

Social Support in eSports: Building Emotional and Esteem Support from Instrumental Support Interactions in a Highly Competitive Environment

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ABSTRACT

In this paper we report an empirical study of how and what types of social support eSports players can experience from their gameplay. Specifically, we interviewed 26 eSports players and sought out their first-person descriptions of experiences of social support. We found that even though most players started out as strangers, the context of eSports facilitated frequent acts of helping through both tangible and intangible means within the game. Such in-game informational and instrumental support often led to emotional and esteem support, and these different types of support functions not only remained within the context of the game but also “bled” out into in-person interactions and relationships. We contribute to CSCW and HCI by both confirming and augmenting existing theories of mediated social support in this underexplored context. Our findings regarding how emotional and esteem support are built from instrumental support interactions in eSports not only provide a rich description of players’ experiences in highly competitive digital environments and the consequences of their social interactions but also suggest a number of future research opportunities.

Author Keywords

eSports; social support; competitive gaming; social capital

ACM Classification Keywords

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

INTRODUCTION

HCI and CSCW researchers have noted a trend to “focus on technology that is playful and highly immersive, meaning technologies that are built around video games or leverage game design in some form.” [37, p. 1088]. Online gaming, thus, has been regarded as a serious and important area of

research at CHI instead of superficial leisure activities [37]. In particular, nowadays the increasing popularity of Electronic Sports (eSports) has pervaded into the youth culture and opened up opportunities for new avenues of inquiry in our field [18].

At a high level of understanding, eSports is usually perceived as a new form of digital gaming that often requires competitive and cooperative interactions between players and involves spectating [18]. In addition, eSports is situated at a unique intersection that combines recreation, interaction, task, competition, and collaboration: it is task-based with serious purposes (e.g., collaborate to complete tasks and win). It also happens in an intense fictional virtual environment that requires fast decision-making and response rate. Furthermore, many players are still amateur, practicing skills at home, without pay, for fun and challenge [24].

While some research have explored the motivations for participating and spectating eSports [5,21,22,48], the legitimacy of playing computer games as sports (e.g., [61]), and designing new interaction modality and communication/streaming technologies for this new genre of gaming [23,27,29,31], the social outcomes of eSports is often a neglected topic. The focus on interpersonal interaction is not new in studies of multiplayer online gaming (e.g., [40,60,64]), yet the tension between eSports as a new context of online gaming that especially values the competitive dynamics between human rivalries and its high demands for extensive social interactions both online and offline for building high performance teams raises interesting questions about players’ experiences of social interaction consequences emerging in their eSports activities.

Therefore, in this paper we use our empirical study of how and what types of social support that eSports players can experience from their gameplay in hopes of investigating players’ various interpretations and sense making of their eSports practices. Specifically, this research builds on previous studies of theories of relationship development and social support in both online and offline social spaces.

Our work makes a number of contributions to the HCI/CSCW community: Theoretically, we contribute to both confirming and augmenting existing theories of

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CHI PLAY '17, October 15-18, 2017, Amsterdam, Netherlands

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ACM ISBN 978-1-4503-4898-0/17/10...\$15.00

<https://doi.org/10.1145/3116595.3116635>

mediated social support using this new dataset. While a large body of previous literature distinguishes between the different types of social support, we found that in the context of eSports, the fact that the team-emphasized, highly competitive gaming practice is a shared goal and core task makes it difficult to separate instrumental support from other types of support. Empirically, our findings regarding how informational and instrumental support serve as a basis for emotional and esteem support, as well as how players had to choose between different relationship roles so as to manage different expectations of support, provide a rich description of players' experiences in highly competitive digital environments and the consequences of their social interactions. This also suggests future research opportunities such as the tension between built-in game features and the natural emergence of social support, the role of physical presence in virtual teamwork, and how to design new sociotechnical features that better serve players' needs for social support in varied online environments.

WHAT IS ESPORTS?

eSports is multidimensional: the term "eSports" can be used to describe a large variety of different "types" of eSports ranging from a professional environment in which players compete in person in large arena settings to semi-professional and entertainment forms of eSports played online. It also involves different levels of gameplay – e.g., as professional play that is denoted by players under contract with an e-sports team/organization or as amateur or entertaining play in more traditional digital gaming. In particular, some even suggest that there is no clear differentiation between "eSports" games as opposed to "non-eSports" games: eSports is more or less a meta-game that can be played based on almost any digital game.

Therefore, in our previous work [18], we have noted that while the term of eSports is widely used, researchers do not have consensus with regard to its definition other than a high level understanding that eSports usually refers to competitive multiplayer gaming that involves spectating. Many players also tended to describe eSports using terms and concepts from traditional sports (e.g., competition and training). Specifically, we found that players' perceptions of eSports often include the following components: competition; goals/ rules; professional scene; spectators; intellectual and motor skills; governing body, and human competitors.

Following this high level understanding, in this study we refer "eSports" to a form of varied computer-mediated competitive gaming activities that attracts spectators: it involves both professional and amateur players as well as a wide range of different game titles. This diversity allows for a broader examination of eSports activities and experiences in different contexts.

THEORIZING SOCIAL SUPPORT ONLINE AND OFFLINE

In traditional social scientific studies, social support relates to "the social resources that people perceive to be available or are actually provided to them by nonprofessionals in the

context of both formal support groups and informal helping relationships" [7, p.4]. It is not an existing resource but rather a form of expression that arises out of one's social structure as well as the relationships with people within that structure.

Social scientists have proposed many different types of conceptualizations of social support, depending on what the criteria for *support* are. The Social Provisions Scale, which was designed for use with general populations [9], is based on Weiss' [58] model of social provisions. This model separates assistance-related support (e.g., guidance, reliable alliance, reassurance of worth) with non-assistance-related support (e.g., attachment, social integration). This four-typology is consistent across varied psychology literature. For example, House [26] categorized social support into "an interpersonal transaction involving one or more of the following: (1) emotional concern (liking, love, empathy), (2) instrumental aid (goods or services), (3) information (about the environment), or (4) appraisal (information relevant to self-evaluation)" (p. 39). Similarly, Barrera [2] categorized social support as emotional support, instrumental support, informational support, companionate, and esteem support. He also distinguished perceived support—the belief that support is available—from actual support—the mobilization and expression of support.

Another approach is to conceptualize social support as a form of *social capital*, which separates functional aspects of support such as those identified above from structural aspects of one's social network (e.g., the size and composition such as strong vs. weak ties [54,56]). The concept of *social capital* was first introduced by Bourdieu [3] and Coleman [8] as a form of capital that is distinct from human capital (e.g., access to people with certain knowledge) or tangible capital (e.g., money): Although social capital can facilitate productive activity (as does human capital and tangible capital), it is inherently unique in that it resides in the connections between people and the potential for individuals to access resources through their social network.

Specifically, Putnam [42] articulated two different types of social capital: bridging and bonding. *Bridging social capital* refers to the potential resources that lie within interactions with weak ties (acquaintances or "friends of friends"). These weaker contacts are more likely to hold different beliefs and have access to novel information. In one of the most famous studies on the power of weak ties, Granovetter [20] found that people were more likely to report hearing about a job opportunity from a weak tie. Individuals with a more diverse network are typically higher in bridging social capital. Close ties, on the other hand, offer different types of support, namely emotional. Close ties usually have access to similar information because they share similar experiences [34], thus close ties are more likely to hold information redundant with our own. The potential to obtain resources that are typically obtained from close relationships, such as emotional support or tangible support

(e.g., money) are commonly associated with *bonding social capital*.

One question, then, is to what degree these theories of social support can be applied to online social spaces, and how, if at all, those mediated environments give rise to new forms of social support. With these concerns, hundreds of studies have documented the supportive functions of online (mediated) environments in helping develop social capital and maintain relationships. One reason is that the Internet has been proven to be able to provide heightened access to social support [30] and facilitate support from both strong and weak relational ties [43,66]. Though many of the earlier arguments on technology-mediated social support focused on whether or not it was a “rich-get-richer” type of buffering effect or if it were indeed beneficial to people who would otherwise not have the support [30,47], the dialog has moved on to understanding the supportive functions of specific online features rather than conceptualizing the Internet as a whole [49]. In particular, social network sites (SNSs) have been found to play a considerable role in both maintaining and building relationships through social support functions [4,12,36]. Even the smallest of social media behaviors—such as single clicks in response to posts—can be perceived as supportive [63] and people perceive attention from strong ties as being more supportive [6].

SOCIAL SUPPORT IN GAMES RESEARCH

There has been a growing body of research that has explored social support emerging in a particular type of mediated environment: online gaming. The majority of existing studies have mainly focused on two different genres of online gaming: fantasy-based Massive Multiplayer Online Role Playing Games (MMORPGs) such as *World of Warcraft (WoW)* (e.g., [40]), and casual/social games such as dancing games (e.g., [15,17]), open-ended virtual worlds (e.g., [16]), and social network games (e.g., [64,65]).

Across these different genres, the consistent finding is that shared gameplay experiences generate social capital and social support among players, both online and offline. For example, in the context of MMORPGs, scholars found that the interaction itself, which includes verbal and non-verbal communication, helps develop people’s sense of social support over a long period of time [44,50,60]. Kobayashi [28] also found that increased social tolerance toward other members in an online gaming environment can be transferred to offline settings, suggesting that the social support built through the game had lasting effects that were not confined within the medium in which the interaction happened. In the context of casual/social gaming (e.g., Facebook games), Wohn [62] found that even the simplest of interactions can lead to feelings of closeness and willingness to provide tangible and emotional support both inside and outside of the game, albeit, the perception being much stronger for in-game contexts. Wohn et al. [64] also found that social network games could serve different social

support functions based on the structural components of the relationship—for example, for weak ties, the games served as a way to maintain relationships by providing a topic of common ground.

In addition, many studies have confirmed that collaborative dynamics in gaming can provide both social support (e.g., emotional connections among multiple players) and strategic support (e.g., knowledge gathering and sharing, player decision-making, leadership, failure) (e.g., [1,59]). In MMORPGs, collaboration-mediated social support mainly emerges in guilds and raiding. Guilds are virtual associations run by players who are natural organizers; they usually have formalized membership and rank assignments in order to encourage participation; and they involve a complicated leader-subordinate and leader-leader relationship. And aiding are large-scale, complex group activities that involve 10-40 people working together in real time to solve extreme problems [1]. As Nardi and Harris [38, p. 152] described in their ethnographic study of *WoW*, “[m]uch of the sociable non-game-related chat takes place in the guild channel. Most is informal, humorous, or downright silly... Though such messages were brief, they provided enough information so that guild mates had a sense of others’ lives.” Instead of merely playing alone or observing others’ behavior via public communication channels, collaboration as groups makes MMORPG players engage in a more intimate forum that allows them to attach themselves to a group, to automatically follow and better understand one another, to naturally compete with other groups, and to show how they react in tense, risky, and unclear situations [35]. Collaboration is also highly generative of belongingness [33], as well as a “trusted responsibility because allowing the wrong people into a guild can ruin its social dynamics” [38, p. 152]. During this process, players come to trust (or distrust) one another.

In more casual/social games, collaboration-mediated social support can occur in small groups or in various forms. For example, Freeman et al. [16,17] discussed emotional connections between players in collaboration in dyad (e.g., virtual marriage). Such a marriage system enforces gameplay in pairs not in groups, allowing players to construct exclusively one-to-one relationship: Once married, the game automatically ties the pair together, and collaboration in dyads not only becomes part of the instrumental gameplay but also involves self-disclosure and sharing deepest feelings – the very basis for emotional connections, intimate experiences, and various types of support.

This prior body of literature provides a picture of how online gaming can support, mediate, and facilitate social support in various ways, such as through the dynamics of collaboration or shared gaming experiences. However, eSports can be distinctive from other popular online games that have been routinely studied throughout the history of multiplayer online games as it adds multiple “layers” of complexity. First, eSports gameplay occurs in highly

competitive and fast-paced virtual environments. Although competition is possible in traditional multiplayer games (e.g., MMORPGs), players usually make their own progress and have individual tasks” [41]. Yet in eSports, competition is the core for the team performance with common goals and interests. As a result, eSports gaming tends to have a higher demand for skills than traditional online gaming even when people are playing the exact same game – since skills are also closely associated with the team’s fame, revenue, and reputation out of the game. For example, *Counter-Strike* players’ skilled expertise [45] and *League of Legends* players’ in-game and out-of-game practices to pursue competitive success [11] have attracted some research attention.

Second, due to the high demand for skills and wins, eSports players are expected to engage in intensive social interactions both online and offline. How players are engaged physically in practice and play [61] as well as their out-of-game or metagame expertise [11] have been considered key to team cohesion and high performance teamwork. For example, players tend to use an array of multimodal communication tools in gameplay for the sake of synchronous information sharing and status updating as well as group decision-making. Out of the game, players also frequently communicate with one another to help either strategize the gameplay beforehand or reflect on (un)successful team performance afterwards. In addition, players often made exerted efforts to arrange face-to-face interaction, such as social gatherings in local eSports clubs, group training/team building activities, and travel to tournaments together.

Third, the sophisticated sociocultural structure of “professionalism” is likely to make studies of eSports different (and probably more complicated) than studies of non-eSports games. In addition, professionalism in eSports does not only refer to highly skilled gameplay and strategic team management [53,57] but also emphasizes the so-called “pro culture” [53]. It explains the broader structural mechanisms that make this field distinctive -- the collaborative efforts of gaming companies, players, communities, spectators, and many other stakeholders who contribute to establishing a set of stable, widely acknowledged, and abided standards [46], and the “rebuilding, rather than blurring, the boundaries between content producers and audiences” [52, p. 293].

To what degree can our existing theories of mediated social support accommodate new phenomena/practices of social support emerging in online spaces? And to what degree can these emerging practices confirm and/or argument our existing understandings of social support? We therefore use eSports as a unique context to further investigate computer-mediated social support.

METHODOLOGY

Research Questions and Data Collection

In this study we ask the following research questions: *How, if at all, do eSports players exchange social support through their team dynamics? How do the different types of social support identified in previous literature map out in the context of eSports?*

To explore these questions, data were collected as part of a larger study that examines player experiences in eSports. After consulting with two professional eSports players, we learned that eSports players usually used Facebook groups to communicate and organize events. Therefore, we searched groups with keywords related to eSports such as *eSports*, *Dota*, *Overwatch*, *League of Legends*, or *LoL* on Facebook. Then we sent requests to join the retrieved groups and posted a message on those groups who accepted our requests ($N = 12$) in order to recruit players who had played eSports games as part of a team and were willing to be interviewed as voluntary participants. All players who responded to our messages and agreed to participate were interviewed. As a result, 26 semi-structured in-depth interviews were conducted via text/audio/video Skype chat by the first author based on participants’ modality preferences from May to July 2016.

In each interview, 23 predefined open-ended questions regarding eSports players’ gaming experiences (e.g., “*Have you ever used eSports as a way to seek friends, romance or any type of close interpersonal relationship? If so, how?*”) were asked and the average length of interviews was 85 minutes. Table 1 provides details about our interview participants. It should be noted that our sample includes both professional and amateur players: six participants had engaged in professional gaming in some ways (e.g., in a colleague team playing for tournaments, contracting with a professional eSports organization, running eSports-related business, and streaming to make income) and 20 (77%) self-identified themselves as amateur players. Most participants belonged to remote teams but 21 (80.8%) of them managed to meet their teammates offline at least once.

Gender	Female: 4 (15%) Male: 22 (75%)
Age	Average: 21.5 years old Oldest: 52 years old
Location	All located in the U.S
Professional players	6 (23%)
eSports games played	<i>League of Legends (LoL)</i> , <i>Dota</i> , <i>StarCraft</i> , <i>Counter Strike</i> , <i>Super Smash Bros</i> , <i>Overwatch</i> , <i>SMITE</i> , <i>Hearthstone</i> , <i>Guild Wars</i> , <i>Halo</i> , <i>World of Tanks</i> , and <i>Rocket League</i>
Experience in eSports	Average: 3 years (max. = 15 years)

Table 1. Interviewee demographics ($N = 26$)

Data Analysis

An in-depth qualitative analysis was conducted to code and interpret the data. This method was used to focus on first-person and narrative accounts of players' unique perceptions and understandings of their eSports activities as well as its impacts on their social life, in order to provide rich and detailed descriptions of human experience [29].

The data analysis in this study ensued the following steps: 1) the authors closely read through players' narratives to acquire a sense of the whole picture as regards their social experiences and interpersonal relationships in eSports; 2) social support emerged as a strong series of themes; 3) the authors conducted literature review on different types of social support; 4) supportive behaviors were separated into four types based on the literature; 5) the authors identified a preliminary set of narrative themes emerging in players' social experiences and interpersonal relationships in eSports for each of the four social support categories; 6) the authors iteratively discussed findings from step three and synthesized those themes to summarize the fundamental aspects of players' social experiences and interpersonal relationships in eSports.

RESULTS

In our interviews, all participants, including both professional and amateur players, expressed that they established a certain type of close interpersonal relationships with their teammates and gained somewhat support from them over time. Especially, various game elements and technological features (e.g., the very emphasis on competition and teamwork; the wide use of in-game and out-of-game multimodal communication channels; the timely action-feedback gameplay process; and the exposure to team members all over the world with diverse backgrounds) create and afford opportunities for meaningful social support that eSports players may experience. In the following sections we discuss the four themes of social support emerging in our data based on previous literature: emotional support, informational support, instrumental support, and esteem support.

Emotional Support through Mediated Friendship and Romance

All players expressed that the emotional connections to team members, either as friendship or romantic relationship, constituted significant part of the social support they gained from teamwork. Considering their life stage (e.g., mostly college students), formation of teams, and gameplay behavior (e.g., collaboration in a highly competitive environment), friendship is a natural outcome of their eSports practices. For example, one participant described how being in a college that was far away from home motivated him to seek friends in eSports, whose very focus on teamwork and collaborative play eventually built his new social circle and made him no longer lonely:

I have used eSports to seek friends. Take college as an example. I went to a school 11 hours away and knew no one. Went to the LOL call out meeting and now I'm

friends with a lot of those guys. (P11, amateur, male, age 19)

For these players, social relationships outside the family started to expand through eSports teamwork, and their quality has been linked to various behavioral outcomes [19]. Their team members thus become a new type of social support: adjust to new and unfamiliar environments and satisfy their growing needs for care and attachment through friendships.

Especially, some players noted that they not only sought new friendship and emotional connections but reinforced established friendship through eSports teams. For example, *"It [Playing eSports] is what really keeps my friends together. We'd all probably stay friends if we stopped playing, but I don't think we would have gotten here without gaming."* (P22, professional, male, age 22) In this sense, continuously engaging in teamwork with friends maintained their attachment to each other instead of drifting apart due to factors such as school, family, distance, or time.

However, while all players admitted the emergence of friendship in their teams, they pointed out that teamwork did not always mediate friendship. For them, friendship was not "sought" but "happened/emerged," though it did require a great amount of emotional investment. Therefore, friendship would only emerge under a certain conditions such as supporting each other in competitions for a long time, communicating outside of the game, and shared interest. Some even talked about how winning was less important when playing with players whom they felt connected to. A few participants have shared their stories:

Friendships form when hardships are endured together. That's why school and sports bond people, and why gaming communities continue to get stronger. (P14, professional, male, age 23)

Most if not all of your teammates start as strangers. You do eventually become real life friends. Playing competitively together builds a strong comradery between players on the team. You'll start not knowing anything about the other members on your team but can eventually exchange other information such as social media, phone numbers, and in some cases even meet up offline. (P17, amateur, male, age 22)

As for how it [our friendship] happens, it usually requires more than just playing the game together - I've only made one friend that way, and it was because we were both making Hamilton references in the entire game. An unlikely shared interest. (P20, amateur, male, age 20)

In addition, emotional supportive words and behaviors could lead to more intimate relationships in some cases. In contrast to friendship, the idea of romance may seem odd due to the highly competitive (sometimes aggressive) nature of eSports. As one player noted, *"In my opinion, the competitive mindset and dedication to the game and your team doesn't really lend itself to those types of relationships*

[romantic relationships]" (P17, amateur, male, age 22). In his opinion, eSports players' focus on comradery and commitment to the team as a unity may discourage them to develop exclusively one-to-one interpersonal relationships (e.g., romance).

Surprisingly, this does not mean that it is impossible to generate romance in eSports. Five participants described how engaging in eSports teams led to a romantic relationship with their teammates; and that such a relationship was the main source for them to feel emotionally satisfied in the team. For example:

I met a guy who I liked from the game. It's interesting because you come to learn the personality first. (P15, amateur, female, age 18)

Interestingly enough I met my current girlfriend through one of the startup online League of Legends teams. I didn't go into it thinking I wanted to pursue a relationship with this person I just thought of it as another team I could join to play on for a while. One day I mentioned that I was going to X [a university] to visit some high school friends and she said that she was going to college there so we decided to meet up at a restaurant and we hung out together for a while afterwards. We talked about it afterwards and decided that we were both willing to give the relationship a go and we've been together for a little over 2 years now. (P5, amateur, male, age 21)

P5's account represents a typical love story of how eSports players built romantic feelings toward their teammates: Starting as online stranger, playing together and supporting each other in competitive and stressful (game-based) scenarios, communicating both online and offline, and eventually moving to an offline relationship. In this process, eSports teams were not only places where they met each other but also a start point to know each other's personality and behavioral patterns through collaborative activities.

Yet players also warned that the intense commitment and the high demand for skills in eSports could both facilitate and destroy the feeling of romance and the affiliated emotional satisfaction:

I spent a lot of time with my ex [girlfriend] on League before meeting more in person. But it really helped the connection by teamwork. A lot of eSports heavily emphasize teamwork and synergy. So things can get really exciting or really scary very quickly, since you spend a lot of time working together (as a team). (P9, amateur, male, age 19)

Think about what would happen if you told a couple that the only way they can survive is if they work together to kill their opponent. That sure will bond or break you quick. And I do mean break. I've seen both sides. You couldn't cooperate to win, you get frustrated, and you get angry. Skill difference in those situations is a lot of the issue. In league of legends asking a

diamond league player to play with a bronze player is rough. You feel like you are babysitting. It's hard for people. (P14, professional, male, age 23)

According to P9 and P14, the very emphasis on competition and teamwork in eSports can be a double-edged sword for developing romantic relationships: On the one hand, the highly competitive environment somewhat forced players to closely collaborate with each other in order to win, which opened opportunities for inter-dependence, familiarity, and eventually intimate interpersonal relationships such as romance. On the other hand, the emphasis on seamless teamwork in fast paced game sessions could undermine such relationships by posing high stress and frustration. Players may need to sacrifice the overall benefit for their team (e.g., win) for the benefit of their one-to-one relationship (e.g., always team with their romantic partner regardless of his/her skill levels). This can generate tensions both between the romantic partners and within all the team members.

Nevertheless, players reported that they received tremendous emotional support through their friendships and/or romantic relationships emerging in eSports. Such emotional support included trust (e.g., "I trust that they will do their best to do their role in the game while I do my best." P24, professional, female, age 19), respect (e.g., "my teammates trust and respect me even when I show weakness with emotions." P18, amateur, female, age 18), a feeling of belongingness (e.g., "I honestly consider them my family. And the one big thing that binds us is that we game together." P22, professional, male, age 22), and a sense of inclusive and promising community (e.g., "all we want now is to be their own big group of prominent people who are valued the same as even a sports star. The community rallies behind that ideology and it's great." P14, professional, male, age 23).

For many players, the emotional connections that they established in the online team can be naturally transferred to the offline life, which we will further discuss in the third section. P21 (amateur, male, age 18) summarized such transition:

When you are in a competitive game, your players' safety becomes very important. You put your life (in game) in danger and you trust your teammate to protect you. You can tell when they try hard to protect you. That connection transfers over to real life. "This player is willing to put his characters life in danger to protect mine" is a strong 'message' on how they treat you in real life. Basically, I see a connection between in game attitude and real life attitude.

Informational Support: A Basis for Team Dynamics and Instrumental Support

In the context of eSports, information could be loosely interpreted as knowledge about game mechanics. This knowledge was transferred through vicarious means (e.g., viewing how others play or in-game chat) or through group

discussions. Some players even consider such informational support a foundation for their team dynamics, for example:

Collaboration could be any form of communication to help the great good of the team such as using the ingame text chat and ping system to give teammates information. Such information can help the team to take important objectives such as tower, kills, or dragons. (P3, amateur, male, age 20).

People are asking questions such as which target I should take first, they are trying to find resources, or they want to know something about the game. I usually answer their questions and give them the information they want. That's how we become a community. (P7, amateur, female, age 52)

In an online tournament, we often get together in a voice chat channel before playing, sharing general information, what we know about the other teams, strategize, etc. I think those sharing and conversations is the key to our success. (P20, amateur, male, age 20)

Another example of collaborative informational support is the discussions around player selection and management for team composition. With regard to game-related tasks, teamwork allows players to combine their avatars' combat skills and pool the capabilities of different avatar classes (e.g., different champions in *LoL*). This decreases the risk of being killed and facilitates the process of avatar advancement through group efforts. Therefore, such informational support became crucial for gathering and maintaining a high performance team. Such informational support extended outside the game as well. As a professional player described,

I was a manager of a professional team at one point. We wanted to add a Korean player to the team. He was extremely talented but less well-known. So we wanted to bring him to represent us and to the world stage for everyone to see. There were a lot of discussions and information sharing about how we could do this, how much it would cost, what benefits and risks were for us, and how we could communicate with the player, etc. (P26, professional, male, age 29).

In addition, both amateur and professional players used a variety of multimodal communication tools in gameplay for the sake of synchronous information sharing and status updating as well as group decision-making under extreme time pressure. Although most games already had in-game communication features, many participants chose to use a third party application such as Skype and ooVoo. Participants also preferred those that were specifically designed for gaming or watching game streaming (e.g., Discord, Curse, and Teamspeak) due to their low latency, in-game overlay (i.e., seamless integration with the gaming environment), encrypted server to client communication, and the affordance of multiple chat channels/groups. It should also be noted that informational support does not

end as exchanges of knowledge or group decision-making. Rather, it functions as a mediator or precursor that leads to other types of sharing (e.g., opinions, mentoring, and resources), which ultimately generate instrumental support.

Instrumental Support In and Out of the Gameplay

Instrumental support was related to two contexts: instrumental support within the game and outside of the game. At the very baseline, players would help them out in the game, mostly through informational support, as described in the earlier section. Players were also supportive of teammates who were seeking professional careers in eSports that extended beyond game mechanics:

It's a close knit group of 6 of us. We'll help each other out with pretty much anything. One of our friends is trying to go pro [professional] in a game and we're all supporting him, going to his tournaments, cheering him on, doing research for him, being his practice partner (even though we all suck), etc. (P22, professional, male, age 22)

However, players also described that the instrumental support they received was often extended to the non-gaming contexts, which contributed to their success and achievements in various situations. For example, a few players noted how the team dynamics emerging in gameplay helped team members achieve career goals not related to games:

Out of game, we often help one another work on personal goals and such. I often chat with my friends about ideas I have for my business and they want me to succeed, so we talk on that. (P8, amateur, male, age 21)

Me and someone that plays for the organization on the team are graphic designers. I've been a graphic designer for 5 years now and he's been one for three. We ended up getting into graphic designing together and no pun intended, collaborate making pieces of art together. (P26, professional, male, age 29)

I would probably say the best example is me and our mid-laner. We are in the same major and we exchange notes multiple times and helped each other try and get through the class. (P10, amateur, male, age 19)

According to these accounts, no matter which direction a team member wanted to pursue, his or her team members enthusiastically provided a variety of instrumental support that might not be available in their regular offline social networks, including verbal encouragements (“cheering him on”), company (“going to his tournaments” “being his practice partner”), working together toward a goal (“getting into graphic designing together”), and sharing information and resources (“exchange notes multiple times” “doing research for him”). In the team, everyone was sincerely happy to see others' success and would love to assist as much as possible both online and offline.

In addition, such a willingness to support team members could be found in almost all aspects of team members' everyday life, including the mundane. This seemed to improve the quality of their offline lives in return. For some, their eSports team members carried them through what had been some "tough times" in their lives. When they encountered life issues, their team members were there to listen, calm them down, and suggest potential solutions. For example,

I live with one of my team members and we clean the house together, organize our bills, etc. We have perfect trust in each other, even with stuff like finances. One of our friends was in a tough financial spot and we all pitched in to help him out; we even bought him a game we knew he wanted but obviously couldn't afford. (P22, professional, male, age 22)

Especially, many players considered supporting team members in the offline life a "natural process." For them, teamwork in the game became "a very immediate thing to tie you to that person. Something to talk about, something in common, something that allows you to engage in a deeper conversation." (P7, amateur, female, age 52) This process enabled them to know each other and establish close relationships, which allowed them to project the same expectations and demands for mutual help in the game (e.g., keep team members alive and win) as well as offline (e.g., keep team members happy and help them succeed), as P17 (amateur, male, age 22) mentioned, "since you develop a strong friendship with your teammates it's very common to go to your team when you need advice on real world issues."

Esteem Support: Self-improvement through Mutual Learning

Through informational and instrumental support, players gradually achieved self-improvement not as a gamer but as a young human being (in most cases) whose personality and identity was still forming.

In our interviews, players identified a few types of learning experiences that emerged in their teamwork. For example, a few players described that how they became more considerate and caring after learning to "look out" peers and pay attention to their mental states:

You're looking out for your peers more. I think in a way it makes you care more because you want people to be there for you too and you understand that stuff can be difficult and it's okay to help and receive help. (P15, professional, female, age 18)

We are always there for a teammate when they are feeling sad or depressed. Overall, we all just look out for each other. (P23, amateur, male, age 18)

The team environment is a great environment in which the more you put in, the more you get out. (P24, professional, female, age 19)

According to them, one of the most important experiences was to learn the fact that care was a mutual activity: in order to receive help, it was important and necessary to give help. This constituted the key to win and the very basis for trust. Especially in a highly risky and fast-paced environment, players immediately experienced the outcome of helping/not helping others. This timely action-feedback process reinforced their understanding of the significance of "taking care of others" in a team.

In addition, while some may consider committing to eSports time-consuming and addictive, players regarded their engagement as an approach to achieve better time management and self-discipline. P26 (professional, male, age 29) explained,

I definitely valued that experience as it taught me to become disciplined in what I do. Being good at anything takes time and dedication. This has definitely made a big contribution to what I would commit in the future. Maybe this skillset is useful for pursuing a PhD. Who knows?

For these players, their dedication to eSports was not distinctive from commitments that were required for success in any other area. Instead, through competitive and collaborating gaming, they learned about endurance, persistence, and tolerance, which would better prepare them for completing tasks in other fields.

How did this happen? A few players pointed out that understanding team members' different cultural perspectives and "the unique experience of suffering through a defeat" made them grow up and become better people intellectual, mentally, and emotionally:

I've had opportunities to meet, talk to, and become friends with hundreds of people from all around the world and gain a very great cultural perspective. I learned a great deal about live streaming and technical skills, and was able to create things that people really enjoyed. (P2, amateur, male, age 21)

I think eSports provides the unique experience of suffering through a defeat in a game. I believe it strengthens the bonds between the people on your team. I believe it provides more of an impact than other sports because of the connection and closeness of your teammates. (P17, amateur, male, age 22)

As part of a virtual team, on the one hand, players gained technical skills with regard to how to better navigate and control the system as well as how to collaborate with others; on the other hand, throughout the gaming process, they exposed to a variety of perspectives, views, and opinions from team members with diverse backgrounds. In this way, the game became a platform where they interacted with other cultures and appreciated the cultural diversity by carrying each other through tough situations (e.g., the highly intensive competition and the frustration of being defeated). As a result, they became more open-minded,

tolerant, and considerate. The following quotes well summarized how teamwork in eSports was so powerful that even shaped players' mindset over time and made them whom they were today:

I was a really quiet person in high school and when I brought in Melee for everyone to play I was able to connect with people through that and make friends. This completely changed my life. (P5, amateur, male, age 21)

I was pretty toxic when I first started. It's like, I was never at fault for my mistakes. It was always my team's fault, haha. But over the years, I've met some very different people. Now I guess I'm more open minded and accepting. Like, mistake happens, something bad happens, that's okay. I don't really blame anybody. (P9, amateur, male, age 19)

I've honestly enjoyed every second I've spent playing and even just watching. It's been a great experience and I've honestly developed a lot as a person due to eSports. (P22, professional, male, age 22)

DISCUSSION

As a new context of online gaming that focuses on competition and as a collaborative system that requires “fast and precise interaction” [23 p. 311], eSports has been considered an emerging research area at CHI [18]. In this paper we focus on players' experiences of social interaction consequences mediated by their eSports activities. We have presented in the previous section how players experienced and interpreted four main themes of social support in their gameplay. In this section we discuss how our findings confirm or augment existing theories of mediated social support.

Intertwined Social Support

While a large body of previous literature distinguishes between the different types of social support, we found that in the context of eSports, the fact that the team-emphasized, highly competitive gaming practice was a shared goal and core task made it difficult to separate instrumental support from other types of support. For example, in the case of emotional support that led to the development of relationships (e.g., romantic ones), the exchanged instrumental support played a crucial role: Many times, this type of instrumental support was phrased as “teamwork.”

To some degree, it is similar to the collaboration-mediated social support in multiplayer games that has been discussed in previous game studies. Yet it is more difficult to put support-related eSports behaviors, rather than supportive behaviors in non-eSports multiplayer games, into traditional support categories due to eSports' high demand for skills, team cohesion instead of individual achievements, win, and professional context. Therefore, instrumental support makes informational and instrumental support serve as a basis for emotional and esteem support. In this sense, it is almost as if there were a hierarchy of the different types of social

support in terms of how they were developed, with instrumental and informational support serving as the starting point.

The instrumental to emotional and esteem support development is also facilitated by the fact that trust could develop quickly through reciprocity. In a “normal” situation between individuals, trust gradually develops as individuals engage in reciprocal behaviors over time. Yet the highly complex eSports activities (e.g., high performance team in a time sensitive, competitive digital environments) require equally complex support for the team efficiency/success. This unique context seems to accelerate the foundation for higher-level support functions by the frequent reciprocal interactions that occur in the game. This might be the reason why players were able to determine compatibility in a relatively easier method than non-game situations. Therefore, our qualitative results extend understandings of the role of reciprocity, as previous studies have found that reciprocity contributes to both perceived emotional and instrumental support, but is stronger with instrumental [62]. Our results suggest that over time, the instrumental could even act as a mediator toward emotional and esteem support and that even in situations where reciprocity is forced upon individuals as a function of game mechanics, this could lead to other types of more meaningful support. Future research should look more into how reciprocal interactions in game contribute to instrumental support and whether or not there are differences based on certain fixed roles of the character. For example, in some games, teams need to be composed of avatars that have different skills—it is advantageous for the team to have people with diverse abilities to win the game. In other games, however, players may be equal in terms of the abilities that their characters have. Then the question becomes: Do complementary roles naturally lend themselves to more supportive functions?

At the same time, it is unclear what would happen in situations where the instrumental support lacks reciprocity. Are people who receive more help more likely to feel instrumental support than those who give it? Again, the likelihood of offering instrumental support to others could be based on a number of different motivations, so it is difficult to unpack in the current study. Moreover, certain characters are designed to give more instrumental support to others. For example, with a “healing” type character, the main function of this character is to make sure everyone remains healthy; similarly, a “tank” character is designed to soak up damage by making themselves a human shield for other team members. These character types may be seen as more altruistic or generous with instrumental support than other types of characters that do not have functions that directly benefit other characters. Future research may also take into consideration the different roles eSports players usually play, to pick apart differences between instrumental support that is a built-in game feature or naturally emerges in gameplay because of personality or social dynamics within the team.

Especially, we found that the relationships were emergent and often the meaningful ones were those that happened organically. This sheds further light on why earlier studies have found that social capital motivations lead to players becoming offline friends, but game performance-related motivations do not [10]. Our research suggests that the transition from online to offline relationship often has nothing to do with the game itself or the instrumental support related to game mechanics—rather, it is the emotional and esteem support that facilitate the desire to meet face to face.

Face to Face Still Matters

In regards to emotional support, our findings are consistent with existing scholarship on the formation and maintenance of relationships. However, unlike much of the MMORPG scholarship, the relationships of eSports players seem to bleed more into offline relationships. This is consistent with some earlier quantitative work, which found a significant association between physical proximity and bonding social capital [55].

Given that a fair number of our participants were college students, it could be that our sample is biased because they are living on or near college campuses. It is also uncertain whether or not the physical proximity is an artifact of emotional and instrumental support, or if the inherent characteristics of eSports lend itself to desire for in-person interaction. Professional eSports teams in South Korea, for example, are known for co-habitation and living a regimented lifestyle. Is the coordination or teamwork required in eSports so satisfactory that players need to be connected physically?

This raises interesting questions about the role of physical presence in virtual teamwork, which is a very unique situation given that most studies on presence has been about the feeling of (non-physical) presence in virtual worlds [25,39].

Bridging or Bonding?

Similar to how the different types of social support were difficult to isolate, we also found that the distinction of bridging and bonding social capital was very different in the context of eSports. Traditionally, the literature suggests that bridging social capital occurs through weak ties and bonding through strong ties, but in this particular context, we found that players—especially team members—could be both weak ties and still be able to provide the type of emotional support commonly found only among strong ties.

In particular, players discussed the role of bridging social capital in the development of esteem support, by being exposed to diverse perspectives and views from people who they would otherwise not encounter in their offline world. Previous studies have shown that online gaming can help with informational support for high school students [13] because they can get novel information from adults who are not part of their offline community. Yet this research may be the one of the few documentation of esteem support

development in online gaming. Given the extensive literature on harassment and trolling in online games [14,51], these examples highlight yet another dimension of the positive social influences of online gaming. However, these results should also be interpreted with caution. Most of our interview participants were young men, and thus it was difficult to tease out gender differences.

CONCLUSIONS

Drawn on previous studies of theories of relationship development and social support in both online and offline social spaces, in this study we used eSports as a unique research site to examine the different types of social support exchanged between players. We found that even though most players started out as strangers, the context of eSports facilitated situations of extremely frequent acts of helping through both tangible and intangible means within the game. Such in-game informational and instrumental support often led to more emotional and esteem support, and these different support functions not only remain within the context of the game but also “bled” out into in-person interactions and relationships. When relationships became more complex, however, players had to manage different expectations of support that accompanied different relationship roles and sometimes had to make a conscious decision between choosing a relationship as a friend or lover over a relationship as a fellow competitive gamer.

We hope that these findings can contribute to a better understanding of player experiences in highly competitive and time sensitive digital environments, the structure and dynamics of those virtual teams, and the consequences of players’ social interactions in such environments, in order to design and develop interactive technologies that better serve those types of collaborative systems and players’ unique social needs.

It should also be noted that our data have a few limitations. All participants were volunteers recruited from Facebook groups. There was a potential bias toward players who used social media. In addition, interviews were the primary data. Therefore, our results may be particular to a selected group of eSports players. A variety of other data sources (e.g., large-scale surveys) and a broader participant population may be needed to further validate and generalize our findings.

ACKNOWLEDGEMENTS

We thank Dean Hayes and all participants. We also thank the anonymous reviewers for their useful suggestions.

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