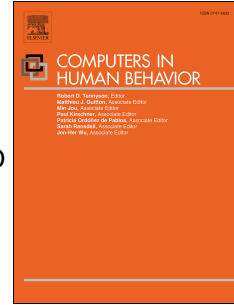


Accepted Manuscript

The role of social identity and online social capital on psychosocial outcomes in MMO players

Linda K. Kaye, Rachel Kowert, Sally Quinn



PII: S0747-5632(17)30273-X

DOI: [10.1016/j.chb.2017.04.030](https://doi.org/10.1016/j.chb.2017.04.030)

Reference: CHB 4929

To appear in: *Computers in Human Behavior*

Received Date: 22 July 2016

Revised Date: 10 March 2017

Accepted Date: 14 April 2017

Please cite this article as: Kaye L.K., Kowert R. & Quinn S., The role of social identity and online social capital on psychosocial outcomes in MMO players, *Computers in Human Behavior* (2017), doi: 10.1016/j.chb.2017.04.030.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

**The role of social identity and online social capital on psychosocial outcomes in MMO
players**

Linda K. Kaye*¹, Rachel Kowert ² & Sally Quinn ³

¹ Edge Hill University, UK; ² University of Münster; ³ University of York, UK

*Corresponding author: Department of Psychology, Edge Hill University, St Helens Road,

Ormskirk, L39 4QP

+44 1695 584413

Linda.kaye@edgehill.ac.uk

The role of social identity and online social capital on psychosocial outcomes in MMO players

Abstract

Previous literature has found inconsistent relationships between online gaming engagement and psychosocial outcomes. To add clarity to this discussion, we explored these relationships through a multidimensional lens of gaming engagement. That is, we examined the role of gamer identity and online social capital as mediators of online gaming engagement and psychosocial outcomes (i.e. self-esteem, loneliness, social competence). We addressed this in a sample of Massively Multiplayer Online (MMOs) players ($N = 708$), via an online questionnaire to establish cross-sectional associations. Findings revealed positive relationships between MMO engagement (measured by a multidimensional measure), gamer identity, and online social capital. Additionally, gamer identity related positively to self-esteem and social competence, and negatively with loneliness. Differential outcomes were also found between social capital and loneliness. Specifically, loneliness was negatively related to online bonding, but positively with online bridging capital, highlighting the importance of exploring the constitution of gaming communities to assess their role in promoting varying dimensions of social capital and the associated psychological correlates. Taken together, we evidence the psychosocial benefits of MMO engagement, specifically in relation to the social value of identifying and connecting with others in MMOs. Additionally, we highlight the complexities surrounding the concept and measurement of gaming engagement.

Keywords: online gaming; psychosocial outcomes; social identity; online social capital

1.1. Introduction

Massively Multiplayer Online games (MMOs) are rich and diverse virtual game environments which can foster a range of social experiences for players. Their appeal is often attributed to the social affordances in which players may meet, interact and play with other players (Domahidi, Festl & Quandt, 2014; Kowert, Domahidi, Quandt, 2014; Yee, 2006). MMOs, and indeed other forms of gaming, have previously been found to hold positive impacts for enhanced social experiences, as well as being related to a range of positive psychological outcomes (Kaye, 2014, 2016; Kaye & Bryce, 2014). Conversely, other research has highlighted inverse relationships between online gaming engagement and indicators of psychological well-being, such as self-esteem, loneliness and social competence (e.g., Caplan, Williams, & Yee, 2009; Kowert & Oldmeadow, 2015). For example, previous research has found significant relationships between problematic online gaming and psychiatric symptoms including anxiety and depression (Király, Urban, Griffiths, Ágoston, Nagygyörgy, Kökönyei & Demetrovics, 2015). More specifically, MMOs players have been found to show more depressive tendencies and lower self-esteem relative to players of other types of games (Stetine, Kothgassner, Lehenbauer & Kryspin-Exner, 2011).

As illustrated from the examples above, it is clear that there is quite a bit of variation in the research findings exploring the psychological effects associated with online gaming, which calls for a greater consistency in the ongoing literature in this area. To help create a more nuanced understanding of the relationships between online video game play and psychosocial outcomes, we propose a number of potential factors which may explain such discrepancy and provide an empirical account. We these in mind, we aim to establish the cross-sectional relations between online gaming engagement and a number of psychosocial

outcomes which have been prone to disparate findings in the literature (self-esteem, social competence and loneliness). Within this, we also take heed of a number of likely confounding variables which may be partially attributable for these discrepancies; 1) operationalisation of “online gaming engagement” and how this may vary in different gaming communities, and 2) relatedly, the way in which gamer identity in these communities may vary in respect of gaming engagement and its impact on psychosocial outcomes. These are discussed in the subsequent section.

1.2. Identifying the issues

There are a number of attributable reasons for the discrepancy in research on online gaming and psychosocial outcomes. The first is the lack of consistency across studies in measuring online gaming engagement, in which a range of indicators have been implemented including: hours per week spent playing, time spent online generally, and the categorisation of “heavy” or problematic players (Caplin et al., 2009; Collins & Freeman, 2013; Lo, Wang & Fang, 2005). As such, it is unsurprising that there is a lack of consensus on how online gaming “engagement” is related to psychosocial outcomes (for more on this, see Kowert, 2015).

Arguably, “engagement” can include a variety of activities which extend beyond simply play-time, as measured by hours per week spent playing. For example, this may include interacting with other players either directly within the game or on associated platforms outside of it (gaming forums, discussion boards). Indeed, the activity of online chat itself has been found to be related to increases in self-esteem and perceived social support, and reductions in loneliness and depression (Shaw & Gant, 2004), which illustrate the importance of accounting for these differential engagement metrics, as a foundation for understanding aspects of online engagement. It is difficult to establish therefore, the extent to which

previous findings would hold true if gaming engagement was to be conceptualised in light of these complexities. Of related interest here is how gaming engagement may vary as a product of the gaming community itself. That is, indicators of online gaming engagement often fail to discriminate between different forms of online gaming, which arguably differ in a range of dimensions, including their structural components, interactivity, types of associated community activities, as well as motivational components (Demetrovics et al., 2011; King, Delfabbro, & Griffiths, 2010; Wood, Griffiths, Chappell & Davies, 2004). Thus, a more specific line of inquiry is relevant in this regard for particular types of online games.

The final confound in previous literature is that there is little indication of the derived identity process of engagement that may hold differential outcomes for players. That is, for those who form positive identity through their online gaming affiliation, there are likely to be more positive outcomes compared to those who do not identify as such. This issue is particularly problematic for previous studies that have not specifically recruited “gamers” and may only have measured gaming engagement solely through measuring hours per week spent playing. Arguably, there are conceptual differences between those who consider themselves “gamers” and those who are simply “players”; specifically the former suggesting an element of domain identity whereas the latter not implicating this notion. This is also likely to interact with motivations for engaging in online gaming in respect of need satisfaction (Demetrovics et al., 2011; Lafrenière, Verner-Filion & Vallerand, 2012), which may vary considerably between “players” and “gamers”. It is conceivable that many participants in these studies may not strongly identify to the domain of gaming, and thus findings may be inadvertently omitting the role of this key concept in this regard. Indeed, we acknowledge this by including gamer identity as a key variable in the current study, and that MMO engagement is conceivably related to stronger gamer identity. This notion is theoretically underpinned by the principles

of social identity theory (Tajfel, 1978, 1979; Tajfel & Turner, 1979), from which we conceptualise gamer identity and its impacts for the purposes of the current study.

H1: MMO engagement will be positively related to gamer identity.

1.3. Gamer identity

Social identity theory explains the process by which one's sense of self is determined by an affiliation to a given social group (Tajfel, 1978, 1979; Tajfel & Turner, 1979). Within this, the "personal self" is merged with the "collective self", by which the strength of affiliation to a social group (i.e. the social identity) has a key influence on one's own personal self-regard (Abrams & Hogg, 1988; Ellemers, Haslam, Platow & Knippenberg, 2003). Gamer identity specifically has been identified as a multi-faceted concept that transcends virtual and offline identities and communities (Grooten & Kowert, 2015).

Previous literature has identified the relationships between strength of social identity and outcomes for self-esteem and psychological well-being across a wide range of different contexts (Crocker, Luhtanen, Blaine & Broadnax, 1994; Haslam, Jetten, Postmes, & Haslam, 2009; Kong, Zhao & You, 2013; Simsek, 2013). For example, a positive social identity has been found to foster feelings of belongingness and self-worth (Branscombe & Wann, 1991). Within the context of digital gaming, less empirical investigation has been sought in this regard, with the exception of a handful of studies (Kaye, 2014; Kowert, 2015). Specifically, gamer identity has been found to promote higher levels of social and psychological investment within the gaming community which, in turn, facilitates a sense of belongingness and self-esteem (Kowert, 2015). Specifically in relation to MMOs, however, this remains unaddressed within the empirical literature and therefore presents a basis for the current study. In particular, one pertinent area of inquiry is the extent to which social identity

processes operate within MMO affiliation and their impact on psychosocial outcomes. As such, we would expect that gamer identity derived through MMO engagement, would correspond positively to indicators of well-being, such as self-esteem, based on the aforementioned theoretical premise.

H2: MMO players' gamer identity will be positively related to their self-reported self-esteem

In addition to self-esteem, gamer identity is also expected to be related to other favourable psychosocial outcomes, including social competence and reduced loneliness. That is, it has been previously found that a positive sense of social identity or being part of a community is associated with lower loneliness (Chipuer, 2001; Hoyle & Crawford, 1994; Pretty, Andrewes & Collett, 1994), arguably through the way in which collective identity may foster feelings of belonging (Branscombe & Wann, 1991). Additionally, in respect of social competence, this has theoretically been established to consist a number of different facets; social skills, sociometric status, relationships and functional outcomes (Rose-Krasnor, 1997). In this sense, one's affiliations and social affordances play a key role in the extent to which one feels competent in this domain. As such, gamer identity, as defined in this case by one's affiliation to gaming groups or communities, may be one means through which a sense of social competence may be derived. That is, dimensions of social identity have previously been found to be related to social competence (Condry, 1984; Tran & Lee, 2010; Valkenburg & Peter, 2008). Indeed, this has been established in respect of one's gender identity (Condry, 1984), ethnic identity (Tran & Lee, 2010) and online identity (Valkenburg & Peter, 2008). Specifically, those who engage more in exploring their identity online, have been found to communicate more often with more people, and in turn, this is related to enhanced social competence.

H3: MMO players' gamer identity will be positively related to their self-reported social competence, and negatively related to loneliness.

1.4. Social capital

In addition to gamer identity, another important mechanism that may mediate the link between online gaming engagement and psychosocial outcomes is that of the social capital derived through these experiences. That is, it has been argued that MMO engagement may be associated with positive psychosocial outcomes as these contexts hold the potential to foster heightened levels of social capital (i.e., social resources) as players experience connectedness with others through their shared experiences (Collins & Freeman, 2013; Williams, 2006). This notion is reflective of the stimulation hypothesis of online engagement (Valkenburg & Peter, 2007), in which it is suggested that Internet-based activities can substantiate social relationships in the “real world” rather than displace the opportunities for real-world social engagements, suggested by the displacement hypothesis (Valkenburg & Peter, 2007). Specifically in line with the idea that online gaming stimulates social relations, social capital focuses on two similar, yet unrelated components of “bridging” and “bonding”. Whilst “bonding” capital refers to those strong and emotional ties with good friends or family, “bridging” capital refers to those weaker ties, for example, with those whom may offer new experiences or perspectives (Putnam, 1995). The accumulation of social capital of both kinds has been found to be associated with a range of positive outcomes including increased life satisfaction (Putnam, 2000), enhanced self-esteem, and general physical and psychological well-being (Helliwell, 2006; Helliwell & Putnam, 2004). The relevance of social capital among MMO players may be the potential from which engagement may foster the “bridging”

social ties, yet also may hold potential for fostering “bonding” through players’ opportunities for engaging with their existing friends in a mutually-favoured activity (Kaye, 2014).

However, there is a certain degree of discrepancy across studies on the extent to which this form of gaming may foster such experiences. That is, whilst some findings indicate that greater engagement in online play impacts upon lower quality social relationships with others (Kowert, Domahidi, Festl & Quandt, 2014; Lianekhammy & van de Venne, 2015), other research suggests the opposite, particularly for promoting wider connections with others within the online context (Reer & Krämer, 2014). Supporting this is other research showing how bridging social capital is promoted through intensity of use for the social networking site, Facebook (Steinfeld, Ellison & Lampe, 2008). Regardless of the mechanism through which online engagement and social outcomes are realised, it is possible that social capital plays a mediatory role, and this is conceivably relevant in the case of online gaming. To further this area of enquiry, a more nuanced account of the types of social involvements MMO players engage in is required (i.e., rather than hours spent playing), to provide a better understanding of how this may foster varying degrees of online social capital and the potential psychosocial impacts. It could be expected therefore, that the different types of MMO activities which players engage in may hold differential outcomes for experiences of the two components of online social capital. Specifically, those who engage in wider online activities such as contributing to MMO communities and discussion boards, may benefit from the affordances which bridging capital may bring, compared to those who may engage in offline-extending interactions with their “real world gaming friends”, in which bonding components may be more conceivable (Putnam, 2000). This presents a basis for the current study in which we aim to assess how different activities which comprise MMO involvement are related to the two facets of online social capital. Specifically, we expected that;

H4: MMO involvement will be positively related to the facets of online social capital (both bridging and bonding).

From a theoretical perspective, one should expect the facets of social capital derived through online gaming to serve positively for the outcomes of self-esteem and social competence, and be negatively related to loneliness in MMO players (Valkenburg & Peter, 2007). Specifically, for MMO games, the richness of social opportunities which are available to players means these are an Internet-based activity which may be best underpinned from the perspective of the stimulation hypothesis, rather than displacement theory. Namely, displacement theorists would posit the likely detriments of online gaming engagement on experiences of loneliness and social competencies (Liu & Peng, 2009; Morahan-Martin & Schumacher, 2003), whilst stimulation theorists would suggest these experiences to provide an additive effect on boosting social opportunities which may protect against loneliness and enhancing social competence (Kowert, Domahidi, & Quandt, 2014; Valkenburg & Peter, 2007). Although these debates are typical in the cyberpsychological literature (see McKenna & Bargh, 1999, for review), a context-specific focus on MMOs in the case of the current study, may provide a firmer basis through which to ascribe to one perspective over another. That is, some previous research has been somewhat vague in its assessment of how “Internet use” is related to outcomes such as loneliness, given that “Internet” use covers a broad range of activities, varying in social affordances. Thus, the current research adopted a more specific line of enquiry in this regard by considering this in the context of MMOs, thus providing a more nuanced account of these issues. In line with this theoretical stance, we expect;

H5: Online bridging and bonding derived through MMO engagement, will be positively associated with self-esteem and social competence, and be negatively related to loneliness

1.5. Current study

Based on the literature discussed, we hypothesise that social capital (bonding and bridging), and MMO gamer identity will act as mediators between MMO involvement and the psychosocial outcomes of self-esteem, social competence, and loneliness. To further enquire into the effects of different types of involvements in MMO communities, we also aim to explore the associations between the different items contributing to MMO involvement and the two components of social capital (bridging and bonding). The specific study hypotheses are illustrated in Figure 1.

[Figure 1 about here]

2. 1. Method

2.1.1. Design

An online questionnaire developed through SurveyGizmo was completed by MMO players. This included demographic measures that consisted a measure of MMO involvement, as well as measures of gamer identity (*Group Identification Scale*; Doosje, Ellmers, & Spears, 1995), and online social capital (*Internet Social Capital Scale*; Williams, 2006). These were followed by a number of indicators of psychosocial well-being. Specifically; self-esteem (*Self Esteem Scale*; Rosenberg, 1965), loneliness (*UCLA loneliness scale*; Russell, Peplau, & Ferguson, 1978), and social competence (*CPI:SY* subscale of the *IPIP Scale*; Gough & Bradley, 1996).

2.1.2. Procedure

Participants were recruited through adverts on online discussions boards and forums relevant to MMOs (e.g., League of Legends, Overwatch and Final Fantasy). An advert to the research was posted on these platforms which included the web-link to the online questionnaire. This was advertised by asking “Do you play MMOs?” with a link to the study website which included the full study information. Additionally, the same advert was posted to Amazon’s Mechanical Turk (MTurk), as a supplementary recruitment strategy. MTurk is an open marketplace which advertises “jobs” which require “human intelligence”. Research has found little evidence to suggest that the data collected online is of a poorer quality than that collected from more traditional subject pools (Gosling, Vazire, Srivastava, & John, 2004; Paolacci, Chandler, & Ipeirotis, 2010). In fact, MTurk workers have been found to be more intrinsically motivated to complete the tasks they are hired to complete (Buhrmester, Kwang, & Gosling, 2011) Participants therefore undertook the survey as a work task, in which they were paid \$0.10 for their participation.

2.1.3. Participants

Participants were MMO players ($N = 708$), the majority of which were male (66.5%), with an average age of 29.72 ($SD = 9.62$). In respect of self-referred gamer type, the majority identified themselves as “hard-core/experienced” gamers (44.8%), with the remainder as “casual” (32.9%), “social” (18.0%), and professional/serious (3.3%), all of whom reported they played at least on an occasional basis. Regarding average hours per week spent playing, about one quarter of the sample indicated they spent 1-5 hours per week (25.2%), 24% for 6-10 hours, 17.8% for 11-15 hours, 11.5% for 16-20 hours, 6.9% for 21-25 hours, 3.7% for 26-30 hours and finally, 6.1% for 30 or more hours per week.

2.1.4. Materials

2.1.4.1. Demographic Information

A number of demographic responses were obtained which related to participants' gender, age, and MMO engagement (e.g., self-referred type of gamer, frequency of play, involvement in MMO-related activities).

2.1.4.2. MMO involvement

MMO involvement included four items on which participants rated their extent of engagement in MMOs (1 = not at all, 5 = a lot). These included items about their playing habits with other players (online-only friends, and real world friends), and contributions to MMO discussion boards and other interactions. Specifically, participants were asked to indicate how often they; "play MMOs with online-only friends"; "play MMOs with 'real world' friends"; "contribute to MMO discussion boards"; and "interact with other MMO players outside the game environment but on online platforms (e.g., community pages, online groups)". In addition to these four items, an additional item was included to measure the number of hours per week spent playing MMOs. This was scored on an 8-point scale ranging from less than one hour (scored as 1) to 30 hours or more (scored as 8). Since this latter item was scored on a different scale to the first four items, all responses to the five items were standardised. A total score was compiled, in which a higher score indicated greater MMO involvement. The Cronbach's alpha for this scale showed adequate reliability ($\alpha = .67$) (Schmitt, 1996).

2.1.4.3. Gamer identity

Social identity is one's sense of self, in respect of one's group membership (Tajfel, 1978, 1979; Tajfel & Turner, 1979). As a metric for assessing identification to MMOs, *gamer*

identity was measured through the *Group Identification measure* (Doosje et al., 1995)¹. This asked participants to rate a series of four statements on a 7-point scale (1 = strongly disagree, 7 = strongly agree), from which a mean score was calculated. Items included “I see myself as a MMO gamer.” Previous research has found this to be highly reliable as a measure of social identity (Kowert & Oldmeadow, 2015), which was also confirmed in the current study ($\alpha = .88$).

2.1.4.4. Online social capital

Online social capital refers to the reciprocal social resources one obtains through engaging in networks (Putnam, 2000; Williams, 2006). Online social capital through MMO play was obtained through the *Internet Social Capital Scale* (ISCS; Williams, 2006). The full version of the ISCS consists of 40 items; 20 items assessing offline social capital and the remainder assessing online social capital. The latter of these sub-scales was used for the purposes of the current study. Within this, there are two further sub-scales assessing online “bridging” (e.g., “There are several people in MMOs to help solve my problems”), and “bonding” (e.g., “Interacting with people in MMOs makes me interested in things that happen outside of my town”). Items were rated on a 5-point scale (1 = not characteristic of me, 5 = extremely characteristic of me), from which a total score was calculated for each sub-scale. The current study found these sub-scales to be adequately reliable, both for online bonding ($\alpha = .88$) and online bridging ($\alpha = .88$).

2.1.4.5. Self-esteem

Self-esteem is understood as being a global concept, which refers to one’s perception of their self-worth (Rosenberg, 1965). Self-esteem was assessed by the *Self-Esteem Scale*

¹ The usual four items of this scale were used, but adapted in the sense that the suffixes of the statements referred to “MMO gamer” to ensure the measure was assessing MMO identity, specifically.

(Rosenberg, 1965). This measure requires participants to indicate their agreement to a series of statements on a 4-point scale (1 = strongly disagree, 4 = strongly agree), from which a total score is obtained. Items include; “I take a positive attitude towards myself”. Previous research has found this measure to be suitably valid and reliable (Fleming & Courtney, 1984; Hagborg, 2006), consistent with the reliability analysis of the current study, revealing an alpha coefficient of .93.

2.1.4.6. Loneliness

Loneliness has previously been conceptualised as comprising two facets; emotional loneliness and social loneliness. The current study focused on the latter of these. Specifically, social loneliness is understood as being one’s perception that they are not part of a social network (Weiss, 1973). Loneliness was measured through the use of two items from the *UCLA Loneliness Scale* (Russell et al., 1978). These were; “I feel alone most of the time” and “I often feel let down”. These were rated on a 5-point scale (1 = not characteristic of me, 5 = extremely characteristic of me), and a total score was obtained. Reliability analysis in previous studies has found this to be acceptable in reliability (Kowert, Vogelgesang, Festl & Quandt, 2015), which was also supported by the current reliability coefficient ($\alpha = .87$).

2.1.4.7. Perceived Social Competence

Perceived social competence refers to one’s perception of their ability to handle social situations or interactions effectively (Rose-Krasnor, 1997). Social competence was measured through the *CPI: SY* subscale of the *International Personality Item Pool Scale*; (Gough & Bradley, 1996). Specifically, through the use of two items; “I get on very well with others” and “I can handle social situations very well”. These were rated on a 5-point scale (1 = not characteristic of me, 5 = extremely characteristic of me), through which a total score was

obtained. Reliability analysis revealed this to be suitably reliable for the purposes of the current study ($\alpha = .76$).

3.1. Results

Table 1 shows the correlations between each of the variables in the hypothesised model. All variables were found to correlate significantly with the exception of (i) MMO Involvement with social competence and loneliness, and (ii) online bridging with self-esteem and loneliness.

[Table 1 about here]

The hypothesised model was tested using the path analysis procedure with the aid of AMOS 22.0.0 (Arbuckle, 2013). Since gamer identity was negatively skewed (skewness = -1.07), the bootstrapping method was used to account for non-normality in the data. The error terms of gamer identity, online bridging capital and online bonding capital were allowed to co-vary as were the error terms of self-esteem, social competence and loneliness. Four model fit indices were used to determine the fit of the model: the chi-square test, the relative chi-square (χ^2/df ratio), the root mean square error of approximation (RMSEA) and the comparative fit index (CFI). Typically, a good model fit is expressed by a non-significant Chi-square test result, a relative chi-square < 3.00 , an RMSEA value $< .06$ and a CFI value $> .95$ (Byrne, 2001; Kline, 2011). The model fit the data well, $\chi^2(3) = 4.68$, $p = .197$, $\chi^2/df = 1.56$, CFI = .999, RMSEA = .028. Figure 2 shows the standardised coefficients of each hypothesised pathway found to be significant in this model, as well as the coefficients for all other pathways.

[Figure 2 about here]

All covariances between the error terms were significant (all p values $<.003$). As can be seen from Figure 2, MMO involvement was positively related to gamer identity ($\beta = .37, p < .01$), online bridging capital ($\beta = .39, p < .01$), and online bonding capital ($\beta = .39, p < .01$). Gamer identity was positively related to self-esteem ($\beta = .18, p < .01$), and social competence ($\beta = .11, p < .01$), and negatively related to loneliness ($\beta = -.12, p < .01$). Online bonding capital was also negatively related to loneliness ($\beta = -.15, p < .01$), whereas online bridging capital was positively related to this outcome ($\beta = .13, p < .05$).

The mediated relationships were subjected to a series of Sobel tests. The three mediated relationships with gamer identity as a mediator were significant (self-esteem as the outcome, sobel test = 4.25, $p <.001$; social competence as the outcome, sobel test = 2.69, $p =.003$; loneliness as the outcome, sobel test = -2.92, $p =.001$). The two relationships with online bridging and bonding as the mediators and loneliness as the outcome, were also significant (sobel test = 2.52, $p =.005$, and sobel test = -3.52, $p <.001$, respectively). Taking into account these mediated relationships, the standardised total effect of MMO involvement on each of the three outcome variables was found to be $\beta = .07, p <.01$ for self-esteem, $\beta = .10, p <.01$ for social competence and $\beta = -.06, p <.05$ for loneliness.

As a further exploration of whether the individual components of MMO involvement activities were independently related to the two components of online social capital as well as gamer identity, correlations were undertaken on the four items of the MMO involvement questionnaire with these variables. It was found each of the four MMO activities

independently correlated positively and significantly with both online bonding and bridging and gamer identity). See Table 2.

[Table 2 about here]

4.1. Discussion

The current study aimed to investigate a number of key research questions surrounding MMO engagement and associated psychological outcomes. In particular, we drew on the principles of social identity theory to underpin “gamer identity”, and social capital to assess their mediational role upon these outcomes. Additionally, as a means of addressing some of the contradictions in the previous literature, we explored the concept of “MMO engagement” by obtaining measures of involvement in a range of MMO activities, including those beyond gameplay itself. To this end, we intended to provide a more nuanced account of “engagement” beyond simple measures of average hours per week spent gaming, which are arguably not completely sufficient in accounting for the additional experiences which MMO can offer (Kowert, 2015). Our key findings and contributions are discussed below.

In respect of our first hypothesis, on the positive relationship between MMO involvement and gamer identity, we found support for this. Additionally, MMO involvement was also positively related to the two online social capital factors. This highlights clear evidence of the social affordances gained through this form of digital gaming, in respect of players’ own sense of self, as well as the value of relationships with others within the MMO community. Although the causality of relationships cannot be established here, it is encouraging to see that the value of relationships obtained through MMO engagement has positive implications

on one's own sense of identity in this regard, suggesting a beneficial personal impact of MMO engagement for some individuals. Specifically in relation to the impact of such social identity, we found this to be related positively to self-esteem and social competence. In this way, we found support for our second hypothesis in respect of the role of gamer identity on self-esteem. The link between social identity and self-esteem is highly contingent with an extensive literature-base revealing these associations across many contexts and domains (Crocker, Luhtanen, Blaine & Broadnax, 1994; Kong, Zhao & You, 2013; Simsek, 2013), and interesting to see how this also appears to be applicable for gamer identity. Specifically, gamer identity (particularly in respect of online gamers) is often stigmatised (Kowert, Griffiths & Oldmeadow, 2012) and as a result could operate as a threat to one's self-esteem. However, it is encouraging to see that for the participants in the current study, gamer identity was upheld positively in respect of self-regard. Of additional interest here was our finding that gamer identity was negatively related to loneliness, suggesting that affiliation through this sense of identity may provide a buffer against experiences of loneliness and isolation. Taken together, these findings clearly highlight the importance of identity with the gaming community and how identification can bolster players' sense of well-being. For future research modelling the impacts of digital gaming, the current findings provide a justification for including measures of gamer identity to more fully account for psychosocial outcomes. That is, gamer identity has been readily ignored within the majority of existing studies on online gaming and psychological outcomes, but this is arguably a highly relevant factor which can theoretically explain these effects. Therefore the current findings provide some theoretical insight into how social identity theory may be applied to the gaming literature, particularly when theorising on gaming outcomes. This also calls for some practical insight into how game industry representatives may best build players' sense of identity within gaming domains. For example, this may consist an exploration of the community activities

that can be available and whether this is practically possible for digital games which may not have an online or Internet-mediated infrastructure. Together, these findings support other research in this area (Kowert, Festl, Quandt, 2014) by disputing the long-held stereotypic perception of online gamers as lonely and isolated individuals (Kowert, Griffiths, Oldmeadow, 2012; Kowert, & Oldmeadow, 2012) and instead recognising the social value to be afforded through online forms of digital gaming.

Additionally, for our third hypothesis, in respect of gamer identity being related positively to social competence (as well as being negatively related to loneliness, as previously mentioned), this is an encouraging finding, particularly given the stereotypical conceptions of online gamers being “socially-inept” and of lower social status compared to other social groups (Kowert, Festl, & Quandt, 2014; Kowert, Griffiths, & Oldmeadow, 2012; Kowert & Oldmeadow, 2012). The social affordances provided through MMO involvement in respect of its impact on gamer identity therefore appear to have positive implications for players’ perceptions of their competences in social situations. One possibility is that the social affordances provided by communication in online gaming spaces (i.e. visual anonymity, asynchronicity of communication) help promote communication, whilst the context of the online game itself provides a perpetual topic of conversation for players. This could be particularly important for individuals who may have difficulty creating and maintaining friendships in “offline” contexts, such those who are shy (Kowert, Domahidi, Quandt, 2014) or insecurely attached (Kowert & Oldmeadow, 2014). Further insight into the interaction between personality types or relevant individual differences and the way specific forms of MMOs (and indeed other online bridging contexts) may proffer a helpful platform for those who may struggle with interpersonal processes in “offline” or face-to-face contexts.

Additionally, in respect of our fifth hypothesis, relationships were found for the online social capital factors on the psychosocial outcomes. Interestingly for online bonding, this was negatively related to loneliness whereas online bridging was a positive predictor for this psychosocial outcome (the latter of these refuting the expected direction in our hypothesis). This makes conceptual sense since bonding is conceivably relates more to “strong ties” and thus associated with decreased loneliness relative to the bridging component. It is encouraging to see that MMOs are a platform through which these stronger connections in the form of online bonding may be derived, as typically these environments are often attributed to only promoting connections with weaker, bridging ties at the expense of closer connections, more often residing “offline”. This suggests future research to offer a more nuanced account of the composition of online gaming communities in respect of the way they may support varying dimensions of social capital, to more fully assess the psychological impacts, rather than focusing too exclusively on “online gaming” as a unidimensional concept. Although existing work provides insight into how online versus offline friendships function with regards to differential psychological outcomes (Domahidi, Festl & Quandt, 2014), less is understood about the way different forms of social capital may operate, particularly for players who may occupy social networks in both virtual and “real world” gaming communities.

For our fourth hypothesis, in which we explored the specific MMO involvement items and their relationship with the two components of online social capital as well as gamer identity, all activities were positively correlated. In this way, we found support for our expectations. Indeed, these correlations were found to be stronger than those between hours per week spent playing and these factors, highlighting that time spent playing may be limited as a measure of “engagement” on its own terms. Many online games provide a platform for a wide range of

associated activities, such as those conceptualised in the current study, and whilst are not directly related to “playing” per se, still hold implications towards gaming engagement and the social activities it can afford. Thus, we advocate that researchers in this area should consider digital gaming engagement through a more critical lens, in respect of the specific gaming environment or platform of interest, to more fully account for the nuances which may arise when exploring the psychosocial correlates of gaming engagement.

Our findings however should be acknowledged in light of limitations. In particular, even though we focused on MMOs more specifically than previous studies which have recruited “online gamers” more generally, there is still speculation about the extent of variation across different types of MMOs. Variations across MMO games in the extent to which they provide equivalent social experiences and wider community activity involvement remains unquestioned in the context of the current findings. However, the inherent nature of MMOs is their multi-player functionality which should be relatively consistent in line with the MMO involvement activities of the current study, and thus not offer too much of a confound to the current findings.

Additionally, even though there were some very encouraging findings within the model, the overall total effect of MMO involvement on the three outcome variables (self-esteem, social competence and loneliness) was relatively low. Clearly there are many factors which contribute to these three psychological constructs beyond those measured within the current study, therefore our findings should be acknowledged with this consideration in mind.

4.2. Conclusion

Taken together, the findings of this study indicate a range of positive psychosocial outcomes associated with MMO engagement, specifically when exploring these relationships in line with mediators of gamer identity and social capital, as well as from a broader perspective of “engagement” consisting involvement in a range of MMO activities. Within this, we highlight the efficacy of a multidimensional approach to considering gaming “engagement” which previous research has been vague in conceptualising. That is, in line with notions previously identified, gamer identity is a multifaceted construct (Grooten & Kowert, 2015), which should move beyond simply being measured by typical average play time per week, which much previous research in this area tends to use. Based on our findings, it is highly conceivable that hours per week are more inherently related to factors such as online social capital and identity derived through such engagement, and hence present key variables for inclusion in the conceptualisation of this field of research. Therefore, to move this research area forward, researchers must be mindful of their conceptualisation of so-called “gaming engagement”, as well as the specific online gaming context under consideration, before fully endeavouring to explore the online gaming engagement-psychosocial outcomes link.

5.1. References

- Abrams, D., & Hogg, M. A. (1988). Comments on the motivational status of self-esteem in social identity and inter-group discrimination. *European Journal of Social Psychology*, *18*, 317-334. doi:10.1002/ejsp.2420180403
- Arbuckle, J. (2013). *IBM SPSS Amos 22 User's Guide*. Crawfordville: Amos Development Corporation.
- Branscombe, N. R., & Wann, D. (1991). The positive social and self-concept consequences of sports team identification. *Journal of Sport and Social Issues*, *15* (2), 115-127. doi:10.1177/019372359101500202

- Buhrmester, M., Kwang, T., & Gosling, S. (2011). Amazon's Mechanical Turk: A New Source of Inexpensive, Yet High-Quality, Data? *Perspectives on Psychological Science*, 6(1), 3–5.
- Byrne, B. M. (2001). *Structural Equation Modeling with AMOS: Basic Concepts, Applications and Programming*. Sussex: Routledge
- Caplan, S., Williams, D., & Yee, N. (2009). Problematic internet use and psychosocial well-being among MMO players. *Computers in Human Behavior*, 25(6), 1312–1319. doi: 10.1016/j.chb.2009.06.006.
- Collins, E., & Freeman, J. (2013). Do problematic and non-problematic video game players differ in extraversion, trait empathy, social capital and prosocial tendencies? *Computers in Human Behavior*, 29, 1933-1940. doi: 10.1016/j.chb.2013.03.002
- Chipuer, H. M. (2001). Dyadic attachments and community connectedness: Links with youths' loneliness experiences. *Journal of Community Psychology*, 29 (4), 429-446.
- Condry, J.C. (1984). Gender identity and social competence. *Sex Roles*, 11, 485. doi:10.1007/BF00287474
- Crocker, J., Luhtanen, R., Blaine, B., & Broadnax, S. (1994). Collective self-esteem and psychological well-being among White, Black and Asian college students. *Personality and Social Psychology Bulletin*, 20 (5), 503-513. doi:10.1177/0146167294205007
- Demetrovics, Zs., Urbán, R. Nagygyörgy, K., Farkas, J., Zilahy, D., Mervó, B., Reindl, A., Ágoston, Cs., Kertész, A., Harmath, E. (2011). Why do you play? The development of the Motives for Online Gaming Questionnaire (MOGQ). *Behavior Research Methods*. 43 (3), 814-25. doi: 10.3758/s13428-011-0091-y.

- Domahidi, E., Festl, R., & Quandt, T. (2014). To dwell among gamers: Investigating the relationship between social online game use and gaming-related friendships. *Computers in Human Behavior*, *35*, 107-115. doi: 10.1016/j.chb.2014.02.023
- Doosje, B., Ellemers, N., & Spears, R. (1995). Perceived intragroup variability as a function of group status and identification. *Journal of Experimental Social Psychology*, *31*, 410–436
- Ellemers, N., Haslam, S. A., Platow, M. J., & Knippenberg, D. (2003). Social identity at work: developments, debates and directions. In S. A. Haslam, D. V. Knippenberg, M. J. Platow, & N. Ellemers (Eds.), *Social identity at Work: Developing Theory for Organisational Practice* (pp. 3-26). Hove: Taylor and Francis Group.
- Fleming, J. S., & Courtney, B. E. (1984). The dimensionality of self-esteem: II. Hierarchical facet model for revised measurement scales. *Journal of Personality and Social Psychology*, *46*, 404–421. doi: 10.1037/0022-3514.46.2.404
- Gough, H. G., & Bradley, P. (1996). *CPI manual* (3rd ed.). Palo Alto: Consulting Psychologists Press.
- Gosling, S., Vazire, S., Srivastava, S., & John, O. (2004). Should We trust web- based studies? A comparative analysis of six preconceptions about Internet questionnaires. *American Psychologist*, *59*, 93–104
- Grooten, J. & Kowert, R. (2015). Going beyond the game: Development of Gamer Identities within societal discourse and virtual spaces. *Loading...*, *9* (14), 70-87
- Hagborg, W. J. (2006). The Rosenberg Self-Esteem Scale and Harter's Self-Perception profile for adolescents: A concurrent validity study. *Evaluation and Assessment*, *30* (2), 132-136. doi: 10.1002/1520-680

- Haslam, S. A., Jetten, J., Postmes, T., & Haslam, C. (2009). Social identity, health and well-being: An emerging agenda for Applied Psychology. *Applied Psychology: An International Review*, 58 (1), 1-23. doi: 10.1111/j.1464-0597.2008.00379.x
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York: Guildford Press.
- Helliwell, J. F. (2006). Well-being, Social Capital and Public Policy: What's New? *The Economic Journal*, 116 (510), 34–45.
- Helliwell, J. F., & Putnam, R. (2004). The social context of well-being. *Philosophical Transactions of the Royal Society*, 359 (1149), 1435–1446.
- Hill, P., & Argyle, M. (2002). The Oxford Happiness Questionnaire: A compact scale for the measurement of psychological well-being. *Personality and Individual Differences*, 33, 1073-1082. doi: 10.1016/S0191-8869(01)00213-6
- Hoyle, R. H., & Crawford, A. M. (1994). Use of individual-level data to investigate group phenomena: Issues and strategies. *Small Group Research*, 25, 464–485
- Kaye, L. K. (2014). Football Manager as a persuasive game for social identity formation. In D. Ruggiero (Ed.), *Cases of Societal Effects of Persuasive Games* (pp. 1-17). IGI Global. doi: 10.4018/978-1-4666-6206-3.ch001
- Kaye, L. K. (2016). Exploring flow experiences in cooperative digital gaming contexts. *Computers in Human Behavior*, 55, 286-291. doi: 10.1016/j.chb.2015.09.023
- Kaye, L. K. & Bryce, J. (2014). Go with the flow: The experience and affective outcomes of solo versus social gameplay. *Journal of Gaming and Virtual Worlds*, 6 (1), 49-60. doi: 10.1386/jgvw.6.1.49_1
- King, D., Delfabbro, P., & Griffiths, M. (2010). Video game structural characteristics: A new psychological taxonomy. *International Journal of Mental Health and Addiction*, 8, 90-106. doi: 10.1007/s11469-009-9206-4

- Király, O., Urban, R., Griffiths, M. D., Ágoston, C., Nagygyörgy, K., Kökönyei, G., & Demetrovics, Z. (2015). The mediating effects of gaming motivation between psychiatric symptoms and problematic online gaming: An online survey. *Journal of Medical Internet Research*, *17* (4), e88. doi: 10.2196/jmir.3515.
- Kline, R. B. (2011). *Principles and Practice of Structural Equation Modeling*. New York: The Guilford Press
- Kong, F., Zhao, J., You, X. (2013). Self-esteem as mediator and moderator of relationship between social support and subjective well-being among Chinese university students. *Social Indicators Research*, *112* (1), 151-161. doi:10.1007/s11205-012-0044-6
- Kowert, R. (2015). *Video Games and Social Competence*. New York: Routledge.
- Kowert, R., Domahidi, E., Festl, R., & Quandt, T. (2014). Social gaming, lonely life? The impact of digital game play on adolescents' social circles. *Computers in Human Behavior*, *36*, 385-390. doi: 10.1016/j.chb.2014.04.003.
- Kowert, R., Domahidi, E., & Quandt, T. (2014). The Relationship Between Online Video Game Involvement and Gaming-Related Friendships Among Emotionally Sensitive Individuals. *Cyberpsychology, Behavior, and Social Networking*, *17* (7), 447-453. doi:10.1089/cyber.2013.0656
- Kowert, R., Festl, R., & Quandt, T. (2014). Unpopular, overweight, and socially inept: Reconsidering the stereotype of online gamers. *Cyberpsychology, Behavior and social networking*, *17*, 141-146. doi:10.1089/cyber.2013.0118
- Kowert, R., Griffiths, M. D., & Oldmeadow, J. A. (2012). Geek or Chic? Emerging stereotypes of online gamers. *Bulletin of Science, Technology and Society*, *32* (6), 471-479. doi:10.1177/0270467612469078

- Kowert, R. & Oldmeadow, J.A. (2012). *The Stereotype of Online Gamers: New Characterization or Recycled Prototype?* Nordic DiGRA: Games in Culture and Society conference proceedings. Tampere, Finland.
- Kowert, R., & Oldmeadow, J. (2014). Party Animal or Dinner for One: Are Online Gamers Socially inept?, In T. Quandt & S. Kroeger (Eds.), *Multi-player: The Social Aspects of Digital Gaming* (pp. 99-110). Routledge
- Kowert, R., & Oldmeadow, J.A. (2015). Playing for social comfort: Online video game play as a social accommodator for the insecurely attached. *Computers in Human Behavior*, 53, 556-566. doi: 10.1016/j.chb.2014.05.004
- Kowert, R., Vogelgesang, J., Festl, R., & Quandt, T. (2015). Psychosocial causes and consequences of online video game play. *Computers in Human Behavior*, 45, 51-58. doi: 10.1016/j.chb.2014.11.074
- Lafrenière, M., Verner-Filion, J., & Vallerand, R. J. (2012). Development and validation of the Gaming Motivation Scale (GAMS). *Personality and Individual Differences*, 53 (7), 827-831. doi: 10.1016/j.paid.2012.06.013
- Lianekhammy, J., & van de Venne, J. (2015). World of Warcraft Widows: Spousal perspectives of online gaming and relationship outcomes. *The American Journal of Family Therapy*, 43 (5), 454-466. doi: 10.1080/01926187.2015.1080131
- Liu, M., & Peng, W. (2009). Cognitive and psychological predictors of the negative outcomes associated with playing MMOGs (massively multiplayer online games). *Computers in Human Behavior*, 25(6), 1306–1311. doi:10.1016/j.chb.2009.06.002
- Lo, S. K., Wang, C., & Fang, W. (2005). Physical interpersonal relationships and social anxiety among online game players. *Cyberpsychology and Behavior*, 8 (1), 15-20

- McKenna, K. Y. A., & Bargh, J. A. (1999) Causes and Consequences of Social Interaction on the Internet: A Conceptual Framework, *Media Psychology*, 1 (3), 249-269. doi: 10.1207/s1532785xmep0103_4
- Morahan-Martin, J., & Schumacher, P. (2003). Loneliness and social uses of the internet. *Computers in Human Behavior*, 19, 659–671.
- Paolacci, G., Chandler, J., & Ipeirotis, P. (2010). Running experiments on Amazon Mechanical Turk. *Judgment and Decision Making*, 5(5), 411–419.
- Pretty, G. M. H., Andrewes, L., & Colett, C. (1994). Exploring adolescents' sense of community and its relationship to loneliness. *Journal of Community Psychology*, 22 (4), 346-358. doi: 10.1002/1520-6629(199410)22:4<346::AID-JCOP2290220407>3.0.CO;2-J
- Putnam, R. D. (1995). Tuning in, tuning out: The strange disappearance of social capital in America. *Political Science and Politics*, 28, 664-683
- Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. New York: Simon & Schuster
- Reer, F., & Krämer, N. C. (2014). Underlying factors of social capital acquisition in the context of online gaming: Comparing World of Warcraft and Counter-Strike. *Computers in Human Behavior*, 36, 179-189. doi: 10.1016/j.chb.2014.03.057
- Rose-Krasnor, L. (1997). The nature of social competence: A theoretical review. *Social Development*, 6 (1), 111-135. doi: 10.1111/j.1467-9507.1997.tb00097.x
- Rosenberg, M. (1965). *Society and the Adolescent Self-Image*. Princeton, NJ: Princeton University Press.
- Russell, D., Peplau, L. A., & Ferguson, M. L. (1978). Developing a measure of loneliness. *Journal of Personality Assessment*, 42, 290–294. doi: 10.1207/s15327752jpa4203_11.

- Schmitt, N. (1996). Uses and abuses of coefficient alpha. *Psychological Assessment*, 8 (4), 350-353
- Simsek, O. (2013). Structural relations of personal and collective self-esteem to subjective well-being: Attachment as moderator. *Social Indicators Research*, 110 (1), 219-236. doi:10.1007/s11205-011-9927-1
- Shaw, L. H., & Gant, L. M. (2002). In defense of the Internet: The relationship between Internet communication and depression, loneliness, self-esteem, and perceived social support. *CyberPsychology & Behavior*, 5 (2): 157-171. doi: 10.1089/109493102753770552.
- Steinfeld, C., Ellison, N. B., & Lampe, C. (2008). Social capital, self-esteem, and use of online social network sites: A longitudinal analysis. *Journal of Applied Developmental Psychology*, 29 (6), 434-445. doi:10.1016/j.appdev.2008.07.002
- Stetine, B. U., Kothgassner, O. D., Lehenbauer, M., & Kryspin-Exner, I. (2011). Beyond the fascination of online-games: Probing addictive behavior and depression in the world of online-gaming. *Computers in Human Behavior*, 27 (1), 473-479. doi: 10.1016/j.chb.2010.09.015
- Steinkuehler, C. A., & Williams, D. (2006). Where everybody knows your (screen) name: Online games as “third places”. *Journal of Computer-Mediated Communication*, 11(4), 885–909. doi: 10.1111/j.1083-6101.2006.00300x
- Tajfel, H. (1978). *Differentiation between social groups*. London: Academic Press.
- Tajfel, H. (1979). Individuals and groups in social psychology. *British Journal of Social and Clinical Psychology*, 18, 183-190. doi:10.1111/j.2044-8260.1979.tb00324.x
- Tajfel, H., & Turner, J. (1979). An integrative theory of inter-group conflict. In J. A. Williams & S. Worchel (Eds.), *The social psychology of inter-group relations* (pp. 33-47). Belmont, CA: Wadsworth.

- Tran, A. G. T. T., & Lee, R. M. (2010). Perceived ethnic–racial socialization, ethnic identity, and social competence among Asian American late adolescents. *Cultural Diversity and Ethnic Minority Psychology, 16* (2), 169-178. doi: 10.1037/a0016400
- Valkenburg, P. M., & Peter, J. (2007). Online communication and adolescent well-being. Testing the stimulation versus displacement hypothesis. *Journal of Computer-mediated Communication, 12*, 1169-1182
- Valkenburg, P. M., & Peter, J. (2008). Adolescents' Identity Experiments on the Internet: Consequences for Social Competence and Self-Concept Unity. *Communication Research, 35* (2), 208-231
- Weiss, R. S. (1973). *Loneliness: The experience of emotional and social isolation*. Cambridge, MA: MIT Press.
- Williams, D. (2006b). On and off the 'net: Scales for social capital in an online era. *Journal of Computer-Mediated Communication, 11*(2), 593–628. doi:10.1111/j.1083-6101.2006.00029.x
- Wood, R. T. A., Griffiths, M. D., Chappell, D., & Davies, M. N. O. (2004). The structural characteristics of video games: A psycho-structural analysis. *CyberPsychology & Behavior, 7* (1): 1-10. doi:10.1089/109493104322820057.
- Yee, N. (2007). Motivations of play in online games. *CyberPsychology & Behavior, 9*, 772–775.

Table 1

Descriptive and correlational analysis of the study variables

	Mean (SD)	2	3	4	5	6	7
1 MMO Involvement	14.05 (4.37)	.37**	.39**	.39**	.05	.05	-.01
2 Gamer Identity	5.52 (1.30)		.31**	.26**	.17**	.15**	-.12**
3 Online Bridging Capital	38.67 (6.80)			.46**	.02	.15**	.02
4 Online Bonding Capital	29.20 (9.05)				.08*	.14**	-.13*
5 Self-esteem	29.34 (6.58)					.52**	-.69**
6 Social Competence	7.47 (1.80)						-.43**
7 Loneliness	4.85 (2.30)						

** $p < .001$ * $p < .05$

Table 2.

Correlational Analysis of MMO involvement with the mediators of gamer identity, online bridging and online bonding.

	M (SD)	2	3	4	5	6	7	8
1. Play MMO with online-only friends		.10**	.37**	.37**	.39**	.34**	.40**	.30**
2. Play MMOs with real world friends			.12**	.18**	.16**	.16**	.11**	.22**
3. Contribute to MMO discussion boards				.57**	.27**	.25**	.31**	.25**
4. Interact with other MMO players outside game environment					.29**	.39**	.33**	.30**
5. Hours per week						.18**	.19**	.17**
6. Online Bonding	29.20 (9.05)						.44**	.26**
7. Online bridging	38.67 (6.80)							.31**
8. Gamer identity	5.52 (1.30)							

** $p < .001$ * $p < .05$

Table 3.

Correlational Analysis of MMO involvement with the mediators of social identity, online bridging and online bonding.

	M (SD)	2	3	4	5	6	7	8
1. Play MMO with online-only friends		.10**	.37**	.37**	.39**	.34**	.40**	.30**
2. Play MMOs with real world friends			.12**	.18**	.16**	.16**	.11**	.22**
3. Contribute to MMO discussion boards				.57**	.27**	.25**	.31**	.25**
4. Interact with other MMO players outside game environment					.29**	.39**	.33**	.30**
5. Hours per week						.18**	.19**	.17**
6. Online Bonding	29.20 (9.05)						.44**	.26**
7. Online bridging	38.67 (6.80)							.31**
8. Social identity	5.52 (1.30)							

** $p < .001$ * $p < .05$

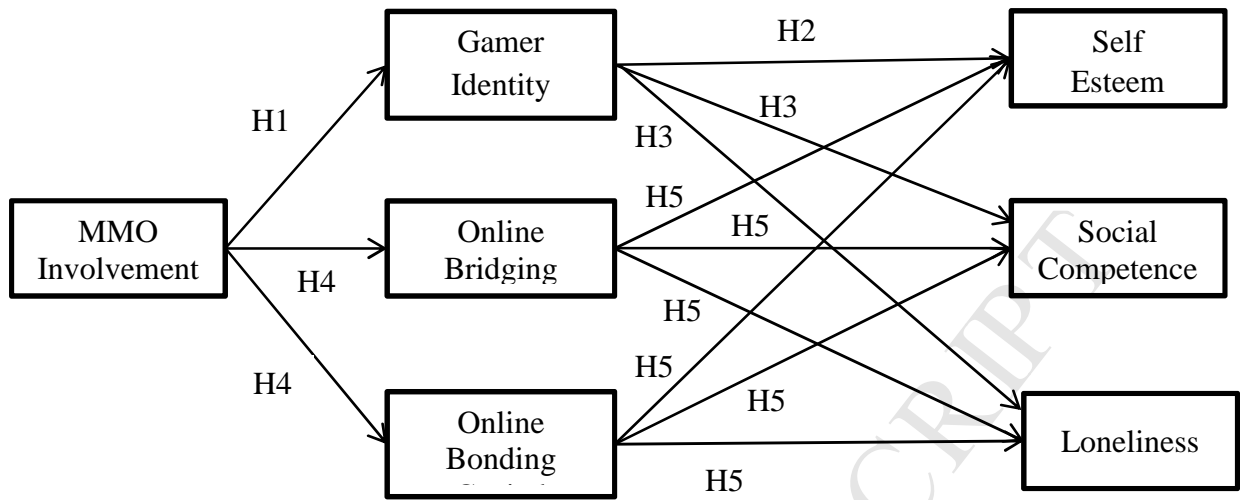


Figure 1 Hypothesised model showing gamer identity, and social capital as mediators between MMO Involvement and psychosocial outcomes

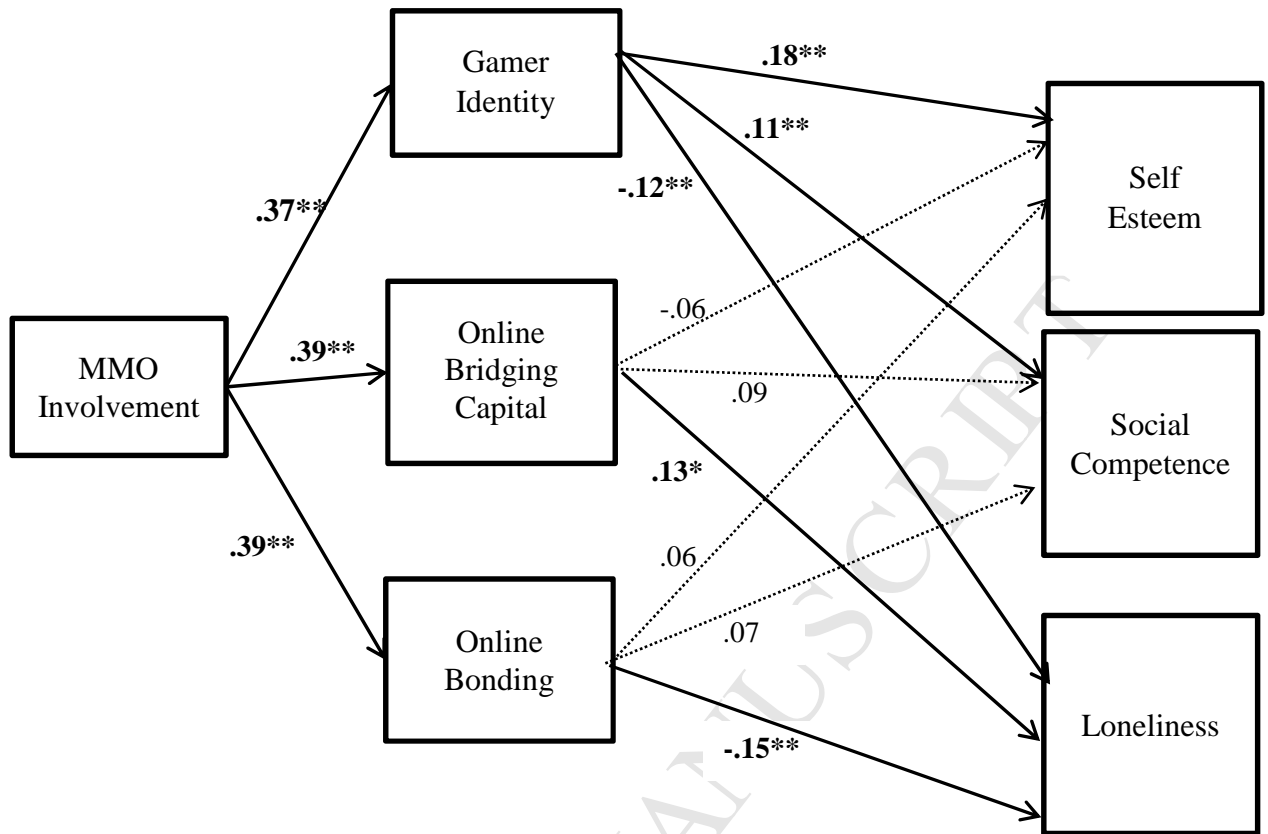


Figure 2

Path analysis showing the standardised coefficients of pathways in the hypothesised model.

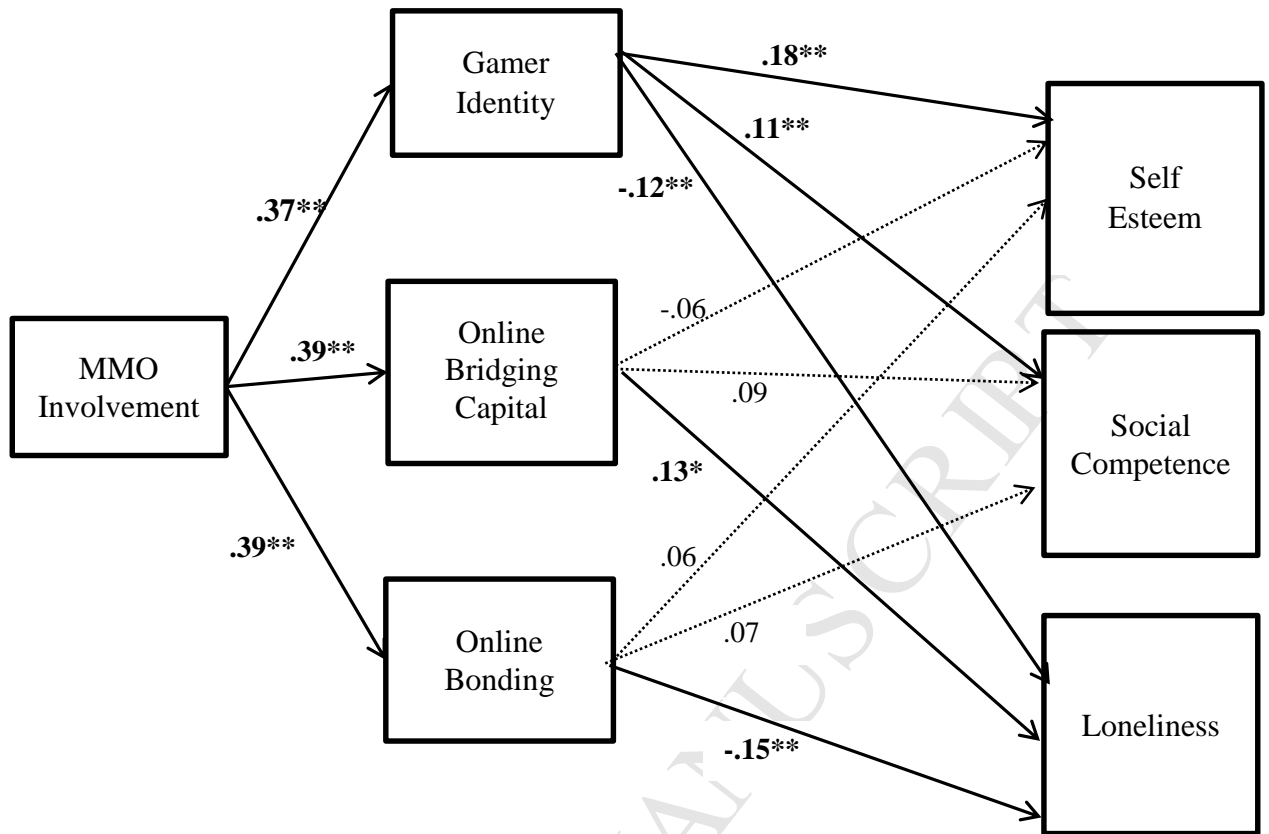


Figure 2

Path analysis showing the standardised coefficients of pathways in the hypothesised model.

Highlights

- Benefits afforded to online gaming and communities
- Conceptual insights into “gaming engagement”
- Social identity and online social capital as key mediators

ACCEPTED MANUSCRIPT