Communicating Through Location: The Understood Meaning of the Foursquare Check-In*

Jordan Frith

Department of Technical Communication, University of North Texas, 1155 Union Circle #305298, Denton, TX, 76203.

Location-based social networks (LBSNs) are mobile applications that allow people to share their physical location with friends through their mobile device. The sharing of location is a relatively new form of computer-mediated communication, and there is a lack of existing research examining the coordination practices of people using social location sharing services. This article reports on qualitative interviews with frequent users of the LBSN Foursquare to show both how LBSNs complicate views of the relative "placelessness" of traditional mobile communication and how the design of Foursquare complicates its utility as a mobile coordination tool.

Key words: Foursquare, mobile communication, place, coordination, LBSNs, smartphones.

Mobile phones have often been viewed as distracting people from their surrounding space and negating the importance of physical distance (de Souza e Silva & Frith, 2012). However, as Gordon and de Souza e Silva (2011) show, newer mobile applications are often built around the importance of physical location. These applications, commonly referred to as location-based services, use the location-aware capabilities of newer mobile phones to provide people with information about their surroundings. The information these applications provide includes locations of historical sites, restaurant reviews, and geotagged narratives about specific locations. Increasingly, individuals also use mobile applications to share their location with friends. Mobile applications that allow for social location sharing are called location-based social networks (LBSNs), and they are a growing subset of location-based services.

With the growth of location-aware mobile applications, people are increasingly able to share their location in multiple ways, whether through check-ins on popular LBSNs like Foursquare, geotagged tweets, or geotagged photos on Flickr. To further our understanding of the social sharing of location information, this study provides a theoretically and qualitatively grounded examination of the mobile communication practices of Foursquare users. The data reported in this study is drawn from 36 interviews of frequent Foursquare users and focuses on two independent yet interrelated areas: the role physical location plays in the coordination practices of Foursquare users and the different ways in which

---

*Accepted by previous editor Maria Bakardjieva

Foursquare users interpret the meaning of the application. Now that over 50% of adults in the United States own location-aware smartphones (Smith, 2013), it is important for researchers to develop frameworks for understanding how the addition of physical location to mobile communication may impact social practices. This study helps develop a framework that will be valuable for future social scientific approaches to location-based services in two significant ways. First, I show that to understand how people use LBSNs, we must understand the physical spaces in which they use the applications. Unlike with text messaging or voice calls, understanding the location of users is necessary for analyzing why they share their location and whether they use their location to coordinate with others. Secondly, this article introduces a heuristic framework for understanding the different ways people use applications like Foursquare. The data reported here reveals four primary types of Foursquare users, and this taxonomy of users can be useful for future research seeking to develop and test hypotheses of usage patterns. In addition, this article shows how these different uses complicate Foursquare's utility as a tool for mobile coordination because people cannot be sure why others are sharing their location information. I use this framework to both understand how the design of the application impacts mobile coordination practices and make tentative suggestions on how future applications may be designed to limit misunderstandings.

The next section of this article provides additional background on the design of Foursquare before moving on to the conceptual framework used to derive the research questions that drove this study. The conceptual framework first discusses literature on mobile coordination to identify how physical location has often been deemphasized in the practices of mobile phone users. The second part of the framework discusses the social shaping of technology to better understand emergent social norms surrounding relatively new media forms. The article then discusses the methods used in this project and my data analysis. The article concludes with a discussion that explicitly links the data analysis to the conceptual framework established earlier.

Background on Foursquare

Foursquare was released at the 2009 South by Southwest (SxSW) festival. Over the next 3 years, the application grew at impressive rates. As of June, 2013, Foursquare has over 30 million users and over 3 billion individual check-ins ("About Foursquare," 2013).

While the design of Foursquare has changed over the last 4 years, the ability to check in to locations has remained in every iteration of the application. When people go to a location, they can choose to check in and broadcast that information to the members of their Foursquare network. Other people can then receive alerts about their friends' location or can look at a list of recent check-ins to see where the members of their social network are currently located. It is important to note that the Foursquare check-in process requires active participation, which contrasts it to other LBSNs like Google Latitude that use a location-tracking model (Cramer, Rost, & Holmquist, 2011). With Latitude, people's actual GPS coordinates are broadcast in real time and others can follow their path through the city. Foursquare, on the other hand, only shares location when people actively click through multiple screens to check in. Consequently, if people do not update Foursquare, their last check-in will not show their current location.

A key factor differentiating Foursquare from earlier location-sharing services like Dodgeball and other contemporary LBSNs like Loopt and Latitude is how diverse Foursquare is. Dodgeball relied on text messaging and was mainly designed as a tool to share location to coordinate behavior (Humphreys, 2007, 2010). Latitude and Loopt function in much the same way. Foursquare, on the other hand, can be used as a social networking service, a mobile game, a spatial search engine, and a personal memory tool. The gaming elements are an especially prominent part of Foursquare's design, and as Dennis Crowley stated, one of the original goals of the application was to "turn life into a game" (Crowley, 2010, n.p.).

For each check-in, people score points and are able to compete over mayorships, which are rewarded to the person who has checked in to a specific location the most times in the last 60 days. Foursquare also awards badges to people who complete specific tasks (e.g. check in to five different coffee shops). These gaming elements can influence people's behavior by encouraging them to go to new locations to earn badges or return to locations to win a mayorship (Frith, 2013). As discussed elsewhere (Frith, 2013), some Foursquare users primarily check in to locations because they can earn badges or compete over mayorships.

In addition, Foursquare also works as a memory tool that people can use to archive their past mobility, and the application now includes additional metadata that increases its efficacy as a location-based archiving application. Anyone who uses Foursquare can go to the website and see a comprehensive log of every single location to which they have ever checked in. Users can also filter this information in a variety of ways and can display their check-ins on a map as a different way to visualize their past mobility. For some people, the ability to log their past experiences can be a prime reason they check in to places on Foursquare.

Finally, Foursquare has now begun to focus much more on spatial search. In 2011, the application added an Explore feature that works as a personalized recommendation engine and allows people to search for nearby locations. The results people see are based on their past check-in history, and the recommendations show places similar to the places they already go. The Explore feature is powered by the over 3 billion Foursquare check-ins, and newer versions of the application have focused more and more on spatial search as a way to monetize the application (Dillet, 2012).

Foursquare's diverse elements are important because the interviews conducted for this study show that the different reasons people used Foursquare complicated the ways they used the application to coordinate with others. Unlike a service like Dodgeball or Latitude, people often check in to Foursquare for reasons that have nothing to do with sociability or coordination. In the next section, I explain the conceptual framework I draw from in this study before returning to how the design of Foursquare affects emerging practices and the application's utility as a coordination tool in my data analysis and discussion sections.

Conceptual Framework

Mobile coordination and physical space

Mobile phones have often been viewed as decreasing the importance of physical space (de Souza e Silva & Frith, 2012). For example, multiple researchers have criticized mobile telephony for distracting people from their surrounding space (De Gournay, 2002; Gergen, 2002). Ling's (2004) concept of microcoordination, in which people are able to change plans on the fly through mobile communication, also shows the weakening of the importance of distance because people are able to stay in constant contact with distant others (Licoppe, 2004). In addition, Wellman (2002) points out that, in contrast to fixed-line telephony, with mobile telephony people call people rather than places.

In contrast to the more typical, dyadic nature of voice calls and text messaging, mobile phones have also been used to enact more macro forms of coordination that do point to the importance of physical location (de Souza e Silva & Frith, 2010), seen notably in the example of Flash Mobs (Rheingold, 2002). In Flash Mobs, people share SMS messages amongst a large group of people to coordinate convergence upon a physical location. The collective mobile coordination enacted in Flash Mobs also closely resembles the types of coordination Humphreys (2007, 2010) found in her study of Dodgeball. With Dodgeball, people texted their location to a central server that sent out their location as a text message to the rest of their

social network. In her qualitative work with Dodgeball users, Humphreys found that people used the service to coordinate sociability through the sharing of location and were more likely to go to new places if they knew friends had checked in there. Humphreys also found that the collective sharing of location among friends through SMS often led to a type of social molecularization, "whereby informants both experience and move about through the city in a collective manner" (2007, n.p.).

Humphreys' findings on mobile coordination and collective movement through physical space were important to theoretical conceptualizations of contemporary LBSNs. de Souza e Silva and Frith (2010) discuss how the sharing of location can lead to new forms of mobile coordination that can cause people to alter their paths through the physical spaces of the city. In a later article on LBSNs, Sutko and de Souza e Silva (2011) identify coordinating social behavior in public space as key to understanding the potential impacts of these applications.

These existing studies show that coordination practices have often been a key area of study for mobile communication scholars and that the role physical space plays in this coordination has shifted with more novel forms of mobile communication. Voice calls and SMS are forms of mobile coordination that enabled people to become "less dependent on place" (Wellman, 2002, p. 15). More macro forms of mobile coordination such as Flash Mobs did focus on converging on a physical location, but the only location that mattered was the final destination, not the location from which people sent their messages (de Souza e Silva & Frith, 2010). Humphreys' work with Dodgeball users did address how location-sharing services reemphasized the importance of physical location in the coordinative practices of individuals. However, there is a lack of research on the role physical location plays in how people coordinate with more contemporary LBSNs. With Foursquare, people share their physical location by checking in to locations, but unlike Dodgeball, people may check into locations for various reasons (to score points, to catalog locations) that have little to do with social coordination and may take place in situations in which physical space is a deterrent to the utility of the check-in as a piece of social information.

The importance of understanding the role physical space plays in the coordination practices of Foursquare users and the gap in the existing literature leads to the first research question that shapes this study:

RQ1: What role does physical location play in the coordination practices of Foursquare users?

Social norms and emerging media

New media are often disruptive, and early users often establish norms that affect later usage. For example, Marvin (1988) shows how the telephone initially disrupted understandings of space and time, and people had to establish conventions to dictate proper telephone etiquette. Williams (1975) famously used an analysis of television to combat technologically deterministic claims by showing how cultural understandings of television were shaped by social practices. These are two of many examples that share a great deal with what Pinch and Bijker (1987) label the Social Construction of Technology, a research agenda dedicated to showing how the meanings and uses of new technologies are not solely shaped by designers; they are also shaped by the way people enfold new technologies into their lives.

Examples of how people negotiate the social norms of new media more germane to this study can be seen in mobile phone use. As Campbell (2008) has shown, how acceptable it is to engage in mobile phone conversations in public depends on cultural factors, with some places even going so far as to ban mobile voice calls on public transportation (Rheingold, 2002). In addition, the SMS system shows the importance of emerging social norms and the social shaping of technology. SMS was originally a minor addition to the GSM mobile phone standard (Agar, 2005). It was individuals, most often teens, who transformed SMS into one of the most significant contemporary communication platforms (Ling, 2004).

We can also see how technological environments are socially constructed by turning to research that examines how different groups use the same technology for different purposes. In his study of Multi User Domains (MUDs) in the mid 1990's, Bartle (2006) described how different MUD participants took advantage of different parts of the computer-mediated environment, and he suggested a taxonomy of MUD participants quite similar to the taxonomy introduced later in this article to understand Foursquare use. Bartle divided MUD users into multiple categories, which included achievers, explorers, and socializers. As Bartle noted, the ways these different types of users interpreted the MUD environment often conflicted and affected emerging social norms.

Building on Bartle's MUD research, Yee (2006) set out to develop a taxonomy of participants in Massively Multiplayer Online Role-Playing Games (MMORPGs). He broke his analysis into three overarching components drawn from Bartle's taxonomy: the Achievement component, the Social component, and the Immersion component (similar, though not identical, to Bartle's "explorers"). Yee's taxonomy shares a great deal with Bartle's earlier research, and they both show how a technological artifact can be interpreted differently by different users. However, a key difference between Yee's research and Bartle's earlier taxonomy was that Yee's quantitative analysis of participants "revealed that play motivations in MMORPGs do not suppress each other as Bartle suggested" (p. 774). Bartle argued that different motivations for use could lead to misunderstandings and suppress other types of goal directed behavior. Yee's findings suggested that people who identified as achievers could also be socializers, and that there was little conflict between the parts of the taxonomy. One of the goals of this study is to better understand how the different ways people interpret usages of Foursquare may or may not come into conflict, and Bartle and Yee's taxonomies provide a tool for analysis I use to understand the Foursquare data discussed below and develop a taxonomy of Foursquare usage.

While it is important to remember that designers do not fully determine how new technologies will be used, it is also important to remember that design does affect later usage patterns (Winner, 1980). For example, SMS was limited to 160 characters, a design choice that likely played a role in shaping some of the linguistic abbreviations found in many text messages. These abbreviations were also partially shaped by the physical design of mobile phones, which often made typing longer messages difficult (Glotz, et al., 2005). As Latour and others have written, the design of technologies do exert some agency over behaviors and do play a role in shaping how people use the new technologies they encounter (Akrich, 1992; Latour, 1988).

The literature on how people develop uses of new technologies and how design affects those uses is important for the study of relatively new applications like Foursquare. As Sutko and de Souza e Silva (2011) point out, while coordination and public sociability have been the focus of other studies of location-based mobile applications, many of these studies "ignored the different coordination and communication affordances of different interfaces" (p. 808). In other words, the authors argue that most studies examine LBSNs in general without paying enough attention to how the design of specific LBSNs may affect usage patterns.

The lack of specific analyses of different LBSNs represents a problem this study addresses through an analysis that focuses on the mobile practices of Foursquare users. As mentioned earlier, the two most influential qualitative studies of how people transmit location both focus on Dodgeball. However, Foursquare is a more diverse application than Dodgeball and most other contemporary LBSNs. It features a number of design elements that encourage people to check in to locations, and those elements can complicate how people use the application to coordinate. Sutko and de Souza e Silva (2011) differentiate LBSNs like Loopt and Brightkite that "encourage users to communicate and coordinate with other people as the end goal of using the application" from location-based mobile games that may facilitate coordination but mostly focus instead on gameplay. Foursquare was designed to be both a social networking tool and a mobile game, meaning the social norms that shape how people use

Foursquare to coordinate behaviors may be more complicated than with applications that primarily focus on either gaming or social coordination. The importance of understanding the role design plays in shaping Foursquare practices and the lack of existing literature on the topic leads to the second research question that shaped this study:

> RQ2: How does the design of Foursquare play a role in shaping the social norms that emerge around using check-ins as a piece of information?

Methods

The data reported in this study are based on 36 interviews with Foursquare users that ranged from 25–90 minutes. The study received approval from my university Institutional Review Board, and the interviews were conducted over a 5-month period ranging from June 2011 to November 2011. The original plan was to interview Foursquare users of varying activity levels, but after performing early interviews with infrequent users, I realized active users provided more comprehensive data that could be used to develop a more dense understanding of the potential social impacts of LBSNs. I then drew from theoretical sampling, a core sampling procedure in grounded theory approaches (Glaser & Strauss, 1967), to target participants who could help develop a theoretically dense understanding of Foursquare use. Active users were defined as individuals who have over 100 check-ins and had checked in to Foursquare at least once in the previous 3 days. These individuals were targeted by identifying people who left publicly accessible tips on venues at locations in Raleigh, North Carolina and contacting individuals from other cities in the United States who made their check-ins available on Twitter. The initial participants were asked to refer other Foursquare users, which is how 14 of the 36 participants were identified.

The demographics of the research participants varied somewhat. The interview participants included 16 women and 20 men. The majority (32) of the participants were between 18 and 36 years old, and two participants were between 36 and 54, and two were over 55. The interview pool only included Foursquare users in the United States, but the participants included people from multiple regions of the country, including cities in the Northeast, the Southeast, the Midwest, and the Pacific Northwest. The participants were interviewed in person when possible, but I also relied on Skype and phone interviews. All interviews were recorded and fully transcribed.

This project draws from the iterative approach of grounded theory described by Charmaz (2006). I transcribed my early interviews, coded them, and used the initial codes to shape future interviews and identify areas to focus on in participants' responses. As later interviews were coded, I both used existing codes and altered existing codes when they did not fit new data. Ultimately, the data was coded multiple times using Atlas.Ti qualitative software as a way to develop a theoretically dense understanding of categories and identify patterns in the data. I also wrote extensive memos to help organize and understand the data, and I wrote detailed vignettes of each of my participants as a way to maintain a more holistic understanding of the data.

Data Analysis

The findings are divided into two separate but interrelated categories that address the two research questions that shaped this analysis. The two categories are (a) Coordination through check-ins and the importance of physical space and (b) Social norms and the understood meaning of the check-in. The first category details the important role physical space plays in how (and if) people use Foursquare as a coordination tool. The second category focuses on how the design of Foursquare complicates its utility

as a coordination tool and how different design elements contribute to the social norms concerning how people use others' check-in information. Both categories discuss situations in which participants used Foursquare to coordinate behaviors, but the second category focuses more explicitly on the importance of understood meaning when analyzing Foursquare check-ins as a form of mobile communication.

Coordination through check-ins and the importance of physical space

As mentioned earlier, LBSNs are built around the ability to map social networks, find nearby friends, and coordinate social behaviors. However, while finding friends and promoting serendipity is certainly possible while sharing location, Foursquare's utility as a social coordination tool was generally limited to a few specific social situations.

One of the main problems participants reported about coordinating behavior through Foursquare was the problem of physical distance. Participants all explained that they rarely rely on Foursquare as a tool for coordination because most of their friends' check-ins are at locations that are too far away for them to then coordinate behavior:

> Me: So … a couple of times where you would be out at a bar for example and see that someone checked-in down the street and go meet up with them?
>
> Donna (27, Cincinnati, OH): Yeah, but most of the time they're just too far away.
>
> Me: So you have changed what you were doing because a friend checked in nearby?
>
> Danny (26, Raleigh, NC): Yeah, not too often, but I have. It only works at specific times though. Most of the time, people check-in too far away for me to really want to stop by. I mean, I'm not going to drive to go meet up with someone cuz of a Foursquare check-in.

Distance plays a major role, regardless of the city in which the participants live, in inhibiting the ability to meet up with people and coordinate action through Foursquare. Interestingly, this problem of physical distance is also closely related to the check-in model Foursquare uses. Unlike location-tracking services that transmit actual location in real time, a Foursquare check-in does not necessarily show someone's current location, making it less likely for people to change their paths through the city to meet up with friends:

> Emily (29, New York City, NY): Yeah, I mean I don't rely on people's check-ins and I hope people don't rely on mine. I check-in everywhere. So if I'm picking up takeout or something, I'll check-in. I might only be at that place for like three minutes, but if I don't go anywhere after, it'll still show up as my current location. If someone's actually going to find me because of Foursquare, they better be super fast with it.

While distance and the nature of the check-in design Foursquare uses complicate its utility as a coordination tool, certain situations arose in which most participants had used the application to coordinate with others and meet up face to face. These instances mostly occurred in specific situations in which participants could expect to find a higher density of friends in a geographically bounded area. Most of these examples concerned nights spent drinking in areas in which bars are concentrated. Participants reported that though their lives are spread out, their social lives on the weekends tend to be concentrated in specific areas, and they had used Foursquare to coordinate and meet up with friends. In these situations, the problem of physical distance is somewhat mitigated because friends tended to be concentrated in a physically bounded area:

Mike (29, Atlanta, GA): Oh, I definitely use it [Foursquare] a lot on Friday and Saturday nights. Most of my drinking occurs pretty much in a three block radius, and a lot of my friends are the same way. So there will definitely be times where we're out and we see a couple people check-in at a bar down the street. Besides weekends though, I don't think I even check to see where anyone else is.

That Foursquare was most useful as a coordination tool when the social situation was geographically and temporally bounded did not only apply to nights out on weekends. Many of the research participants also described using Foursquare to coordinate meetings during lunch breaks at work. Because people were already congregated at an office and could only travel so far because of the temporal restrictions of their lunch breaks, they were able to use Foursquare to see where coworkers headed for lunch and go meet up with them. The social situation of the work lunch lead to a denser concentration of people than most situations because the lunch options were often limited to within a mile or two of the office, making it easier to coordinate meeting through Foursquare:

Toby (29, Minneapolis, MN): No I don't think I really use Foursquare to coordinate all that often. Well, I guess I do when I go out to lunch because of coworkers who are on Foursquare, but that was just my office. It's easier because all our lunch places are right next to each other. Otherwise, things are just too spread out.

As this category has examined, physical space shapes the way people use Foursquare to coordinate behavior in ways that contrast with traditional conceptualizations of mobile communication. In fact, the physical location of Foursquare users compared to the locations of the members of their network served as a primary predictor of whether or not people used check-ins as a way to coordinate with others. The quotes above show why physical distance played such a major role in the utility of the check-in as a piece of social information: People were often simply too far away from each other to be able to respond to a friend's check-in in a valuable manner. However, physical distance also often has explanatory power for why certain situations did allow for Foursquare to work as a valuable coordination tool: During situations such as nights out and work lunches people were more densely congregated in physically bounded areas and better able to respond to others' check-ins. As I expand upon in the discussion, these examples of both when participants used Foursquare as a coordination tool and when they did not show how LBSN usage brings attention to the importance of physical space in ways that are significantly different from previous forms of mobile communication.

Interestingly, another prominent reason my participants only rarely used Foursquare to coordinate with others had more to do with the lack of an understood "correct" way to use the application, which is closely related to the design of the application. In the next section, I explore how the lack of predetermined context surrounding the Foursquare check-in also played a role in limiting how my participants used location sharing to coordinate with others.

Social norms and the understood meaning of the check-in

One of the most common issues that emerged from the interview data concerned how people viewed others' check-ins as a piece of shared information. The interview data showed that few participants viewed check-ins as direct invitations to friends to show up to a location. In some of the early popular press articles about Foursquare and serendipity, the check-in is imagined to stand alone, with people seeing a friend checked in nearby and heading directly to that location. Only two of my research participants

had ever gone somewhere because of a friend's check-in without first calling or texting them, and most participants claimed that type of behavior would make them uncomfortable:

> Ainsley (24, New York City, NY): You mean, they'd see I was checked-in somewhere and just show up? That's never happened. I don't think I'd be too happy if it did. I mean, just because I check-in somewhere doesn't mean I want to hang out with people.

The quote above is representative of most participants' responses and suggests that Foursquare check-ins should not necessarily be viewed as invitations for face to face interaction. Instead, check-ins are far more often a form of mobile communication that invites further mobile communication. In other words, the proper etiquette surrounding Foursquare check-ins was to text or call someone if a friend sees someone checked in somewhere interesting.

> Claudia (28, Raleigh, NC): Yeah, if I see they're checked in I'll text them and be like "are you still there? Do you want to go to this place instead?"

> Josh (34, Kennesaw, GA): Like, if I'm at a game and other people are nearby and I'll decide to text them. I don't necessarily just show up and say "hey!" I'll let them know and I'll ask how long they'll be there.

Participants gave multiple explanations for why they did not view check-ins as invitations to directly engage in copresent interaction. Most basically, as mentioned above, the check-in does not necessarily display someone's current location, which is a significant way in which the design of Foursquare affects user practices. People can check in to a location and leave a minute later, or they can intentionally check in as they are leaving. The check-in model is a notable design difference between Foursquare and location tracking LBSNs like Google Latitude or Glympse that share location information in real time. The design of the check-in model grants people more control over the locations they share, but the design choice can negatively affect how people use the application to coordinate with others.

The social norms surrounding how participants treat the check-in as a piece of information are also shaped by the diverse design elements in Foursquare and how people take advantage of those elements. Interviews revealed that only a few participants used Foursquare primarily as a tool to find friends and be found by friends. Most people had used it in this manner at one time or another, but people also checked in to locations to keep a log of their personal mobility, to highlight certain locations to friends, to score points, to win mayorships, and to earn badges. The differing nature of just why people use Foursquare complicates its utility as a social coordination tool and shows the importance of context.

Context is key to understanding the social norms surrounding how participants viewed their Foursquare check-ins. As many participants expressed, simply sharing their location with friends does not provide enough context for someone to assume that it is okay to stop by. This problem of meaning goes to the core of just what a check-in represented to the research participants. Unlike a text message that is accompanied by textual instructions, the large majority of Foursquare check-ins do not contain any information besides a physical location. The check-in tells the observer nothing about why the person is sharing her physical location, which would not be as much of a problem from a coordination standpoint if the only reason people used Foursquare was to promote face-to-face meetings with others, which is the primary goal encouraged by the design of other location-sharing applications like Glympse. The design of Foursquare encourages people to check-in even when they have no intention of meeting others, which complicates the understood meaning of the check-in. Without initiating further contact,

someone cannot assume that a friend did not check in primarily to compete for a mayorship or create an archival record of their mobility.

> Greg (27, Raleigh, NC): Most of my check-ins are for myself. I have plenty of Foursquare friends, but I don't check in primarily because of them. I mostly check- n so that I can remember where I go, and I use stuff like 4Sqand7yearsago [a third-party application] to remind me about what I was doing a year ago on Foursquare. I'd definitely think it was weird if someone just showed up, especially because I check-in everywhere I go. Is someone going to show up when I'm out to dinner with my mom? Really?

The quote above shows how a Foursquare check-in often does not work as a stand-alone piece of information. There are too many reasons people check in to be sure about the meaning of a single check-in. However, in certain situations with certain friends, the context of the check-in is understood or established beforehand, and then the situation changes. For example, Leo (34, Atlanta, GA) and his friends sometimes make plans to go out but also occasionally just head to restaurants and bars in their neighborhood and check in on Foursquare and wait to see if other friends stop by because they see the check-ins. In this example, it is okay for Leo and his friends to assume that the check-in is an invitation because they have a shared understanding of what it means when one of their friends broadcasts their location in that area on a Friday or Saturday night. Most people do not have that detailed understanding of context, however, and the check-in instead becomes an invitation to seek more information about what the person is doing.

Leo's example shows that context is key to understanding the social norms surrounding how people coordinate behavior using Foursquare check-ins. The example also shows the interplay between design and user interpretation. Because of the different design elements of Foursquare, the social norms participants reported suggest that check-ins cannot stand alone as a piece of social information unless people ironed out the meaning of the behavior beforehand. However, Leo's example showed that design does not fully dictate behavior. He and his friends worked to establish a shared meaning of "proper" Foursquare usage, and they then were able to shift how they coordinate through the application. In most situations, however, the norms of usage dictated that the check-ins instead had to be followed by further communication, showing how the design of the applications affects both how people use it and how they understand the information the members of their social network share.

Discussion

The first research question this study addresses examines the importance of physical location in how Foursquare users coordinate behavior. The interviews showed that coordination through Foursquare does occur, but it is generally limited to situations in which many people may be congregated in a limited physical area. The two primary situations in which this occurred were on nights out in a specific area of the city or during lunch hours at work. At other times, people tended to be too widely spread out to be able to coordinate with friends through the sharing of location. This finding is important because, as Dourish and Bell (2011) point out, much of the writing on mobile computing, especially in the computer science literature, often views mobile technologies as somehow separate from the spaces in which they are used. In other words, despite that fact that mobile computing, by definition, occurs as people move through physical space, designers often ignore the role that physical space plays in shaping the context of mobile technology use.

Part of the reason researchers have ignored physical context is that mobile telephony has often been viewed as somewhat negating the importance of physical space and distance. As mentioned in the discussion of mobile coordination, one of the significant shifts with the growth of mobile telephony came in the way mobile communication lessened the importance of physical distance (Ling, 2004). A text message reads the same regardless of from where it is sent. LBSNs, on the other hand, center on the importance of physical location and the types of mobile communication they enable are significantly affected by the physical space in which they are used. At their most basic, check-ins are an example of people communicating *through* physical location, and their utility as a tool for coordination is consequently limited by physical proximity. The data presented in this article suggests that these applications reemphasize the importance of location in mobile communication.

The importance of physical location found in the interviews with Foursquare users is likely just as pertinent to studies of similar applications such as Loopt, Latitude, and Dodgeball. However, the data also addresses the second research question concerning how the design of Foursquare plays a role in shaping the social norms that emerge around using check-ins as piece of social information. The research presented here shows that people use Foursquare to accomplish different goals, goals that include finding friends, engaging with gaming elements, and logging past mobility as a memory tool. To some degree, this diversity of uses is representative of the "interpretive flexibility" of technologies (Pinch & Bijker, 1987). The concept of interpretive flexibility argues that "Technological artifacts are culturally constructed and interpreted" (Pinch Bijker, 1987, p. 34), and the data presented here shows that the research participants have different interpretations of how to use Foursquare. However, these different uses are also closely related to the design of the application. Applications like Loopt and Latitude focused almost solely on finding friends through the sharing of location. The design of Foursquare, on the other hand, was not nearly as specific. The application was designed to allow people to share location with friends, score points, earn badges, explore surrounding space with the spatial search feature, and catalog their location history. Because there was no suggested "correct" way to use Foursquare, participants were freer to use the application to achieve different goals. The design choice to include different gaming, social networking, and search elements likely played a significant role in shaping the norms that arose around the coordination practices of Foursquare users.

A productive point of comparison is Humphreys' (2007, 2010) field work with Dodgeball users. In her field work, Humphreys found that the mobile communication facilitated through Dodgeball often contributed to a form of "social molecularization" in which people coordinated behavior by sharing location and moved through the city in a sort of small pack in ways that were not present in the interviews analyzed for this study. A possible explanation is that Dodgeball was designed mainly to coordinate social behavior through location and did not include gaming elements, mobile annotation, or spatial search elements. Humphreys did find that not every check-in on Dodgeball was meant to coordinate behavior. Some people checked in as a way of "showing off and cataloguing one's life" (Humphreys, 2007, n.p.). However, most people in Humphreys' data used the application to coordinate with friends. Because that was its dominant purpose, people could assume that when someone checked in on Dodgeball, they were inviting others to meet up. Humphreys even points out that some of her participants complained about instances in which people checked in when meeting up with others was unlikely. To many of her participants, checking in to coordinate behavior was the "correct" way to use Dodgeball.

For the research participants in this study, the variety of reasons people used the application came into conflict. To understand these different uses, it helps to return to the taxonomies developed by Bartle (2006) and Yee (2006) to understand the different reasons people participate in MUDs and MMORPGs. Both authors analyzed different types of uses that included social, gaming, and exploratory elements, and their taxonomies provide a framework for understanding the different types of Foursquare usage revealed in this study. Some Foursquare participants could be actively described as "social users."

They used Foursquare mostly as a way to find friends and be found by friends. Other users could be more accurately described as "gamers." To them, Foursquare was primarily a game they played to score points and win mayorships. These participants often checked in everywhere with no intention of meeting friends through the application. Others could be labeled as "explorers" who use Foursquare mostly to find new locations using the Explore feature. And finally, some participants were "cataloguers" who used Foursquare mainly as way to log their life rather than as a way to meet up with friends or score points. Except for the cataloguing category, the categories introduced here closely resembled those developed by Bartle and Yee, suggesting that the socializing, playfulness, and exploration are categories of use that extend to multiple technological artifacts. Almost all participants described occasional uses that could fall in each of these labels, but most did have one dominant reason for using the application.

The different reasons people use Foursquare complicate the issues of sociability and collective mobile communication discussed above. Some people who used Foursquare for more social reasons or as a way to catalogue their life only checked in to more interesting locations they wanted to highlight. But other users who saw Foursquare more as a game checked in everywhere. In this way, the interview data reported in this study suggests that Foursquare users may fit more closely with Bartle's view of his taxonomy than Yee's taxonomy of MMORPG users. Yee found that people could fit into multiple categories and these categories did not come into conflict. My interview data also found that people could use Foursquare for multiple reasons, but they generally had one dominant reason, and the different types of uses often made the meaning of the check-in unclear.

Understanding this taxonomy of Foursquare users is important because it shows how different interpretations of the best uses of the application affect its utility as a tool for mobile coordination. Rather than trust check-ins as an invitation as Humphreys found in her Dodgeball study, the social norms that arose around Foursquare check-ins involved texting or calling other users before meeting up. The example of Leo, discussed in the previous section, is the exception that proves the rule. Of all the participants, he was the only one who reported using Foursquare check-ins as a primary way to coordinate with his friends on nights out. His circle of friends was able to do so because they came to an understood agreement that check-ins at certain locations at certain times meant they were available for face-to-face contact. They established a set of social norms limited to their small group because they understood they were primarily using the application for social reasons at those times. Other participants, on the other hand, did not have this kind of established understanding with their Foursquare friends and consequently viewed check-ins significantly differently.

As discussed earlier, the different categories of users described above are related to both the interpretive flexibility of the application and the design of the application. People do have power to bring different interpretations to a new technological artifact, but the fact that Foursquare's design included socializing, gaming, cataloguing, and searching functions also contributed to those different uses. One of the main contributions of this study has been to show how both the flexibility of interpretation and the flexibility of design complicates the ways people communicate through the application. Importantly, newer versions of Foursquare have sought to limit the interpretive flexibility of the design. As mentioned in the initial description of the application, earlier versions of Foursquare focused mostly on gaming elements and sharing check-ins amongst friends. However, in recent years, the applications has begun to focus more and more on the mobile search function at the expense of check-ins, and the Explore function has now become the primary way in which Foursquare hopes to monetize the data the application has collected (Bilton, 2013). In many ways, the gaming elements have begun to be phased out, and Dennis Crowley stated that "Foursquare is much more than mayorships and badges. It's a perception issue. We've definitely been phasing a lot of that stuff out" (Bilton, 2013, n. p.). Even the check-in and the location of one's friends have begun to lose their prominent position on the intro screen, and Crowley has said that, "If anything we might have de-emphasized the check-in a little bit" (Taylor, 2012, n.p.).

The gaming elements and check-ins have now taken a backseat to the Explore search function, which now dominates the screen people first see when logging into the application. The increasing emphasis on mobile search at the expense of the other design elements suggests that Foursquare's designers may recognize that the application, and likely other location-based services as well, is best served by focusing on one specific element. However, the focus on search at the expense of check-ins also shows that commercial interests play a role in shaping the design of mobile applications. Despite Foursquare's growing popularity, the application has had trouble developing revenue streams because it has been difficult to make money off people who check-in for gaming, socializing, and cataloguing. Social, mobile, and local search likely provides better commercialization opportunities (Bilton, 2013), so many of the design elements discussed in this application are being pushed aside to develop a more unified application that focuses on doing one thing well: providing socially relevant location-based searches. While a focus on search will likely reduce some of the conflicting dominant uses of the application, it may also alienate long-time users who fit in the categories described above. The monetization push that is so key to the future of many location-based services also serves as a reminder of the ultimate goal of collecting all this check-in data. For users, the check-in may serve a social function, a gaming function, or a cataloguing function. For the application's developers, however, each one of these check-ins is a data point that drives future monetization plans.

Ultimately, this study has focused on the importance of physical location in LBSN communication and the specific social norms and design of Foursquare. However, the data analyzed in this article can be important to future mobile application as well. As discussed above, Foursquare's design focused on a variety of elements that encouraged different categories of uses. To some degree, the inclusion of multiple design elements likely helped popularize the application, allowing different groups of users to identify value in using Foursquare. This diversity, however, also inhibits Foursquare's utility as a social networking tool for mobile coordination, and the application's designers have begun to focus on spatial search at the expense of the other design elements. For LBSNs to reach their full potential as tools for finding friends and coordinating social activity, future applications may be best served by limiting the flexibility of the application and focusing more specifically on location-sharing amongst friends as compared to gaming, cataloguing, and search.

Limitations

There are several limitations to this study. The interview participants all live in the United States, so the research does not examine how individuals in other parts of the world use Foursquare. In addition, I chose to only interview frequent Foursquare users because they provided richer data on the potential social impacts of location-sharing applications. Consequently, the data is likely not generalizable to average Foursquare users who may use the application less frequently.

Finally, this article focuses on mobile coordination. The increasing popularity of LBSNs means there are many opportunities for future research not addressed in this study. Future research will almost certainly examine how individuals maintain a sense of privacy when sharing location, how location-based services affect experiences of surrounding space, and how individuals outside of the U.S. may use these applications to accomplish different goals. Future research might also form hypotheses from the different categories of users examined in this study and examine if the categories may correlate with variables such as the age of users. In a survey of Swedish mobile phone users, Axelsson (2010) found that "Whereas older users agreed to a moderate extent that the mobile phone can be used for coordination of daily activities with friends … the 18–24 year old cohort expressed a significantly stronger level of agreement" (p. 47–48). Axelsson's findings suggest that certain categories of users detailed in this study, specifically

the socializer category, may be more likely to apply to younger users who already use their mobile phones more frequently to coordinate social behavior.

Conclusion

The findings presented in this article about the social practices of Foursquare users contribute to our knowledge of how people use relatively new mobile applications to coordinate behaviors and how they establish social norms when using new communication technologies. This article argues that, unlike with other forms of mobile coordination, people's physical location plays a key role in how they communicate and coordinate when using LBSNs like Foursquare. I also showed that, as a relatively new technological artifact, there are no established "correct" ways for people to use Foursquare. Different people take advantage of different elements of the applications, and the variety of reasons people use the application plays a role in shaping how they view the meaning of the information their Foursquare friends share.

More and more people now own smartphones, leading to new opportunities for innovative location-based mobile applications that can be used to enact new forms of mobile coordination. As this article has argued, future research projects should be sure to examine both the role physical space plays in people's use of these applications and the importance of design and social context when understanding location-based communication practices. These issues will continue to be important in the social practices of LBSN users, and with the increasing adoption of location-aware mobile phones, people will find new ways to communicate through location that will enable new forms of mobile coordination and require detailed understandings of the social norms that arise due to these relatively new information practices.

References

About Foursquare. (2013). Retrieved February 21, 2013, from https://foursquare.com/about/

Agar, J. (2005). *Constant touch: A global history of the mobile phone*. Cambridge, MA: Totem Publishers.

Akrich, M. (1992). The de-scription of technical objects. In W. E. Bijker & J. Law (Eds.), *Shaping technology/building society: Studies in sociotechnical change* (pp. 205–224). Cambridge, MA: MIT Press.

Axelsson, A. (2010). Perpetual and personal: Swedish young adults and their use of mobile phones. *New Media & Society*, 12, 35–54.

Bartle, R. (2006). Hearts, clubs, diamonds, spades: Players who suit MUDs. In K. Salen & E. Zimmerman (Eds.), *The game design reader: A rules of play anthology* (pp. 754–787). Cambridge, MA: The MIT Press.

Bilton, R. (2013). The new, more amazing Foursquare is about the money — not the mayorships. *VentureBeat*. Retrieved July 3, 2013, from http://venturebeat.com/2013/03/20/new-foursquare/

Campbell, S. (2008). Perceptions of mobile phone use in public: The roles of individualism, collectivism, and focus of the setting. *Communication Reports*, 21(2), 70–81.

Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. London, England: Sage Publications.

Cramer, H., Rost, M., & Holmquist, E. (2011). Performing a check-in: Emerging practices, norms and "conflicts" in location-sharing using Foursquare. In *MobileHCI 2011*.

Crowley, D. (2010). Interview with Dennis Crowley of Foursquare – Turning life into a game. *Intruders*. Retrieved July 2, 2013 from http://intruders.tv/en-tech/interview-with-dennis-crowley-of-foursquare-turning-life-into-a-game/

De Gournay, C. (2002). Pretense of intimacy in France. In J. Katz & M. Aakhus (Eds.), *Perpetual contact: Mobile communication, private talk, public performance* (p. 193). Cambridge, MA: Cambridge University Press.

De Souza e Silva, A., & Frith, J. (2010). Locative mobile social networks: Mapping communication and location in urban spaces. *Mobilities*, 5(4), 485–505.

De Souza e Silva, A., & Frith, J. (2012). *Mobile interfaces in public spaces: Locational privacy, control and urban sociability*. New York, NY: Routledge.

Dillet, R. (2012). Dennis Crowley: Foursquare considered selling, is the best local search tool on the planet. *Wired*. Retrieved July 2, 2013, from http://techcrunch.com/2012/10/11/dennis-crowley-foursquare-considered-selling-is-the-best-local-search-tool-in-the-planet/

Dourish, P., & Bell, G. (2011). *Divining a digital future*. Cambridge, MA: MIT Press.

Frith, J. (2013). Turning life into a game: Foursquare, gamification, and personal mobility. *Mobile Media and Communication*, 1(2), 248–262.

Gergen, K. (2002). The challenge of absent presence. In J. Katz & M. Aakhus (Eds.), *Perpetual contact: Mobile communication, private talk, public performance* (pp. 227–241). New York, NY: Cambridge University Press.

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago, IL: Aldine.

Glotz, P., & Bertsch (Eds.). (2005). *Thumb culture: the meaning of mobile phones for society*. Bielefeld; Piscataway, NJ: Transcript; Distributed in North America by Transaction Pub.

Gordon, E., & de Souza e Silva, A. (2011). *Network locality: How digital networks create a culture of location*. Boston, MA: Blackwell Publishers.

Humphreys, L. (2007). Mobile social networks and social practice: A case study of Dodgeball. *Journal of Computer-Mediated Communication*, 13.

Humphreys, L. (2010). Mobile social networks and urban public space. *New Media & Society*, 12, 763–778.

Latour, B. (1988). Mixing humans and nonhumans together: The sociology of a door closer. *Social Problems*, 35(3), 298–310.

Licoppe, C. (2004). Connected presence: The emergence of a new repertoire for managing social relationships in a changing communication technoscape. *Environment and Planning D: Society and Space*, 22, 135–156.

Ling, R. (2004). *The mobile connection: The cell phone's impact on society*. San Francisco, CA: Morgan Kaufman.

Marvin, C. (1988). *When old technologies were new: Thinking about electric communication in the late nineteenth century*. Oxford: Oxford University Press.

Pinch, T. J., & Bijker, W. E. (1987). The social construction of facts and artifacts: Or how the sociology of science and the sociology of technology might benefit each other. In W. E. Bijker, T. P. Hughes, & T. J. Pinch (Eds.), *The social construction of technological systems: New directions in the sociology and history of technology* (pp. 17–50). Cambridge, MA: MIT Press.

Rheingold, H. (2002). *Smart mobs: The next social revolution*. Cambridge, MA: Perseus Publishing.

Smith, A. (2013). *Smartphone ownership – 2013 Update*. PEW Internet and American Life Project. Retrieved from http://pewinternet.org/~/media//Files/Reports/2013/PIP_Smartphone_adoption_2013.pdf

Sutko, D. M., & de Souza e Silva, A. (2011). Location-aware mobile media and urban sociability. *New Media & Society*, 13(5), 807–823.

Taylor, C. (2012). Dennis Crowley on reinventing Foursquare: De-emphasizing check-ins, digging into data, moving toward revenue. *Techcrunch*. Retrieved July 3, 2013, from http://techcrunch.com/2012/06/07/dennis-crowley-on-foursquare-5-update-video/

Wellman, B. (2002). Little boxes, globalization, and networked individualism. In M. Tanabe, P. Van den Besselaar, & T. Ishida (Eds.), *Digital cities II: Computational and sociological approaches* (pp. 10–26). Berlin: Springer.

Williams, R. (1975). *Television: technology and cultural form*. New York: Schocken Books.

Winner, L. (1980). Do artifacts have politics? *Daedelus*,109, 121–138.

Yee, N. (2006). Motivations for play in online games. *CyberPsychology & Behavior*, 6, 772–777.

About the Author

Jordan Frith (Ph.D., North Carolina State University) is an Assistant Professor in the Technical Communication department at the University of North Texas. His research focuses on social media and mobile media, with a specific focus on location-based mobile media. **Address:** Jordan Frith, University of North Texas, 1155 Union Circle #305298, Denton, TX, 76203.
E-mail: frithjh@gmail.com