From Faux-Social to Pro-Social: The Mediating Role of Copresence in Developing Expectations of Social Support in a Game

Abstract

Social network games—games that incorporate network data from social network sites—heavily rely on helping behavior between players as a central mechanism of play. Does this “faux social” behavior still generate expectations of social support among players? An experiment \((N = 88)\) was conducted to examine the effect of helping on copresence and perceived social support between strangers playing the Facebook game Cityville. Three types of social support were examined: instrumental support within the game, instrumental support outside of the game, and emotional support. Findings indicate that the simple action of being helped in a game generates copresence, the feeling of proximity in a virtual environment. Copresence was a positive predictor of all three types of perceived social support but had highest explanatory power for instrumental support within the game.

1 Introduction

On any given day, millions of people are playing games on social network sites such as Facebook. Inside Network (2013) reported that in early 2013, the top five Facebook games each had more than 10 million people playing on a monthly basis. These games are referred to as social network games (SNGs) because they incorporate network data from social network sites (Wohn, Lampe, Wash, Ellison, & Vitak, 2011; Wohn & Lee, 2013). The social graph characteristics of SNGs enable players to tap into their online social networks for game play (Kirman, Lawson, & Linehan, 2009), which creates interesting interactions among players both within and outside of the game (Wohn et al., 2011).

SNGs are diverse in game genre, ranging from card games and arcade games to simulation, strategy, and shooting games. SNGs are not defined by game type but by how they utilize the network connections that players have because they are hosted on social network sites (Wohn & Lee, 2013). Compared to other online multiplayer games that involve playing within a system designed only for game players (e.g., Xbox Live, World of Warcraft, Steam), SNGs are unique in that players can have game-related interactions with both players within the game as well as their larger social network, which may include friends and family as well as strangers (Consalvo, 2011; Wohn & Lee, 2013). Some examples of this, in the context of Facebook, are the ability to post one’s game...
achievements to one’s Facebook Wall or getting Facebook Friends to join the game to unlock certain tasks.

2 Social Network Games: Friends or Faux?

Situated within an existing rich online social network, many SNGs are designed in a way that makes it difficult for players to advance in the game without engaging in various types of exchange behavior with other players (Radoff, 2011; Wohn et al., 2011). For example, the game Candy Crush requires players to collect “tickets” from other players to move on to new stages. In simulation games like Farmville and Klondike, players need resources to build buildings that are essential to complete in-game tasks, but these resources are difficult to collect alone. Thus players are incentivized to swap or “gift” resources to each other to avoid spending real money buying virtual materials. Because SNGs require people to interact through exchange behaviors to advance in the game, some scholars and popular press have critiqued that SNGs are not genuinely social because the social interactions are involuntary and lacking in meaning (Bogost, 2010; Deterding, 2010). Even executives of major SNG producers have admitted that the games are not “truly social” (Brightman, 2012). Thus one could argue that the social interactions in SNGs are fake, or “faux social,” because they are devoid of autonomy.

It is thus unsurprising that much of the exchange in SNGs is without social motivation—most people report that they play out of boredom or to pass time rather than for social reasons (Hou, 2011; Wohn, Lee, Sung, & Bjornrud, 2010). Some have argued that SNG players expect to help and be helped in return, but do not perceive it as a social act because it is just a method to enhance their level in the game (Wohn & Lee, 2013). This could imply that even if people are helping each other in the game, this type of helping behavior is less driven by moral obligations (i.e., wanting to do so because one is a good person) in comparison to helping behaviors in day-to-day contexts.

Yet there is also research that suggests that some people who play SNGs are able to achieve positive relationship outcomes, such as reconnecting with old acquaintances, meeting new friends, connecting with family, and adding spark to existing relationships (Boudreau & Consalvo, 2014; Wen, Kow, & Chen, 2011; Wohn et al., 2011; Woh, Lee, & Ozkaya, 2015). These results suggest that even if people do not have social motivations or social expectations when playing SNGs, they seem to be getting prosocial outcomes. This lends itself to the question of what is happening in the game that generates these positive outcomes. In particular, can design elements of the game that “force” interactions between players facilitate positive relational outcomes? How? Understanding the mechanism of how positive relationships among players are generated can be important to understand theoretically. Furthermore, this may also help designers build these mechanisms into games to facilitate positive relationships among players, which may be important for games that require collaboration or are aiming to have pro-social outcomes.

3 Understanding Social Support in Multiplayer Games

The lack of social motivations among SNG players is somewhat disconnected from how the games affect relationships among people who are playing with each other. Studies looking at relational outcomes of playing SNGs report that people interpret in-game exchange as a nonverbal communication cue and feel grateful when their friends help them out in the game, even if they know that the other person is helping them for selfish reasons (Wen et al., 2011; Woh, Lee, Sung, & Bjornrud, 2010). Some have argued that SNG players expect to help and be helped in return, but do not perceive it as a social act because it is just a method to enhance their level in the game (Wohn & Lee, 2013). This could imply that even if people are helping each other in the game, this type of helping behavior is less driven by moral obligations (i.e., wanting to do so because one is a good person) in comparison to helping behaviors in day-to-day contexts.

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Experiencing positive relationship outcomes through game play is certainly not a finding exclusive to SNGs; expectations of social support and generation of social capital among online game players has been well documented in the literature, though most studies to date of social support and gaming have been conducted in the context of massively multiplayer online games (MMOs). Several studies have shown that an individual’s perception of social support forms over time because of the social interaction that occurs within the game (Ratan, Chung, Shen, Williams, & Poole, 2010; Steinkuehler & Williams, 2006; Williams et al., 2006). Moreover, in a three-wave longitudinal study, Kobayashi (2010) found that increased social tolerance toward other members in an online gaming environment could even be transferred to an offline setting, suggesting that the social support built through the game may not necessarily be confined within the game.

These studies, however, did not isolate the specific factors in explaining the formation of perceived social support. There is a wide range of interactions that online game players could engage in, from exchanging virtual items and helping others complete tasks, to chatting within the game. Any, or all, of these factors may explain why playing online games with other people leads to a stronger feeling of bonding. Moreover, in comparison to MMOs, the social interactions between players in SNGs are primarily asynchronous. MMOs also have embodied virtual representations (avatars) so that one can actually see other players, while in SNGs, there are limited, if any, embodied interactions among players.

This article attempts to narrow down alternative explanations and test the relationship between helping behavior and perceived social support based on paradigms of social exchange. This study investigates three types of perceived social support: perceived ability to gain instrumental support within the game, perceived ability to gain instrumental support outside of the game, and perceived ability to receive emotional support.

4 Social Exchange

Here, the concept of social exchange is introduced to understand how interactions in an SNG relate to development of perceived social support. Social exchange is an approach to studying interpersonal relationships, as communication can be considered a form of social exchange (Blau, 1964; Roloff, 1981). The idea that exchange is not confined to the economic marketplace goes back to the early 1900s (Beniger & Savory, 1981). One of the earliest studies of social exchange was conducted by Malinowski (1920), who documented gift exchange practices in the primitive society of the Kula tribe in New Guinea. However, studies of social exchange didn’t “take off” until almost thirty years later (Beninger & Savory), with the seminal theoretical works of Claude Levi-Strauss (1949) and George Homans (1958).

There are various theories of social exchange across a wide range of disciplines (Beniger & Savory, 1981). Although these theories vary in degree of detail, there are certain basic concepts and assumptions that generally apply. Social exchange describes the exchange of resources that occurs between actors within a certain structure. Actors are driven by self-interest and are motivated by the desire to obtain valued benefits (Blau, 1964). This leads to a transfer of resources, which may be tangible resources, such as physical goods, or a service, such as a behavior. The resource transfer then takes place within a structure of mutual dependence (Emerson, 1976).

This paper focuses on direct exchange at the dyadic level. In direct exchange relations, transactions between actors take two forms: negotiated and reciprocal (Molm, Takahashi, & Peterson, 2000). The distinction between negotiated transactions and reciprocal transactions is important for this paper, because social exchange is a general term that has been used to describe both of these types of exchange.

Negotiated transactions are economic exchanges that are based on exact calculations of the unit of exchange (Blau, 1964). For example, if I am moving, I can hire a moving company and sign a contract in which a specified amount of money is exchanged for specific services. Both parties understand that the units of exchange are of equal value.

Reciprocal transactions, on the other hand, are transactions that involve general expectations of some future return but are not immediately apparent at the time of
the transaction (Blau, 1964). For example, if I ask my friend to help, I would be obliged to give something to him in return, but how I choose to do that is unspecified. I may give him a fruitcake or help him plant a vegetable garden. I could also be an inconsiderate person and never return the favor. There is always an uncertainty as to whether the units of exchange are of equal value.

Social network games are a unique environment that is sometimes difficult to draw parallels to in the real world because both reciprocal and negotiated exchanges occur within the game. Let’s imagine that I help out my friend and the mere act of helping generates a tangible reward, say, coins dropping from the sky. This would be an example of a negotiated exchange, since I receive money in exchange for helping out my friend. However, it is also a reciprocal exchange because by helping my friend, I also have an expectation that this friend will do something in return for me, as per the norm of reciprocity.

This scenario would be difficult to imagine in a non-game scenario, because there is no “god” entity that gives me money for helping out other people. However, this can happen in a social network game environment because the game company can reward players for helping out other players. At the same time, those who receive help can choose to reciprocate that help. This situation thus creates two types of exchange simultaneously: negotiated and reciprocal transactions. Yet the game places a higher value on reciprocal transactions; negotiated transactions will yield only a small reward—coins, which can be obtained elsewhere—while the goods that are exchanged through reciprocal transactions are items which cannot be obtained elsewhere. This structure of the game system incentivizes players to interact with other players. For example, in the city-simulation game Cityville, players earn money if they visit cities of their in-game “friends” and collect rent from those friends’ buildings. From the friend’s perspective, this behavior is not seen as stealing, but rather as the friend helping out; thus both players benefit from the behavior—this is a situation that would not be feasible in a real economy, yet is a mechanism of the game.

SNG players know that helping others comes with a financial reward. It is thus uncertain whether when being helped themselves, they perceive it as an exchange that is negotiated or reciprocal. Arguments can be made for either case. Since players receive rewards from the system for helping other players, the transaction value is predetermined and fixed; thus any exchange of helping behavior could be perceived as a negotiated exchange. In this case, players would most likely have expectations for social support within the game but not outside of the game. Moreover, it is unlikely that they would develop any expectations of emotional support.

On the other hand, if players perceive helping behavior as a type of reciprocal exchange, it could be that they develop expectations for emotional support in addition to the expectations for instrumental, or tangible support within the game. This study thus has a general research question about how SNG players interpret in-game helping behavior and how that correlates to different types of perceived social support:

RQ1a. Is being helped associated with perceived instrumental support within the game?
RQ1b. Is being helped associated with perceived instrumental support outside of the game?
RQ1c. Is being helped associated with perceived emotional support?

5. Explaining the Mechanism Between Being Helped and Expectations of Social Support

The previous section outlined the general rationale for examining the relationship between being helped (in the game) and the psychological outcome of perceived social support. Here, we begin to unpack that relationship by examining the theoretical mechanism of why that connection would exist. The first factor is reciprocity, and the second is copresence.

5.1 Reciprocity

Reciprocity is the act of giving benefits to another in return for benefits (Molm, Schaefer, & Collett, 2007). Scholars have argued that reciprocity is embedded in human nature: Becker (1956) coined the term “homo reciprocus” to suggest reciprocity as an innate characteristic unique to humans; Gouldner (1960)
claimed that human beings have a moral obligation that leads to a “norm” of reciprocity.

Reciprocity is a contingency intrinsic to all social exchange (Blau, 1964; Emerson, 1976), a mechanism that “reinforces and stabilizes tendencies inherent in the character of social exchange itself” (Blau, 1964). Reciprocity differentiates social exchange from economic exchange and altruism: economic exchange is a negotiated exchange while altruism is unconditional with no expectation of any future returns (Bolton & Ockenfels, 2000).

Reciprocity is an important element of social exchange because it helps generate something more than immediate rewards; over time, it creates social attraction (Blau, 1964). This is because reciprocity has a communicative value in addition to instrumental value (Molm, Schaefer, & Collett, 2007); instrumental value is the value of the resource obtained from the exchange, whereas communicative, or expressive, value is the value of uncertainty reduction and expressive acts that generate trust, respect, and social solidarity between the actors engaging in reciprocal exchange. The act of reciprocity itself becomes a symbolic piece of information that enables actors to make inferences about the person they are interacting with. Thus even if reciprocity originates in pure self-interest, it can evolve through iterations of interactions. People who play social network games may at first reciprocate for the selfish purpose of earning points, but repeated reciprocity can change the nature of the exchange.

The probability and predictability of each individual act of reciprocity can be a signal to the other person. For instance, consistent reciprocity can lower uncertainty and build affective bonds, such as trust (Molm, Takahashi, & Peterson, 2000). Once a strong trust is formed, individuals may continue to engage in reciprocity that yields very little instrumental value. In a reciprocal exchange, obligations created by unilateral giving that precedes reciprocity can contribute to communicative value (Molm, Schaefer, & Collett, 2007) and outstanding obligations become a form of social capital (Coleman, 1988). We can thus hypothesize that people who are helped are more likely to reciprocate the favor.

**H1.** People who are helped will be more likely to reciprocate help than those who are not helped.

### 5.2 Copresence

While being helped could have a direct relationship to perceived social support, it could also be that the effect is indirect. In this section, we introduce the concept of copresence as a potential mediator.

In an online environment, players have differing degrees of perceived distance with others. This subjective experience of being in a certain place is called “presence” (Nowak & Biocca, 2003; Zhao, 2003). Scholars have proposed many different types of presence (see Nowak & Biocca, 2003), but this study will focus on copresence (Slater, Sadagia, Usoh, & Schroeder, 2000), the degree to which people in a virtual environment feel like they are sharing the space with people who are physically remote (for an overview, see Zhao, 2003). Goffman (1963) introduced the term “copresence,” which he explains “renders persons uniquely accessible, available, and subject to one another” (p. 22). Copresence has since been redefined several times in the literature in the context of virtual environments.

Although presence has been examined in the context of various types of technology, the definition of presence refers only to the “psychological construct dealing with the perceptual process of technology-generated stimuli” (Lee, 2004, p. 30). Many scholars have tried to classify different types of presence. Heeter (1992) suggested that presence is personal, social, and environmental, while Biocca (1997) categorized presence into physical, social, and self. Lombard, Ditton, and Weinstein (2009) defined it as the feeling of “place” within the virtual environment.

In the context of virtual environments, Heeter (1992) described copresence as the extent to which other beings, both physical and virtual, exist in the virtual world and react to human interactants, while Lee (2004) limited copresence to the experience through social agents (e.g., avatars) connected through technology. Slater and colleagues (2000) used a broader definition—the sense of being and acting with others in
a virtual space. This study uses the more general conceptual definition of copresence by Slater et al. (2000) because the SNG examined in the study has a very weak concept of social agents (i.e., there are no avatars) to fit Lee’s (2004) definition.

Copresence would be an important construct in the context of SNGs, because, like MMOs (Williams, 2006; Williams et al., 2006), SNGs have a virtual environment that mixes goals along with social interaction (Wohn & Lee, 2013). Although the graphics of SNGs are less sophisticated than that of MMOs, they have visual representations of the virtual environment, making them more “place”-like than a text-based chat room. We thus predicted that increased copresence would be positively associated with perceived social support:

**H2.** Copresence will positively be associated with . . .

- **H2a.** Perceived instrumental support within the game.
- **H2b.** Perceived instrumental support outside of the game.
- **H2c.** Perceived emotional support.

SNGs allow participants to view the behavior of the people with whom they are playing within the game; even if two people are playing asynchronously, the design of the game gives one player the illusion that the other player is playing the game synchronously. Players can see the profile pictures of other players at the bottom of the screen, which makes salient who they are playing with, but the existence of the other players becomes more apparent through helping behavior. For example, in the game Cityville, players can create a city and build houses and businesses in the city. These buildings periodically generate rent, which one can collect by clicking on the building. Players can visit other players’ cities and “help” them collect rent, which generates money for both the helper and the person being helped. Even if two players play at different times, they can see who has helped them, because the game has a “playback” feature similar to a video playback function, where one player sees an icon of the other player moving around on the screen and simulating the helping behavior that had already been done by the other player at an earlier time.

Seeing the other person move around in one’s city may give a player an enhanced feeling of being together, even if the two people are not playing at the same time. We could thus predict that this type of helping behavior contributes to one’s sense of copresence:

**H3.** Participants who are helped will have a stronger sense of copresence.

### 5.3 Fully or Partially Mediated?

These hypotheses examine the relationship between helping behavior, copresence, and social support. However, it is uncertain whether copresence will be a complete or partial mediator of the relationship between helping and social support. In social exchange theory, exchange is described as a requisite for developing feelings of social support (Blau, 1964) but the exact mechanism is not very clear. This is because traditional studies of exchange are in the context of face-to-face interactions; thus copresence has not been a variable of interest. However, because this study focuses on exchange in an online environment, the relationship between these three variables must be examined:

**RQ2:** Is copresence a full or partial mediator of helping behavior and perceived social support?

### 6 Methods

#### 6.1 Participants

Undergraduate students taking telecommunication courses in a large Midwestern university were invited to participate in a study in which they would have to become Facebook Friends with an anonymous student on Facebook and play a Facebook game with that student for one week. Participants were offered a $10 incentive if they completed the study and were also entered in a raffle to win 20 $10 gift cards.

Volunteers were first directed to an online survey, which asked them about their prior game experience and basic demographics. There were 114 students respondents to this survey and 112 were sent instructions on how to start the experiment; the two who were eliminated from the study had already played the game. Ninety participants initiated the experiment.
6.2 Study Design and Procedure

The experiment employed a 2-independent-groups design looking at the effect of help versus no help on perceived social support. Cityville, a city simulation game available on Facebook, was chosen for the experiment. Two Facebook accounts with depersonalized names (“X1 Person”) were created for the purpose of the experiment. This name was chosen because the Facebook system would not allow an account with the name “Anonymous.” A gender-neutral silhouette was selected for the profile pictures of these two accounts, which were identical (see Figure 1). No information about the account holder was provided in the profile information except for the institution of the profile holder, which was the same as the institution in which the study took place.

Participants who filled out the screener survey were randomly assigned to two conditions: a help condition and no-help condition. Participants in the help condition received help from the confederate every day. In the no-help condition, the participant did not receive any assistance from the confederate. No blocking was done for gender.

Participants were instructed to play the game for at least five minutes every day for seven days. This was acceptable because the game used was very casual in nature, such that even playing for a short amount of time substantially contributes to the game play (Juul, 2009; Wohn, 2012). They also had to become in-game “neighbors” with one of the accounts created by the experimenter; a neighbor is similar to the concept of becoming a “friend” in Facebook in that it allows players to be connected within the game. Participants were told that this account was being played by an undergraduate student of the same institution but were not given any guidelines on how to play or whether they had to interact with this player. Participants were also asked not to play the game with other people for the duration of the experiment. An undergraduate assistant was hired to play the part of the confederate. The assistant was given details on how to carry out the experiment but was not informed of the hypotheses.

In the game, one can help the player by visiting the player’s city and clicking on buildings and other elements of the player’s property, which generates virtual money for the participant. Although the game is asynchronous, the player can view the helping behavior of the confederate when he or she logs into the game as mentioned earlier, by seeing a small icon of the confederate’s profile picture moving across the screen (see Figure 2).

For participants in the help condition, the confederate helped participants every day between 9 pm and 11 pm in the local time zone. The confederate did not help any participants in the no-help condition. No other form of communication took place between the confederate and the participants other than the in-game behaviors. For both groups, the game interface showed the confederate as an in-game “friend” at the bottom of the screen, so they would be aware of the confederate’s existence even without direct interaction.

Because there was no server-level access to the game, a research assistant manually kept a record of every interaction that took place with the participant and entered the information every day into a spreadsheet; this was double-checked each day for accuracy. The participants’ level in the game was also recorded daily and screenshots of their virtual city were taken to track their progress and verify that the participants were indeed playing the game.

On the eighth day, participants were sent a message with a link inviting them to the post-experiment survey.

1. X was the name of the university where the study took place.
This survey asked them about their game play experience and their perception about the confederate. Eighty-nine participants completed the post-experiment survey. One participant in the no-help condition was taken out of the analysis because he did not play the game. There were 44 participants in the help condition; 28 were male and 16 were female. There were 44 participants in the no-help condition; 27 were male and 17 were female. The majority of participants were Caucasian (75.3%), followed by Asian (11.2%), African American (6.7%), multiracial (3.4%), American Indian (1.1%), and “other” (2.2%).

6.3 Measures

Perception about the confederate was assessed by asking the participant to “think about X, the person you played Cityville with during the past week,” and rate subsequent statements. As mentioned earlier, three types of perceived social support were measured: instrumental support within the game, instrumental support outside of the game, and emotional support. These constructs aimed to ask the participants about how much support they expected the confederate to provide in the future.

Instrumental support within the game was a three-item scale (Cronbach’s alpha = .77, $M = 3.14$, $SD = .78$) adapted from the social capital assessment tool used by Krishna and Shrader (1999) for the World Bank. This measurement looked at perceived support in farming societies, and reflected concepts such as “harvesting” that were similar to the rent-collecting content in the game. The items were, “If I needed help with the game, I think I could turn to X,” “If I needed to go away for a few days, I could count on X to help me out,” and “Even if the game task does not directly benefit X, he/she would contribute time to the task.”
Instrumental support outside of the game (Cronbach’s alpha = .73, M = 2.46, SD = .76) was based on the “reliable alliance” subscale of social provisions by Cutrona and Russell (1987) that measures an individual’s level of assurance that others can be counted on for tangible assistance. These items did not make any specific reference to the games. The items were, “If something went wrong, X would come to my assistance,” “I can count on X in an emergency,” and “I can depend on X to help me if I really need it.”

Emotional support (Cronbach’s alpha = .80, M = 1.88, SD = .71) was based on the “attachment” subscale of social provisions (Cutrona & Russell, 1987) that refers to the emotional closeness from which one derives a sense of security. The three items were: “I feel close to X,” “I feel a strong emotional bond with X,” and “I lack a feeling of intimacy with X” (reverse-coded).

Copresence (Cronbach’s alpha = .86, M = 2.74, SD = .89) was a four-item measure based on copresence scales (Bailenson, Yee, Merget, & Schroeder, 2006; Nowak & Biocca, 2003), which were adapted to the context of our specific SNG: “I felt like X was playing with me,” “I felt like X was visiting me,” “I could feel the presence of X,” and “I had a sense that X was there with me.” Table 1 shows the means and standard deviations of these constructs per experimental condition.

### Table 1. Means and Standard Deviations of Dependent Variables by Condition

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<thead>
<tr>
<th></th>
<th>Help condition</th>
<th>No-help condition</th>
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<tbody>
<tr>
<td>Perceived instrumental support within the game</td>
<td>M = 3.47, SD = .67</td>
<td>M = 2.80, SD = .74</td>
</tr>
<tr>
<td>Perceived instrumental support outside of game</td>
<td>M = 2.63, SD = .83</td>
<td>M = 2.29, SD = .65</td>
</tr>
<tr>
<td>Perceived emotional support</td>
<td>M = 1.90, SD = .71</td>
<td>M = 1.86, SD = .72</td>
</tr>
<tr>
<td>Copresence</td>
<td>M = 3.14, SD = .81</td>
<td>M = 2.35, SD = .80</td>
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#### Results

7.1 Manipulation Check

A t-test of mean comparisons between the two groups indicated no significant difference in time spent playing the game. More than half of the participants (61.1%) reported playing for more than five minutes but less than 20 minutes every day; 18.9% of the participants said they played more than 20 minutes but less than 40 minutes; 11.1% played more than 40 minutes but less than 1 hour every day; 7.8% played more than 1 hour every day.

The anonymity of the confederate was also checked by asking participants about whether they were aware of the gender of the person they were playing with: 47% reported that they “couldn’t tell,” 29% said that they “didn’t notice gender.” An equal number of participants (12.2%) thought that the confederate was female or male; there were no significant differences between the two groups.

A manipulation check of group assignment was assessed by asking participants whether the confederate helped them. All participants correctly identified whether they were helped by the confederate.

7.2 Helping and Perceived Social Support

To examine RQ1, a one-way between-subjects ANOVA was calculated using SPSS 20.0 to examine the effect of helping on the three measures of perceived social support.

Being helped in the game (RQ1a) had a significant main effect on instrumental support within the game, $F(1, 87) = 19.64, p < .001$. Participants who were helped had significantly higher perceived instrumental support within the game ($M = 3.47, SD = .67, 95\% CI: 3.27 \sim 3.67$) than those who were not helped ($M = 2.80, SD = .74, 95\% CI: 2.58 \sim 3.03$). The difference was significant but small in terms of effect size: Cohen’s $d = -2.13$ (95% CI).
Receiving help also had a significant effect on perceived instrumental support outside of the game (RQ1b), \( F(1, 87) = 4.39, p = .03 \), although the size effect was miniscule, Cohen’s \( d = -.50 \) (CI 95%). Participants who were helped (\( M = 2.63, SD = .83, 95\% CI: 2.38 \sim 2.88 \)) had slightly higher perceptions of instrumental support outside of the game than those who were not (\( M = 2.29, SD = .65, 95\% CI: 2.09 \sim 2.49 \)).

There was no significant difference in perceived emotional support (RQ1c) between the two groups, \( F(1, 87) = .09, p = .77 \). Participants who were helped (\( M = 1.90, SD = .71, 95\% CI: 1.69 \sim 2.12 \)) had slightly higher levels of perceived emotional support than those who were not (\( M = 1.86, SD = .72, 95\% CI: 1.63 \sim 2.07 \)) but the difference was not statistically significant, Cohen’s \( d = -.02 \). Table 1 summarizes the means and standard deviations of the dependent variables by each condition.

### 7.3 Helping and Reciprocity

H1 posited that being helped would increase the likelihood of reciprocating help. Receipt of helping behavior was tracked across all seven days. As can be seen in Figure 3, participants’ helping behavior was similar between the two groups at day one, but the number of participants in the help condition who were helping the confederate steadily increased over time. For participants in the no-help condition, helping behavior dropped by half on the second day and remained relatively stable for three days, then gradually increased, although the increase rate was more gradual than that of the helped group.

On the seventh day, the final day of the experiment, when a request was sent to all participants to help the confederate, all 45 participants in the help condition responded to the request and helped the confederate. Only 19 participants in the no-helping condition helped the confederate. The difference between the two conditions was statistically significant, \( F(1, 86) = 32.68, p < .001 \). Based on the interaction of the final day, H1 was supported.

### 7.4 Copresence and Perceived Social Support

A Pearson’s Product moment correlation with copresence and social support variables showed that copresence was significantly associated with instrumental support within the game (\( r = .67, p < .001 \)). H2a was supported. Copresence was also significantly associated with instrumental support outside of the game (\( r = .41, p < .001 \)). H2b was supported. Copresence also positively correlated with emotional support (\( r = .33, p = .002 \)). H2c was supported.

### 7.5 Mediated Model of Social Support

RQ2 was posed to look at possible full or partial mediation effects of copresence between receiving help and the three perceived social support measures. AMOS 19.0 was used to test mediation effects using path analysis.

The model explaining perceived instrumental support within the game supported full mediation; CFI 1.0, RMSEA = .000. Regression weights showed that receiving help was significantly related to copresence (\( \beta = .78, p < .001 \)), and copresence was significantly associated with in-game perceived instrumental support (\( \beta = .52, p < .001 \)). The direct link between receiving help and perceived instrumental support approached but was not statistically significant (\( \beta = .26, p = .05 \)).

The model explaining perceived instrumental support outside of the game also supported full mediation and the association between helping and perceived instru-
mental support was much weaker in this context; CFI 1.0, RMSEA = .000. Regression weights showed that receiving help was significantly related to copresence (β = .78, p < .001) and copresence was significantly correlated with perceived instrumental support outside of the game (β = .35, p < .001). The direct link between receiving help and perceived instrumental support was not statistically significant (β = .06, p = .72).

The model explaining perceived emotional support also indicated a fully mediated model; CFI 1.0, RMSEA = .000. Parameter estimates (regression weights) indicated a significant relationship between receiving help and copresence (β = .78, p < .001), and copresence and emotional support (β = .31, p < .001) but no direct relationship between receiving help and emotional support (β = -.20, p = .21).

To assess the explanatory power of these models, linear regressions were employed to see the effect of helping behavior and copresence on the three types of social support. The model predicting perceived instrumental support within the game had the highest explanatory power, \( R^2(2, 86) = 37.0, p < .001 \), with helping behavior and copresence explaining 45% of the variance of the dependent variable. Receiving help and copresence explained only 17% of the variance of instrumental support outside of the game, \( R^2(2, 86) = 9.58, p < .01 \), and 10% of the variance of emotional support, \( R^2(2, 86) = 6.04, p < .01 \). Beta values can be seen in Table 2.

### Table 2. Regression Models with Social Support Variables as Dependent Variables. Beta Values are Standardized

<table>
<thead>
<tr>
<th></th>
<th>Instrumental support in the game</th>
<th>Instrumental support outside of the game</th>
<th>Emotional support</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beta (sig) t</td>
<td>Beta (sig) t</td>
<td>Beta (sig) t</td>
</tr>
<tr>
<td>Help or not?</td>
<td>.17 (.06) 1.92</td>
<td>.04 (.73) .35</td>
<td>-.14 (.21) -1.25</td>
</tr>
<tr>
<td>Copresence</td>
<td>.59 (.00) 6.67</td>
<td>.41 (.00) 3.76</td>
<td>.39 (.001) 3.46</td>
</tr>
<tr>
<td>R (adjusted ( R^2 ))</td>
<td>.68 (.45)</td>
<td>.43 (.17)</td>
<td>.35 (.10)</td>
</tr>
</tbody>
</table>

8 Discussion

Participants in the help condition had higher perceived instrumental support than those who were not helped, in the context of the game as well as outside of the game. This suggests that even without any verbal exchange, the mere behavior of receiving help in a game can make participants expect that they will receive instrumental support in the future. These results also imply that in terms of instrumental support, the exchange in social network games may be considered reciprocal exchange.

The direct effect of receiving help on perceived instrumental support in the game approached significance. Increasing the sample size may make that effect statistically significant, but the strong mediation effect of copresence suggests that receiving help plays a larger role in enhancing copresence than directly affecting perceived social support. Copresence was a significant predictor of all three types of social support. The large effect of copresence on social support suggests that individuals’ perception of proximity—even in the virtual world—has a strong psychological effect, as it affects expectations of instrumental support within the game, outside of the game, as well as emotional support. The effect of copresence, however, was markedly smaller for instrumental support outside of the game and emotional support in comparison to instrumental support within the game. This suggests that other factors may play a larger role when explaining instrumental support outside of the game and emotional support.

One explanation could be anonymity. Not knowing the other person would make it difficult for the participant to translate online helping behavior into perception of offline social support. Another explanation could be time and frequency. The experimental time frame of one week or the frequency of interaction may not have been sufficient to develop the level of intimacy required to feel emotional support; past interview studies documenting...
relationship developments were normally those that developed over weeks or months (Williams et al., 2006; Wohn et al., 2011). However, if time and frequency were not the issue, an alternative explanation could be that the type of simple behavior exchange that is facilitated by SNGs does not induce the level of intimacy necessary for perceived emotional support, and that more tailored communication, such as verbal exchange, is required.

The positive effect of copresence presents great opportunities for designers of computer-mediated systems who wish to encourage pro-social outcomes. Higher levels of copresence may be induced by increasing “helping” behaviors among players. Moreover, the profile photos that participants saw in this particular game were silhouettes, so there was very little sense of embodiment, which would have lowered copresence compared to a 3D avatar. This may explain why massively multiplayer online games such as World of Warcraft foster social support among players, as they involve embodied characters that are moving around in the same virtual space. Social network games are also different from massively multiplayer online games in that the interactions are asynchronous and there is no discourse exchanged among players. Future research should examine how variables that have been shown to be correlated with copresence in the past—such as embodiment (e.g., Gerhard, Moore, & Hobbs, 2004) synchronicity (e.g., Zhao, 2003), and communication (both through text and voice)—interact with exchange behaviors. The present study was an optimal environment in which to study exchange behaviors in isolation because it lacked these features, but a more complex online environment will have more complex interactions among all of these variables.

8.1 Limitations

One limitation of this study is that the experiment lasted only one week. Although it provides more ecological validity than laboratory studies that usually last a few hours at most, perceived social support is something that accrues over time; a longer experiment may have yielded stronger effects. Also, this study was conducted in the social network game, Cityville. Not all SNGs have the same functions; thus it is important to consider the features of this particular game in applying the results to other games or media.

The study looked only at interactions between strangers and should not be generalized to explain interactions among acquaintances. The order of the social support questions (e.g., asking about in-game support before asking about support outside of the game) could also have affected how participants answered those questions. This study examined perceived social support from the perspective of social exchange because the experiment looked only at dyads. Future studies should also look at larger network effects on social capital.

Finally, this study examined only helping behavior; harmful behavior, which is also a form of social exchange, may yield different patterns of results.

9 Conclusion

SNGs, which are played by millions of people on social network sites such as Facebook, mainly involve asynchronous, non-verbal communication. This study suggests that a very simple yet consistent helping behavior in an SNG can generate copresence, the feeling of proximity in a virtual environment, among strangers, within one week. Copresence was a significant positive predictor of perceived emotional support and perceived instrumental support both within and outside of the context of the game, but had the highest explanatory power for perceived instrumental support within the game. These results begin to give us insight on why players of such games can make people develop expectations of social support from their fellow players even when they are not playing for social motivations. Like the saying “seeing is believing,” even forced interactions may lead to positive relationship outcomes because those interactions make the presence of the other player more prominent.

References

tion recognition, and copresence in dyadic interaction. Presence: Teleoperators and Virtual Environments, 15, 359–372. doi/abs/10.1162/ptv.15.4.359


