Playing for social comfort: Online video game play as a social accommodator for the insecurely attached

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ABSTRACT

Internet connectivity has changed the way video games are played by allowing individuals to connect worldwide in shared gaming spaces. These highly social environments allow players to connect, interact with, and learn from each other. However, there is a growing concern that these social environments also have the potential to displace real-world connections and interactions, contributing to a variety of losses in ‘offline’ sociability. The current study aims to elucidate what users may be gaining or losing (socially) as a result of continued participation in online video game environments, and what potentially underlies these social changes, by examining the associations between social skills and online video game involvement through the perspective of attachment theory. The results challenge the assumption that online video game play is inexorably associated with negative social consequences for the player and indicates the potential for online gaming spaces to serve critical attachment functions by providing a social outlet that promotes a sense of closeness, belonging, and security that satisfies attachment needs for those high in attachment avoidance.

1. Introduction

Since the popularization of e-mail and online chat rooms, researchers have noted concern over the potential consequences of utilizing the Internet for social purposes. Due to lower social presence (Slouka, 1995; Wellman & Gulia, 1999) and the production of bridging rather than bonding social capital (Ellison, Steinfield, & Lampe, 2007; Steinfield, Ellison, & Lampe, 2008; Williams, 2007), Internet-based social spaces have come to be branded as “pseudo communities” that provide a superficial sense of social support and displace the time that could be spent fostering meaningful offline relationships (Beniger, 1987; Wellman & Wortley, 1990) by disrupting the time allocated for offline social activities (Nie & Hillygus, 2001; Sanders, Field, Diego, & Kaplan, 2000).

While these concerns have been raised in reference to a variety of Internet-based social services (i.e., chat rooms, social networking sites, etc.), online video games (OVGs) have been given greater attention as they uniquely provide a social space characterized by shared, playful, and often novel, activities. This difference is key, as these shared activities contribute to the formation of long-lasting friendship bonds with sustainable levels of self-disclosure and intimacy not traditionally found in other mediated spaces (Cole & Griffiths, 2007; Hsu, Wen, & Wu, 2009). The formation of such bonds could contribute to a preference for online interaction that is potentially greater than other mediated outlets, and, over time, lead to a variety of negative consequences for the user, such as declines in the size and quality of one’s offline social circles (Bessiere, Kiesler, Kraut, & Boneva, 2012; Kraut et al., 1998; Shen & Williams, 2010; Williams, 2006) and increased loneliness (Lemmens, Valkenburg, & Peter, 2011; Morahan-Martin & Schumacher, 2003).

Online games have also likely received particular attention due to the increased amounts of time that are being spent in these spaces. For example, a report by the Nielsen NetView. (2010) found that Americans spend substantially more time on the Internet playing online games (10.2%) than other online social tasks such as e-mail (8.3%) or instant messaging (4.0%). However, this report is likely an underestimation of the amount of time being dedicated to online gaming, as the same report states that 22.7% of the time spent on the Internet is dedicated to social networking websites, which are known avenues for online gaming. Patel (2011) found that up to 50% of Facebook users reporting that they sign into their account just to play games. Similarly, a recent industry report by SpilGames. (2013) found that individuals are spending more...
time playing online games than they do on any other source of online entertainment (e.g., YouTube, reading online news, etc.).

As the online gaming industry continues to flourish, the concern over the possible social impact of prolonged interactions within online gaming environments also continues to rise, particularly in relation to its potential long-term impact on a user's social ability, or social skills. Because increased OVG involvement has been shown to negatively impact one's level of offline social engagement (Bessiere et al., 2012; Hussain & Griffiths, 2009; Kim, Namkoong, Ku, & Kim, 2008; Kolo & Baur, 2004; Lo, Wang, & Fang, 2005; Shen & Williams, 2010; Smyth, 2007; Williams, 2006), and having and maintaining face-to-face relationships is integral to developing effective social skills and learning socially appropriate behavior (Engles, Finkenauer, Meeus, & Dekovic, 2001), becoming socially disengaged or isolated from one's offline contacts due to OVG play could substantially hinder the development, or stimulate the deterioration, of effective "offline" social skills, for instance the ability to verbally engage others or manage one's social self-presentation in real-time (Cole & Griffiths, 2007; Hussain & Griffiths, 2009; Shen & Williams, 2010). As outlined by Kim et al. (2008), "the [use of] online games is associated with a decline in participants' communication … and a decline in the size of their social circles, and because of this they become socially isolated and are no longer able to socialize in a normal way" (p. 215).

At first glance, these claims may seem misguided, as online video games appear to be ideal spaces for cognitive-social learning (Bandura, 1962; Bandura, 1977; Bandura, 1986) as they provide a venue for social observation, rehearsal, and feedback. For example, Steinkeuher and Williams (2006) have suggested that the social immersion provided by online games could lead to an increase one's overall sociability by expanding and diversifying one's world-views. Similar arguments have been voiced by Young and Whitty (2012) who believe that virtual worlds hold great potential for the psychological growth of its users. Some of these hypothesized social benefits of online games have also been documented empirically. For example, it is well-known that online video games often facilitate social interaction between players (Chen, 2009; Ducheneaut & Moore, 2005; Jakobsson & Taylor, 2003; Moore, Ducheneaut, & Nickell, 2007; Steinkeuher & Williams, 2006), which can help to stimulate the formation of close, intimate friendships (Domahidi, Festl, & Quandt, 2014; Hussain & Griffiths, 2009; Penä & Hancock, 2006; Williams, 2006; Yee, 2006). Additionally, cooperative play with others (both off- and online), even within violent video games, has been found to be associated with increases in pro-social behavior (Barlett, Anderson, & Swing, 2009; Ewoldsen et al., 2012; Gentile, 2011; Gentile et al., 2009). The positive social influence of video game play can also extend outside the context of gaming itself. For example, Domahidi et al. (2014) found that online game players often transfer their in-game, online friends into offline contexts, leading to an expansion of the size of their friendship circles. Similarly, Gentile et al. (2009) found that elementary school children who played pro-social games (i.e., games in which players help other players more so than hurt or kill other players in the game) at the beginning of the school year were more likely to display helpful behaviors later in the year. A recent report by Granic, Lobel, and Engels (2014) provided an overview of the research in this area and concluded that the immersive, playful, social spaces of video games hold the potential to promote the learning of a variety of social skills, such as pro-social behavior (Gentile et al., 2009) and cooperation (Ewoldsen et al., 2012), as well contribute to increases in one's general sociability through increased participation in civic activities (Lenhart et al., 2008).

While this research seems to dispute some of the concern surrounding the detrimental social impact of video game play, it does not invalidate the possibility that through prolonged play other social abilities may deteriorate or fail to properly develop. The disparities between online and offline social communication (e.g., lack of non-verbal cues, absence of time constraints in sending and receiving messages, etc.) may not reduce online games' viability as a social learning space for skills such as pro-social behavior and cooperation, but may be limited in its ability to support other valuable social skills. For example, the ability to verbally engage others (i.e., social expressivity) in real time is integral for initiating and guiding face-to-face conversation (Moore et al., 2007; Sacks, Schegloff, & Jefferson, 1974). However, in the text-based communication systems often found in online games, one cannot achieve these traditional pairs of actions (i.e., question–answer) (Garcia & Jacobs, 1999); an individual receives a message from their communication partner in its entirety, which they must read and interpret prior to formulating a response (Halloran, 2011). This expectation of asynchronicity grants players communicative flexibility in regards to message construction by providing considerable leeway in the immediacy of responses to any incoming communication. The game environment further accommodates this flexibility, as engagement within game-related tasks may further delay (or provide an excuse for delaying) communication. This absence of time constraints in sending and receiving messages within online gaming environments affords players the opportunity to carefully craft, edit, and re-edit, any outgoing messages (Chan & Vorderer, 2006), providing a variety of self-presentation strategies not available in the offline world. Without the ability to observe, rehearse, or receive feedback on the use of this particular skill, one's proficiency in enlisting it may atrophy. Alternatively if an individual had not yet mastered this ability, prolonged interaction within a space where it is not necessary for effective socialization may thwart its development.

There is evidence to support this possibility, as more involved video game players have been found to exhibit a greater concern for social norms and public appearance, a lower verbally fluency, and a reduced ability to engage others in conversation, effectively express emotions, and/or adapt to social situations (Chiu, Lee, & Huang, 2004; Griffiths, 2010; Kowert & Oldmeadow, 2013; Lemmens et al., 2011; Liu & Peng, 2009). For example, researchers have uncovered inverse relationships between Social Expressivity (e.g., the ability to engage in verbal discourse Riggio, 1989) and OVG play (Kowert & Oldmeadow, 2013; Lemmens et al., 2011), suggesting that online gamers have difficulties engaging others in social conversation and exhibit a lower verbal fluency. Through prolonged engagement, a deterioration of the skills associated with Social Expressivity (SE) is believed to occur as players disengage from offline communication and become more reliant on the social success achieved within an environment where these particular skills are not required for effective socialization. Alternatively, if an individual had not yet mastered the skills associated with SE, prolonged interaction within a space where these abilities are largely accommodated for may impede its development. Significant relationships between OVG involvement and Emotional Sensitivity (i.e., the ability to receive and interpret the non-verbal communication of others) have also been documented (Kowert, Domahidi, & Quandt, 2014; Kowert & Oldmeadow, 2013).

However, the ability for video game involvement to significantly contribute to individual change in and of itself is questionable, as many researchers have argued that relationship between video game play and outcome effects are grossly overstated, if evident at all (e.g., Anderson et al., 2010; Barlett et al., 2009; Ferguson, 2007; Gentile, 2011; Granic et al., 2014). Furthermore, the main effect of media use has historically been behavior reinforcement.

1 Kowert and Oldmeadow (2013) and Liu and Peng (2009) specifically evaluated differences within online playing populations, while the work of Chiu et al. (2004), Griffiths (2010), and Lemmens et al. (2011) did not specify whether their samples were drawn from an online or a general gaming population.
of media effects) of involvement game involvement being attributable to media use itself, this Thus, rather than the relationships between social skills and video social anxiety) that holds an intrinsic relationship with social skills. 2000), this research suggests that OVG involvement may be moti- & DePaola, 1990; Segrin, 1996; Segrin & Flora, Brannen-McNulty, Ross, & Burgess, 2003; Riggio, Throckmorton, & DePaola, 1990; Segrin, 1996; Segrin, 1998; Segrin & Flora, 2000), this research suggests that OVG involvement may be moti- ized by a pre-existing disposition (e.g., loneliness, depression, social anxiety) that holds an intrinsic relationship with social skills. Thus, rather than the relationships between social skills and video game involvement being attributable to media use itself, this research suggests that they are only indirectly related to displacement mechanisms through compensation motivations. However, a general lack of longitudinal research in this area has made it difficult to determine if the uncovered links between compensatory mechanisms (i.e., loneliness, depression, social anxiety) and use are a cause (i.e., motivator) or a consequence (i.e., product of media effects) of involvement. However, it is possible that the mechanism underlying the relationship between social skills and video game involvement may be attributable to a more fundamental construct - one that can be measured cross-sectionally, but provide insight into the potential directional nature of the relationship between involvement and social outcomes, e.g., insecure attachment.

1.1. Adult attachment theory

Attachment theory is a developmental framework that emphasizes the role of early experience in influencing the expectations, beliefs, and behaviors of an individual's responsiveness and trustworthiness of others (Ainsworth, 1978; Bowlby, 1969; Bowlby, 1973; Bowlby, 1979; Fraley, 2002). Depending upon the nature of the relationship between an individual and their caregiver, a secure or insecure attachment bond can develop. Those who experience responsive and reliable care develop the expectation that others will be available and supportive when needed, and become securely attached. However, individuals who were raised by inconsistent or neglectful caregivers may form an insecure attachment (Ainsworth et al., 1978; Bartholomew & Horowitz, 1991), which can be characterized along the dimensions of anxious or avoidant (Brennan, Clark, & Shaver, 1998; Collins & Allard, 2004). If one's primary caregiver in childhood was inconsis- tent, an individual may develop a working model in which one fears and expects rejection from others. This is known as attachment anxiety, which can be defined as an anxious or fearful preoccupation with relationships (Smith, Murphy, & Coats, 1999). As adults, individuals high in attachment anxiety tend to be less trusting of others and hold high levels of worry and impulsiveness in their relationships (Bartholomew & Horowitz, 1991; Hazan & Shaver, 1987; Hazan & Shaver, 1990; Hazan & Shaver, 1994), while desiring high levels of intimacy, approval, and responsiveness (Buote, Wood, & Pratt, 2009). This combination of high anxiety and desire for inti- macy can result in an over dependence on others through a pursuit for excessive closeness (Buote et al., 2009). If one's primary care- giver was neglectful, a child may develop a working model of others as undependable. These individuals, who can be described as attachment avoidant, will begin to view themselves as self-suffi- cient, with no need for close relationships (Feeny & Noller, 1990). As adults, this may result in social isolation (Buote et al., 2009), as avoidant individuals will tend to dismiss or avoid intimate relationships, due to the belief that they will eventually be disappointed (Buote et al., 2009; Smith et al., 1999).

While attachment theory was developed to explain children's attachment to their primary caregivers, one's initial attachment organization tends to remain fairly consistent and stable, as continui- ties have been found across the lifespan (Fraley, 2002; Hamilton, 2000; Urban, Carlson, Egeland, & Sroufe, 1991; Waters, Merrick, Treboux, Crowell, & Albersheim, 2000) and across generations (Benoit & Parker, 1994). This ingrained system of thoughts, beliefs, expectations, and behaviors about the self in relation to others continues to develop with time and experience (Merce, 2006), and contributes to the development and maintenance of all subsequent relationships (Fraley, 2002).

1.2. Attachment and social skills

A secure attachment is a fundamental component for the develop- ment of skills associated with social competence (Gutstein & Whitney, 2002), as it provides individuals with a set of expecta- tions about how to effectively interact with others (Sroufe & Fleeson, 1986), and the ability to develop the skills necessary for establishing and maintaining reciprocal interpersonal relationships (Allen et al., 2002; Bartholomew & Horowitz, 1991; Cassidy, Kirsh, Scoleton, & Parke, 1996; Engles et al., 2001). The links between attachment and social skills have been widely validated, with a variety of social skills exhibiting positive associations with secure attachment and inverse relationships with insecure attach- ment. Researchers have found that securely attached infants develop into more socially competent adults than their insecure counterparts (Schaffer, 2007). Researchers have also linked secure attachment to increases in social skill levels across adolescence (Allen et al., 2002), and significantly higher scores on skills mea- sured at university age (Deniz, Hamarta, & Ari, 2005). Insecurely attached individuals have also been identified as more vulnerable to developing social problems (Berlin, Cassidy, & Appleyard, 2008), including ineffective social skills (Berlin et al., 2008; Schaffer, 2007). A secure attachment has been specifically linked with the development of a variety of social skills such as negotia- tion, receiving critiques, and the ability to provide positive feed- back to others (Bell, Avery, Jenkins, Feld, & Schoenrock, 1985; Nada Raja, McGee, & Stanton, 1992; Rice, 1990; Rice, Cunningham, & Young, 1997; Schneider & Younger, 1996). More

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2 The work of Lemmens et al. (2011) provides the only empirical insight into this debate through a longitudinal examination evaluating loneliness, social skills, and video game involvement over a six-month period. Among pathological game players, Lemmens et al. (2011) found loneliness and lower social competence to be a motivator (i.e., cause) of problematic video game play. Additionally, greater loneliness was found to be a consequence of use over a six-month period. While this provides preliminary support for the postulation that compensation phenomena drives video game involvement (i.e., loneliness and lower social competence were both found to be prerequisites to play), it is difficult to draw broad conclusions from this work as the empirical assessments were limited (i.e., only one psycho-social component was assessed, the measure of social skills was ambiguous and only consisted of four items), the focus was placed on problematic game players rather than a general gaming population, and the researchers failed to specify whether the participants engaged in online or offline gaming environments.
broadly, social and emotional expressivity have displayed positive associations with secure attachment (Deniz et al., 2005), and inverse relationships with insecure attachment (DiTommaso et al., 2003).

1.3. Attachment and social media use

While no known research has explored the relationships between attachment and video game involvement directly, researchers have found insecurely attached individuals to utilize mediated social environments, such as chat rooms and social networking sites, in different ways than their securely attached peers (Buote et al., 2009; Oldmeadow, Quinn, & Kowert, 2013; Ponder, 2009). For example, a 2009 study by Buote, Wood, and Pratt found that, unlike securely attached individuals, individuals with high attachment anxiety reported being equally satisfied with the level of intimacy, approval, and responsiveness of their friendships, irrespective of whether they were based offline or online. Thus, rather than online friendships being less fulfilling than those supported by physical proximity (Wellman & Wortley, 1990), this research suggests that online friendships may be well suited for highly anxious individuals by providing an additional outlet in which friendships can be created and sustained. Buote et al. (2009) also found individuals high in attachment avoidance to be the most likely to disclose personal information online, and the only group to report being equally forthcoming to both offline and online friends. For avoidant individuals, Internet-based mediated spaces can be socially comforting spaces, in the sense that they provide a less risky, social environment where they can overcome their traditional social difficulties and form intimate bonds online.

As a highly social, mediated, and anonymous space, online games may be particularly suited to provide a sense of closeness, belonging, and security that can satisfy attachment needs, while compensating for any associated social difficulties. Furthermore, as attachment forms in childhood (Ainsworth et al., 1978; Bowlby, 1969; Bowlby, 1973; Bowlby, 1979), which is likely prior to OVG exposure⁴, significant links between attachment, social skills, and involvement would signify that social differences amongst game players are, at least partially, attributable to an underlying construct that existed prior to exposure (even in the absence of a longitudinal design).

1.4. Present study

The current study aims to explore the relationships between social skills and video game involvement through the perspective of attachment theory. Examining the potential foundational role of attachment will help to further unravel the connections between social skills and OVG involvement and help to determine why individuals are becoming increasingly involved in this activity, how they are utilizing this medium, and what they are potentially gaining or losing (socially) as a result. Significant relationships between attachment, social skills, and Involvement, amongst online players would suggest that individuals engage within these spaces for their ability to compensate for social difficulties, and obtain a sense of closeness, belonging, and security that satisfies attachment needs. Furthermore, as attachment forms in childhood (Ainsworth et al., 1978; Bowlby, 1969; Bowlby, 1973; Bowlby, 1979), which is likely prior to OVG exposure, these links would signify that social differences amongst game players are, at least partially, attributable to an underlying construct that existed prior to video game exposure.

As playful, social communities that provide anonymity and encourage the creation of intimate friendship bonds, OVGs are likely particularly suited to serve attachment needs for those high in attachment avoidance. The relative anonymity and invisibility provided by online games could substantially diminish any fear and consequences of social rejection (Morahan-Martin & Schumacher, 2003; Suler, 2004; Walther, 1996), while the shared, playful activities experienced by co-players stimulate intimate friendship bonds (Cole & Griffiths, 2007; Hsu et al., 2009; Iacono & Weisband, 1997; Williams, 2006; Yee, 2002). The latter is particularly important, as engagement within shared activities can contribute to the formation of long-lasting, highly intimate friendship bonds, with sustainable levels of self-disclosure and intimacy not traditionally found in other mediated spaces (Cole & Griffiths, 2007; Hsu et al., 2009; Iacono & Weisband, 1997; Williams, 2006; Yee, 2002). Taken together, these features would allow avoidant individuals to develop and maintain intimate interpersonal relationships while retaining their autonomy, as they would be doing so in the absence of physical proximity. Additionally, OVG environments are able to provide a sense of social community even in the absence of direct socialization with others (Ducheneaut, Yee, Nickell, & Moore, 2006; Steinkeuhler & Williams, 2006), as, at their core, many OVGs center around shared, group activities. This may be preferable for individuals high in attachment avoidance, as it would allow them to participate in a shared, environment with a sense of social presence even in the absence of direct social interaction. In consideration of this, the following predictions have been made:

H1. Online exclusive players will display higher attachment avoidance than non-online exclusive players.

H2. A positive linear association between attachment avoidance and OVG involvement will emerge within the subgroup of online exclusive players.

As individuals high in attachment anxiety have been found to utilize a wide variety of media to supplement their need for excessive closeness (e.g., chat rooms, social networking sites; Buote et al., 2009; Oldmeadow et al., 2013; Ponder, 2009), it is possible that significant relationships between attachment anxiety and OVG involvement could also be found. However, as OVGs are a less mainstream form of mediated communication than online chat rooms or social networking websites⁴, it seems unlikely that individuals high in attachment anxiety will display a preference for online gaming spaces more so than those high in attachment avoidance. Furthermore, anxious individuals have been shown to utilize a wide range of mediated outlets to serve their attachment needs (Buote et al., 2009; Oldmeadow et al., 2013; Ponder, 2009), both anonymous and non-anonymous, while avoidant individuals seem to require a space where self-disclosure is promoted and intimate social contacts can be formed, but self-sufficiency can be retained. Thus, OVGs are likely providing a social space that is particularly suited to serve the social needs of individuals high in attachment avoidance.

In addition to assessing the relationships between insecure attachment, social skills, and Involvement, emotional motivations for OVG play will be evaluated. If OVG players are becoming increasingly involved for their social functionality and ability to serve attachment needs, then there should be a discernible motivation to engage for social comfort, rather than entertainment, which is often viewed as one of the primary functions of video game play.

⁴ Online games are considered to be a less mainstream form of mediated communication in terms of their popularity as indicated by use data. A 2013 state of the industry report by SpilGames reported that there are 700 million online game players worldwide. While sizable, it is still 500 million users less than those who use Facebook (1.23 billion users; Smith, 2014), which is just one of many social networking websites and chat client providers available today.
both off- and online (Griffiths & Hunt, 1998; Senlow, 1984; Yee, 2007). As such, the following predictions have been made:

**H3.** A positive relationship will be found between attachment avoidance and playing for social comfort among online exclusive players.

**H4.** A negative relationship will be found between attachment avoidance and playing for entertainment among online exclusive players.

It is also predicted that the relationships between social skills and video game involvement uncovered by previous research (Griffiths, 2010; Kowert & Oldmeadow, 2013; Lemmens et al., 2011; Liu & Peng, 2009) will be replicated within the current sample. This is reflected in the following predictions:

**H5.** An inverse relationship between Social Expressivity (SE) and video game involvement will be found.

**H6.** A positive relationship between Emotional Sensitivity (ES) and video game involvement will be found.

## 2. Material and methods

### 2.1. Variables of interest

#### 2.1.1. Social skills

To assess social skills, an abridged version of the Social Skills Inventory (SSI) (Riggio, 1989) was administered. The standard SSI uses 90 items to measure six subcomponents of social skills, three emotional (emotional expressivity, sensitivity, control) and social (social expressivity, sensitivity, and control). Because of the length of the SSI, an abridged version of this scale was constructed by selecting the four highest loading items (i.e., 24 items in total) from a previous study in which we administered the full SSI to over 600 participants (see Oldmeadow et al., 2013 for an overview of this procedure).

The Kaiser–Meyer–Olkin measure verified the sampling adequacy, KMO = .913, and Bartlett’s test of sphericity ($X^2(4005) = 23306.75, p < .001$) indicated that the correlation between items were sufficiently large for PCA. Nineteen items emerged with eigenvalues over Kaiser’s criterion of 1 and explained 62.27% of the variance. The four items from each subscale with the highest factor loading (rotated component matrix) were then selected (i.e., 24 items in total). Only items that loaded highly on their primary factor were chosen. Cronbach’s alphas for the subscales were all above .8 except for emotional expressivity (alpha = .53). Correlations between subscales ranged from -.359 to .578. Taken together, the four items used for each subcomponent capture distinct and reliable aspects of social skills, indicating they constitute an adequate measure of the intended constructs.

Participants were asked to rate each item on a 1 – 5 scale ranging from “not at all like me” to “exactly like me”. Outcomes were averaged to represent factor scores for each subscale (see Appendix A for a copy of the scale).

#### 2.1.2. Attachment

The Experiences in Close Relationships (ECR) scale (Brennan et al., 1998) was utilized to assess adult attachment. This 36-item, self-report measure of adult attachment conceptualizes attachment on a continuum, rather than assigning individuals to a particular attachment style category (Ainsworth et al., 1978; Bartholomew & Horowitz, 1991), thus making it ideal for assessing linear relationships between social skills, video game involvement, and attachment. The ECR has shown excellent reliability and validity across hundreds of studies (Mikulincer & Shaver, 2007). In the current assessment, a high internal consistency was found for both the avoidant (alpha = .91) and anxious (alpha = .92) attachment subscales. These two subscales were also found to be positively correlated ($r = .226, p < .001$), suggesting that individuals who score higher on the avoidance dimension also report being more anxiously attached. This slight correlation was not considered to be problematic, as it was relatively weak and similar patterns have been noted in previous research enlisting the ECR (e.g., Butzer & Campbell, 2008; Sibley, Fischer, & Liu, 2005; Wei, Russell, Mallinckrodt, & Vogel, 2007). Outcomes from the ECR were averaged to represent participants’ anxious and avoidant outcome scores.

#### 2.1.3. Emotional motivations for play

To evaluate emotional motivations for play, participants responded to a series of six questions relating to game play motivations (i.e., I play video games when I feel: stressed, anxious, sad, lonely, happy, excited) on a 1 – 5 scale ranging from “strongly disagree” to “strongly agree” (see Oldmeadow et al., 2013 for a similar approach). These six items were subjected to a principal components factor analysis to determine if different constructs underlie emotional motivations for play. The Kaiser–Meyer–Olkin measure verified the sampling adequacy for the analysis of the sample, KMO = .744, and Bartlett’s test of sphericity ($X^2(15) = 949.26, p < .001$) indicated that the correlation between items were sufficiently large for PCA. Two distinct components emerged. Items loading highly on the first factor included those related to playing video games when feeling negative emotions (stressed, anxious, sad, and lonely) and was called “Playing for Social Comfort” (alpha = .81). The items loading on the second factor related to playing video games when feeling positive emotions (Happy and Excited) and were called “Playing for Entertainment” (alpha = .80). Playing for Social Comfort and Entertainment were moderately correlated ($r = .443, p < .001$).

#### 2.1.4. Involvement

To conceptualize video game involvement, a single variable, called Involvement, was developed to represent the degree to which participants are involved in video gaming as a form of activity (see Kowert & Oldmeadow, 2013 for a similar approach). This score was derived as a composite of play frequency, game variety, and social identity. To assess play frequency, participants were asked to report their average weekly play time.

To assess game variety, participants were asked to indicate which types of game genres (i.e., role-playing, puzzle, simulation, first person shooter, real time strategy, turn based strategy, party, sports, and other), across modalities (i.e., single- or multi-player), they were currently playing by choosing any that applied from a set list of fourteen combinations. The total number of game types was summed to create the game variety outcome score. Engaging in a wider variety of gaming behavior is indicative of greater general involvement within video game environments and communities, differences that is not detectable through the measurement of play frequency alone.

Social identity with the community of gamers was assessed with a four-item scale based upon a measure developed by Doosje, Ellmers, and Spears (1995). Participants rated each statement (“I see myself as a gamer,” “I am pleased to be a gamer,” “I identify with other gamers,” and “I feel strong ties with other gamers”) and responded on a 1 – 7 Likert scale, ranging from “strongly disagree” to “strongly agree.” Outcome scores on this scale were averaged. Reliability analyses confirmed that this measure was highly reliable (Cronbach’s alpha = .93).
(Cronbach's $\alpha = .84$). Prior to calculating the composite measure of Involvement, each indicator was standardized to account for the variation in response options across constructs.

The correlations and reliabilities for the SSI, ECR, and Involvement subscales can be seen in Table 1.

### 2.2. Procedure

To explore the association between attachment, social skills, and video game involvement an online survey was constructed. In addition to reporting general demographic information (age, gender, etc.), participants were asked to complete the abridged Social Skills Inventory (Riggio, 1989), the ECR (Brennan et al., 1998), and a series of questions relating to video game involvement and play motivations.

#### 2.2.1. Participant recruitment

Participants were primarily recruited from Amazon’s Mechanical Turk (MTurk). MTurk is an online open marketplace that allows individuals to advertise jobs that require human intelligence to complete (Buhrmester, Kwang, & Gosling, 2011; Paolacci, Chandler, & Ipeirotis, 2010). Participants, or “workers” as referred to by MTurk, represent a more demographically diverse sample than the typically recruited undergraduate university population (Buhrmester et al., 2011; Paolacci et al., 2010), and, therefore, should produce a sample of video game players across a broader spectrum, and a greater range of backgrounds, than would be found within the typical opportunity sample of undergraduate students. Research has found little evidence to suggest that the data collected online is of poorer quality than that collected from more traditional subject pools (Gosling, Vazire, Srivastava, & John, 2004; Paolacci et al., 2010). Test–retest reliabilities are similar to those found in traditional methods of testing, and the quality of data has been shown to meet or exceed the standards associated with published research (Buhrmester et al., 2011). Participants were paid $0.50 for their participation.

Advertisements for the survey were also placed on the popular social networking site facebook.com and on online forums and websites oriented towards the gaming community. This included online realm forums, individual guild and clan forums, and gaming clubs and game-related websites.

### 3. Results

#### 3.1. Demographics

In total, 797 individuals completed an online survey that included all the above measures, which were randomized across participants. In order to reduce cross-cultural variance, the current analyses were restricted to participants who indicated their ethnicity as Caucasian ($n = 568$). Comparisons across ethnicities were not undertaken, as non-Caucasian subsamples varied greatly and contained too few participants across groups for reliable analyses. In line with previous assessments of this nature (Griffiths, Davies, & Chappell, 2004; Kowert & Oldmeadow, 2013; Williams, Martins, Consalvo, & Ivory, 2009; Yee, 2006), a range of demographic variables were first assessed across age categories (e.g., under 19 years, 20–24 years, 25–29 years, 30–34 years, 35–39 years, 40–44 years, 45–49 years, and over 50) to determine if play frequencies and preferences across gender and age categories correspond with previously employed samples. This categorization revealed a disproportionate distribution of the sample across ages, with substantially fewer participants within the older age brackets. As any age effects found in these age categories would likely be skewed, and therefore unreliable, participants over the age of 40 were excluded from further analysis ($n = 55$), leaving 514 participants.

Prior to analysis, the data was tested for normality. As graphical inspections of normality are often more informative than statistical analyses in large data sets (Field, 2009), normality was evaluated with QQ plots. The plots showed evidence of a normal distribution for play frequency across gender and age categories.

Within the remaining sample, 409 participants reported a history of video game play, (i.e., offline exclusive, online exclusive, or both offline and online play). Of these, 256 (62.6%) were male and 153 (37.4%) were female. Age ranged from 18 to 39 ($M = 24.52, SD = 5.34$). The majority of participants (61.9%) reported playing video games at least an hour a week and just under half of the sample reported the same frequency of regular online play (44.8%).

#### 3.2. Attachment, social skills, and video game involvement

##### 3.2.1. Between-group analyses

Broad differences in attachment were first assessed between online exclusive players (i.e., those who reported to engage only in online game play) and non-online exclusive players (i.e., all other participants) with MANOVA analyses. If individuals are engaging in online game play) and non-online exclusive players (i.e., all other participants) with MANOVA analyses. If individuals are engaging in online exclusive play to compensate for social difficulties underpinned by an insecure attachment, then online exclusive game players should exhibit a higher degree of insecure attachment as compared to participants who do not exclusively engage in OVG play ($H_1$). Controlling for gender and age, no significant differences were found between online exclusive players ($n = 61$) and non-online exclusive players ($n = 447$) for anxious or avoidant attachment ($F$'s < .61, $p$'s < .05). As these findings indicate an absence of broad differences in attachment between online exclusive players and non-online exclusive players, $H_1$ must be refuted.

---

### Table 1

Correlations and reliabilities for SSI, ECR and involvement subscales ($N = 386$).

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>(z)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Social identity</td>
<td>–</td>
<td>.704*</td>
<td>.548*</td>
<td>.876*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.82</td>
</tr>
<tr>
<td>2. Play frequency</td>
<td>–</td>
<td>.605*</td>
<td>.876</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.45</td>
</tr>
<tr>
<td>3. Game variety</td>
<td>–</td>
<td>.837*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.82</td>
</tr>
<tr>
<td>4. Involvement</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>.78</td>
</tr>
<tr>
<td>5. Emotional expressivity (EE)</td>
<td>–</td>
<td>.115</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.91</td>
</tr>
<tr>
<td>6. Emotional sensitivity (ES)</td>
<td>.221*</td>
<td>–</td>
<td>.080</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td>.85</td>
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<td>7. Emotional control (EC)</td>
<td>.061</td>
<td>.125</td>
<td>.051</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.79</td>
</tr>
<tr>
<td>8. Social Expressivity (SE)</td>
<td>–</td>
<td>.291*</td>
<td>.170</td>
<td>–</td>
<td>.065</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.91</td>
</tr>
<tr>
<td>9. Social sensitivity (SS)</td>
<td>–</td>
<td>–</td>
<td>.010</td>
<td>–</td>
<td>.329*</td>
<td>.096</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.92</td>
</tr>
<tr>
<td>10. Social control (SC)</td>
<td>.031</td>
<td>–</td>
<td>.201*</td>
<td>.214*</td>
<td>.024</td>
<td>.578*</td>
<td>–</td>
<td>.057</td>
<td></td>
<td></td>
<td></td>
<td>.92</td>
</tr>
<tr>
<td>11. Anxious attachment</td>
<td>.007</td>
<td>.184*</td>
<td>–</td>
<td>.009</td>
<td>–</td>
<td>.315*</td>
<td>–</td>
<td>.115*</td>
<td>.479</td>
<td>.177*</td>
<td>.91</td>
<td></td>
</tr>
<tr>
<td>12. Avoidant attachment</td>
<td>.027</td>
<td>.537</td>
<td>–</td>
<td>.071</td>
<td>.072</td>
<td>.422*</td>
<td>–</td>
<td>.078</td>
<td>.299*</td>
<td>.226*</td>
<td>.91</td>
<td></td>
</tr>
</tbody>
</table>

\(a\) \(p < .05\)

\(b\) \(p < .01\)

\(c\) \(p < .005\)
3.2. Within-group analyses

To determine the statistical association between attachment, SSI subscale scores, and levels of Involvement, Involvement was regressed by both attachment scales and all six of the SSI subscales. A potential problem with this type of analysis is the correlational fallacy (Huff, 1954), in which two variables (e.g., OVG involvement and social skills) are correlated because they share variance with a third variable, such as gender or age. This can lead to an erroneous interpretation that the two variables are directly related when in fact they are not. As significant gender differences were found within the SSI in previous research (e.g., Kowert & Oldmeadow, 2013; Riggio, 1989), and some variation was found across gender, attachment avoidance showed a significant, positive relationship with playing for social comfort (H3). Amongst online exclusive players, increased ES and decreased SE outcomes predicted increased levels of video game involvement, supporting the predictions of H5 and H6.

3.2.1. Mediation analyses. To determine if social skills mediate the effects of attachment on Involvement, extensive mediation analyses were undertaken within each gaming sub-group (i.e., all participants, offline and online players, offline only, online only) using PROCESS (Hayes, 2013). No significant effects of mediation between for any of the SSI subscales, within any of the subgroups, on the relationship between attachment and video game involvement. A lack of primary relationships between Involvement and attachment in Step 2 of the regression analyses, and no evidence of social skills mediating a relationship between attachment and video game involvement, indicates the unlikelihood that the relationships between social skills and Involvement are underpinned by insecure attachment.

3.3. Attachment and emotional motivations for play

To evaluate the associations between attachment and emotional motivations for play, partial correlations (controlling for gender and age) were analyzed amongst the different game playing communities (see Table 3). As predicted, attachment avoidance showed a significant, positive relationship with playing for social comfort (H3). Amongst online exclusive players, attachment avoidance and anxiety showed a both positive association with playing for social comfort and a negative association with playing for entertainment. However, the inverse relationships between playing for entertainment and attachment only reached significance among the anxiously attached, providing partial support for H4.

4. Discussion

The current study explored the relationships between social skills and video game involvement through the perspective of

---

Table 2
Total R squared and unstandardized beta weights (standard error) for individual predictors in the final model.

<table>
<thead>
<tr>
<th></th>
<th>All participants (N = 386)</th>
<th>Active on and offline (n = 136)</th>
<th>Offline only (n = 102)</th>
<th>Online only (n = 57)</th>
</tr>
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<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.210a</td>
<td>-.259b</td>
<td>-.311b</td>
<td>-.379b</td>
</tr>
<tr>
<td>Age</td>
<td>-.002 (.227)</td>
<td>.040 (.329)</td>
<td>-.043 (.301)</td>
<td>-.083 (.045)</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxious</td>
<td>.069 (.110)</td>
<td>.133 (.123)</td>
<td>-.055 (.198)</td>
<td>-.138 (.235)</td>
</tr>
<tr>
<td>Avoidant</td>
<td>.012 (.116)</td>
<td>-.029 (.143)</td>
<td>-.030 (.199)</td>
<td>.295 (.213)</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Anxious</td>
<td>.095 (.125)</td>
<td>-.050 (.165)</td>
<td>.144 (.212)</td>
<td>-.263 (.266)</td>
</tr>
<tr>
<td>Avoidant</td>
<td>-.063 (.140)</td>
<td>.083 (.181)</td>
<td>-.530 (.240)</td>
<td>.556 (.271)</td>
</tr>
<tr>
<td>EE</td>
<td>-.127 (.178)</td>
<td>.211 (.226)</td>
<td>-.845a (.297)</td>
<td>.102 (.534)</td>
</tr>
<tr>
<td>ES</td>
<td>.634b (.129)</td>
<td>.450b (.157)</td>
<td>.131 (.235)</td>
<td>.506 (.331)</td>
</tr>
<tr>
<td>EC</td>
<td>-.126 (.137)</td>
<td>-.240 (.184)</td>
<td>.160 (.213)</td>
<td>.266 (.300)</td>
</tr>
<tr>
<td>SE</td>
<td>-.098 (.130)</td>
<td>-.477c (.163)</td>
<td>-.268 (.236)</td>
<td>.102 (.279)</td>
</tr>
<tr>
<td>SS</td>
<td>-.208 (.132)</td>
<td>.213 (.171)</td>
<td>-.323 (.210)</td>
<td>.072 (.314)</td>
</tr>
<tr>
<td>SC</td>
<td>-.065 (.141)</td>
<td>.287 (.184)</td>
<td>.230 (.260)</td>
<td>-.167 (.302)</td>
</tr>
<tr>
<td><strong>Total R2</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>.001</td>
<td>.007</td>
<td>.001</td>
<td>.037</td>
</tr>
<tr>
<td>Step 3</td>
<td>.058*</td>
<td>.107c</td>
<td>.113d</td>
<td>.093</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
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<td></td>
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<tr>
<td><strong>R2 Change</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>.183</td>
<td>.189</td>
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<td>.153</td>
</tr>
<tr>
<td>Step 3</td>
<td>.242</td>
<td>.296</td>
<td>.223</td>
<td>.246</td>
</tr>
</tbody>
</table>

a p < .001.

b p < .01.
c p < .05.
attachment theory, examining its potential as an underlying imper-
tus behind the relationship between social skills and OVG involve-
ment. However, before the role of insecure attachment can be ex-
plored, the relationships between social skills and OVG need to
first be confirmed.

As predicted, significant linear relationships between social
skills and video game involvement emerged, confirming that more
involved video game players (both off- and online) perceive them-
selel to be emotionally sensitive (ES) and less able to effectively
engage in and maintain verbal interactions (SE) (Griffiths, 2010;
Kowert & Oldmeadow, 2013; Lemmens et al., 2011; Liu & Peng,
2009). However, SE and ES emerged as significant individual predic-
tors among all active game players, off- and online, reflecting video
games' general ability to accommodate for the social discomfort
and/or inhibition associated with a low verbal fluency (i.e., low
SE) and a hypersensitivity to the communicative messages of others
(i.e., high ES). These findings dispute the all-encompassing, mal-
adaptive social skills that are anecdotally attributed to game play-
ners, particularly online players (Kowert, Griffiths, & Oldmeadow,
2012; Kowert & Oldmeadow, 2012; Williams et al., 2008), as not
only were the inverse relationships between social skills and video
game involvement limited to the SE and ES subscales but were also
only evident within the broader game playing sample, rather than
being unique to the subgroup of online game players. Although,
based on these results alone, it is unclear whether the positive rela-
tionships between ES and VG involvement reflect an underlying
shyness disposition, the development of a hypersensitivity to non-verbal
cues over time, or a greater aptitude for the skills associ-
ated with ES, either dispositionally (i.e., personality characteris-
tic) or as cultivated through engagement. Although, given the
relative lack of non-verbal cues in online gaming spaces and the
established links between ES, shyness, and social self-consciousness
(Riggio, 1989), the former seems more likely.

Contrary to predictions, attachment was not found to be a sig-
ificant individual predictor of video game involvement indepen-
dent of social skill outcomes, nor a mediator of the relationship
between social skills and Involvement. The lack of direct relation-
ships, mediation effects, and broad differences in attachment
between online and non-online players, suggests that individuals
who engage in online exclusive play are unlikely doing so to com-
 pense for inept social skills underpinned by an insecure attach-
ment. However, positive correlations between insecure attachment
and "Playing for Social Comfort" did emerge, indicating that
users high in attachment anxiety and avoidance report greater
participation in OVG environments when feeling stressed, anxious,
sad, and lonely. This relationship was slightly stronger for avoidant
individuals, suggesting that online play may be particularly suited
to serve attachment functions for the highly avoidant. This may be
the case as the playful, social environments of OVGs are able to
accommodate for their traditional challenges with self-disclosure,
intimacy, and closeness with others.

Traditionally, individuals high in attachment avoidance avoid
closeness with others, value their self-sufficiency, and perceive
no need for social relationships. Due to the belief they will eventu-
ally be disappointed, these individuals largely dismiss and avoid
interpersonal relationships, putting them at risk for social isolation
(Buote et al., 2009; Smith et al., 1999). However, the proliferation
of Internet-based social spaces has led to a social revolution,
allowing individuals to connect easily with others in a variety of
computer-mediated environments. These virtual social spaces are
believed to be particularly desirable, and potentially beneficial,
for those high in attachment avoidance, as they can accommodate
their need to retain autonomy by promoting the development and
maintenance of interpersonal relationships without the need for
physical proximity, while also helping them to overcome their tra-
ditional difficulties with self-disclosure through the provision of
anonymity and the reduced amount of social cues found online
(Lea & Spears, 1995; McKenna & Bargh, 2000; Parks & Floyd,
1996; Reis & Shaver, 1988; Suler, 2004). By accommodating for
their traditional difficulties with self-disclosure, and allowing for
the retention of autonomy through physical distance, OVGs seem
to be well suited for avoidant individuals to form, and maintain,
imintate bonds online that may have been unattainable in tradi-
tional contexts. However, as avoidant attachment did not emerge
as a significant individual predictor until the final regression
model, the relationship between attachment and Involvement seems
to be intertwined with social skills outcomes.

It must be noted that correlational analyses identified both anx-
iuous and avoidant attachment as a motivator for OVG play. How-
ever, attachment anxiety showed significant, positive correlations
with playing for social comfort within offline and online gaming
environments. Thus, unlike avoidant individuals, those high in
attachment anxiety seem to be seeking social closeness with others
from offline and online social contexts. As a wide variety of Inter-
net-based mediated outlets, both anonymous (Buote et al., 2009)
and non-anonymous (Oldmeadow et al., 2013), can potentially
generate social satisfaction for individuals high in attachment anx-
xiety, it is possible that the particular qualities of OVGs may not be
as integral, or appealing, to anxious individuals, as compared to
avoidant individuals, who may need greater social safeguards, such
as anonymity. This difference is further reflected in the regression

<table>
<thead>
<tr>
<th>Table 3</th>
<th>Partial correlations (controlling for age and gender) between emotional motivations for play and insecure attachment across game playing groups.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motivation</strong></td>
<td><strong>All participants</strong></td>
</tr>
<tr>
<td></td>
<td>(N = 515)</td>
</tr>
<tr>
<td>Comfort</td>
<td>.26</td>
</tr>
<tr>
<td>Entertainment</td>
<td>.22</td>
</tr>
<tr>
<td>Anxious</td>
<td>.02</td>
</tr>
<tr>
<td>Avoidant</td>
<td>.02</td>
</tr>
</tbody>
</table>

\*a p < .001. \*b p < .01. \*c p < .05.
analyses, as the long-held dichotomous thinking about video games as all good or bad and indicate that video game play holds the potential to be socially impactful on the individual level in both positive and negative ways. While inverse relationships were found between VG involvement and social skills among the broader game playing population, positive correlations between online video game play, insecure attachment, and playing for social comfort indicate that OVGs may be socially beneficial for those with pre-existing social difficulties.

Appendix A. Supplementary material

Supplementary data associated with this article can be found in the online version, at http://dx.doi.org/10.1016/j.chb.2014.05.004.

References


Denzin, N., Hannan, E., & Flick, R. (2005). An investigation of social skills and loneliness levels of university students with respect to their attachment styles in a sample of Turkish students. Social Behaviour and Personality, 33(1), 19–32.


