strength of the relationship between a knowledge seeker and knowledge source is one important condition for efficient and satisfactory knowledge transfer. A knowledge source who has a relationship with a knowledge seeker will have more trust and less anxiety about whether the knowledge seeker will unfairly take advantage of the knowledge they possess and undermine their power, authority, or clout with it (Jarvenpaa & Majchrzak, 2008; Pentland, 1995). Strong interpersonal relationships are often characterized by positive affect, such that people who like each other are more likely to exchange knowledge and information with each other (Lewis, 2003; Wegner, 1987). Also, knowledge transfer takes time and effort on the part of a knowledge source. He or she has to pause from important work tasks to transfer knowledge to someone who does not have it. Consequently, costs of knowledge transfer accrue to both the knowledge seeker, who initiates transfer, and the knowledge source, who follows through with it. For these reasons, research suggests that strong interpersonal relationships ease the time and effort to transfer knowledge (Hansen, 1999; Reagans & McEvily, 2003).

When relationships are strong, people know each other better and have a good understanding of when and how to approach each other with questions or petitions; consequently, knowledge can be transferred without too much difficulty because the

knowledge seeker faces little ambiguity about how and when to ask for needed knowledge. Of course, no two people agree on everything and share exactly similar tastes. Even people who are good friends often differ from one another in particular beliefs, values, and actions. And even good friends differ in the knowledge they possess. A strong relationship is the mechanism that two people use to reduce the ambiguity surrounding which of their differences matter and which of their differences do not (Ross & Nisbett, 1991) because people who know each other well are able to entrain to other's rhythms and understand not only when their schedules are more burdened or more free, but also when and how to ask them for something in ways that do not seem obtrusive (Kilduff, 1992).

In this way, a knowledge seeker with a strong tie to the knowledge source possesses the conversational material to initiate communication that asks for the desired knowledge, as well as insight about when, how, and under what conditions to ask for the knowledge. Thus, we would expect to see the most effective and satisfactory knowledge transfers occur among individuals with strong social ties; indeed, that is what the research suggests (e.g., Hansen, 1999; Tortoriello, Reagans, & McEvily, 2012). Therefore, we hypothesize that when a strong tie exists between the knowledge seeker and knowledge source, the knowledge seeker will ask for knowledge right away after determining that he or she needs it because ambiguity is low. In such cases, knowledge seekers are certain of how to get the desired knowledge. And because knowledge seekers face greater ambiguity when they identify a knowledge source with whom they have a weak tie, we expect knowledge seekers will be less likely to ask for knowledge right away. In these cases, the knowledge is stuck and the knowledge seeker—at the present—is uncertain about how to dislodge it. Put more formally:

**Hypothesis 1a (H1a):** The likelihood that a knowledge seeker asks for needed knowledge right away is positively related to the strength of the tie that he or she shares with the source.

Another important source of knowledge stickiness can arise from the complexity of knowledge itself (Szulanski, 1996, 2003). Complex knowledge can create ambiguity for the knowledge seeker regarding how to ask for knowledge in a way that gives the knowledge source precise information about what he or she needs. Research shows that knowledge complexity, which is traditionally characterized on a continuum in which the poles of *explicit* and *tacit* represent, respectively, low and high degrees of complexity, plays an important role in whether knowledge transfer will be successful (Argote & Ingram, 2000; Hansen, 1999). Complex knowledge—knowledge that is less codifiable and more *tacit*—is often more difficult to communicate to others (Kogut & Zander, 1992). Transmission of this kind of knowledge requires some level of expertise on the part of the knowledge source to translate the knowledge into a form in which someone else can understand it (Leonardi & Bailey, 2008).

Therefore, when knowledge is complex, the knowledge seeker is uncertain about which questions to ask so that the knowledge source will be more likely to give the knowledge seeker what knowledge he or she wants. Furthermore, research shows that

the knowledge seeker may have limited experience with the desired knowledge, or low absorptive capacity (Szulanski, 1996), which could potentially exacerbate ambiguity about how to ask for knowledge in the best way. Such ambiguity may compel the knowledge seeker to decide not to ask for the knowledge immediately and to think about how and when to ask for it; that is, of course, if he or she can afford to wait some time for it. Yet, when knowledge is simple and codified, the knowledge seeker is aware of the conversational language and semantics to communicate what he or she needs. Knowledge seekers feel that, in that case, asking right away is an appropriate decision. We would, therefore, expect the following:

**Hypothesis 1b (H1b):** The likelihood that a knowledge seeker asks for needed knowledge right away is negatively related to his or her perception of the complexity of the knowledge held by the source.

A knowledge seeker's choice to ask for knowledge right away is driven by his or her assessment of whether knowledge transfer at the present time would be satisfactory. Knowledge seekers will ask for knowledge right away if they have a strong tie with the knowledge source (H1a) or if the knowledge is easily codified (H1b) because they are certain about what conversational material to use to ask for the knowledge effectively (i.e., ambiguity is low and knowledge is not sticky). Therefore, when knowledge is not sticky, individuals will be satisfied with knowledge transfer if they ask right away. When knowledge is sticky due to high ambiguity, however, the knowledge seeker will be less satisfied if they ask for knowledge right away. In other words:

**Hypothesis (H2):** When ambiguity surrounds needed knowledge, the likelihood of satisfactory knowledge transfer is negatively related to the knowledge seeker's decision to ask for knowledge right away.

We have hypothesized that knowledge seekers ask for knowledge right away when (a) tie strength is strong, and (b) knowledge complexity is low because there is minimal interpersonal and knowledge-related ambiguity surrounding knowledge transfer such that it makes sense to ask for knowledge immediately. Knowledge seekers, however, cannot always find a knowledge source with whom they have a strong tie, and they certainly cannot ensure that the knowledge they seek can be easily codified. Under these conditions, what can knowledge seekers do when they have decided they need sticky knowledge?

Of course, a knowledge seeker could, in theory, avoid the stickiness and leverage an indirect tie to contact the knowledge source and hope to gain the knowledge secondarily, or ask a less knowledgeable individual with whom the seeker does have a strong tie. In many cases, however, knowledge seekers cannot reroute knowledge transfer, nor do they want to. In fact, the only reason why issues like stickiness arise is because a knowledge seeker cannot change the source of the knowledge or the knowledge itself without sacrificing the quality of the knowledge they ultimately receive. A knowledge seeker's best option is thus to access the knowledge directly from the

chosen source. Therefore, given this boundary of feasible alternatives, knowledge seekers must choose between two options: to ask for knowledge now (immediately after they decide they need it) or later (after some time has passed between the moment they decide they need it and the moment in which they will ask the source for it).

It is improbable that simply delaying knowledge transfer will change the outcome of knowledge transfer. Knowledge seekers who delay asking for sticky knowledge must also take strategic actions to reduce ambiguity in anticipation of knowledge transfer and, in turn, free stuck knowledge. The key to ambiguity reduction is increased awareness (Weick, 1995). Knowledge seekers must become better aware of what knowledge sources are doing, what their motivations are, when they are available, whether they feel overloaded or free, and how they think about and conceptualize their knowledge if knowledge seekers are to be able to address both the interpersonal and knowledge-related dimensions of stickiness.

### *Ambiguity Reduction Through Ambient Awareness: Using Social Networking Sites*

Given that delaying knowledge transfer necessitates action by the knowledge seeker, which communication medium (or multiple media) is best for alleviating ambiguity in the period between the time when a knowledge seeker decides he or she needs knowledge from a source and the time when he or she asks the source for it? A large body of literature suggests that face-to-face communication or other rich media are most effective when transferring highly ambiguous knowledge, especially knowledge that is related to unanalyzable tasks (Daft & Lengel, 1986; Murray & Peyrefitte, 2007; Rice, D'Ambra, & More, 1998). Yet, media that are effective at helping to actually transfer knowledge from one person to another (like face-to-face communication) are not necessarily useful or essential for alleviating ambiguity in anticipation of knowledge transfer. To lubricate sticky knowledge before knowledge transfer—in the time between the moments when knowledge seekers decide they need knowledge and then decide to ask for it—knowledge seekers must quickly access diverse information about the knowledge source and the knowledge itself, and in turn gain the conversational material that can help them ask for the knowledge in the best way possible. Then, the transfer will come later. Consequently, although research suggests that face-to-face communication is best for transferring knowledge in ambiguous situations, it remains an open question as to which media may be best at enabling the information flow necessary to lubricate stuck knowledge in the time leading up to knowledge transfer.

During the last several decades, organizations have implemented many technologies through which employees expand their awareness of their coworkers' behaviors and communications (see Gross, Stary, & Totter, 2006). Studies have explored how organizations use collaborative editing technologies (Dourish & Bellotti, 1992) or public calendars and schedules (Bodker & Christiansen, 2006) to improve task-related or social awareness, or, in other words, awareness about what people are doing and who they are communicating with. Social networking technologies do this as well. As

Treem and Leonardi (2012) argued, by providing people visibility into the daily communications occurring among their coworkers, enterprise social networking sites are escalating people's awareness of coworkers' activities and availabilities at unprecedented rates. Following Leonardi, Huysman, and Steinfield (2013), we defined enterprise social networking sites as

Web-based platforms that allow workers to (1) communicate messages with specific coworkers or broadcast messages to everyone in the organization, (2) explicitly indicate or implicitly reveal particular coworkers as communication partners, (3) post, edit, and sort text and files linked to themselves or others, and (4) view the messages, connections, text, and files communicated, posted, edited and sorted by anyone else in the organization at any time of their choosing. (p. 2)

As the authors suggested, what differentiates enterprise social networking sites from other communication technologies commonly used in the workplace is that through the use of social networking sites, people can see the communicative activity of their coworkers, even if they are not directly involved with that activity themselves. Ellison and boyd (2013) corroborated this unique aspect of social network sites (but not those used within organizations). They asserted that a user's abilities to access their own and others' public connections, and in turn both produce content for connections and consume content produced by connections, are defining features of enterprise social networking sites.

Consequently, it is easier to become aware of what others in the organization are doing and saying, and when and with whom they are doing and saying those things, when knowledge seekers use enterprise social networking sites than with almost any other kind of communication technology, because such sites enable users to view an aggregate of multilayered and multidirected communications. Therefore, enterprise social networking sites afford users awareness beyond dyadic communication enabled by the telephone or instant messaging, or even broader communication via email in which individuals may see others' interactions but within a limited knowledge and interpersonal domain.

Ellison, Steinfield, and Lampe (2011) have argued that the awareness of other people's activities enabled by the use of social networking sites may allow users of these new technologies to more effectively scaffold their interactions with others. They suggested that by allowing people to see the profiles and communications of their friends, social networking sites act as a "social lubricant" (Ellison et al., 2011, p. 887) for interpersonal relationships. In other words, people who do not know each other very well but can easily view each other's communications and other online activities have more fodder for conversation that allows them to more easily initiate and maintain their interactions with each other. In a parallel way, we believe enterprise social networking sites can provide knowledge seekers with conversational material that will serve as social lubricant to free sticky knowledge.

Consider an example in an organizational setting. Two coworkers do not know each other well, but they can see each other's communications with people throughout the

organization through an enterprise social networking site. One of these individuals may see that his coworker has knowledge about a consultant who was used in the past, and he wants more information about how to have a good working relationship with this consultant. Their relationship is not strong, however, and thus knowledge is sticky. Therefore, there is uncertainty about how to ask for knowledge about the consultant in a way that personally motivates the knowledge source to dedicate the time and energy to explain the desired knowledge. The knowledge seeker could ask for knowledge right away, but that is risky. Alternatively, if the knowledge seeker delays asking for knowledge, then he or she can use the social networking site to get information about the knowledge source's interests in and outside of work, daily schedule, or how helpful he or she is as a colleague. This information is the conversational material that the knowledge seeker can leverage as social lubricant for knowledge transfer when interpersonal stickiness exists.

Similarly, enterprise social networking sites can facilitate a reduction in knowledge-related stickiness. If the knowledge seeker observes the knowledge source's posted files, group membership, and content on their profile, then he or she can gain knowledge about what the knowledge seeker knows more precisely. As before, assuming the knowledge seeker does not ask for knowledge right away, he or she can increase awareness in the interim time period by observing common language and vocabulary, or assessing categories that help compartmentalize the needed knowledge. Then, the knowledge seeker can be certain to ask for knowledge in a precise and specific way that enables the knowledge source to give the seeker exactly what he or she was looking for.

Overall, enterprise social networking sites provide knowledge seekers with two kinds of conversational material that correspond precisely with the two dimensions of knowledge stickiness. Gathering conversational material in the time leading up to knowledge transfer alleviates ambiguity, and in the end, the knowledge seeker can use this conversational material as social lubricant to free stuck knowledge. In this way, the knowledge seeker can transform a situation that would have likely led to unsatisfactory knowledge transfer if the knowledge was asked for right away to one that will more likely be satisfactory, due to the knowledge seeker's choice to delay knowledge transfer and use an enterprise social networking site as a source of social lubrication.

Therefore, delaying knowledge transfer and gathering relevant personal and contextual information have the potential to reduce ambiguity and improve the likelihood of a satisfactory transfer. By virtue of making people's communications visible to third-party observers, social networking sites enable users to develop awareness of what those others know and when and how they work, and that awareness may help to provide the lubrication necessary to reduce the ambiguity surrounding knowledge transfer. If awareness increases, then ambiguity lessens, meaning that knowledge seekers are more confident about how to ask for knowledge from sources. This awareness can serve as lubrication to unstick the knowledge from its place of origin and ease its transfer. For this to work, however, knowledge seekers would need to use the enterprise social networking site to gain awareness of the context in which the knowledge source is situated during the period between the time when he or she decided the knowledge was needed and the time he or she asked the source for it. Put another way:



**Hypothesis 3 (H3):** Frequent use of an enterprise social networking site to reduce ambiguity surrounding needed knowledge between the point when a knowledge seeker decided he or she needed knowledge and when he or she actually asked for it is positively related to the likelihood of satisfactory knowledge transfer.

Thus, enterprise social networking sites offer knowledge seekers a way to increase awareness and reduce ambiguity surrounding knowledge transfer. But what is it about social networking sites that makes them uniquely able to reduce ambiguity regarding knowledge transfer? After all, social networking sites can be used in a similar way to other communication media such as instant messaging and email communication, which we argue do not enable ambiguity reduction. We theorize that the mechanism at play is awareness of the bits and pieces of information communicated by others throughout time, because what distinguishes enterprise social networking sites from those other media is that they provide the capabilities for people to develop ambient awareness through third-party observation (Hampton, Lee, & Her, 2011; Treem & Leonardi, 2012). It would be unlikely that the knowledge seeker gains awareness through an enterprise social networking site by observing communication that contains a concise description of someone's knowledge and the best way to ask him or her for that knowledge. It is much more probable that a knowledge seeker would witness communication that contains some bits of information that can be used, in summation, only to make conversations regarding and requests for knowledge easier.

Thompson (2008) described this phenomenon eloquently in his discussion of ambient awareness enabled by the use of the public social networking site Facebook:

This is the paradox of ambient awareness. Each little update—each individual bit of social information—is insignificant on its own, even supremely mundane. But taken together, over time, the little snippets coalesce into a surprisingly sophisticated portrait of your friends' and family members' lives, like thousands of dots making a pointillist painting. This was never before possible, because in the real world, no friend would bother to call you up and detail the sandwiches she was eating. (p. 46)

The concept of ambient awareness, then, is that communications occurring among others may be merely background noise to any individuals not directly involved in them. But awareness of these ambient communications can help knowledge seekers to encounter the material with which to help them gauge how to approach and ask knowledge sources for desired knowledge. Passive exposure to multiple communications occurring between potential knowledge sources and their communication partners, throughout time, can provide the aggregate material out of which a knowledge seeker can increase awareness and reduce ambiguity. It is this ability of enterprise social networking sites that makes this communication medium uniquely effective for alleviating ambiguity in anticipation of knowledge transfer.

If our claim about the role of ambient awareness holds, enterprise social networking sites should mostly act as a social lubricant for knowledge transfer when individuals are observing others rather than communicating directly with them. To explore the

mechanism through which enterprise social networking sites help knowledge seekers reduce ambiguity (see H3) and to test this assumption that it is through the development of ambient awareness, rather than through direct communication with others, that knowledge seekers become certain about how and when to ask others for knowledge, we offer our final hypothesis:

**Hypothesis 4 (H4):** Frequent use of an enterprise social networking site to gain ambient awareness of the activities of the knowledge source between the point when a knowledge seeker decided he or she needed knowledge and when he or she actually asked for it is positively related to the likelihood of satisfactory knowledge transfer.

## Methods

### *Data Collection*

Data for our study were collected from a mobile communications business unit in a large telecommunications company, TeleMobile, in Lima, Peru. TeleMobile provides infrastructure and technology services to people and organizations in Peru. Diverse knowledge and expertise exist throughout TeleMobile, and thus sharing knowledge among employees is essential for success. Leadership at TeleMobile recently adopted the social networking tool Chatter (see Salesforce.com, 2014). Chatter is an enterprise social networking site for organizations that aims to facilitate communication and knowledge-sharing processes. Similar to other social networking sites, users develop a profile that provides work-related information on individual expertise and projects, as well as newsfeeds that record in-the-moment actions of users. Chatter also possesses social intelligence that recommends relevant people, groups, and files to users. Furthermore, users can “follow” people, files, groups, or other artifacts in the organization.

We focused data collection on TeleMobile employees who possessed at least minimal knowledge about this new tool. Our sample included employees who had—at minimum—an active profile on the Chatter site. We identified the sample through navigation of the Chatter site until a point of saturation at which no new individuals could be identified. Of the 207 employees in TeleMobile’s mobile communications business unit, 81 individuals were registered as users of Chatter at the time of this study and maintained profiles on the social networking site. All 81 individuals were sent an online, anonymous survey that took 45–60 minutes to complete. A total of 78 responses were returned, giving a response rate of 96.3%. A few responses were incomplete, leaving 69 responses (85%) for analysis. The respondents were 38.5% female and 62.5% male, with an average age of 35.5 years. Tenure ranged from 1 year to 15 years, with an average 5.7 years of experience. All respondents had used Chatter for at least 3 months, and more than half of the respondents had more than 6 months of experience with the site.

Our survey broadly gathered information about instances of knowledge transfer when the respondent was the knowledge seeker. The survey asked each respondent to

think of at most five situations in the past year when he or she had asked a colleague “for work-related information, knowledge, or advice.” Each respondent reported an average of 4.7 instances of knowledge transfer, and we had a full sample size of  $N = 326$ . For each instance, respondents were asked to identify the name of the source for this knowledge from a list of predetermined colleagues, who were the same 81 individuals who were sent the survey (and were users of Chatter). The autofill feature of online surveys enabled us to autopopulate a description of the knowledge piece and the knowledge source’s name throughout the survey to ensure clarity.

After the respondent broadly identified cases of knowledge transfer, we then asked more specifically about each instance. Respondents were asked to assess the complexity of the knowledge, their relationship strength with the knowledge source, and their satisfaction with the knowledge transfer. Next, respondents were asked whether they asked for the knowledge immediately after deciding they needed it and discerning who held it, or if they delayed before asking the source for it. This dichotomized the data into knowledge pieces that were obtained immediately and those that were obtained after an interim period ( $N = 193$ ). When respondents reported delaying asking for knowledge, they answered questions about what they did in the interim period. Only for these cases were respondents asked questions about actions they took to alleviate ambiguity in the time leading up to knowledge transfer, which included questions about what media were used, how each medium was used, and how often. Of these 193 instances, a total of  $N = 156$  (80.8%) instances of knowledge transfer included sufficient data to be included in our analysis.

### Dependent Variables

**Overall satisfaction.** Satisfaction with knowledge transfer was calculated as an average of four questions, each of which was assessed on a 5-point Likert scale. The measure was modified from Levin and Cross’s (2004) measure of knowledge seeker–reported usefulness. Our questions asked the knowledge seeker to indicate the degree to which he or she (a) felt the knowledge received was what he or she was looking for, (b) felt the knowledge source was a good person to ask for the knowledge, (c) felt the knowledge was useful, and (d) felt the knowledge improved the quality of his or her work (from 1 = *strongly disagree* to 5 = *strongly agree*). The second and third questions were negatively phrased, and thus reversely coded, to reduce the impact of respondent bias and fatigue. Our four measures were well aligned and gave a Cronbach’s  $\alpha$  of 0.91. A Shapiro–Wilk test revealed nonnormality of the average measure, which violated the regression assumption of normally distributed data. Due to this nonnormality, satisfaction was conservatively dichotomized. Because only response levels 4 and 5 indicated satisfaction (3 = *neutral*), we set levels 1 and 2 as dissatisfied (*satisfaction* = 0), and levels 4 and 5 as satisfied (*satisfaction* = 1).

**Asked right away.** For each instance of knowledge transfer, the respondent identified was asked, “Overall, after you decided you needed knowledge about [description of knowledge sought] from [name of knowledge source], what did you do?” to assess

whether the knowledge seeker asked right away for knowledge or waited before asking (1 = *asked right away* and 0 = *waited before asking*).

### **Independent Variables**

**Knowledge complexity.** Our measure for knowledge complexity paralleled the one used in Hansen's (1999) study of explicit and tacit knowledge transfer, and later used by Levin and Cross (2004). Three questions were asked to assess how codified the knowledge was or could be by asking respondents (a) the degree to which the knowledge was documented (from 1 = *very well documented* to 7 = *not well documented*), (b) the degree to which the knowledge could be explained in writing (from 1 = *all of it* to 7 = *none of it*), and (c) the type of knowledge that actually came from the knowledge source (from 1 = *mainly reports, manuals, documents, self-explanatory software* to 7 = *mainly personal practical know how, tricks of the trade*). The knowledge complexity measure was calculated as an average (Cronbach's  $\alpha = 0.85$ ) of the responses from these three questions.

**Initial tie strength.** We asked knowledge seekers to assess their relationship with the knowledge source "around the day you decided you needed the knowledge source to give you knowledge" to measure the initial relationship strength between the knowledge seeker and source. We measured *tie strength* as the average of emotional closeness and communication frequency (Cronbach's  $\alpha = 0.94$ ), similar to Hansen (1999), Reagans and McEvily (2003), and Levin and Cross (2004). Respondents were asked to indicate to what extent they agree with the statement that they (a) communicated frequently with the knowledge source and (b) had a close working relationship with the knowledge source (from 1 = *strongly disagree* to 7 = *strongly agree*). To reduce the impact of friendship as a potentially confounding effect, our second question explicitly elicited the nature of the workplace relationship by asking if they had a "close working relationship" with the knowledge source. The tie strength was based only on the respondents' assessments; we did not require that the knowledge source corroborate the tie strength.

**Media variables.** Respondents were asked how often they used five different media—*face-to-face*, *instant message (IM)*, *phone*, *email*, and *enterprise network site*—after they made the decision to delay asking for the knowledge. We wanted to assess how these media were used between the moment when the knowledge seeker identified the needed knowledge, and when he or she actually asked for it—not how often knowledge seekers used each medium in general, in the search process, or for knowledge transfer itself. Therefore, we asked respondents to "please answer the following questions about the time between when you decided you needed the knowledge and the time you asked for it." Our questions about media use asked the knowledge seeker how each communication medium was used as directed at the knowledge source by asking him or her to identify to what extent they agreed with a statement that he or she "used [communication medium] to communicate with [knowledge source]" (from 1 = *strongly disagree* to 5 = *strongly agree*). Furthermore, to eliminate possible overlap among media, such as sending a message via an social networking site, questions about IM and email were specifically asked with the parenthetical condition "(not through Chatter)."

*Direct communication.* Given the diversity of communication options among social networking sites, we asked specifically about five different social networking site communication techniques the knowledge seeker might have used during the period between when the knowledge seeker identified the source of knowledge and when he or she asked the source for knowledge. Two of these five methods—sending the knowledge source a private message and commenting on the knowledge source’s activity—involve a clear sender and receiver. These actions represent two different ways that a knowledge seeker could directly attempt to communicate with the knowledge source. Therefore, these two methods were considered *direct communication* methods. Although we do not believe that sending a message privately and commenting publicly are equivalent methods, we expect their use to indicate how much direct communication occurred between when the knowledge seeker identified he or she needed the knowledge, and when he or she actually asked for it. Respondents were asked to indicate how frequently they “sent a private message to [name of knowledge source]” and “comment on [name of knowledge source]’s activity” (from 1 = *very infrequently* to 5 = *very frequently*). The *direct communication* variable was an average of these two values.

*Awareness of ambient communication.* *Awareness of ambient communication*, in contrast to *direct communication*, results from behavior that enables the individual to indirectly observe and gather information about the knowledge source. Knowledge seekers were asked, in addition to the previous two actions, three questions about their ambient behavior. Respondents were asked how frequently they “looked at [name of knowledge source]’s profile,” “followed a group that contains [name of knowledge source],” and “followed a file that [name of knowledge source] also followed” (from 1 = *very infrequently* to 5 = *very frequently*). Like *direct communication*, *awareness of ambient communication* should be considered to have multiple dimensions: Each of the three methods can heighten awareness in different ways (e.g., knowledge-related awareness, interpersonal awareness, or both), rather than each tapping into the same type of general awareness. The *awareness of ambient communication* variable was an average of the three frequency values.

## Analysis

Our analysis used the full sample ( $N = 326$ ) to predict two dependent variables, *overall satisfaction* and *asked right away*, and the subsample of instances of knowledge transfer that occurred after the knowledge seeker chose to wait ( $N = 156$ ) to predict *overall satisfaction*. The dependent variables were all binomial. Therefore, a logistic regression model was used. The logistic regression model accounts for nonnormal errors and makes no assumptions about the distribution of the independent variables. Similar to a standard linear regression, the signs of  $\beta$ -values indicate an increasing or decreasing logistic curve.

A potential problem in our analysis arose because knowledge seekers identified multiple instances of knowledge transfer such that the independent variables,  $X_{ij}$ ,

represented the observed value from the  $j$ th instance of knowledge transfer for the  $i$ th knowledge seeker. Thus, the observations are not independent, which violates a key assumption in a standard logistic regression. To address this concern, we separately accounted for the variation attributed to within-individual characteristics. Each respondent was assigned a random identification number, which we modeled as random effect  $r_i$ . This approach is commonly known as a random-effects model (Snijders & Bosker, 1999; see also Marin, 2004). Our model for the log odds of the dichotomous outcome variable,  $Y_{ij}$ , the outcome associated with the  $j$ th instance of knowledge transfer for the  $i$ th knowledge seeker, is as follows:

$$Y_{ij} = \mu + r_i + \beta X_{ij}$$

In addition to addressing non-independence, random effects for each respondent  $i$  control for any unobserved tendencies within individuals, such as tendencies that arise from demographic factors such as sex or tenure, or simply an individual inclination to be more or less satisfied with knowledge transfer. We performed all analyses in  $R$  using logistic random-effects modeling tools (i.e., the lme4 package). Laplace estimation was used to find maximum likelihood estimates of  $\beta$ -coefficients.

We use two methods to assess goodness of fit. First, we used the likelihood ratio  $\chi^2$  to determine whether our models had significantly better explanatory power than a random-effects, intercept-only model. The value of the  $\chi^2$  test statistic was found using the formula below, in which  $L$  is the likelihood value, *null* represents the intercept-only model, and  $k$  represents our fitted model. The degrees of freedom are the number of parameters in the full model.

$$\chi^2 = -2 \ln \left( \frac{L_{null}}{L_k} \right)$$

In addition to this assessment, we also calculated a pseudo- $R^2$ . The logistic regression model does not support the traditional ordinary-least-squares (OLS)  $R^2$  for assessing fit. Therefore, we used the well-established analog for OLS  $R^2$ , the McKelvey and Zavoina  $R^2$ . McKelvey and Zavoina (1975) proposed this measure for ordinal outcomes, but it can be applied to binary outcomes as well (DeMaris, 2002; Long, 1997). The formula for the McKelvey and Zavoina  $R^2$  is

$$\text{McKelvey and Zavoina } R^2 = \frac{\text{Var}(\hat{y})}{\text{Var}(\hat{y}) + \text{Var}(\varepsilon)}$$

In our case, for a logistic regression, the  $\hat{y}$  represents the estimates given by the logistic model. This approach does not estimate the variance of the error terms but instead assumes a fixed variance based on the logistic curve  $\text{Var}(\varepsilon) = \pi^2/3$ . It is important to note that this analog value does not render an assessment of the amount of variance explained, as in the OLS case, and should be considered only in conjunction with other goodness-of-fit tests, as well as conceptual rhetoric (Long, 1997).

**Table 1.** Means, Standard Deviations, and Correlations for  $N = 326$  Instances of Knowledge Transfer.

Variables	Mean	SD	1	2	3	4
1 Knowledge complexity	4.106	1.696	1.000	—	—	—
2 Asked right away	0.408	0.492	-0.209***	1.000	—	—
3 Initial tie strength	3.009	1.809	-0.113*	0.452***	1.000	—
4 Overall satisfaction	0.670	0.469	-0.115*	-0.223***	0.027	1.000

Two-tailed tests.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

## Results

Descriptive statistics and correlations are reported in Table 1 for all instances of knowledge transfer ( $N = 326$ ) and in Table 2 for all instances for which knowledge seekers chose to not ask for knowledge right away ( $N = 156$ ). Results of the analyses are reported in Tables 3 and 4. For each model, we assessed the variation attributed to heterogeneity among respondents separately. All variance attributed to natural variability among respondents, including typically controlled factors such as age, tenure, and sex, were accounted for through the random-effects approach; thus, they are not included as separate variables in the model. In Tables 3 and 4, we report the remainder of the model, which assesses whether the additional variance (beyond individual variation) that occurs in the model is more or less than what would be expected by chance. For all predictor variables, parameter estimates are shown, with standard errors in parentheses.

As predicted, both the complexity of knowledge itself and the nature of the relationship between the knowledge source and knowledge seeker can generate ambiguity in knowledge transfer. Table 3 shows that *initial tie strength* has a positive, significant impact and *knowledge complexity* has a negative, significant impact on the likelihood that the knowledge seeker would ask for knowledge right away. Thus, the stronger the initial relationship between the knowledge seeker and the source, and the less codified the knowledge, the more likely the knowledge seeker is to ask for knowledge right away. Furthermore, the results equivalently suggest that knowledge seekers are more likely to delay asking for knowledge when relationships are weak and knowledge is complex. These findings are a logical extension of prior research that suggests that weak relationships and knowledge tacitness make knowledge sticky (Szulanski, 1996) and transfer less successful (Hansen, 1999; Reagans & McEvily, 2003) by suggesting that knowledge seekers perceive the level of ambiguity surrounding knowledge transfer and then make a strategic decision to ask right away or delay based on the extent of this ambiguity.

Our second hypothesis sought to measure that, when ambiguity surrounds knowledge transfer, asking for knowledge right away decreases the likelihood that the knowledge seeker is satisfied with knowledge transfer. Table 3 shows that, as expected, *initial*

**Table 2.** Means, Standard Deviations, and Correlations for N = 156 Instances of Knowledge Transfer in Which the Knowledge Seeker Delayed Asking for Knowledge.

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10
1 Knowledge complexity	4.429	1.534	1.000	—	—	—	—	—	—	—	—	—
2 Initial tie strength	2.131	1.140	0.613**	1.000	—	—	—	—	—	—	—	—
3 Overall satisfaction	0.850	0.362	-0.058	0.065	1.000	—	—	—	—	—	—	—
4 Enterprised social networking site	4.190	1.179	-0.090	-0.052	0.324**	1.000	—	—	—	—	—	—
5 Phone	2.140	1.138	0.126	0.095	-0.182*	-0.101	1.000	—	—	—	—	—
6 Instant message	1.690	1.052	-0.117	-0.186*	-0.128	-0.124	0.177*	1.000	—	—	—	—
7 Email	3.100	1.148	0.090	-0.045	-0.070	-0.119	-0.105	-0.053	1.000	—	—	—
8 Face-to-face	2.280	1.417	0.284**	.0349**	-0.043	-0.301**	-0.028	-0.058	0.098	1.000	—	—
9 Awareness of ambient communication	3.220	1.007	-0.147	0.021	0.318**	0.510**	-0.055	-0.143	-0.174*	-0.144	1.000	—
10 Direct communication	4.038	0.826	-0.008	0.007	0.322**	0.781**	-0.136	-0.294**	-0.106	-0.232**	.0428**	1.000

Two-tailed tests.

\*p < .05. \*\*p < .01. \*\*\*p < .001.

**Table 3.** Effects of Ambiguity on Likelihood That a Knowledge Seeker Asked Right Away for Knowledge and on Overall Satisfaction (N = 326).

	Asked right away (Hypotheses 1a and 1b)	Overall satisfaction (Hypothesis 2)
Intercept	-1.063** (0.403)	1.769*** (.492)
Initial tie strength	0.590*** (0.082)	.244** (.086)
Knowledge complexity	-0.269*** (0.082)	-.244** (.082)
Asked right away	—	-1.584*** (.306)
Likelihood ratio $\chi^2$ (df) <sup>a</sup>	70.9*** (2)	32.8*** (3)
McKelvey and Zavoina R <sup>2</sup>	0.3067	0.1476

Standard errors are in parentheses.

<sup>a</sup>Compared with random-effects, intercept-only model.

\*p < .05. \*\*p < .01. \*\*\*p < .001.

*tie strength* positively, significantly predicts and *knowledge complexity* negatively, significantly predicts *overall satisfaction*, as would be expected given prior research (see Hansen, 1999; Kogut & Zander, 1996; Levin & Cross, 2004; Reagans & McEvily, 2003). Table 3 also shows that *asked right away* negatively predicts the likelihood that the knowledge seeker is satisfied with knowledge transfer. This supports H2’s claim that asking for knowledge right away when ambiguity is high reduces the likelihood of satisfactory transfer. But this result also suggests that asking for knowledge right away reduces the likelihood that the knowledge seeker will be satisfied with knowledge transfer even when ambiguity is low. This suggests that at all levels of *initial tie strength*



**Table 4.** Effects of Media Choice and Communication on Overall Satisfaction of Those Who Delayed Asking for Knowledge ( $N = 156$ ).

Intercept	0.817 (1.699)	-2.209 (2.301)
Initial tie strength	0.357 (0.303)	0.266 (0.296)
Knowledge complexity	-0.153 (0.213)	-0.069 (0.216)
Phone	-0.410 (0.227)	-0.355 (0.224)
Instant message	-0.157 (0.246)	-0.015 (0.250)
Email	-0.163 (0.238)	-0.031 (0.245)
Face-to-face	0.039 (0.203)	0.040 (0.201)
Enterprise social networking site	0.684*** (0.202)	
Awareness of ambient communication		0.719* (0.345)
Direct communication		0.663 (0.350)
Likelihood ratio $\chi^2$ (df) <sup>a</sup>	20.7(7)**	24.9(8)**
McKelvey and Zavoina $R^2$	0.2660	0.3157

Standard errors are in parentheses.

<sup>a</sup>Compared with random-effects, intercept-only model.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

and *knowledge complexity*, the knowledge seeker will decrease his or her likelihood of satisfaction by asking for knowledge right away, and this further implies that delaying transfer and taking action to reduce ambiguity may remedy this problem.

Given that knowledge seekers take strategic steps to avoid knowledge transfer in situations of high ambiguity, what actions do they take after they chose to delay asking for knowledge? The knowledge seeker cannot simply wait and sit idly by in the time between identifying the knowledge source and the time he or she asks for knowledge. The knowledge seeker must choose a quick and effective method to increase awareness and alleviate existing ambiguity in anticipation of knowledge transfer. Because our final hypotheses explore actions taken by knowledge seekers who chose to delay asking for knowledge, the remaining analyses uses only the subsample of knowledge transfers ( $N = 156$ ) involving those who did not ask for knowledge right away. The results are presented in Table 4.

In the final two analyses, we chose to include, as controls, the two known predictors of satisfaction with knowledge transfer—*identify tie strength* and *knowledge complexity*—that had a significant impact on the full sample of all instances of knowledge transfer.

Table 4 shows that, for the sample of knowledge seekers who did not ask for knowledge right away, of the five media we tested (*phone, email, instant message, face-to-face, and enterprise social network site*), only *enterprise social network site* was significant and positive. This suggests that, in support of H3, the enterprise social networking site was the only medium—when used in the short time between when the knowledge seeker identified the knowledge source and when he or she asked for the knowledge—that increased the likelihood that the knowledge seeker was satisfied with transfer. Furthermore, neither *identify tie strength* nor *knowledge complexity* had a significant impact on the likelihood of satisfactory knowledge transfer.

Importantly, the finding that only enterprise social networking sites play a significant role in alleviating ambiguity in anticipation of knowledge transfer does not conflict with existing research that all individuals in organizations, including knowledge seekers, use multiple media to improve relationships and develop knowledge (Haythornthwaite, 2002), but instead supports the idea that successful outcomes arise when communication media support the task at hand (Daft & Lengel, 1986; Treem & Leonardi, 2012). Enterprise social networking sites have unique capabilities that allow knowledge seekers to aggregate knowledge-related and interpersonal information that can serve as conversational material to alleviate ambiguity surrounding knowledge transfer. In this way, among those knowledge seekers who chose to delay asking for knowledge, the more often they used enterprise social networking sites to communicate with the knowledge source in that interim period, the more likely they were to be satisfied with knowledge transfer. Furthermore, the results suggest that the initial, potentially detrimental effects of low tie strength and high knowledge complexity are neutralized by the action taken by the knowledge seeker.

Also importantly, this finding does not suggest that knowledge search or transfer are best accomplished via social networking sites, but only that enterprise social networking sites are uniquely equipped to help knowledge seekers gain bits and pieces of information that provide enough lubrication to unstick the desired knowledge. If we combine this finding with prior research that face-to-face communication is best for accomplishing ambiguous tasks (Hiltz et al., 1986; Rice et al., 1998; Van Over & Kinney, 1990), then the relationship between enterprise social networking sites and face-to-face communication for anticipated knowledge transfer in which ambiguity exists may be best described by Nohria and Eccles (2000): “Electronically mediated exchange can help in enabling information flows useful for mobilizing actions, but face-to-face interaction is vital to actually taking action” (p. 1669). Social networking sites help knowledge seekers to gather information about the knowledge source and the knowledge itself in anticipation of knowledge transfer, but when a knowledge seeker asks for knowledge, doing so face-to-face is likely to be best to ensure the knowledge seeker can effectively use the gathered information as social lubrication.

Theoretically and intuitively, we have argued that enterprise social networking sites can uniquely alleviate ambiguity around impending knowledge transfer, and in the final step to our analysis we aimed to assess if our hypothesized mechanism—awareness of ambient communication—was significant at increasing satisfaction with knowledge transfer. The variety of communication options available on social networking sites is

one of the many benefits of its use, and as a result, social networking sites can be used to communicate in ways comparable to email or other dyadic communication. Therefore, we wanted to ensure that knowledge seekers were in fact using enterprise social networking sites—not direct communication—to alleviate ambiguity as theorized (i.e., to gather small bits of information through third-party observation).

For the final model, we removed *enterprise social networking site* and replaced it with its two components: *direct communication* and *awareness of ambient communication*. The findings presented in Table 4 show that, as expected, *awareness of ambient communication* has a positive, significant impact on the likelihood of *overall satisfaction*, whereas *direct communication* is not a significant predictor. Again, tie strength and knowledge complexity had no impact on knowledge transfer outcomes for those who delayed asking for knowledge. This suggests that the more often knowledge seekers gathered information about the knowledge source by looking at his or her profile, joining a mutual group, or following the same files, the better the knowledge seeker was able to develop an awareness about the knowledge source and the knowledge itself, and overcome known sources of ambiguity such as tie strength and knowledge complexity.

## Discussion

At the beginning of this article, we explained that because knowledge is sticky, knowledge seekers face uncertainty or ambiguity about how to ask for needed knowledge when knowledge is complex and when the relationship between the knowledge seeker and source is weak. In these situations, we expect that knowledge seekers often give their best efforts to procure the knowledge they need. Therefore, we hypothesized that interpersonal stickiness, deriving from low tie strength, and stickiness deriving from highly complex knowledge both reduce the likelihood that a knowledge seeker will ask for knowledge right away. After all, research suggests that asking right away in these circumstances is unlikely to lead to desirable outcomes (Hansen, 1999; Levin & Cross, 2004; Reagans & McEvily, 2003). We further hypothesized that asking right away would lead to satisfaction when ambiguity was low but not when ambiguity was high. Our analysis supported this hypothesis and further showed that delaying asking for knowledge helped increase satisfaction with knowledge transfer even when ambiguity was low. A possible explanation for this result may be that delaying asking for knowledge is an indication that the knowledge seeker is strategic and careful when asking for knowledge, and this attentiveness may lead to more satisfactory transfer.

We did not assume that delaying asking for knowledge alone could help the outcome of knowledge transfer. We hypothesized that, in between the moment knowledge seekers decide they need knowledge (and decide from whom they should get it) and the moment they ask a knowledge source for it, use of an enterprise social networking site could help knowledge seekers overcome two dimensions of knowledge stickiness: interpersonal stickiness and knowledge-related stickiness. We found evidence that social networking sites enabled knowledge seekers to gather information about the knowledge itself and about the person who holds it. This is made possible by the fact

that enterprise social networking sites make other peoples' communications visible to casual observers such that knowledge seekers could ascertain more about the knowledge and its source simply by watching the source interact with others through the technology, even if they never interacted with the source directly themselves. In other words, through observation of a knowledge source's actions, knowledge seekers could increase awareness about how to interact with the source in appropriate ways to ease knowledge transfer.

Furthermore, for those who delayed knowledge transfer, after we control for the action taken by the knowledge seeker in anticipation of knowledge transfer, the impact of knowledge complexity and tie strength on knowledge transfer was no longer significant. This finding suggests that sources of ambiguity in knowledge transfer—such as high knowledge complexity and low tie strength—can potentially be overcome if knowledge seekers take action in anticipation of knowledge transfer. An alternative explanation is that in the interim period, some or all knowledge seekers are increasing tie strength and their absorptive capacity. We believe that significant changes to either would require more time and effort than delaying before asking for knowledge would allow; however, understanding the possible role of communication media for improving tie strength or increasing absorptive capacity before knowledge transfer should be explored in future research.

Finally, we hypothesized that simple awareness of others' communications (what we call *ambient awareness*), and not direct communication, helped knowledge seekers to obtain the conversational material with which to lubricate their interactions with knowledge sources. We found evidence that ambient awareness, and not direct communication on social networking sites, was what knowledge seekers who delayed asking for knowledge effectively used to equip themselves with social lubricant—both interpersonal and knowledge-related conversational material—to free stuck knowledge.

Overall, the findings of this study suggest, in line with prior research (Ellison et al., 2011), that social networking sites may act as a social lubricant, helping people become better aware of the activities of those in their network. Ambient communication on social networking sites aggregates in a way that allows knowledge seekers to gather conversational material relevant to the knowledge source, such as how to ask, when to ask, or what can simply get the conversation going for knowledge transfer, as well as to the knowledge itself, such as what language to use when asking for knowledge, and what questions precisely should be asked for knowledge transfer, to lubricate knowledge transfer and thereby stop knowledge from sticking in its place of origin. These findings have implications for established theory about organizational knowledge transfer and for emerging theory on the role of social technologies in the workplace.

The findings of studies on the problem of stickiness in knowledge transfer often conclude, descriptively, that a particular level of relationship strength (a strong tie or a weak tie) or a particular type of network structure (a dense network or a sparse network rich in structural holes) is most effective for the transfer of a particular kind of knowledge (tacit knowledge or explicit knowledge). These studies seem to suggest that if a person does not have the right type of relationships or the right type of

network, he or she may not be able to acquire the needed knowledge (Hansen, 1999; Reagans & McEvily, 2003; Tsai, 2001). Other studies are more prescriptive, arguing that organizations can overcome knowledge stickiness by properly incentivizing the knowledge source to share what he or she knows with others and by creating the right kinds of organizational structures and procedures that reduce the barriers among individuals in the organization and, consequently, encourage knowledge to flow more freely among departmental, divisional, and geographic boundaries (Hansen, 2009; Szulanski, 2003). These solutions ignore the role that a knowledge seeker can play in helping to lubricate knowledge transfer. Our findings suggest that knowledge seekers can play an important role in ensuring their own satisfaction by asking the right questions at the right time, essentially making it easy for the knowledge source to transfer knowledge to them, a notion not yet explored by research on knowledge sharing in organizations.

To further explore the role of knowledge seekers in knowledge transfer, scholars must reposition knowledge seekers as important actors in the knowledge transfer process. To improve knowledge transfer outcomes, knowledge seekers in our study exhibited caution. Previous research found that cautious knowledge seekers reflected mistrust or a lack of motivation (Levin & Cross, 2004), which in turn hurt knowledge transfer outcomes. Yet knowledge seekers in our sample who exhibited caution facilitated knowledge transfer. Thus, caution may be part of a larger, social-cognitive process in which knowledge seekers assess the ambiguity that surrounds knowledge transfer and in turn do not simply ask right away when conditions are unfavorable.

In conjunction, knowledge seekers in our study were also strategic. Knowledge seekers increased their own satisfaction by, in the time leading up to knowledge transfer, gathering conversational material to serve as social lubricant for freeing sticky knowledge. The ability of knowledge seekers to neutralize the negative effects of ambiguity suggests, in line with relational psychology research (Fiske, 1992), that like all people, knowledge seekers engage in social cognition when they assess relationships and use communication techniques to overcome social obstacles. Therefore, our findings suggest that organizational scholars, as well as managers in organizations, should consider the agency of knowledge seekers in general, and specifically the potential of cautious and strategic action on the part of knowledge seekers to improve their own satisfaction with knowledge transfer.

The findings also contribute to the emerging literature on the role that social networking sites play in the workplace. Studies of social media use within organizations (and of social networking sites in particular) largely explore the profile of people's social networks created and maintained on enterprise social networking sites (DiMicco et al., 2008), the way that these technologies promote collaboration on projects (McAfee, 2009), and how these technologies help people to find the knowledge and information they need to complete their work tasks (Jarrahi & Sawyer, 2013). We are unaware of any studies that have considered whether social media broadly, and enterprise social networking sites specifically, can be used to improve satisfaction with knowledge transfer within the organization. The findings of this study suggest that this benefit is possible.

Our study did not directly assess the ambient awareness of knowledge seekers, but instead measured media usage behaviors to represent how the knowledge seeker collected interpersonal and knowledge-related information that contributed to awareness. Yet our findings suggest the important relationship between awareness and social networking sites, and future research could advance theory and empirical methods to assess ambient awareness and the behaviors that contribute to it. Furthermore, we do not know from our study whether the requested knowledge itself was transferred through the enterprise social networking site. We believe, however, that our findings could be used in future research in conjunction with research that explores the best communication medium for knowledge transfer itself. Particularly, our study suggests that social networking sites are best for information flow in anticipation of an action such as knowledge transfer, but other media, namely face-to-face communication, may be best when taking action (Nohria & Eccles, 2000). In addition, our study did not explore whether enterprise social networking sites are effective media for knowledge seekers to actually improve their relationship with the knowledge source or develop a greater absorptive capacity throughout time. What we do know, however, is that conversational material about the knowledge source and the knowledge itself can serve as social lubricant, which was shown to be sufficient to free stuck knowledge.

## **Conclusion**

The goals of this study were twofold. First, we explored whether perceived stickiness can affect a knowledge seeker's decision to ask for knowledge right away, or to delay and ask for knowledge at a later time. Second, we explored whether use of enterprise social networking sites for those who delay asking for knowledge could help knowledge seekers unstick sticky knowledge. Our study showed that knowledge seekers do delay asking for knowledge when they are uncertain they can effectively unstick knowledge from its place of origin, and that enterprise social networking site use was the only significant communication medium that enabled knowledge seekers to alleviate this uncertainty, or ambiguity, in knowledge transfer. Our results indicate that simple awareness about the knowledge source and the knowledge itself can reduce ambiguity and provide the lubricant necessary to ensure that knowledge does not stick to its point of origin. Future research may want to explore, to a greater extent, what knowledge seekers understand about how to make transfer successful and, in addition, how they translate understanding into strategic action.

In addition, future research on social networking sites may want to explore how this medium can facilitate knowledge transfer in organizations. As other studies have shown, enterprise social networking sites do not appear, at first glance, to be superior to other communication technologies in their ability to help dyads communicate more effectively. As our study showed, however, they do appear to be superior to most other communication technologies at helping people ascertain information about the communications among others. The simple—even mundane—use of enterprise social networking sites in between when knowledge seekers identified the source of knowledge and when they asked for the knowledge had a positive, significant impact on

the outcome of knowledge transfer. Knowledge transfer is undoubtedly a complex organizational process, fraught with uncertainty and obstacles. Yet, as our findings suggest, not all solutions are equally complex. Simple awareness of a knowledge source's actions and communications on enterprise social networking sites can go a long way to helping knowledge seekers feel more satisfied with the knowledge they receive.

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