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INTRODUCTION

People are becoming more connected through technology – or are they? According to recent statistics, more than 800 million people are active Facebook users, with more than 50% logging on every day (Facebook, 2012). About 150 million Facebook users are in United States; on average, each user has 130 Facebook friends (Parfeni, 2010). American Internet users have an overall network of 669 social ties, compared to 506 social ties for non-Internet users (Hampton, Goulet, Rainie, & Purcell, 2011). Internet users also have more close ties (people with whom with they could discuss important matters) – an average of 2.27, compared to non-Internet users who average 1.75 close ties. In sociological terms (Putnam, 2000), Internet users have more “bridging social capital” (connections to diverse individuals in large, weak networks) and
more “bonding social capital” (small, strong networks with strong emotional support) than non-Internet users.

Steinkuehler and Williams (2006), examined the utility of virtual communities in MMOs (Massively Multiplayer Online games) to act as “third places” (separate from workplace and home) for informal sociability. They found that MMOs provided bridging social capital connecting diverse individuals in large, weak networks that served as a sociological lubricant but offered little in the way of emotional support. Conversely, MMO communities tended not to provide bonding social capital (small, strong networks with strong emotional support). The concluded that although MMOs are not particularly socially useful for individuals seeking emotional and substantive support, MMOs can open windows to new people and ideas, expanding players’ social bridging capital (loose social ties to diverse individuals that yield access to novel information and resources). On the other hand, Pearce (2009) and Taylor (2004, 2006) have extensively documented the emergence of culture and community in MMOs. Casual players may gain casual social connections, whereas more committed and involved players create and experience deeper community.

Although people now have increased opportunities to communicate online, studies show this sometimes makes them be less likely to interact with co-present others. Mobile devices and Wi-Fi hotspots make it possible for individuals to go online while they are in coffee shops and other public spaces rather than talk to the people near them, rendering these public places less public (Goldberger, 2003). Before a conference presentation or class begins, audience members can be seen checking email or browsing the web, rather than chatting with the person beside them. Hampton and Gupta (2008) refer to this kind of use of technology to create a private sphere of interaction within a public space as “public privatism.”

Laurier, Whyte, and Buckner (2001) conducted ethnographic research in a neighborhood café, observing that cafés are public places where common codes of conduct are adhered to. Cafés often provide a different social status to strangers. Café environments are conducive to strangers interacting. Local Wi-Fi in a café might increase communication among strangers, or it might inhibit such interactions. Hampton and Gupta (2008) conducted an ethnographic study of how Wi-Fi was used local cafés in Boston, and Seattle. They identified two types of users: “true mobiles” who use the café as a space of productivity to continue their work and “placemakers” whose primary activity is not to engage in paid work but instead to interact with the café and its inhabitants. Placemakers were regular customers who lived nearby and usually arrived alone. True mobiles withdrew into public privatism, whereas placemakers used technology but also engaged with café staff and other patrons.

**Local Wi-Fi Enabled Paired Gaming Study Design**

Placemakers already do engage to some extent with café staff and other patrons. But could technology be used to increase that engagement? In our research, we examine how a Wi-Fi enabled gaming environment could be socially engineered not merely to allow but to actively promote local social connections. We simulated a multiplayer local Wi-Fi gaming service designed to serve as a “social lubricant” for café patrons who are interested in reaching out to other people at the café they may not already know. The idea is somewhat akin to a checkerboard in an old general store — the game is not important in itself, but has value as a mode of bringing people together. Coffee shops and family restaurants often provide physical board games for patrons to play. However, it is likely that these games are going to be played by people who already know each other. Strangers would be unlikely to walk up to someone, chess board in hand, and propose to play.

Location-based multiplayer online gaming (via local Wi-Fi) could potentially lower the barriers to initiating play between strangers. Our field research simulates what could happen in a coffee shop where local Wi-Fi gaming was
promoted and facilitated. Imagine that a coffee shop hosted a local “gaming portal.” Since the goal is to increase social connection, only multiplayer games would be offered. Patrons who were interested in gaming with other patrons could create a user ID and log in to the portal. There they would see a list of the other patrons in the coffee shop who are looking for gaming partners. The portal would offer a (short) list of multiplayer online games. Users could find each other and start playing any of the available games together.

These gaming-interested patrons could play the entire game without ever knowing whom they were playing with, or they could volunteer information about themselves and even share identifying information to locate each other. Players would know that the person they are playing with is located in the same café. They could choose to take the initiative to propose moving to the same table, or play from wherever they are sitting. This approach provides players with control over how much personal information they share (self-disclosure during gameplay including whether the user ID they create is their real name or a fake name) and over whether their interactions with their gaming partner occur exclusively through electronic means or expand to include face-to-face communication. There is, however, a chance that play partners would happen to be facing each other and might realize they are playing together. If the venue is small, realizing whom one is playing with is more likely. If the venue is large, the chance of happening to discover your gaming partner is less likely.

**Anonymity and Visibility**

An obvious question is, why not just arrange for the play partners sit together once they decide to play together. This issue is central to our research. An argument in favor of preserving anonymity is that it may offer a non-threatening initial entrée to gaming with a stranger. Gregarious extroverts may not need a cloak of anonymity, but shy people more likely would. Anonymity could provide an emotional safety net which allows players to relax and speak freely. By extension, this kind of semi-anonymous gaming might be an appealing, non-threatening way for lonely people to initiate connections with others. An important benefit of playing with someone who is physically nearby may be that doing so may feel more socially satisfying than playing with an anonymous stranger somewhere in the world. Physically meeting is easily and immediately possible. And players have something in common – they share an affinity for the café they are both visiting.

Anonymity influences social interactions. Watt (2010) identified three levels of anonymity: no anonymity (operationalized as full visual representation); intermediate anonymity (represented by a graphical avatar); and full anonymity (providing no visual representation at all). He found that when the anonymity level increases, it has two opposing effects: it decreases the sense of emotional connection while at the same time increasing the amount of self-disclosure of intimate information. Previous research has also looked into the correlation of trust and anonymous online play. (Note that Watt’s anonymity categories presume that visibility is the same as anonymity. As we will point out later in this review, the two constructs are related but not synonymous.) Foo and Koivisto (2004) looked at the relationship between online anonymity and trust. They defined trust as freedom from fear of rejection. This is afforded by anonymous online play. They found that anonymity reduces self-awareness and motivates multiplayer gaming. Anonymity is also a motivation factor for Internet use (Choi & Haque, 2002). Anonymity encourages users to speak more freely on the Internet than they would if they were physically with other people (Ryan, 1995).

Awareness of proximity to anonymous, co-located others motivates both parties to communicate, which results in reducing anonymity. Licoppe and Inada (2005) studied interaction conventions that emerged when players used a geo-localized mobile game. Online players were represented by an icon in the game’s “radar map.” Players simultaneously experi-
enced both screen space and ordinary public space. People could play from anywhere on the Internet. However, if players were within 500 meters of each other, they could see their own and the other player’s icon on the virtual game board. The closer two players were in space, the closer their icons appeared to each other. Most players were very sensitive to the distance separating their icons. The researchers found that when players were physically proximate enough that they could see each other’s icon on the game screen, geographic proximity was likely to turn into relational proximity. After “seeing” one another’s icons indicating proximity, they were likely to start text message communication, even they were strangers. Awareness of anonymous proximate players motivated curiosity to communicate with the proximate other and to discover their mutual locations.

Study Design

Rather than conduct a large-budget study equipping a café with Wi-Fi gaming tables and a local Wi-Fi gaming portal, we approximated this future scenario by “manually” locating pairs of solo patrons, recruiting them to play, and handing them an iPad that was already connected to the game and an anonymous, co-located gaming partner at the same café. The method is unusual, but the experience we created was structured to simulate paired gameplay between co-present strangers that might occur with a local-Wi-Fi enabled gaming portal in a café.

We arranged for each participant to play from wherever he or she was already sitting. We handed them their iPad, which was already connected to the game and their anonymous gaming partner at the same café. The method is unusual, but the experience we created was structured to simulate paired gameplay between co-present strangers that might occur with a local-Wi-Fi enabled gaming portal in a café.

Visibility (Line of Sight Condition)

Visibility (whether participants could see each other) emerged as an important dimension of the research. Three visibility conditions are possible, with have strong implications for the relative anonymity players would experience (Figure 1). Which conditions players end up in will be an accident of where each happens to be sitting when they connect via local Wi-Fi with a play partner. If both players in the pair happened to be close to and facing each other, and if they were observant, they could correctly surmise that the other patron with an iPad and a researcher was their opponent. This represents the High Visibility condition. If the pair was facing in opposite directions with their backs to each other, they might turn and look over their shoulder to scan the parts of the café they could see, perhaps noticing their opponent. Otherwise, the location and visual identity of their play partner was a mystery. Back to back in the same room, facing opposite directions represents the Moderate Visibility condition. Many coffee shops and restaurants are large enough that it would be easy to end up with participants who were in completely different physical spaces from each other. This represents the No Visibility condition. As shown in Table 1, high visibility results in lower anonymity, and no visibility yields the most complete anonymity of the three conditions.

Knowing which stranger you are playing with reduces but does not eliminate anonymity. Visible strangers must still choose whether to reveal their real name and self-disclosure of other personal details. This confounding of visibility and anonymity accurately reflects the curious reality of multiplayer gaming via local Wi-Fi networks in public spaces.

Research Questions

Informed by prior research, this study will address these research questions:

Research Question 1: Do participants enjoy the experience of paired play with an anonymous, co-located stranger? Would they choose to play this way in the future, if a system was in place that made it possible to do so?
Research Question 2: Do participants experience a sense of social connection with their play partner? Do partners communicate with each other during the game, using the built in text chat function online or by physically looking at or talking with each other?

Research Question 3: Is sitting at the same table to play the first game with a stranger the preferred condition, or do players prefer more anonymous initial gaming meet-up, even if it is with someone physically nearby?

Research Question 4: How does visibility impact communication behaviors and the experience of social connection among paired players using local Wi-Fi online gaming?

Loneliness and Friendship Drive

Longing for social interaction might in itself present a barrier to making social connections. Lonely people are more likely to interact negatively with others and to be less confident in their ability to make connections (Cacioppo, Fowler, & Christakis, 2009) and they tend to be more anxious and shy (Cacioppo et al., 2006). Other research has shown that lonely individuals tend to use the Internet and e-mail more for emotional support than do less lonely people. Lonely individuals would be more likely to report making online friends and experienced heightened satisfaction with their online friends (Martin & Schumacher, 2003).

<table>
<thead>
<tr>
<th></th>
<th>Visibility</th>
<th>Anonymity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facing each other</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Back to back</td>
<td>Moderate</td>
<td>Medium</td>
</tr>
<tr>
<td>Separate rooms</td>
<td>None</td>
<td>High</td>
</tr>
</tbody>
</table>
However, people sitting alone at cafes are alone but they are not necessarily lonely. Returning to Hampton and Gupta (2008)’s characterization, placemakers are drawn by the ‘inherently casual sociability’ of coffee shops and come there, often alone, to engage with the “social hubbub” of the place. Half of the placemakers the researchers interviewed reported having met someone new at the café. Clearly, many placemakers are not just friendly, but are open to meeting new people.

Duck (1977, 1983) conceptualizes friendship as a “critical mass phenomenon.” The desire to make new friends is not a function of extroversion or friendliness, but instead it is a yearning that turns off when the individual’s personal, unconscious critical mass of close friends is reached. Once someone’s friendships reach a certain number (their personal critical mass), the individual loses the desire to seek out new friends. If they do add new friends, they do so at the expense of existing friends. If friends are lost through death or circumstance, the individual will be motivated to add new friends to regain that critical mass. Duck (1983) also notes that friendship drive declines sharply after the age of 30 (unless close friends are lost), and returns just before retirement age. Do people who visit cafés alone do so because of a drive to make new friends?

**Research Hypotheses**

We hypothesize that friendship drive will influence how research participants respond to paired local online gaming in our study:

*Hypothesis 1:* Individuals who are experiencing friendship drive, because their longing makes them more hesitant about social interaction, will prefer to begin with anonymous play with a co-located stranger, whereas those who are socially satiated will prefer to sit at the same table with their play partner after the study gameplay ends than will those who are socially satiated.

*Hypothesis 3:* Individuals who are experiencing friendship drive (hoping to make new friends, thus increasing their bonding social capital) will be more interested in location-based gaming with people they don’t know than will those who are socially satiated.

**METHODOLOGY**

Our study is an exploration in a real-world setting of how social interaction can be supported or augmented by locally connected electronic games. The recent availability of iPads, which allow online play through the Internet or a local network, provides a relatively inexpensive, user-friendly platform. We chose to use iPads rather than iPhones or other small devices based on current usability guidelines (Haywood & Reynolds, 2008). The purpose of this experimental study is to find out whether locally connected electronic games could promote social interaction among strangers, and to what extent participants might willingly give-up anonymity to gain closer social contact. To test these questions we designed a field experiment in a natural setting. The experiment was inspired and informed by preliminary ethnographic research in the spring of 2010.

**Preliminary Ethnographic Research**

Preliminary ethnographic research was conducted to identify a target audience who might be interested in playing an electronic game product concept we called “Coffee House Classics.” Table-sized touch screen gaming platforms could offer coffee shop patrons slower-paced old-time games, such as checkers, chess, Scrabble, and Parcheesi. Potential players would be those who have ample time to devote to these contests. Visitors to three local coffee shops and one restaurant were observed for two hours per location.

All 44 of the customers who sat at a table during the observation periods were coded by
gender, group size, duration of stay, and apparent activities. Fifteen users appeared to be engaged in business pursuits (they fit Hampton and Gupta’s (2008) true mobile classification); eight were casually reading newspapers or books; six ate; five worked on projects; five socialized with friends either in person or by phone; three looked out a window. The people who read casually, ate, socialized and looked out a window were potential product users, since they appeared to have leisure time. These potential users accounted for 55% of all observed customers. They fit Hampton and Gupta’s (2008) placemakers classification. Males and older customers stayed longer than did females and younger people. Thirty-six percent of customers came to the coffee shop alone; the majority, 64%, sat alone.

**Field Study Design**

Preliminary observations of coffee shop visitors convinced us that going to a coffee shop alone, spending a half hour or more, and not seeming terribly busy were reasonably common behaviors. We designed and conducted a field experiment targeting solo coffee shop patrons. The research was conducted during the summer 2010, in a natural environment within a mid-western American city. Overall, four graduate researchers were involved in the data collection. First, we purchased three iPads and gift-certificate compensation for the study participants. Next, we identified several local coffee shops, and visited them separately to select the venues for our experiment. We purposely chose large coffee shops to include no-visibility conditions. One establishment had an upstairs and a downstairs. Another had indoor and outdoor tables. Some had more than one room. During our exploratory visits, we tested the local Wi-Fi connections for the coffee shops to be sure the sites we selected could support gameplay. The next step was to identify an appropriate coffee shop game.

**Game Selection**

The selection of iPad game was a challenge. Although games for the iPad abound, the selection of multiplayer Wi-Fi games was extremely limited as of June of 2010, when we needed to select a game. We wanted the game to meet several criteria: it had to be either well-known or easy to learn; had to be playable over a local intranet; had to be turn-based so as to allow time for players to communicate; and had to allow players to chat online without leaving the game screen. Although we would have preferred a well-known game such as Checkers or Hearts, we could find no version for iPad with an online chat feature included. The only game we found with seamless chat was Carcassonne (Coding Monkeys, 2012), and since it met all the other criteria, as well as being visually beautiful, it appeared to be the best fit for our experiment. Carcassonne is a turn-based game in which players lay down pictured tiles of roads and buildings in order to build a civilization. Figure 1 shows a screen shot of the game, including text chat.

**Participant Recruitment**

We informally ran the protocol with two participants to test the game, the settings, and the observation protocol. Based on that test, the protocol was refined. Our next hurdle was finding participants. We did not recruit any participants in advance. We went to the coffee shops and tried to find people who were sitting at a table alone but didn’t appear involved in purposeful activity. Of course, we had to find two such people at the same time within the same coffee shop during our visit. Our recruitment of participants was driven by the following criteria: the participants should not be in social communication and should be sitting alone in a casual manner without being focused on serious work or study.
Getting people to agree to participate was another hurdle, and was mainly determined by their availability and interest in the project. We needed participants who were willing to stay for at least half an hour at the coffee shop to ensure that we could find two participants and they could finish playing and complete the survey. Approximately 25% to 30% of the people we invited to participate refused, almost always because they did not have time.

After obtaining two participants for a session, each researcher handed their participant an iPad with Carcassonne already running and connected to the second iPad (to be used by their play partner, our second recruit). Participants knew that they and their gaming partner were both physically located in the coffee shop or café, but they usually didn’t know whom or where the other was in that space. We gave them a card explaining the rules of the game, and pointed out the chat feature. We did not point out the other person they would be playing against nor did we ask them to move in order sit together. Had they asked to do so, we would have permitted it. Researchers worked in two person teams, so that each researcher could focus on observing one of the two player-participants. Overtaxed Wi-Fi connectivity presented a serious barrier to the research. All of our locations offered free local Wi-Fi. When we began the actual research, we learned that network connections in our target locations got slow or dropped entirely when the locations were crowded and many customers tried to get online. Multiplayer gaming via local Wi-Fi did not work under these conditions. We had to conduct the study during low-traffic times, when network conditions were most favorable.

**Data Collection**

Over a period of three weeks, the research team observed 20 pairs of players. Overall, 40 people were recruited and played the game, and 39 research participants completed post-game surveys. Each of the participants choose a pseudonym/player ID we used for the game and the study. Two of the 20 sessions experienced severe network failure within the first 16 minutes, and thus are omitted from most of the analyses.

**RESULTS**

**Demographics and Visibility Conditions**

Two thirds of the 40 player participants were male. Player age ranged from 18 to 82, and all except one of the study participants were younger than 45. Study participants were recruited because they were sitting alone and did not look overwhelmingly busy. Based on survey results after the observation period, we learned that our participants tended to spend a lot of time in coffee shops. The average days per week participants visited that café or coffee shop was 2.4, and the average amount of time per visit was 2 hours and 45 minutes.

Because this was field research in a natural setting, completing the research required recruiting available participants in whatever visibility configuration they happened to be in when network conditions were right. It was not practical to randomly assign participants to visibility conditions. This chance arrangement mirrors actual play conditions if a coffee shop promoted local Wi-Fi social gaming. Overall, 50% of the play sessions were classified as No Visibility. The two players could not see each other at all, due to being in separate rooms or otherwise separated by impenetrable visual barriers. Twenty-two percent of the play sessions were classified as Moderate Visibility. The two players were facing in opposite directions and were located behind each other in somewhere in the same room. The remaining 28% were High Visibility play sessions involved two players who were in the same room and facing each other.

**Research Questions**

*RQ1: Enjoyment*

The experience of playing Carcassonne was generally enjoyable; 58% enjoyed playing, 29% were neutral, and 13% did not enjoy playing.
A majority (64%) would play the game again with someone they don’t know.

**RQ2: Communication and Social Connection**

Opinions were divided about how connected players felt with their partner, whether they wished they could have communicated outside of the game while they played, and whether they would prefer to sit at the same table rather than separate tables if they played with someone they don’t know in the future. Specifically,

- 40% wanted to communicate outside of the game while playing and 34% did not;
- 41% felt connected to their gaming partner and 44% did not;

**RQ3: Preference for Initial Anonymity**

- 41% would prefer to sit at the same table and 23% would prefer not to sit at the same table. (The remainder was neutral.)

**RQ4: Impacts of Visibility**

It is not surprising that visibility had a strong impact on communication between the players. Players who were in separate rooms (the No Visibility condition) were most likely to use text-chat, those back-to-back (Moderate Visibility) text-chatted about half as often as players in separate rooms. Very few of the players facing each other (High Visibility) used text chat at all. High Visibility players were significantly more likely to attempt to make eye contact and to talk to the other player. (No Visibility players were unable to do so; Moderate Visibility players sometimes but rarely made eye contact or communicated verbally). All three communication behaviors were significantly different based on visibility condition, using analysis of variance to compare means. A fourth communication behavior difference, overtly expressing emotions, neared significance (p=.061). Players who could see each tended to express more visible emotions (laughs or expressions of exasperation) than did players in low- and moderate-visibility conditions. In other words, it seems that players who knew the other player might be watching tended to perform emotions, and the others expressed emotions outwardly less often (Table 2).

### Public Gaming with Strangers and Impact of Visibility

Table 3 summarizes comparisons of player attitudes based on visibility condition. There was little difference in how interested participants were in playing online games with an anonymous local stranger based on how visible that partner was in the study. It is curious that there was also no difference based on visibility as to how connected players felt with their partner. Partner visibility was significantly correlated with desire to communicate (r=.307, p=.036). Those who could not see their partner were least likely to say they wanted to communicate

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Table 2. Impacts of visibility on player communication behavior (Separate data was recorded for each player in each pair. Significance levels are based on one way ANOVAs comparing means)

<table>
<thead>
<tr>
<th></th>
<th># Text chats</th>
<th># Eye contacts</th>
<th># Verbal contacts</th>
<th># Overt emotions</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>2.4</td>
<td>0.1</td>
<td>0.1</td>
<td>0.7</td>
</tr>
<tr>
<td>Moderate</td>
<td>1.1</td>
<td>0.4</td>
<td>1.4</td>
<td>1.0</td>
</tr>
<tr>
<td>High</td>
<td>0.1</td>
<td>7.1</td>
<td>4.0</td>
<td>3.6</td>
</tr>
</tbody>
</table>

F=4.721, df=2,33, p=.016
F=15.921, df=2,33, p=.000
F=4.566, df=2,33, p=.018
F=3.053, df=2,33, p=.061
with the partner while playing, while those who could easily see each other were most likely to want to communicate. Seeing one’s partner while playing seemed to fuel communication behaviors and desire to communicate.

Visibility was significantly correlated with for sitting at the same table when playing with a stranger \( r=0.397, p=0.008 \). Those who experienced the High Visibility condition were most likely to want to sit at the same table when playing with a stranger in the future; those who experienced the No Visibility condition were the most open to repeating the No Visibility circumstance they just experienced.

We looked at how well each partner’s feeling of connectedness to his or her play partner matched the partner’s sense of connection. High Visibility resulted in more similar connectedness. There was no difference by visibility on how connected players felt to their partners. However, those in the High Visibility conditions reported more similar feelings of connectedness (an average disparity of 0.8 on a 5 point scale); those who had played with No Visibility had the most disparate feelings of connectedness (an average disparity of 2.0 between play partners) and those in the Moderate Visibility condition had an average disparity of 1.8. Playing partners with Moderate or No Visibility experienced less synchronized feelings of connectedness than those with High Visibility.

**Qualitative Observations**

In this results section we qualitatively examine individual pairs of players, highlighting commonalities and unique stories. Five player pairs ended up in High Visibility condition. They were located facing each other. Two of those five pairs engaged in a great deal of eye contact and verbal contact throughout the game. Al, an 82-year-old, was paired with Jasper, age 19. Both men had social yearning, a desire for at least a few more friends. They moved to a table together and chatted for a while after completing the study. Jason (age 30) was paired with Karl (age 23). We will explore friendship drive in detail in the next section of the manuscript, but we note here that Jason was socially satisfied—he was not experiencing friendship drive (not hoping to make new friends), whereas Karl was experiencing friendship drive. Yet it was Jason who wrote that he wished he had been able to get to know his opponent more.

The other three High Visibility pairs, who could have easily communicated outside of the game, mostly did not do so. Neither Meta, a 44-year-old with friendship drive, nor Alan, a socially satisfied 23-year-old, engaged in eye contact or verbal contact. Both focused on the game. Meta reported feeling connected to Alan, but Alan reported NOT feeling connected to Meta. Behemoth and John, and Sarah and Kim were both similar-age, same-sex pairs comprised of one socially satisfied young adult and one young adult with friendship drive. In both pairs, the socially satisfied partner sometimes attempted eye contact, but the person with friendship drive never returned that contact.

Three of the four Moderate Visibility pairs had one player who made an effort to communicate and one who did not. The com-

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Table 3. Impacts of visibility on player attitudes (These questions used a strongly agree-strongly disagree scale where 1=strongly agree and 5=strongly disagree)

<table>
<thead>
<tr>
<th>Visibility</th>
<th>Interest in anonymous gaming</th>
<th>Felt connected</th>
<th>Wanted to communicate</th>
<th>Prefer same table</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Visibility</td>
<td>3.3</td>
<td>2.9</td>
<td>2.8</td>
<td>2.9</td>
</tr>
<tr>
<td>(n=18)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate Visibility</td>
<td>3.8</td>
<td>2.9</td>
<td>3.1</td>
<td>3.4</td>
</tr>
<tr>
<td>(n=8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Visibility</td>
<td>3.4</td>
<td>2.8</td>
<td>3.4</td>
<td>3.7</td>
</tr>
<tr>
<td>(n=10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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municating partner typically reported a stronger feeling of connection to their partner than did the non-communicant, despite the seeming lack of responsiveness. Ali, a 23-year-old female with friendship drive, laughed and frowned while playing and reported that she liked that she could make new friends by playing. Domonic, her 35-year-old play partner, did not enjoy the experience. In the fourth Moderate Visibility pair, neither partner communicated – both seemed distracted, but both liked the iPad. The researcher observed that Mike seemed torn between socializing and competing, and after sending one text message, seemed to settle on competing. It is interesting that two members of a playing pair can have distinctly different experiences of connectedness and enjoyment. Perhaps this is more possible when players have to look over their shoulder to see each other.

The final set of nine play pairs were so separated in space that they could not see each other at all. They had No Visibility. Three of these nine pairs never used chat; they simply played against each other. (Five of those six players were classified as socially satisfied, the sixth did not answer.) Despite a total lack of communication, two of these six players agreed that they felt connected to their anonymous partner (even though their partners did not share that perception).

Frank (29) and Blue (31) were socially satisfied, High Visibility male gaming partners. Blue sent the most chat messages of any player (9), and Frank, who sent 4 chat messages, reported that what he disliked most about the experience was chatting with his partner. Both Frank and Blue agreed that they felt connected to their partner. Neither felt a desire to communicate during play, outside of the game. Ryan, a 38-year-old with friendship drive, was paired with 25-year-old Sarah who also had friendship drive. Ryan wrote that he disliked the lack of communication with his partner. (He sent three chat messages and she sent one.) However, both agreed they felt connected with their partner.

When the other player is an anonymous other, who is safely out of sight, there are no social restrictions on what other things a player does while playing. Players in the No Visibility condition seemed more likely to engage in other activities during play. Sam used his laptop while waiting for his turn. Sarah seemed distracted and started talking with someone else at the coffee shop while she played. “Muddy” checked the rules during play and looked up other things on his laptop. “Dude” sometimes read a book while waiting. “Minnolol” asked lots of questions of the researcher while playing. “Nick” ate breakfast while playing.

**Friendship Drive and Response to Wi-Fi Public Gaming**

**Operationalizing Friendship Drive**

Members of our sample were recruited because they were sitting alone at a coffee shop, and did not appear to be reading or writing intently. They were alone, but not necessarily lonely. On average, study participants reported having 363 Facebook friends, 40 friends they communicated with at least once a month, and 15 people they spent time with at least once a month.

To operationalize Duck's (1977, 1983) friendship drive construct, we initially measured three flavors of friendship drive: Facebook friendship drive, “communicate with” friendship drive, and “spend-time-with” friendship drive. We asked how satisfied participants were with the number of friends they had on Facebook, the number of friends they communicated with at least once a month, and the number of friends they spent time with at least once a month. Possible responses were: “I wish I had many more friends”; “I wish I had a few more”; “I have just the right number”; “I have a few too many”; and “I have way too many friends.” We combined having “a few too many” and “way too many friends,” and we combined wanting “a few more” and wanting “many more” friends. The results are shown in Table 4. “Wanting more friends” fits the definition of having friendship drive.

Only two participants experienced Facebook friendship drive. Facebook friends could be equated with bridging social capital. Sixty-
nine percent were satisfied with their (Facebook) bridging social capital. Nearly one fifth felt overloaded, wishing for fewer Facebook friends. For our research, we are attempting to use local online gaming to increase sociability in coffee shops among co-present players. Therefore, spend-time-with friends is the most relevant friendship drive for this study. Participants were almost equally divided along their spend-time-with friendship drive; 47% were experiencing friendship drive, and 53% were not. Spend-time-with friendship drive is used in these next comparisons.

This research was inspired by envisioning tabletop gaming in coffee shops as a means for connecting strangers who are there alone yet are interested in social contact. Certainly, both socially satisfied café visitors and those with a drive to make new friends may enjoy the sociability of the place. We looked at demographic and friendship differences between socially satisfied participants and those with friendship drive (Table 5). Players who felt social yearning were similar in age, gender, or the average number of friends they spent time with to socially satisfied players. Within Facebook users, socially satisfied participants had an average of 444 friends, whereas those with friendship drive averaged significantly fewer (268) Facebook friends. Two other differences neared significance. Participants who experienced friendship drive tended to be less likely to use Facebook; (94% of socially satisfied participants used Facebook, compared to 69% of those who wanted more friends, p=.062). And participants with friendship drive visited coffee shops an average of three days per week, compared to 1.8 days for those who were socially satisfied (p=.080).

Hypothesis 1: Friendship drive will be associated with social hesitancy

We hypothesized that those longing for social interaction, because they are also more hesitant about social interaction, would prefer semi-anonymous play with a local stranger, whereas those who are socially satiated would prefer to sit at the same table with their play partner. This hypothesis was not supported.

Socially satiated and social yearning participants were not different in their desire to communicate outside of the game while playing or in their interest in sitting at the same table when playing with someone they don’t know. Furthermore, participants with and without social yearning did not differ regarding their desire to communicate outside of the game while play or in how connected they felt to their partner while playing. There were no differences by friendship drive in the number of text chats sent or the number of times eye contact or verbal contact was attempted. There was no evidence of social awkwardness or hesitancy based on friendship drive. Hypothesis 1 was not supported.

Hypotheses 2 and 3: Friendship drive will be associated with: a stronger desire to form a relationship with their gaming partner (Hypothesis 2) and more interest in anonymous location-based gaming with strangers (Hypothesis 3).
Participants who were interested in making new friends (who experienced friendship drive) reacted significantly more positively to their partner and to the idea of playing the game with someone they didn’t know (Table 6). They were more likely to say they would like to play with the same partner again and that they hoped to see their partner again. They were also more open to the idea of playing again with someone they didn’t know in the future. In other words, Wi-Fi gaming with a stranger in a public place was a more attractive experience for those experiencing friendship drive than for those who were socially satisfied. These hypotheses are supported.

Friendship drive was associated with more interest in playing with the same partner again, stronger desire to see the partner again, and more interest in anonymous, co-located gaming with strangers. Friendship drive may have contributed to how participants reacted to playing with someone they didn’t know. The results point to a possible causal relationship. To explore these effects further, linear multiple regressions were run, predicting these same three dependent variables using friendship drive and number of spend-time-with friends as independent variables. Table 7 shows that friendship drive significantly predicted each of these sociable gaming attitudes. The number of spend-time-with friends participants had was not related to their interest in developing a relationship with their partner or with the idea of co-located anonymous gaming with a stranger. Thus, friendship drive was an important factor in how players reacted to the experience. How many close friends players wanted was more important than how many friends they had impacted their interest in anonymous gaming with stranger and their interest in seeing their study gaming partner again. The overall regression predicting interest in gaming with strangers was significant, as was the standardized Beta. For hoping to see their gaming partner again, the overall regression was not significant, but

Table 5. Characterizing participants by friendship drive (Significance levels are based on t-tests comparing means)

<table>
<thead>
<tr>
<th>Friendship Drive</th>
<th>No</th>
<th>Yes</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>27</td>
<td>31</td>
<td>n.s</td>
</tr>
<tr>
<td>Gender (% male)</td>
<td>60%</td>
<td>80%</td>
<td>n.s</td>
</tr>
<tr>
<td>Coffee shop visits</td>
<td>1.8</td>
<td>3.0</td>
<td>t=1.812, df=30, p=.080</td>
</tr>
<tr>
<td>Facebook use</td>
<td>94%</td>
<td>69%</td>
<td>t=1.938, df=35, p=.062</td>
</tr>
<tr>
<td>Facebook friends</td>
<td>444</td>
<td>268</td>
<td>t=2.067, df=25, p=.049</td>
</tr>
<tr>
<td>Friends communicate with</td>
<td>32</td>
<td>26</td>
<td>n.s</td>
</tr>
<tr>
<td>Friends spend time with</td>
<td>13</td>
<td>11</td>
<td>n.s</td>
</tr>
<tr>
<td>n</td>
<td>19</td>
<td>17</td>
<td></td>
</tr>
</tbody>
</table>

Table 6. Friendship drive and sociability desires (Significance levels are based on t-tests comparing means)

<table>
<thead>
<tr>
<th>Friendship Drive</th>
<th>No (satiated)</th>
<th>Yes (yearner)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Play with partner again</td>
<td>3.1</td>
<td>3.7</td>
<td>t=2.052, df=33, p=.049</td>
</tr>
<tr>
<td>Hope to see again</td>
<td>2.9</td>
<td>3.3</td>
<td>t=2.285, df=34, p=.029</td>
</tr>
<tr>
<td>Play with stranger</td>
<td>2.8</td>
<td>3.9</td>
<td>t=3.386, df=33, p=.002</td>
</tr>
</tbody>
</table>
the standardized Beta for friendship drive was significant.

**DISCUSSION**

A goal of this study was to evaluate the potential impact of local Wi-Fi-enabled multiplayer gaming to increase social connectedness in public cafés. We implemented a proof-of-concept, socially-engineered gaming protocol using iPads connected to local Wi-Fi-enabled to act as an ‘ice-breaker,’ or social lubricant, to support social connectedness in a real world setting. Although our sample size is relatively small, our pilot study showed that location-based online multiplayer games can support different forms social connectedness among strangers within a public space. The result suggests these games can be used as bridge to break the ice between two adult strangers in a real world setting.

Face-to-face communication is typically the gold standard against which mediated communication systems are judged (Newman, Webb, & Cochrane, 1995). We could have simply arranged for our player pair to sit at the same table and play Carcassonne together, over local Wi-Fi, each using their own iPad. Instead, we allowed circumstances of where each member of a recruited pair happened to be sitting to dictate the visibility of their experience. This parallels where individuals who find each other online via local Wi-Fi might be located, if the service we are simulating in our experiment actually existed. A large motivation for the care we took observing the behavior of each player throughout the game was to see what people would do in these conditions. Would they try to find each other? Would they move to the same table? Would they communicate through the game and not in the real world?

In our particular situation (Wi-Fi local online gaming), visibility and anonymity were linked. High visibility equates to lower anonymity, although participants can choose whether to further reduce anonymity by revealing their location and self-disclosing other personal information. Visibility allowed for face to face communication; lack of visibility eliminated face to face communication channels. Players in Low-Visibility conditions sent more text messages, and made less verbal and eye contact. They also were less interested communicating outside of the game interface and less interested in playing at the same table with a stranger. In other words, they opted for more of the low-visibility condition they had just experienced. Conversely, those who “tasted” higher visibility play wanted to continue face to face. The affordance of face to face seems to be a more consequential outcome of visibility than the corresponding reduction of anonymity.

Visibility strongly impacted whether and how players communicated during the game and anonymity was more incidental. If they could see each other, they tried to make eye contact and they talked. If they could not see each other, they used text chat. The people who could see each other wanted to communicate outside of the game. Those who could not see each other were less likely to want to communicate outside of the game. It almost seems that seeing

<table>
<thead>
<tr>
<th></th>
<th># Friends</th>
<th>Friendship Drive</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Play with partner again</td>
<td>-.153, n.s.</td>
<td>.298, n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>Hope to see again</td>
<td>-.069, n.s.</td>
<td>.356, p=.039</td>
<td>R=.372, F=2.567, df=2.31, p=.092</td>
</tr>
<tr>
<td>Play with stranger</td>
<td>.001, n.s.</td>
<td>.487, p=.004</td>
<td>R=.487, F=4.810, df=2.31, p=.015</td>
</tr>
</tbody>
</table>
someone brings with it a desire to communicate in person and makes online anonymous typing appear constrained and less desirable. But when players never saw each other, they were satisfied with anonymous play. Players in the No Visibility condition were less likely to want to sit at the same table if they gamed with a stranger in the future. Research indicates that it takes much more effort to maintain an online social relationship than off-line (Walther, 1997). Local, anonymous multiplayer gaming via Wi-Fi can serve as a gateway to new social connections. Players can choose to transition to face-to-face communication, eliminating the extra burden online social relationships come to entail.

When we conducted the study, in summer 2010, iPads were new and quite uncommon. Using iPads provided a coolness factor that may have helped recruit participants. But doing so also meant that participants were using an unfamiliar technology. If instead they played using their own laptop, we may have seen an increase in typing and texting. Similarly, they were playing an unfamiliar game. If instead they played a familiar game, their focus could have been more on playing and on their partner and less on how to play and how to use the iPad.

We measured friendship drive and found that people who experienced friendship drive (those who wish they had a more friends to spend time with) were more open to the idea of playing with strangers and more interested in forming a relationship with the partner they happened to play with in the study. They were more likely to want to play again with that person and to hope to see that person in the future. Visibility was unrelated to these things.

We had expected that social yearning would have a self-destructive side effect of interfering with social yearners’ social skills or social confidence, and as a result, that socially satiated people would be more able to enjoy and succeed at playing and communicating with a stranger. Kraut (2000) suggested the postulate of ‘rich- get -richer’ which states that people who are highly sociable and who have social resources will reap more social benefit. Our data did show that social yearners were less likely to make eye-contact. But there were no differences between social yearners and socially satiated participants regarding feelings of social connectedness, desire to communicate, verbal contact, texting, or performed emotions. We did not find that the “rich get richer.” We found that the (socially) rich and the (socially) poor both got (socially) richer.

A question for future research is whether this kind of very casual, mostly anonymous social connection is satisfying and whether it can lead to deeper connections. Since in our study, only one game was played, and there was not an environment where the service was consistently available, we cannot address this deeper question. Future research could construct a portal easily configured to any local Wi-Fi. Such a portal could be promoted and used at one or a few public locations, where natural social behavior could be observed. This would allow researchers to study play among strangers over time. Is there a progression, from initial anonymous play to face-to-face, side-by-side play? Do social yearners game more? Do they seek out play with strangers? Does the form of social capital players receive from playing change from bridging social capital (during casual play with a random nearby stranger) to bonding social capital?

A key difference between fully online MMOs which have been the subject of prior research and our concept of location-based local online play is the physical distance between players. Because our players are physically close by, there could be a faster transition to deeper connection than might occur between placeless, distant strangers playing an MMO. Wi-Fi players could transition from bridging to bonding social capital. The possibility of physically meeting the mysterious stranger you are playing with may enhance the appeal and the value of this form of social gaming.

**CONCLUSION**

Public, location-based online social gaming is technologically possible today, but is not yet
common. Wi-Fi multiplayer gaming is possible over different platforms, including laptop computers, iPads, smart phones, and experimental interfaces such as tabletop touch screens. Barriers to this kind of play include lack of a portal to connect local players with each other and compatible Wi-Fi-enabled games. Players need compatible devices to play.

To our knowledge, very few studies have actually looked into whether Wi-Fi enabled multi-player games can be used to form new social connections in natural settings (Mahmud et al., 2008). Our contribution in this paper is to implement local multiplayer online gaming on a small scale and study whether it can serve to increase social connectedness among lonely people in public places.

This study shows how a game played anonymously online, as opposed to the traditional face-to-face format, can lead to a socially satisfying experience between two co-present strangers at the same public space. In fact, it turns out that people desiring more social connections are also more open to the idea of gaming online with people they don’t already know. Our finding showed no difference between participants who were currently experiencing friendship drive and those who were socially satiated participants regarding feelings of social connectedness, desire to communicate, verbal contact, texting, or performed emotions. However, social yearners, at least the ones outgoing enough to spend time at coffee shops alone, seized the opportunity to game with an anonymous stranger and had much the same experience as their more socially satiated counterparts.

Our findings suggest that Wi-Fi enabled local multiplayer video games can act as a ‘social lubricant’ to bring strangers together and create new social connections. To accommodate friendship drive, multiplayer gaming in public spaces should give players the option of “hiding” their identity while playing in public, or of revealing their location either at the outset of play, during, or at the end of play. A Facebook-like local “friending” feature in the local Wi-Fi network portal could help players satisfy their friendship drive. Future research should explore whether strangers who meet through Wi-Fi local gaming opt to deepen those connections.

REFERENCES


