

Can You See Me Now? Location, Visibility and the Management of Impressions on foursquare

Shion Guha

Department of Information Science
Cornell University
Ithaca, NY 14853
sg648@cornell.edu

Jeremy Birnholtz

Department of Communication Studies
Northwestern University
Evanston, IL 60208
jeremyb@northwestern.edu

ABSTRACT

Location based social networking applications enable people to share their location with friends for social purposes by “checking in” to places they visit. Prior research suggests that both privacy and impression management motivate location disclosure concerns. In this interview study of foursquare users, we explore the ways people think about location sharing and its effects on impression management and formation. Results indicate that location-sharing decisions depend on the perceived visibility of the check-in, blur boundaries between public and private venues, and can initiate tensions within the foursquare friend network. We introduce the concept of “check-in transience” to explain factors contributing to impression management and argue that sharing location is often used as a signaling strategy to achieve social objectives.

Author Keywords

impression management; check-in; visibility; foursquare

ACM Classification Keywords

H.5.m.Information interfaces and Presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

As GPS-enabled mobile devices become ubiquitous, applications using location information have proliferated as well [23]. Location information can be used, for example, to recommend nearby points of interest [22], provide directions [6, 27], or to facilitate social coordination among groups of friends [6]. Facilitation of social activities and coordination is one of the key motives driving development of recent location-based social network (LBSN) systems [6, 27]. These systems allow users to share their current location with others; typically via mechanisms that assign recognizable names (e.g., Starbucks, My House) to GPS coordinates and allows users to “check in” to them.

One persistent question in exploring the use of LBSNs and location-based services in general has been one of privacy.

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Many users initially resisted sharing location information (and quite a few still do) [3, 5], and researchers have sought to understand people’s motives for sharing location [5, 27, 32], the circumstances under which they are willing to share [3], and with whom they share [3,5,6,27].

One motive that has surfaced repeatedly in these studies but has not been systematically explored is impression management [15]. Cramer et al. [6] found that some LBSN users are concerned about what others will think of them when they disclose that they have visited a particular location. They found that emergent social norms in foursquare suggest a shift from privacy as a dominant concern to more performative considerations of audience reaction.

Thus, a primary focus on privacy as a main user concern for at least some types of LBSNs may not be most appropriate. Emerging evidence [6, 27, 32] suggests that within known groups of contacts, users are concerned less with the fact that others can access their location than with what their friends will think of them for having checked in a certain location. That is, they are concerned about the role of location in managing and forming impressions.

In the paper that follows, we present, in contrast to the prevailing focus on privacy in location sharing, results from an interview study of foursquare, a popular LBSN. We asked about factors people consider in checking into places and in viewing others’ location information, with a specific focus in analysis on how these behaviors are related to concerns about the visibility of behavior and managing impressions.

Using this approach yields several novel results. First, people’s decisions around sharing location depend not just on who can see their location but also on their perceptions of how visible the check-in is and how public the venue is. Second, these factors create a sense of blurring boundaries between public and private venues and initiate tensions in the LBSN friend network, which have subsequent, temporal impacts on impression formation and management. Third, we introduce the concept of “check-in transience” and argue that the last check-in (being the most visible one, often for significant time periods) can contribute to impressions in a greater capacity than the cumulative sum of previous check-ins.

BACKGROUND & RELATED WORK

In this section we discuss prior work related to the use and disclosure of location information and the potential role of this information in impression management and formation.

Location Disclosure: Visibility, Places and Impressions

An issue that emerges repeatedly in discussions of SNS is privacy and the regulation of information flows or appropriate disclosure of information [2]. Privacy has been recently conceptualized by Nissenbaum [30] as a context-specific regulation of information flows. Where context was historically dictated by physical and architectural constraints on the flow of information, SNS and LBSNs enable the easy and rapid sharing of information beyond the boundaries of any one physical or geographic context. This forces users of these systems to constantly make decisions about what information to share. We argue that in LBSNs, one key motive for disclosing (or withholding) location is users' desire to manage others' impressions of them.

Goffman's theory of impression management [15] provides an important and useful framework for considering these decisions. He uses a dramaturgical metaphor to distinguish between "frontstage" - a cultivated public and social persona and a "backstage" - a private self, about which few details may be fully disclosed.

Goffman builds on this [16] by defining the notion of the "public place" as one in which behaviors are visible to others (the "audience," to further the dramaturgical metaphor) and where there is a set of norms for appropriate behavior. Impression management in a public setting depends on the nature of the public place, what one is doing and the audience present in that space. Visibility of actions then, is a key aspect of impression management especially in conjunction with the idea of a public place

In recent years, impression management theories by Goffman and others have been applied to study of SNS. Bloggers, for example, appreciated site customization tools that allowed them to cultivate a particular impression [34]. Others (e.g., [9,26]) have observed that users develop unique strategies for managing interaction within and between different social groups on SNS such as Facebook.

In addition to managing flows of information to different groups of online contacts, affiliation with particular individuals and groups can also influence others' impressions of SNS users. Donath and boyd [7], for example, suggested that "public displays of connection" are important signals of individual identity that help people navigate their extended network and validate identity information in profiles.

Some other thinking around spatiality [18] has expanded the idea of a place from a physical structure in a built environment to a media space or a cultural activity. Harrison and Dourish [18] opine that there is a distinction between a place and a space in that places frame appropriate behavior and have social meaning. Thus, a deeper understanding of visible actions in a public place in the context of LBSNs

and impression management could add meaningful knowledge about the natures of places and spaces.

LBSN's are a type of SNS where users "check in" or disclose their physical location to other users [27]. Barkhuus et al. [4] found that users in a location sharing system called Connecto considered where their friends were as an important motivator for using the system to socially engage with them. Additional recent work in this area has looked at decisions around location disclosure through the lens of privacy [13]. However, we argue that these decisions can also be usefully viewed from the perspective of impression management in public places. For instance, Giuliani [14] suggests that affiliation or emotional engagement with locations, sometimes expressed via a visible presence at those locations, can signify who a person is or wants to be [14].

Consistent with this, others [6, 27] have studied emerging norms in foursquare and found that users consider their potential audience in deciding whether to check in to a location. They also tend to adopt different roles for their different audiences. By suggesting impression management as one motivator, these prior studies set the stage for a deeper exploration of what other underlying processes drive management and formation of impressions in LBSNs.

Summarizing the above discussion, it is clear that users of SNS and, more recently, LBSNs consider their audience in deciding whether or not to disclose information to their networks. It is further clear that affiliation with or presence at particular locations can play a role in constructing a particular impression. We do not have a good understanding, however, of the circumstances and strategies that surround decisions about location sharing in LBSNs, and how this plays into impression management. We therefore ask:

RQ1: How does the visibility of disclosures affect LBSN users' decisions about whether or not to check in to particular locations?

Location Disclosure: Visibility, Audiences and Tensions

Another issue that arises often in discussions of LBSNs and visibility of actions in public places is the potential audience to which a user's behavior and interactions are visible. Location disclosure in a LBSN [27] is an action visible by default to their entire set of contacts. It would therefore be useful to study how such disclosures may affect relationships with these audiences and how these audiences form impressions based on these visible actions.

Many factors have been found to influence impression formation in online and face-to-face contexts such as gender and racial stereotypes [21]. Lee et al. [26] found that the quality and quantity of information that a user receives about another user affects the overall impression formed, but there is some evidence that not all information is equally important. Lampe et al. [24] found, for example, that certain elements of SNS profiles were more important than others. Moreover, consistent with Walther's hyperpersonal

model [36], the absence of information in profiles can lead to exaggerated or inaccurate impressions [27].

Location has also been shown to influence impression formation. Liu & Donath [28] built a wearable prototype of a bag that displayed “fashion signals”. This helped observers form nascent impressions of the bag wearer, which were often affected by the wearer’s location. While the influence of location sharing on impression formation has not been studied extensively, Reilly et al. [33] did find that the interpretation of shared locations can vary substantially with context. For instance, sharing that one is in the office on Monday will likely be interpreted differently than the same information late on a Saturday night.

Sharing locations and other information on SNS has also been influenced by concerns about audience and visibility. In tagging Flickr images, for example, people are conscious of the audience to whom they thought the images would be visible to [1]. Recent work [32] has found that people’s decisions to share location depends upon specific audiences like family, friends or significant others. This is similar to early work on LBSNs where Humphreys [18, 19] found that LBSN users had two different audiences – an “inner circle” of close friends and family and an “outer circle” of acquaintances. She suggested that in these contexts, public places become spaces around which existing social relationships evolve.

In a foursquare study, Patil et al. [31] found that more than one quarter of their participants expressed regret over having shared location usually based upon some subsequent tension with a friend. The authors conclude by relating these regrets to undesired social concerns and privacy.

In summarizing the above discussion, we find evidence of tensions between audiences in social media and also in LBSNs. What needs to be understood in greater detail is how the relationship between visibility of actions in LBSNs and audience tensions affect impression formation and management. This leads us to our second research question:

RQ2: How does the visibility of disclosures to different potential audiences affect LBSN users’ decisions about location disclosure on LBSN?

RESEARCH METHOD

Research Context and Terminology

We conducted an interview study with users of foursquare [10], a location based social networking app where users “check in” to locations via a smartphone. This location is then visible to the user’s foursquare network, and can also be made visible via other SNS such as Facebook or Twitter. Prior work has shown that people use foursquare for different purposes such as social coordination and connecting with friends; and that the system employs incentive mechanisms such as location-specific achievements (e.g., badges, discounts and mayorships) for those who check in frequently at specific places and a point system to motivate users [27]. We selected foursquare because it is the most popular

(in terms of membership) LBSN, with 20 million registered users [11]. We felt that focusing on one popular site would make it easier to find participants and capture emerging norms and motivations.

The main functions on foursquare are checking in and viewing the most recent location (no history is provided) of one’s contacts. To “check in,” users select from a list of pre-defined nearby locations (e.g., coffee shops, bars, stores, homes, parks, etc.) that are shown based on the phone’s current GPS coordinates. Importantly, it is possible to “fake” one’s location by checking in to nearby locations that appear as options based on relative GPS position, but do not reflect actual location (e.g., checking in to a place further down the street). We refer to any public check-in on foursquare as an act of location disclosure.

We use several additional terms throughout the paper to describe behavior and locations, which we define here. First, while behavior is nearly always theoretically “visible” in a literal sense (except perhaps in the dark or around the visually impaired), we consider an individual’s behavior to be “visible to others” if it is easily discernible by people not actively involved in the individual’s current activity. We consider a space to be “public” if one does not require an explicit invitation to be there, and “private” if an invitation of some sort is required. Thus, we would consider a conversation between two people alone in a bedroom to be an activity that is not visible to others, and occurring in a private space. The same conversation in a coffee shop would be visible and in a public space.

Participants

Participants were recruited for this study using a number of different techniques. Initially, flyers were posted around the campus of a university in the northeastern United States, recruitment emails were sent to various mailing lists at the university, an advertisement was setup in the university’s web based human participant recruitment system and existing contacts were also spoken to. In addition, participants were also recruited via snowball sampling. All participants were compensated with ten dollars in cash or by credit for appropriate courses.

Thirty people participated in this study between the time period January 2012 and April 2012 (16 female, 14 male). These included sixteen undergraduates, eight PhD students and six students in a professional masters degree program. We interviewed until there was significant repetition in what our participants were telling us, suggesting that we had reached at least preliminary theoretical saturation for the population being studied. This is consistent with [12, 29] who suggest sample sizes ranging from 12 - 30.

Procedure

Participants participated in semi-structured interviews conducted by the first author in person in a private office or conference room. Every participant also completed a post-interview survey, which included questions about basic demographic information (age, sex), basic foursquare usage

information (check-ins, badges, mayorships) taken directly from the participant's phone and several 5-point Likert-type questions which asked the participants generally about how they feel about location sharing and foursquare.

The interview protocol was constructed before the start of the study, but iteratively refined through discussion by the authors as well as through several pilot interviews not included in the reported data. However, the set of questions remained relatively constant throughout the entire process. As the interviews were semi-structured, the order of questions was sometimes adjusted to fit the participant and the nature of the conversation. Interviewees were asked about their usage of LBSN platforms, when, how and why they did so, how they decided where to check-in (or not to check-in), and their feelings and emotions towards various actions in this LBSN platform. Interviewees were also asked to provide specific examples when the interviewer noticed instances of impression management strategies.

Data Analysis

Interviews lasted between 24 and 51 minutes ($M=39.2$ minutes). All the interviews were audio recorded and fully transcribed for analysis by the first author.

The data analysis process was directed by the authors' research questions and ideas. The first author closely read all the transcripts of the interviews and made relevant notes. After discussion, the authors developed an open coding scheme, which was guided by initial questions about impression management and iteratively refined through coding and discussion. Transcripts were annotated and a spreadsheet was used to identify themes in the data.

RESULTS

Participants described a wide range of practices in using foursquare and sharing location. Most of them reported potential concerns about privacy but at the same time also mentioned that their foursquare friends were only people whom they knew and had met in real life. This meant that participants' privacy concerns were less about possible threats from strangers gleaning information about them, and more concerned with what information they wanted their foursquare contacts to see and when. We were struck by a seeming paradox in what our participants told us. On the one hand, participants said their foursquare contacts were known friends, so were generally not concerned with the idea of sharing location with these people. At the same time, though, participants described many scenarios in which location sharing in these known relationships did matter a great deal. As we analyzed the data, we noticed three key themes in our results, which are the organizing principles for this section of the paper.

Foursquare Alters Visibility of Behavior

One key theme that emerged in our data was that foursquare changes the way that participants think about the visibility of their behavior, and the public versus private nature of places. Despite saying frequently that they did not care about sharing their location with friends, for example, most

participants acknowledged that they did not disclose all of the locations they visited by checking in on foursquare. Instead they described conscious decisions about the ones they did choose to disclose. We refer to this as "selective location disclosure."

While foursquare enables users to hide check-ins via the "private check-in" feature, most participants did not use this feature. They opted instead simply to not check in at places they did not wish to disclose. Frequently, their decisions around check-ins turned on whether or not they wanted others to see that they were in a particular place. For our purposes, what was interesting in these decisions was participants' perceptions of how foursquare altered the visibility of their behavior, whether they were in traditionally public or private spaces.

In describing her decision not to check in at her gym, for example, Liz, an undergraduate student, said:

I don't check in to gyms because I don't want my friends knowing when and where I work out. They might think that I think I am too big and want to lose weight. They don't need to know about all of that. If I want to lose weight, I don't want them knowing about it.... The gym is my private place even though it is really public. I suppose foursquare would prevent me from being unseen there. I just want to lose myself among all the people there but checking in would not help me there.

What is interesting here is that Liz understands that the gym is a public place and her behavior there is visible to others whether she checks in or not. At the same time, she is concerned about what her foursquare contacts will think if they see that she has checked in there. In this way, it is not just whether behavior is visible to others that mattered to our participants, but also who those others are. Thus, foursquare forces our participants to reconsider the visibility of their behavior even in public places, as it can take already public behavior and render it visible to a different set of people. We expand on this notion further in the next section, where we discuss different audiences even within one's foursquare contacts.

In other cases, we saw evidence of foursquare taking behavior that is typically not visible to others because it occurs in a private space like somebody's home, and rendering it visible to others who are not there. Tammy, an undergraduate student reported:

I always check in to my friend's apartment when I am there. I don't care. I want to tell people where I am... I am a social person, people should know where I am. For me, my location is not really private, its public and open to my social world... I have nothing to hide and nothing to be ashamed of.

In Tammy's case, her visiting a friend's apartment would not ordinarily be visible to her other friends because it occurs within the privacy of that apartment. With foursquare, the apartment is still private, but Tammy's presence there

is visible and therefore known to her foursquare friends. Thus, foursquare can take not-typically-visible behavior and make it visible to foursquare contacts.

A third way that foursquare alters the relationship between privacy and visibility is that it can be used deliberately to make specific behaviors occurring in a private space visible. Megan said that when she hosts parties she sometimes uses foursquare to change the nature of behavior in her own apartment to make it more visible, and make the space appear more public than it typically would be:

I usually don't check in to my own apartment because it is my own personal space and I don't want everyone knowing where I am. But if there is a party at my place then I will check-in, create tips and tag people. After all, it is a party at my place and I want people to know it.

Here, the party serves to make Megan's apartment a quasi-public space in that she wants people to come to her party. By making her own presence there, which she usually opts not to share with others, visible and using the tagging feature of foursquare to do the same for others, she draws attention to the otherwise private space in ways that allow her to accomplish the goal of a successful and well-attended party.

These three examples illustrate themes that emerged repeatedly in our results. Many participants described instances in which foursquare changed the audience to which already visible or public behaviors were being displayed, or served to make traditionally private behavior more visible, sometimes in service of transforming a private space into a temporarily public or quasi-public space. Participants also described concerns about different perceptions of their behavior even within their set of foursquare contacts. This is the topic of the next section.

Visibility to Multiple Audiences Creates Tension

A second theme in our results was that, as foursquare altered the audiences to which our participants' behavior was visible, they had to be conscious of how their behavior might be perceived differently by different people within their set of foursquare contacts. They described being very conscious of this and had detailed strategies for accomplishing these impression management goals.

As noted above, the visibility of behavior in real-world physical spaces is constrained by features of the environment, such as architecture and distance. People sometimes exploit these constraints, as Liz does in the example above by choosing a gym where she is unlikely to run into friends unexpectedly. As we noted above, however, foursquare blurs the boundaries between public and private by rendering behavior visible in novel ways. Here we focus on how people manage the visibility of their behavior to different potential audiences on foursquare.

Before discussing the details of participants' strategies, however, we describe the different audiences they perceive on foursquare.

One tension that arose for our participants was between the visibility of check-ins to commercial locations for verification purposes (i.e., retailers, restaurants, etc.) and to one's foursquare friends. Many retailers, seeking to derive value from the visibility of check-ins, offer promotions and specials to those who check in at their locations. Several of our participants were interested in these offers, but also concerned about what others might think about them checking in at certain locations. Jill, an undergraduate student says:

Rite Aid used to have a discount for checking in. But I don't want my friends to see me checking in there. It's stupid. I used to check-in somewhere else nearby as well. [immediately after checking in to Rite Aid] I thought that my friends would not notice.

Thus, Jill experienced tension between her objectives of using foursquare to obtain discounts and using it as a social tool to cultivate a particular impression for her friends, into which shopping at Rite-Aid, a US drugstore chain, did not fit. Using the framework we presented above, this is a case in which Rite-Aid offers Jill an incentive to check in because it believes that the visibility of Jill's presence there can increase the store's appeal to others like her. Conscious of how her friends might perceive her check-in there, however, Jill seeks to limit the visibility of her presence there by checking in elsewhere immediately after getting her discount.

Another tension participants experienced was between different audiences within their set of foursquare friends. Sometimes this tension was between what behavior should be visible to family versus friend contacts. Megan, an undergraduate, reports that her check-in strategy takes into account her father's use of foursquare:

I usually don't check in to bars late at night because my dad is on foursquare. I don't care about my friends knowing where I am but I care about my family knowing. I don't know whether he [her dad] checks my foursquare notifications or not but I don't want to take that chance.

She goes on to mention that she would like to check in to every place she visits but knowing that her father might see her at certain potentially undesirable places prevented her from doing so. In this way, Megan's behavior in an essentially public place is made visible to others, such as her father, who would not ordinarily see her there, and who might form a negative impression or be upset. This consideration forces her to alter her behavior.

Amit, a graduate student from India, experienced a similar tension, but his was between local friends and friends back in India. Amit described an active social life in graduate school, but wanted his friends in India to believe that he was working hard in the US. To avoid making behavior visible that might run counter to this impression, he says:

My friends shouldn't be allowed to think that I am not working hard at [our university]. Indians are very competitive and my friends back in India shouldn't be as-

suming that I am partying here. But, I do party but when I do I only check-in to party places on Fridays and Saturdays, basically, weekends. Even if I go out on weekdays, I don't [check in].

Amit is conscious moreover, of the impression he is making with the places where he does opt to check in. He also says "But I want to check in to cool places when I am out." On one hand, he would like to check-in to interesting locations. On the other hand, he does not want the visibility of his behavior to lead to unfavorable impressions of his work habits. His strategy is to check in only when he believes it will be perceived as socially acceptable by his friends in India. He reasons, "I don't think that my friends would see any red flags if they saw me check in on weekends."

Importantly, both Amit's and Megan's situations would be quite different if their family and friends were local, and there was some chance of seeing them at the bars. It is the expansion of this usual range visibility that causes the tension they experience.

One recurring concept from our findings was what we have defined as "*check-in transience*." We argue that a check-in, its visibility, the venue and the audience are of interest only during the lifetime of that particular check-in, which, in many cases is very short and changes rapidly. On the other hand, the last check-in could also be long lasting and greatly visible during periods of foursquare inactivity. Our results suggest that people have used this to great effect in formulating different location-sharing decisions.

One strategy was to "randomly" check in to a location they are not actually visiting or remaining at for long. For instance, Jack, a graduate student says: "I will randomly check-in somewhere to throw off a person off my scent." He goes on to say "I feel like people may stalk me all the time so sometimes, I should fool them." Jack's experience, and particularly the desire to throw people off "his scent," belies some underlying tensions that users experience in using foursquare. Indeed, one might wonder why Jack shares his location at all if he is concerned about the potential consequences of others knowing where he is. It was clear, though, that he and other participants did derive value from checking in at *some* locations, and that this was one common strategy they used in impression management. They did not, however, *always* want all of their contacts to know or see where they were.

Another strategy was to use "micro check-ins" (defined previously) to "spam" the notification system, with the goal of frustrating friends looking at their notifications. This is possible because foursquare friends can only see a user's last check-in. Thus, multiple check-ins can provide cover for a user looking to disguise her true location, but still appear active on the site. Greta, an undergraduate student reports that she finds this a useful strategy:

I mean, I am not lying. I am walking through the engineering quad, the Statler bus stop, the naked man statue etc. Since I have my iphone in my hand all the time, its

easy to check-in. My friends complain about my spam on their notification system all the time but I think that it does not allow them to really know where I am because if I am doing this, then they just stop looking.

Importantly, those who described employing this strategy do not do so all the time. Instead, they only do so when they feel the need to hide their true location. For instance Greta goes on to say that "I feel as if I have to take cover from my friends' gazes sometimes ... sometimes, I don't want them to know where I am. Then, I do this."

We also saw some evidence of outright deceptive behavior, such as checking in to locations not actually being visited. For instance, Anthony, an undergraduate reported:

Sometimes I will check-in to places where I am actually not at. I don't want my friends to think that I am a geek for staying in the dorm and studying on a weekend.

Clearly, Anthony cares about what his foursquare friends think about him – so much so that he takes steps to check in to locations he is not at to maintain an impression of him as a fun friend. Similarly, Jill, an undergraduate student said:

If I am getting dinner at Pita Pit on a weekend [which is near her apartment, to which she will return after dinner], my first reaction will be to check in. But, if I see that a friend has checked in to a club downtown, I am not going to check-in. I may just check-in to a restaurant next door. I don't want my friends to think I am uncool or something. I mean, some of my close friends will obviously know what I am doing but there are some people - I don't want them to think I am a boring person who doesn't go out – who just stays in on a weekend, you know.

Participants generally had two different types of friend groups on foursquare. The first was a group of close friends and family and the second consisted of acquaintances. We explored in the next theme how location sharing and visible, public behavior affected these relationships.

Visible Behavior Affects Impressions and Behavior

As our participants reflected on the visibility of their own behavior in different places and to different audiences, it was clear in their descriptions that another key factor was the likely impact of visibility on impressions for a particular audience. This raises the question of how participants assessed the likely impact of making behavior visible to particular audiences.

In some cases, as we described above, this was relatively simple. These were cases where there was already a strong relationship and a clear sense of how others might feel, as with Megan and her father or Amit and his friends in India. In other cases, though, impressions and relationships for both our participants and their foursquare contacts were less stable (and therefore more malleable); so impact on impression was harder to predict and required more active management. For instance, Emily, a graduate student reported:

I usually text with my close friends even if they are on foursquare and I don't care about what they think about

me ... I mean, they already know me in real life much better than the others but the others, maybe I don't want them knowing something about me ... I mean, I trust all of them on a basic level but some things about me, everyone doesn't have to know.

This raises the question of what participants considered as they tried to predict the impact of location disclosure on impression formation, and how they themselves drew on this information in forming impressions about others based on their visible behavior on foursquare.

Location clearly was a factor as participants formed impressions of others, particularly when they knew little about those others. For instance, Maya, an undergraduate student said:

I saw him check in at Gimme Coffee downtown and I thought that he was such a total hipster. I mean, I go to Starbucks and it's where normal people go. Gimme is for coffee snobs or wannabe hipsters.

Here, we see that Maya's feelings about a certain coffee shop play a role in her judgments about a foursquare friend. Maya's feelings would clearly have been different if she knew this person better, in that she would already have a sense of the type of person he was.

Another factor participants described was looking at the frequency of their foursquare friends' check-ins, sometimes regardless of the specific locations being shared. For instance, John, an undergraduate student said:

I look at her check-ins and I think that she checks in everywhere, all the time. She is always outside. I mean, when does she study? Does she study? Why is she always eating out everyday? Can't she cook?

What is interesting in this example is that it shows how impressions can be influenced by patterns of visible behavior, in addition to isolated instances. Here this is evidenced in the combination of both the frequency of check-ins and the general types of locations (i.e., an apparently large number of restaurants), but not the specific places that affect John's judgments.

Participants also described cases where others' check-ins at particular locations surprised them, and caused them to update their impressions in a positive way. This is an important point, as we have largely discussed audience management considerations as ways to avoid being perceived in a negative light. Julie, however, describes a case where she learned from foursquare that she and a friend unexpectedly shared an interest in dance:

I saw him check in to [a gym on campus] and I was so surprised. I thought, wait a minute, he doesn't do weights. Why the hell is he in a gym? I commented on his check-in and he replied back and said that he was attending a dance class. I was so surprised. I didn't know that he danced because I love dancing and I didn't think that he was a dancer. I thought that I knew him well enough but apparently not. I signed up for the dance class and started going with him [the] next week. [...]

Of course, I checked in there with him every week. Why wouldn't I?

Similarly, Jane, a graduate student who was self-conscious about checking in at her gym said (about a close friend):

She checked in once there [a tattoo studio] and I thought that if a girl like her can check in there then I can also check in to my gym.

Prior to seeing the check-in, Jane did not associate her friend with visiting tattoo studios. What is interesting here is not that Jane then felt comfortable checking in at tattoo studios, but rather that she saw the check-in as a sign of her friend's confidence. This confidence then served as inspiration for her own impression management tactics, in that she was less worried about possible negative perceptions associated with a gym check-in.

We also saw evidence of participants' impressions of a person affecting their impression of a place. Terry, an undergraduate, describes the effect of seeing her friend check into a local independent coffee shop:

I remember seeing him check-in to [a local independent coffee shop] all the time and I thought, that's a pretty cool place from the tips and [the fact that] he is a pretty cool guy. I thought that I should start taking my homework there instead of Starbucks. [...] I visited there so much that I became the mayor of the place replacing him.

From our standpoint what is interesting here is that the visibility of Terry's friend's behavior, combined with other information on foursquare (i.e., tips, etc.), that allows her to understand what type of people go to the independent coffee shop, without having to visit it. Thus, there is a sense in which the extended visibility provided by foursquare extends the traditional bounds of the coffee shop by allowing others to "peek inside" and see who goes there.

DISCUSSION

We began with questions about the visibility of location information. The first was what role visibility had in the decision of users to disclose location and the second was about what impact visibility of these location disclosures had on the potential audiences and future decisions of the users. Overall, we found that users have evolved different strategies for location disclosure, and that disclosure decisions frequently considered visibility and venue attributes that were responsible for initiating tensions in the foursquare friend network.

Theoretical Implications

We began with the assumption that location-sharing behavior might not be fully explained within a privacy centric framework but also by considering impression management as a key factor. While analyzing the data, we looked for ways to disprove this premise but instead found strong support in our results. Through careful reading and interpretation, we concluded that selectively sharing location is often used as a strategy for social signaling, usually for an underlying purpose. Therefore, a decision to (not) share location

will have multiple factors behind it and privacy is only one of them. In our results, it becomes clear that impression management is another important factor. We use this as a motivating guideline to explain several specific theoretical implications that emerge from the results.

Blurring Boundaries: Visibility and Public Behavior

We refer to Goffman's framework [15,16,17] and consider his notions of "public behavior", "public relations" and "visibility of public behavior" as a framework for understanding how people make decisions about self-presentation under the context of the public-ness of their actions.

foursquare blurs boundaries between different contexts. On one hand, foursquare can be considered an inherently "frontstage" technology in that it is designed explicitly for revealing (i.e., placing on frontstage) location information to selected others. At the same time, however, it can be used in virtually any real-world location, including those in which "backstage" or otherwise private behaviors may take place. In these cases, people may simply choose not to check in, but even the absence of a frontstage check-in by a habitual user over a time period when they would ordinarily check in can be informative. Such an absence might lead to an impression that backstage behaviors (i.e., studying on a Friday night) are taking place but are not being shared. This is distinct, moreover, from absence at a real-world frontstage place in that the audience is larger: one's last foursquare check-in is immediately visible to all friends.

On the other hand, foursquare also blurs the boundaries between public and private places as defined by Goffman [16]. Here, the visibility of exhibited or intended behavior becomes a key factor in subsequent impression management. We argue that foursquare check-ins make possibly private behavior visible to a larger, more public audience of foursquare contacts, and the decision to not check in can make behavior that is possibly public (in that it occurs in a public place) seem more private by not rendering it visible to foursquare contacts.

Previous literature [6,27,32] suggests that users have multiple objectives and multiple roles. Our results add to this by showing that participants often manipulated check-in information to create specific appearances. Our participants described a range of strategies for balancing the visibility of their public behaviors and their intended objectives. These included, for example, "micro check-ins" or falsely checking in at a "random" location, both of which make behavior visible, but leave out the details or actual location. The implication here is evident. A certain brand of fuzziness has emerged in what behavior is considered public or private or appropriate especially when mediated through the interface of a mobile phone. This was true, for example, for Megan and Amit, who both did not post when they were at bars. In Megan's case, she did not want her father to know what she was doing because he might judge it as inappropriate. In Amit's case, he did not want his friends at home in India to think he wasn't working hard, which might also be seen as

inappropriate or counter normative. What is interesting in both of these cases is that they were not concerned about the appropriateness or consequences of going to the bar, which is a public and social behavior that would clearly be visible by their local friends and others at the bar, but rather they were concerned about the perceptions of distant others.

This suggests that the clear lines between private and public behaviors discussed in prior work are made fuzzier by the context collapse that often occurs with social media. [8] This fuzziness is further enhanced by the public visibility afforded to check-ins at private locations. Users were conscious of the quasi-permanence of their check-ins and used strategies that were impression conscious. From an impression management view, this further suggests that even traces of behavior -- often viewed as accurate representations [9] -- are often manipulated by users to create particular impressions.

Re-imagining Public Places: Audiences and Objectives

Our next question was about tension between multiple audiences and objectives. To address this question, we turn to the framework defined by Harrison and Dourish [18] around the nature of a place and a space. They make a distinction between a virtual place and a space in the built environment and then explain that social interactivity in a virtual place is a cultural phenomenon. foursquare check-ins result in a transformation of the physical venue into a cultural production of place where the potential visibility of presence is a key factor in the tensions between audiences, objectives and impressions.

The majority of our participants described this tension that in turn, affects others' impressions of the participants when behavior is visible to them. There is an important implication here. Our participants reported that their LBSN network usually consisted of relatively close friends and family with whom there already exists a close, offline interpersonal relationship. We assumed initially that sharing location to people one already knows well would not have much impact on impressions. This implies that participants are using location sharing as a tool to supplement their offline social goals and also suggests broadly that they will use any means they possess for their social signaling objectives.

Redefining Spatial practices: Relationships and Contexts

The previous implications raised the issues of visibility of public behavior and tensions in audience considerations as prime motivators in the location sharing decisions in a LBSN. Our third implication then deals with how relationships and decisions around location sharing affected by the visibility of activities in a LBSN.

Our results suggest that foursquare, by blurring boundaries and making behaviors visible have contributed to this discussion. Participants frequently report influencing and being influenced by visible behaviors around a given location. One caveat here is that often the locations themselves are not of prime importance, but the social structures around visible behavior in those locations are more important. For

instance, Julie joined a dance class with her friend and Terry started visiting a coffee shop her friend frequented after seeing their check-ins.

In an earlier section, we have introduced the concept of “*check-in transience*”. We have also shown how it is used to good effect by our participants in making location-sharing decisions. These strategies differ wildly in nature. Specifically, the examples of Jack, Greta and Anthony show that people increasingly use the spatio-temporal importance of the last check-in as a strategy to cultivate favorable impressions of themselves to their social network. This is a very good case for how people use a system mechanism and subvert it for their particular, social reasons.

Summarizing this discussion, manual location sharing (at least for some categories of users) has evolved to the point where it is being used as a tool for nurturing impression management strategies. In this context, a check-in becomes less about sharing location to track venues or get special offers [27, 32] and more as a signal to achieve a social goal. On the other hand, choosing not to share location becomes less about privacy considerations [3] and more about intentionally currying favorable impressions in a social network.

Implications for Design

We also considered several design implications as an outcome of the theoretical implications from this study.

Access Control by Location

One design implication that follows from our results is that people consider not just their willingness to share their current location with certain individuals (as other privacy approaches would suggest), but are also concerned about the visibility of this act with different audiences and their multiple objectives in using foursquare.

To address these many concerns and audiences, one useful alternative to filters based on specific contacts or groups of contacts would be to allow LBSN users to filter according to specific locations or general types of locations in combination with individual-based controls. One could, for example, set a filter to avoid sharing locations identified on foursquare as “bars or clubs” with parents or certain friends, but to share these with local friends. One could also share “coffee shops” with any contact, but restrict “pharmacies” or other potentially sensitive types of location. In the terms used above, this would allow for a clearer specification of what types of spaces are “public” to all contacts, such that impressions could be more carefully managed for certain contacts. At the same time, though, the ability to share all locations with, for example, local friends would allow for the social coordination functionality that users value.

Selective Location Disclosure for Geographical Regions

Another of our results is that people’s impression management concerns often related to what we have referred to as a blurring of boundaries between public and private spaces, and from a broadening of the visibility afforded by local public spaces to render them visible to remote contacts as well. We believe that LBSNs could be more sophisticated

in their use of location information to allow for sharing, for example, only with users within (or outside of) a specified geographic distance from the location. In this way, one could share certain activities only with local friends or even only with remote contacts.

A second and related use of location could allow for the specification of geographic regions that one wishes or does not wish to share. Checking into any place in certain neighborhoods, for example, could convey a particular impression. Users could be permitted to identify these regions themselves using a map interface, or to use shared specifications for certain popular neighborhoods.

Limitations and Future Work

One limitation of this study is a limited population of participants, namely undergraduate and graduate university students. We also asked participants specifically if their foursquare usage behavior was different in large cities, small college towns etc. Participants had varied responses roughly equally divided among those who believed that their behavior differed and those who believed that their behavior did not differ. We acknowledge that behavior might be different in a more urban environment or in a population with fewer students. However, we do believe that this inquiry from a LBSN perspective provides a useful exploratory overview for others interested in the theories of impressions, visible behavior and public places.

This work also sets the stage for a range of future studies of impression management and other behaviors in LBSNs. Specifically, we plan to study impression management on LBSNs in other settings and among a broader population, using both qualitative and quantitative survey methods, in combination with users’ usage data from such LBSNs.

CONCLUSION

We presented an interview study of how visibility and public behavior affect audience considerations and impression formation and management in LBSNs. This work builds specifically on studies by Cramer et al. [6] and Lindqvist et al. [27], which identified impression management as a factor but did not explore strategies for maintaining these impressions via check-ins in a detailed way. Our results suggest that visibility of behavior and the potential public-ness of a venue are key factors in location sharing decisions. These create tensions in the foursquare friend network that further affect impressions and behaviors. We also introduce the idea of “*check-in transience*” to argue that the last check-in (and its visibility to the foursquare friend network) affects impressions to a greater degree than the cumulative sum of the previous check-ins. Participants evolved different strategies to deal with these different aspects.

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