TRUSTING SOCIAL LOCATION TECHNOLOGIES AND INTERACTIONS

Research-in-Progress

Paul Russo
Polytechnic Institute of
New York University
Room 401, Dibner Building
Six Metrotech Center
Brooklyn, NY 11201
prusso@poly.edu

Oded Nov
Polytechnic Institute of
New York University
Room 401, Dibner Building
Six Metrotech Center
Brooklyn, NY 11201
onov@poly.edu

Abstract

Social networks provide rich opportunities to interact with friends and other members. While research on motivations and interaction design help explain what makes online communities successful, the influence of trust on social location technologies and interactions that integrate online and off-line activities remains unclear. Drawing from research on information systems, social psychology, and social networks, we identify the drivers of users' trust in social location artifacts and other subscribers. We will test our hypotheses on Facebook's Places application by connecting surveys to actual usage data. We expect trust in the artifact to depend on usability, situation normality, perceived critical mass, and referrals from trusted sources. We also hypothesize that trust beliefs toward other users—split into friends and everyone else—will depend on instinctive feelings of trust, rationalizations that others won't do harm, and structural assurances. Implications for theory and practice as well as limitations and future work are discussed.

Keywords: Online communities, Social networks, Trust, Online trust, ICT artifact, Adoption, online/offline activities, Location technologies, Facebook Places

Introduction

The last decade has witnessed a dramatic expansion in the use of social computing technologies designed for enabling social interactions between networks of users—some may be friends, others not (Kolko 2010). These types of technology-mediated social participation (Pirolli, Preece, and Schneiderman 2010) bring together people one-on-one and into communities of individuals based on shared interests and friendships. However, users are often asked to risk sharing personal information, such as family photographs or relationship interests, with a network of other users many of whom they are likely never to meet; likewise, participants are encouraged to act on the invitations or advice of other people as they might in response to user friendship requests or product reviews, respectively. One emerging class of social technologies depends on users sharing their location online (Junglas and Watson 2008). Often, location sharing is a private transaction between the user and a trusted service provider, for example, searching for directions on the mobile version of Google Maps in which users may "allow" Google to know their current location. But in other cases, location-sharing applications such as FourSquare, a popular mobile social networking platform, divulge one's whereabouts to a group of people or even to the public with the intention of combining online with off-line activities.

While it is clear how these technology-mediated social interactions can be a source of spontaneity and community, the risks involved are equally obvious. The press is filled with stories of trusting individuals who share their whereabouts on the Web, only to return home to find they are the victims of crime (CBS News 2010); similarly, those who show up for events or gatherings publicized via location-sharing technologies may be surprised to find that the individual extending the invitation is not who he or she claims to be. There are other complications, for example, concerns about privacy . With a network of other users involved, less clear kinds of social calculus emerge, making it unclear with whom and when a user intends to share his or her location. This raises questions about the perceived difference between one's friends and the community-at-large, and whether or not all friends are the same?

Previous studies show that social network subscriber behaviors are situational, varying from community to community, and are influenced by others (boyd and Ellison 2008; Erickson et al. 2010). Therefore, we investigate why social network users trust social location technologies—specifically, the artifact—as well as the other network subscribers who they make themselves vulnerable to by participating in the combined online/off-line interactions that these technologies promote (Lo and Riemenschneider; Vance et al. 2008).

Our study seeks to answer the following questions:

1. How do a social network user's trust beliefs in a social location technology artifact and in other network users—friends and everyone else—influence his or her intentions to participate in specific interactions mediated through technology?
2. What are the antecedents of these two sets of trust beliefs?

To answer these questions, we examine adopters of Facebook's new "Places" application (Figure 1). Launched in fall 2010, Facebook Places asks users to share their location, who they are with, and what is happening around them by "checking in" so that friends, or even the entire network of Facebook users, can join in the fun.

In addition to extending our theoretical understanding of privacy and online communities, interaction designers and community managers will benefit from understanding why people trust social location technologies and interactions with other network users—on and off-line. This knowledge will not only allow the creation of better websites but also the preservation of the safety of users.

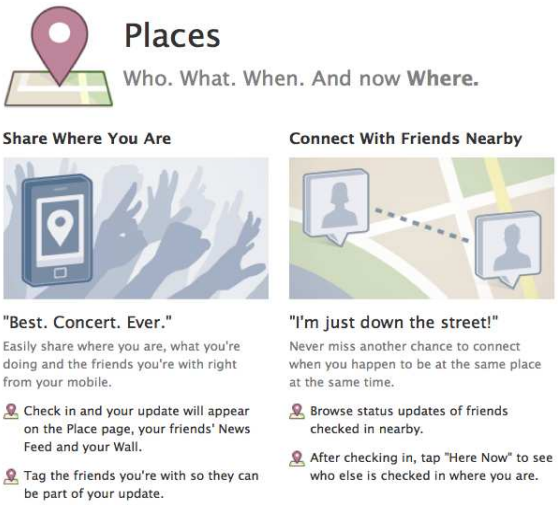

Figure 1. Description of Facebook Places (Facebook Website$_a$ 2011)

The next sections discuss related literature and opportunities for this study to contribute, followed by the details of our theory development. The remaining sections outline our research method, implications for theory and practice, as well as limitations and future research opportunities.

Related Literature

Trust stems from a human need to understand the behavior of others in their social surroundings (Gefen et al. 2003). It reduces social complexity in the face of risk and uncertainty, where the environment is not well understood. The literature on trust spans a number of academic disciplines including psychology (Rempel et al. 1985; Worchel 1979), sociology (Gambetta 1988; Lewis and Weigert 1985), and organizational behavior (Mayer et al. 1995; Tyler and Kramer 1996), often leaving conflicting concepts that make trust difficult to define (Rousseau et al. 1998). Kramer (1999) defines trust as "a state of perceived vulnerability or risk that is derived from individuals' uncertainty regarding the motives, intentions, and prospective actions of others on whom they depend," keeping the focus on the trustor. Other scholars view trust in terms of the character or "trustworthiness" of the individual being trusted; namely, his or her competence, good will, integrity, and predictability (Butler 1991; Gabbaro 1978; Jarvenpaa et al 1998; Mayer et al. 1995). Recently though, McKnight et al. (2002) set us on solid footing by providing a theoretically derived and empirically validated collection of trust measures, many of which we employ in this study.

Interpersonal relationships depend on trust to facilitate interaction (McAllister 1995). In the same way, communities and social networks rely on trust to undergird shared spatial relations and interactions that are necessary for the spontaneous sociability inherent in social location technologies (Fukuyama 1995; Mynatt et al. 1997). We posit that trust—defined as a willingness to be vulnerable to another party based on a set of trustworthiness beliefs about his or her benevolence, integrity, competence, and predictability (Gefen et al. 2003; Jarvenpaa et al. 2000; Mayer et al. 1995; McKnight et al. 2002)—allows people to interact and take action when they lack information about the potential risks of doing so. On the Internet, trust is critical due to the complexities that come with physical separation and the introduction of, often emerging, technological artifacts. Likewise, social cues may be different than in the physical world, making it necessary to explore more deeply who or what is to be trusted online and the antecedent conditions of that trust.

Objects of Trust

Often the trust literature speaks about interpersonal trust or the trust between people (Boon and Holmes 1991; Kramer 1999). However, O'Leary et al. (2002) extend the idea of people as objects of trust to include individuals, groups, organizations, institutions, and systems. Furthermore, and central to this study, Actor Network Theory (Latour 1997) suggests that nonhuman entities also have agency and are responded to in ways that mirror traditional human interactions, thereby raising the question of whether or not nonhuman actors can be objects of our trust. The literature contains conflicting view on this notion.

Scholars propose several possible targets of trust on the Internet, including the e-commerce provider, the information system itself ("the artifact"), and other users. Gefen et al. (2003), McKnight (2002), and Ou et al. (2010) provide ample evidence that trust beliefs in the online vendor play a critical role in predicting an individual's intention to purchase and share critical information with the seller. In a series of five experiments, Nass et al. (1997) illustrate how people interact socially with machines while at the same time are unaware that they do so. However, Kiesler and Sproull (1997) argue that these behaviors may be the result of misplaced feelings and that they depended heavily on the degree to which the technology's interface reflected human personas. Overall, whether technology artifacts lacking any human character can be objects of trust remains unresolved (Gefen et al. 2008). Our findings would add empirical validation that social location technologies, a unique type of technology artifact that exhibits no human characteristics, can be an object of trust.

Dwyer et al. (2007) raise a critical question about trusting behaviors on the Internet when other users are involved. "Is it possible to join a social network of millions of people and be able to trust all of them?" Their results suggest that perceived trust is not always critical in establishing online friendships, but that for some sites, trust is necessary for particular actions to take place. We contend that when online and off-line activities are combined, trust in other members is essential for participation. In the case of online

communities, and in particular, social location interactions, the network—a user's immediate circle of friends and the broader online community—might now be an object of trust. Dwyer and her colleagues' survey-based study was limited to 117 users divided in a comparison of two social networks, or about 60 subjects per social network. Besides a small sample set, unfortunately the two items measuring trust in other members yielded an alpha value of 0.148, and therefore had to be split into two single item constructs. These issues suggest the need to reexamine the network of users as an object of trust. Our study would provide evidence based on actual usage data that the network of other users can be an object of trust.

Antecedents of Trust on the Internet

Early research on e-commerce, which often focuses on trust in online vendors, has shown that trust comes from five sources: personality, cognition, knowledge, calculation, and institutional structures (Awad and Ragowsky 2008; Choudhury and Karahanna 2008; Erickson et al. 2010; Gefen et al. 2003; McKnight et al. 2002). Personality-based trust forms from positive experiences early in life and results in a general tendency to trust others regardless of situational context (Rotter 1967). Similarly, cognition-based trust depends on rationalizations and assumptions before the trustor has first-hand experience with the trust target (Lewis and Weigert 1985; Meyerson et al. 1996). Conversely, knowledge-based trust results from direct experience, and once gained, typically dominates trust decisions (Lewicki and Bunker, 1995). In calculative-based trust, people expect that from a cost-benefit perspective, it is not worth it for others to take advantage of them (Dasgupta 1988; Williamson 1993). And even should another person wanted to cheat, institution-based trust helps individuals to discount risk because they believe there are guarantees, safety nets, or other third-party structures in place (Shapiro 1987; Zucker 1986) to protect them from harm.

Not all sources of trust are rational. Researchers have long identified the influence of emotion and affect on trust in social relationships (Chua et al. 2008; Kramer 1999; McAlister 1995; Tyler and Kramer 1996). Trust is often more an emotional reaction than thought-out decision; more heart than head. Trust depends on a perceived emotional bond and the intrinsic value of the relationship between the trustor and trustee (Lewis and Weigert 1985; Morrow et al. 2004). Fine and Holyfield (1996) posit that trust emerges from a complex intermixing of culture, emotion, and social interactions so that people experience emotional and instinctual feelings of trust towards other individuals and communities alike.

In the e-commerce literature, Gefen et al. (2003) and others argue that emotions do not factor in trust. While this is reasonable for (at least some) economic transactions, there is alternative evidence suggesting that affect is important in brand selection and rejection (Chaudhuri and Holbrook 2001). In addition, the personal and communal nature of online social networks (boyd and Ellison 2008), and interactions where users risk meeting up face-to-face, should indeed be different from shopping sites. Our research would contribute by combining traditional trust antecedents with affective influences to create a comprehensive set of trust predictors for social location technologies.

With an emergent technology such as location-based artifacts, the design and use characteristics of the technology can have a strong influence on user beliefs and intentions to use it (Gefen et al. 2003; Karahanna et al. 1999; McKnight et al. 2002). In particular, usability—defined as a user's perception that a technology is efficient, error free, and easy to navigate (Nielsen 1994)—promotes trustworthiness. For example, McKnight el al. (2002) find a direct relationship between perceived website quality and initial trust formation. Similarly, Hampton-Sosa and Koufaris (2005) and Flavian et al. (2006) show that a website's appeal and usability lead to increased trust in the provider.

For online social interactions and the technologies that make them possible, other people can be a source of trust through what they say and do. Social network theory provides a way of understanding how our relationship with others affects our choice to trust some people (Granovetter 1973; 1983). Uzzi (1997) demonstrates the importance of third parties in the development and diffusion of trust; trust was less a calculation of risk and loss but more the presumption that potential partners were honest if a trusted contact said so. In their study of online banking, Kim and Prabhakar (2004) began the effort to integrate rational antecedents of trust with word-of-mouth referrals. However, they do not include online feedback mechanisms, which are a unique opportunity to leverage the Internet's large-scale, word-of-mouth capabilities (Dellarocas 2003) that include inputs from individual users, experts, and aggregate ratings.

Individuals can similarly endorse a product or service by using it themselves. Leibenstein (1950) writes about the bandwagon effect where people join in an activity because others have done so. Further, the

actions of crowds or a perceived critical mass can inspire trust (Hsu and Lu 2004). The online gaming literature has demonstrated that users value the actions of other users and trust sites more when a perceived critical mass joins in (Hsu and Lu 2004). To the best of our knowledge, existing studies of trust in technology artifacts do not integrate antecedents related to artifact characteristics with antecedents of a social nature. Our study would contribute by integrating trust antecedents related to perceived properties of the technology artifact, referrals from other sources, and a perceived critical mass of other users.

Research Model

Both the Theory of Reasoned Action (TRA) (Fishbein and Ajzen 1975) and the Theory of Planned Behavior (TBP) (Ajzen 1991) posit that beliefs about a behavior have been shown to precede the intentions to perform that behavior, and intentions, in turn, lead to actual behaviors. And, both have been shown to hold true in a number of contexts. Most relevant for the current work is the use of TRA and TBP in explaining how a user's positive beliefs toward a technology lead to it's acceptance (Venkatesh and Davis 2002; Venkatesh et al. 2000). Gefen et al. (2003) and McKnight et al. (2002) demonstrate the relevance of trust beliefs in a user's decision to perform specific actions with a vendor when shopping online.

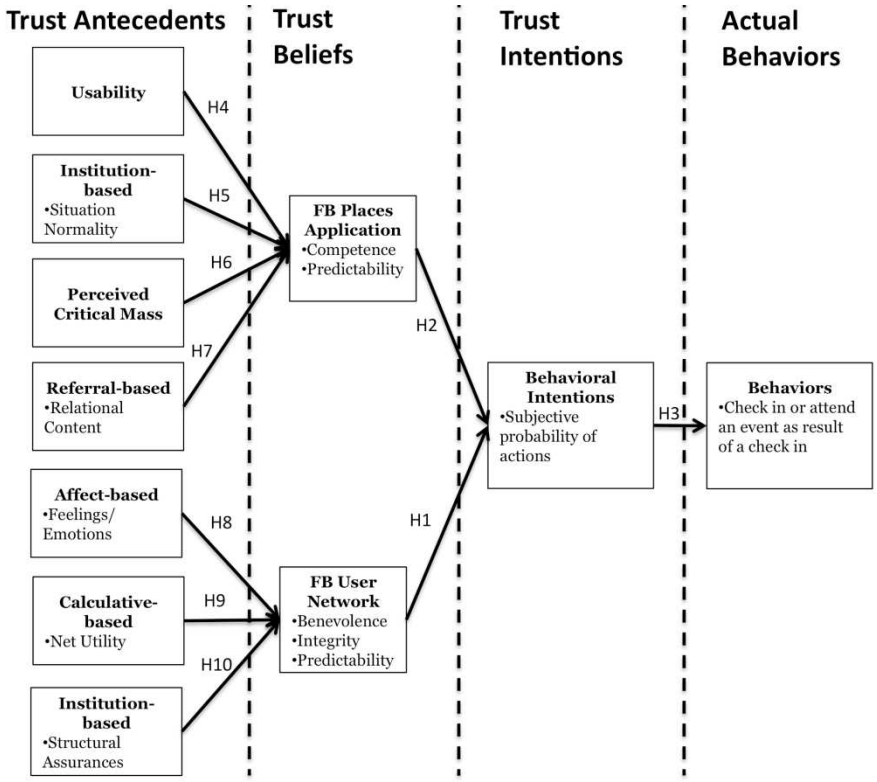

Figure 2. Research Model

Figure 2 tells a simple story. Social network subscribers might trust and intend to use an emerging social technology based on beliefs in its trustworthiness and in the trustworthiness of its users. Given that social location technologies are new, users develop and maintain trust in the technology artifact based on its usability (if it is efficient, easy to learn and use, and operates with out errors). As importantly, the new technology must be perceived as acting normally and as expected, or else risk losing the trust of its subscribers. In addition, trust in the technology artifact can come from other people, i.e., through a positive referral or by demonstrating trust vis-à-vis using it themselves. If an individual perceives that a sufficient number of other people use a technology, then it must be trustworthy by default. When it comes beliefs in the trustworthiness of other network subscribers, users depend on their emotions and instincts as well as rationalizations that there is no net value for these others to "cheat the system." Moreover, trust in other users depends on the perception that there are safeguards in place to stop them even if these other users are ill intentioned. Below we provide the theory that led to our hypotheses.

The literature provides several interesting definitions and frameworks for conceptualizing trust. In a study of consumer trust in an Internet store, Jarvenpaa et al. (2000) define trust as the "ability and the motivation to reliably deliver goods and services of the quality expected by the consumer" (p.47). Riegelsberger et al. (2005) generalize this definition into a set of contextual and intrinsic properties where context is determined by a trustee's temporal, social and institutional embeddedness with a trustor and their relationship. Intrinsic properties include an actor's ability, motivations based on internalized behavioral norms, and his or her benevolence. These frameworks can be helpful in explaining trustworthy

behavior. And while these models may be appropriate for future investigations, here we follow McKnight et al. (2002) and Gefen (2003)—where perceived benevolence, integrity, competence, and predictability of the network influence perceptions of trustworthiness—because the latter models provide a logical basis with wide empirical support on which to compare and critique our theoretical extensions.

In online and off-line relationships, people depend on communities and individuals for friendship, emotional support, entertainment, information sharing and advice; just to name a few things. This dependence often requires one party to trust another when their mutual engagement contains risks and uncertainty. Because social network technologies depend heavily on interactions between users, possibly both on- and off-line, we posit that a user's beliefs in the trustworthiness of other social network subscribers influence his or her intentions to use the technology. Likewise, because many online social networks allow users to segregate interactions between various groups requires our model to separate the network into two distinct trust targets: a user's friends and the social network as a whole (Lo and Riemenschneider 2010). We also hold that users may trust these two entities differently, and the difference may be exacerbated if in-person meetings with strangers are possible. **(H1):** *The more a social network user trusts others in the network, the stronger his/her intentions will be to use the technology.*

Like Vance et al. (2008) and Gefen et al. (2008), who suggest that technologies and software applications can be objects of trust, we hold that beliefs in the trustworthiness of a technology lead to increased intentions to use that technology. Unlike Actor Network Theory, (Latour 1997), Chopra and Wallace (p. 5) posit "social relations are directed toward the technology itself, rather than the human behind the technology." Recognizing that social location technologies lack human character and is not a moral actor (Riegelsberger et al. 2005), we exclude the traditional subconstructs of trustworthiness that relate purely to interpersonal relationships. Therefore in our model, trust in the technology is rooted in technical competence and predictability. In initial interviews, subjects suggested that they do not think about technologies as caring or honest. Unlike in Nass et al. (1997), our subjects ascribed these properties to the provider. **(H2):** *As beliefs in a social location technology's trustworthiness increase, so does a user's willingness to use that technology.*

Based on the Theories of Reasoned Action (Fishbein and Ajzen 1975) and Planned Behavior (Ajzen 1991), the Information Systems literature, namely in the Technology Acceptance Model (TAM), contains an abundance of evidence demonstrating behavioral intentions as good predictors of actual behaviors across a number of different types of technologies and under varying environmental conditions (e.g., Davis 1989; Davis et al. 1989; Venkatesh et al. 2003). Social location technologies should follow suit. We posit that the likelihood of actual behaviors increases with stronger intentions to perform those behaviors. **(H3):** *As user's intention to use a social location technology increases, so will his or her usage.*

Websites are often characterized as usable when they are efficient, easy to learn and use, and not prone to errors (Nielsen 1994, 2003). A website's design and navigability have been shown to impact a user's perceptions of its quality and trustworthiness (Flavian et al. 2006; Hampton-Sosa and Koufaris 2005; Vance et al. 2008). The same should be true in the case of social location technologies, that is, when a user finds the technology artifact easy to learn and use, and the artifact works without errors and as expected, it will be viewed as trustworthy. **(H4)**: *Increasing site usability will result in increasing trust beliefs in a social location technology artifact.*

When individuals feel secure because their surroundings seem normal and as expected, they will be more trusting of their environment (McKnight et al. 1998). In the case of e-commerce, Gefen et al. (2003) provide evidence that users of an online book vendor were more willing to enter their personal information and credit card numbers when they felt that the information requested and transaction process were typical of comparable websites (situation normality). For social location technologies, if users believe that the types of information requested are typical of similar applications, their interactions comparable, and that the technology works as they expect, then they are likely to trust the technology artifact. **(H5):** *Increases in perceived situation normality will result in increased trust beliefs in the social location technology artifact.*

Findings from the innovation diffusion literature demonstrate that the adoption of a new technology accelerates once a critical mass of users is met (Rogers 1995). Often this perceived minimum threshold is a subjective quantity (Li, Chau, and Lou 2005). Research shows that online gamers are more willing to engage a technology and its associated activities when they perceive that a sufficient number of other people are using it (Hsu and Lu 2004; Sledgianowski and Kulviwat 2009). In online social networks,

perceived critical mass represents individual's belief that there are an ample number of users who are like themselves, such as friends or online community members might be, to make it worth joining (McPherson, Smith-Lovin, and Cook 2001). However, we believe that perceived critical mass has other effects, namely, if enough people subscribe to the social networking site then that site must be trustworthy. For social location technologies, if a sufficient number of other users "check in" and "show up," then their actions suggest the technology is trustworthy. **(H6):** *An increase in a perceived critical mass will result in increased trust beliefs in the social location technology artifact.*

Users often outsource their decisions and rely on others for important inputs, e.g., emotional support or information (Rosen and Olshavsky 1987). Trust is in essence transferred from one person to another (Stewart 1999). Beyond the advertising and hype put out by a vendor, the Word-of-Mouth literature suggests that relational content, which deals with the substantive information shared by others, has the ability to encourage and dissuade the buying decisions (Brown and Reingen 1987). With the strength and popularity of today's peer recommender and review systems as well as the broad reach and search capacity of the Internet, users can more readily access third-party decision inputs. Like Kim and Prabhakar's (2004) exploration of trust in online banking systems, we believe that receiving positive advice from other sources will impact a user's trust beliefs in a social location technology artifact. **(H7):** *Rising levels of relational content (positive feedback) will result in increased trust beliefs in the social location technology artifact.*

Not unlike the rationalizations from cognition-based trust theories where people's preconceptions of others influence their beliefs and attitudes towards them (Lewis and Weigert 1985; Meyerson et al. 1996), our model posits that people act or react to strangers without prior information. However, we explain these resulting attitudes through emotions, feelings, and instincts. McAllister (1995) found a positive relationship between affect-based trust and both interpersonal relationships and organizational citizenship. Given the personal nature of interactions in online social networks such as Facebook (Dwyer et al. 2007), we believe that a user's instincts about the trustworthiness of other users influence trust beliefs in the network. Following Morrow et al. (2004), we model affect-based trust between a social location technology user and others in the social network as an issue of instinct. **(H8):** *As positive affect (instinct) toward others in the online social network increases, so does belief in their trustworthiness.*

Calculative trust is based on a user's expectations that others have no incentive to behave in an untrustworthy manner (Gefen et al. 2003). For online social location technologies, this suggests that there is no net utility to cheat others in the network. Institution-based trust assuages the user's concerns of being victimized by bad behavior even if another subscriber wanted to take advantage (McKnight et al. 2002); structural assurances embedded within the technology and social constructions of an online site can protect the user from harm. Structural assurance promotes confidence because there are policies, control mechanisms, and 3rd party guarantees in place to keep users safe. Both perceptions are critical when online meetings can lead to face-to-face interactions with new people. **(H9):** *Increasing beliefs that other users will not receive any net benefit from behaving opportunistically increases trust in the network.* **(H10):** *Greater perceived structural assurances lead to stronger beliefs in the network's trustworthiness.*

Method

Gathering survey data and system usage statistics from users of Facebook's new Places application, this study examines the drivers of trust in this new social location technology. Facebook Places asks the user to let other subscribers know where he or she is, with whom, and what's happening around them by "checking in," which is equivalent to sharing one's location online and tagging other users who are nearby. The application gives users privacy options to share their checkins with only friends or with everyone on Facebook. Facebook Places is an ideal venue to begin this research. Location sharing is in its nascent stages. We believe that examining an application that requires subscribers to self-post their whereabouts will likely give access to a larger community of users. At its core, Facebook is a true social networking site, as interactions and activities are centered on people, not topics of interest or common themes (boyd and Ellison 2007); therefore, it should serve as a test environment that depends somewhat heavily on affect and social constructs. Moreover, its massive membership, the frequency with which many use the site, and the multiplicity of features they use, supports our assumption that trust in the artifact is a given. (Facebook Website$_b$ 2011) Likewise, Places provides the opportunity to examine users' trust in a truly anthropomorphic artifact.

Independent variables will be collected using an online survey. Items will be adapted from previous work, for example, behavioral intentions (Gefen et al. 2003; McKnight 2002), trust in a technology artifact (Flavian et al. 2006; Vance et al. 2008), trust in the network (Gefen et al. 2003; Lo and Riemenschneider 2010), usability (Flavian et al. 2006), situation normality (Gefen et al. 2003; McKnight et al. 2002), critical mass (Hsu and Lu 2004), referral content (Duhan et al. 1997; Kim and Prabhakar 2004), affect/instinct (Morrow et al. 2004), calculative trust (Gefen et al. 2003), structural assurances (Gefen et al. 2003; McKnight et al. 2002). Most items are evaluated on a seven point Likert scale, though a limited number have specific responses, e.g., yes/no and age. One concern is that the number of items necessary for testing our hypotheses may approach practical limits before inducing participant fatigue. Subjects that do not complete the survey are easy to filter out. To identify other subjects who simply click through the questions, we will embed a timer in the survey.

The dependent variable measures actual behaviors; in this case, the user action is checking in using Facebook Places. The number of checkins can be captured directly from Facebook through its application programming interface (API). The API makes available a selection of user and network data that can be helpful in understanding actual behaviors in online communities. The types of data available might include age, gender, tenure in the community, numbers of friends, clustering coefficient, numbers of posts, photos…, and in our case, checkins. Live system data offers significant gains in accuracy and validity compared with self-reported information, and has been successfully used in online behavior studies (e.g., Huberman et al. 2008; Mislove et al. 2008; Russo and Nov 2010).

We will distribute the survey to a sample of 4,000 undergraduate and graduate students at a large public university in the northeast United States; we will include only established Facebook users to avoid the heavy usage bias that frequently associated with new users and to diminish the confounding impact from significantly inexperienced respondents. To test the model, we will use a structural equation model (SEM) implemented in SmartPLS, a partial-least-squared-based analysis tool. Though our items have been validated in previous research, they will be validated again in this study. Our procedure for determining validity and reliability follows Straub (1989) and Straub et al. (2004). Confirmatory factor analysis (CFA) will be used to verify reliability. To confirm convergent and discriminant validity, we will calculate the average variance extracted (AVE) for each component. To verify convergent validity, the AVE must exceed 0.5; while to meet the discriminant requirement, the square root of the AVE must exceed the correlation with other constructs.

While there is often concern about the generalizability of using students as subjects, here, they are representative of the types of individuals that use Facebook and other social networking applications. In age and education alone, the sample set mirrors approximately 50% of Facebook's 500 million plus users (DigitalSurgeons.com 2010). To increase the validity of our findings, we will collect usage data through the Facebook application programming interface (API). System usage data helps to triangulate what subjects say they do with actual behaviors and methodologically avoid problems of common method bias.

In our analysis, trust is modeled as a second-order construct (McKnight et al. 2002), with subconstructs such as benevolence, integrity, competence, and predictability. However, there is still an open question about whether to model trust as reflective (following Wang and Benbasat 2007) or formative (following Vance et al. 2008). If the correlation between subconstructs is high, then we will proceed with the reflective model as planned; if not, we will evaluate the best model based on effect size. Should the formative model of the trust construct be more appropriate, we will determine validity using a multitrait-multimethod (MTMM) technique outlined by Loch et al. (2003). For our purposes, SmartPLS is a more flexible choice of SEM package because it handles both reflective and formative constructs equally well as opposed to covariance-based tools such as LISREL, which are not appropriate for formative constructs.

Limitations and Potential Research Opportunities

While Facebook Places is an important venue, it is only one platform and it requires users to manually post their location. Future studies will examine more ubiquitous location-aware applications and devices to ensure the generalizability of the model across a variety of contexts. In addition, we intend to create an application that simulates the Facebook Places experience so that prospective users can also be surveyed about their intentions to use this emerging social location technology. Finally, it might also be possible to improve the model's predictive capacity by employing a more detailed model that considers the relationship between a full set of antecedents leading to three separate trusting beliefs about the technology artifact, the

provider, and the network. However, there are practical limits on survey size that may make testing the complete set of trust beliefs in a single survey implausible.

Implications for Theory and Practice

We add to the literature a theoretically derived model for the adoption of emerging social technologies. First, social technology adoption studies would now need to consider factors related to the technology artifact and the network of other users. Our subjects are all existing Facebook users; their beliefs in the provider's trustworthiness can be assumed. Secondly, we identify a comprehensive and easy-to-understand set of trust antecedents for both the technology artifact and the network of users. For the artifact, we would show that trust depends on the usability of its design, the perception that it operates as it should, and its broad adoption by other members as well as referrals from trusted sources. We would also demonstrate that trust beliefs towards friends and the "network as a whole" may be different, especially when online and off-line interactions are involved. Furthermore, those beliefs will depend on a user's instinctive feelings of trust towards the others, rationalizations that it is not worth it for others to cheat the system, and that there are structures and policies in place to protect against ill intentioned users.

System designers and community managers alike will benefit from understanding the reasons for social network users' trust in social location technologies, where online and off-line interactions are possible. For designers, the study informs them on the importance of creating systems that "act as users expect" and thereby avoiding suspicions that the technology artifact is operating with wrong intentions. Community managers will benefit from understanding the role of networks in establishing and maintaining trust in social location technologies. A primary outcome of this research will be to provide evidence of the importance of well-structured policies and permissions in helping community members to trust a social technology. This study is also expected to show that other network subscribers are critical in the trust equation, both as informers or referrers of the technology's trustworthiness and also as proof-by-example. In the latter case, when a critical mass of users demonstrates their trust in a social technology through subscribing, then others are expected to extend trust to the system as well. Community managers would do well to make public that large numbers of other people use the system.

Conclusions

We argue that people trust and are willing to perform specific actions with social location technologies—still a somewhat emerging phenomenon—so long as they believe in the trustworthiness of the technology artifact and the network of other users. As importantly, we have identified the antecedents of both sets of trust beliefs. People trust a social location technology if it is usable and works as users expect. In addition, trust in the technology artifact can come from the advice of others and through their actions; that is, if people say good things about the technology or from the perception that a critical mass of individuals use it. Beliefs in the trustworthiness of other users stem from instinctual and affective feelings. These trust beliefs also result from rationalizations that other users will not benefit by cheating the system and that even if they wanted to cheat, there are policies and protections in place to keep that from happening.

Since our context includes a social dimension, we extend earlier theories in the e-commerce literature, which focus on trust in the vendor, by simultaneously including measures for trust in the technology and trust in the network, and test that they are distinct. In addition, we will explore if users view their network of friends as different from "everyone else." The study adds an emotional or affect-based component that is missing in trust models for e-commerce acceptance. And, we examine these parameters under varying perceptions of risk. To increase the validity of our results, we test our hypotheses on a large data set that connects independent variables collected through surveys with a dependent variable represented by system usage data. We will be able to connect what people say they do with what they actually do.

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