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Gaming Social Capital: Exploring Civic Value in Multiplayer Video Games

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Recent research suggests that social interactions in video games may lead to the development of community bonding and prosocial attitudes. Building on this line of research, a national survey of U.S. adults finds that gamers who develop ties with a community of fellow gamers possess gaming social capital, a new gaming-related community construct that is shown to be a positive antecedent in predicting both face-to-face social capital and civic participation.

Keywords: Video Games, Multiplayer Games, Gaming Social Capital, Social Capital, Civic Participation.

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Video gaming is becoming a popular pastime, especially among younger adults. Nearly 58% of Americans play video games and the average gamer plays about 13 hours a week (Entertainment Software Association, 2013; NPD Group, 2010). Additionally, a majority (68%) of video gamers are now adults (ESA, 2013). Video games are often viewed as a source of distraction or worse, as a negative influence on people that play them. For instance, a large body of research has studied how game play violence can increase aggressive behavior, thoughts, and feelings in players (e.g. Limperos et al., 2013; Anderson & Bushman, 2001). Prior to online gaming, multiplayer gaming was limited to participants in the same room, using the same gaming console. As mass adoption of broadband internet has spread throughout the United States, multiplayer online video games have become popular (Williams, 2006a). These online games allow a distributed community of gamers to play together, sometimes in pairs or small groups (for dueling or cooperative play), and other times with hundreds of people in a single virtual space (massively multiplayer online games, or MMOs) (Williams, 2006a).

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Previous research has established that gaming can be a social experience (Peña & Hancock, 2006) and suggests that social interactions within online games may end up contributing to the formation of social capital (Steinkuehler & Williams, 2006). But the gaming experience consists of more than social interaction in game. Many of the most popular online multiplayer games require teamwork and collaboration (Raptr, 2014). Also, because these games are played online, it is common for players to participate in online forums, wikis, and other fan websites related to the games they play. Fan forums like WOWWIKII for the game *World of Warcraft* have become their own digital communities, with hierarchies and codes of conduct much like the games themselves (Jenkins, 2006). Within these gaming communities fans contribute art, create new maps or software to modify the game, or post hints and tips in game forums. When people with a shared interest can come together in a multiplayer game, there is the potential for positive, prosocial interaction among them both in the game and outside it (Baldwin-phillippi et al., 2014).

This paper theorizes that gamers who develop ties and work together with a community of fellow gamers build gaming social capital, one's sense of belonging to and participating in a gaming community. This new measure draws from a more general construct of social capital (Shah, McLeod, & Yoon, 2001; Shah & Gil de Zúñiga, 2008; Rojas & Gil de Zúñiga, 2010), adapts it to the gaming context, and treats it as a necessary intermediary step between multiplayer gaming and the development of offline, real-world social capital. That is, multiplayer gaming itself, which includes a variety of nonsocial, noncollaborative activities, is not itself a direct cause of offline social capital unless gamers first develop social ties within the game world. This gaming social capital may then "map" onto real-world interactions (Williams, 2010). This spillover effect occurs in much the same way that other online communities (including those on social media) have been observed to strengthen real-world ties by encouraging communication and collaboration on shared interests or problems. Using a 2014 nationally representative survey of U.S. adults, this study tests the path from multiplayer gaming to gaming social capital and then to real-world social capital. Next, the paper proposes that gaming social capital will also be related to civic participation, predicting a similar spillover effect from the teamwork and collaborative aspects of video games to the ability to work together in a real-world community. Results suggest there is a relationship between gaming social capital and offline social capital and civic participation. Finally, these paths are assembled into a theoretical model that explains the social and civic effects of multiplayer gaming and gaming social capital.

Social capital

Social capital has been studied as both a characteristic of communities (Coleman, 1988) and a characteristic of individuals (Brehm & Rahn, 1997). In both research traditions, social capital is a function of resources embedded in ties to others (Lin, 2008) which can be leveraged for individual benefit or collective good. In other words, the concept of social capital recognizes that there is some value inherent in one's connections to other community members (Shah & Gil de Zúñiga, 2008), whether those ties are weak or strong (Granovetter, 1973). Social capital is a multilevel construct including psychological and sociological factors, and evidence of it may be found at macro, meso, and microlevels of measurement. Interpersonal communication and trust are obvious foundations of ties between individuals; this study includes discussion network size as a separate control variable. However, this study is concerned primarily with another key aspect of social capital: one's sense of belonging to a community (Zhang & Chia, 2006). Social connectedness within a community allows people to work together. Thus, being a member of a community does not constitute participation in that community; instead, research suggests social connectedness is both a predictor and an antecedent of civic and political participation (Gil de Zúñiga, Jung, & Valenzuela, 2012; Gil de Zúñiga, Molyneux, & Zheng, 2014), and this study replicates and builds on this theoretical link.

Some argue that social capital is declining as modern lifestyles change. Putnam (2000) documented a decline in Americans' involvement in community life, largely blaming a privatization of leisure time, particularly television viewing. Additional research of television viewing seems to support this hypothesis, though different types of television programs seem to have different effects (Shah, Kwak, & Holbert, 2001). Others have found no negative effects from television (Uslaner, 1998). The debate has continued in the internet age, with some complaining that digital communication displaces face-to-face interaction (e.g., Kraut et al., 1998; Nie & Erbring, 2000) and others arguing that the internet provides new opportunities to connect with others (e.g., Granovetter, 1983; Hampton & Wellman, 2001; Wellman, Boase, & Chen, 2002). Recent research of social media platforms suggests they are well-suited to the formation of social capital (Kushin & Yamamoto, 2010; Gil de Zúñiga et al., 2012; 2014). Media's effects on social capital are now being examined in connection with video games (e.g. Kowert & Oldmeadow, 2013; Shen, 2013; Vieira 2012; Zhong, 2011). This study treats multiplayer video games as an opportunity for mediated social interaction and shared activity and examines gaming's role in creating connections among individuals.

Multiplayer video games

According to a 2013 study by the Entertainment Software Association, nearly 68 percent of gamers play socially. Online gaming facilitates different levels and types of interactions between players engaged with games on their smartphones, computers, or designated gaming consoles (Williams et al., 2008). Players motivated by socialization, immersion, and achievement, three key motivators of online gaming, have been shown to engage in varying degrees of prosocial behaviors while gaming (Dalisay, 2014; Yee, 2006). Mobile games such as *Words With Friends* can involve just two players, whereas games like the first-person shooter *Counter-Strike* involve up to 40 players at a time (Williams, 2006a). Perhaps the most immersive types of games are Massively Multiplayer Online games (MMOs), which may involve hundreds of gamers playing for days on end (Williams, 2006a). The most popular video game in the world in terms of both regular players and hours played is *League of Legends* (Tassi, 2014), a game which pits two five-player teams against each other in a game of strategy and objective control.

Regardless of the platform, research suggests that interaction through online, multiplayer gaming fosters prosocial behaviors such as teamwork, developing trust and community building. In some senses multiplayer video games may be seen as similar to other digitally mediated human interactions. People are brought together in a virtual online space where they may converse and interact with one another. Indeed, some research identifies online social capital as a distinct form of social connectedness that is in some cases tied to offline social capital (Williams, 2006a). Under this conception, any type of online community might provide opportunities for social interaction such that (fill-in-the-adjective) social capital can develop.

But multiplayer video games are different in at least one key way. Players in these games go beyond social interaction to participate in shared tasks and objectives within the virtual world where they meet. Social media may be considered a third space where people can meet and interact, but they do not provide the same kind of alternate world that is the setting of many video games. Within these worlds players become part of social hierarchies that frequently collaborate to accomplish game objectives. Players must develop skills, execute tasks and complete quests to progress further within the game's narrative or what Salen & Zimmerman (2005) call meaningful play (Gee, 2011). In multiplayer environments players achieve these goals together by learning tactics from one another, collaborating on solving problems within the game, and offering feedback on ideas (Jenkins, 2006). Feedback and collaboration have been shown to facilitate lateral trust between gamers trying to achieve a common

goal (Baldwin-phillipi et al, 2014, Ratan et al., 2010). And these types of interactions are not among the minority of games. In fact, the top six most-played PC games (Raptr, 2014) all require players to work together in teams or squads, either to defeat opposing teams of humans or accomplish difficult in-game objectives. When players work cooperatively, players tend to exhibit more social benefits than when playing competitively or alone (Velez et al., 2014). Overall, working together is a key component of both video games and civic life, and other digitally mediated social platforms do not provide tasks and objectives that can be achieved collaboratively within a virtual world in the way that video games do.

Gaming communities

MMOs such as *World of Warcraft* facilitate perhaps the strongest social experiences for gamers (Williams, 2006a). Players represent themselves through an avatar and navigate virtual worlds by interacting with both other players and artificial infrastructure as well as engaging in community life (Jenkins, 2006; Williams, 2006a). Players can create or join social groups called guilds that take on missions such as raids on rival groups that optimize success by strategizing based on each members' skill set (Ratan et al., 2010, Coleman & Dyer-Witheford, 2007; Steinkuehler & Williams, 2006, Zhong, 2011). Gaming communities can give players a sense of belonging and also offer them opportunities to take on leadership roles, organize initiatives for their group, and achieve greater success as part of a larger organization (Williams, 2006a). Smaller communities tend to foster more trust amongst players which is related to self-disclosure of personal information between guildmates (Williams, 2006a, Ratan et al., 2010). Trust is also garnered through in-game cohesive gameplay (Greitemeyer & Cox, 2013). Studying the online video game *Jedi Knight II,* Peña & Hancock (2006) found that gamers sent three times as many socioemotional text messages as task-based messages while engaged in gameplay. As gamers collaboratively take on tasks such as raids and battles, they develop emotional bonds for their teammates who have gone through the same high stress situations (Skoric & Kwan, 2011).

In summary, multiplayer video games can be seen as a "third place" (beyond home and work) where meaningful social interaction can occur (Steinkuehler & Williams, 2006). Ratan et al. found that social interaction was a main motivation behind multiplayer video games and that gamers form significant relationships through games (Ratan et al., 2010; Page 108). Outside the game's virtual world, players can discuss in-game practices, rules and laws through online forums, fan sites, and wikis related to the game. This study proposes that these meaningful social interactions and collaborative work come about not in any kind of game but primarily in multiplayer video games; that is, gaming itself should not lead to prosocial behaviors, but working together with other gamers to accomplish game-related tasks and to form teams is likely to lead to significant social ties within that gaming community. Williams (2006c) suggests that the presence of a network is what leads to the creation of social capital. The network, in this case, is among players of multiplayer video games.

However, as Zhong (2011) found in a two-wave online survey of 232 Chinese MMORPG players, there is evidence there may not be a direct connection between collaborative gameplay and offline bonding or bridging capital. This study therefore proposes the concept and measure of *gaming social capital,* defined as one's sense of belonging to and participating in a gaming community. Gaming social capital as used here is distinct from Consalvo's definition of "gaming capital," which has more to do with achievement in the game environment through a combination of ability and resources (Consalvo, 2007). Gaming social capital focuses on the social ties among gamers, the positive interactions and teamwork that may arise during digitally colocated, collaborative gameplay. This concept is then hypothesized to act as a mediating step between multiplayer gaming and offline social capital.

Not all types of multiplayer video games are expected to produce gaming social capital. Some multiplayer video games are played asynchronously, and others only pit individuals against each other. The games most likely to produce gaming social capital are those multiplayer games that give players opportunities to work together, including MMOs, multiplayer online battle arena (MOBA) games like *League of Legends*, and squad-based games like *Counter Strike: Global Offensive*. We see these multiplayer video games (among the most popular types in the world) as the primary setting in which gamers' social interaction and collaborative community building can lead to the construction of community-specific social capital, even if not all gamers will participate in this way.

H1: Multiplayer gaming is positively related to gaming social capital.

The spillover effect

Much research has demonstrated that attitudes and behaviors developed online can spill over into other areas of life (Gil de Zúñiga & Coddington, 2013). This is true for social capital and civic participation (Shah, 2005; Shah et al., 2001), both endogenous variables in this study. These studies relied on other forms of media use, usually informational, to show that individuals can learn prosocial behaviors online and then apply them in the real world. In these models, communication with others and expression are key in making the transition from online to offline behavior. In fact, mediated exposure to diverse others can lead us to be more considerate of these others under a hypothesis known as parasocial contact (Schiappa, Gregg & Hewes, 2005). Williams has referred to a similar effect, in which behaviors learned in virtual worlds play out in real life, as the mapping principle (Williams, 2010).

We argue that this process can also occur in connection with multiplayer video games. In an applied experiment, researchers asked community members to play a specially designed civic planning game (Baldwin-Philippi, College & Gordon, 2014). They observed "civic learning," a process in which, through in-game communication and interaction, participants came to trust one another and feel greater ties to their community. In fact, this spillover has been linked directly to social capital (Skoric & Kwan, 2011). Dalisay et al. (2014) found an association between players motivated by socialization (Yee, 2006) and neighborliness, a proxy for (or sometimes an indicator of) social capital. Additionally, the study found a positive relationship between the immersion gaming motivation and civic engagement as well as political participation (Dalisay et al., 2014). A study of teenage gamers by the Pew Internet & American Life Project and MIT found that teens who had more civic gaming experiences and engaged with game-related websites were more likely to engage civically offline (Kahne, Middaugh, & Evans, 2009). These findings suggest that social connections developed within gaming communities can foster real-world social capital.

H2: Gaming social capital is positively related to (face-to-face) social capital.

Civic participation

Researchers have been able to draw a distinction between political participation — seeking to influence government action and policymaking (Verba, Schlozman, & Brady, 1995; Kim et al., 2013) — and civic participation, which focuses on involvement aimed at resolving community-level problems (Zukin, Keeter, Andolina, Jenkins, & Delli-Carpini, 2006). This distinction recognizes that participation involves much more than voting or donating money and includes activities like protesting and attending

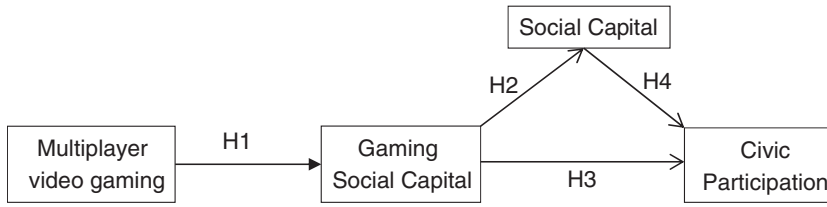

Figure 1 Theorized model of multiplayer video gaming's effect on gaming social capital and real-world civic engagement.

meetings. One's participation in these community-focused activities is at least partially dependent on how closely tied an individual is to the community. In fact, a main premise of social capital research is that people can leverage ties they have to other people in order to produce some benefit (Putnam, 2000). Previous research has found a connection between social capital and civic participation (Bennett, Flickinger, & Rhine, 2000; Zhang & Chia, 2006; Lim, 2008; Zhong, 2014), and this study attempts to replicate this finding.

H3: Social capital is positively related to civic participation.

Given the community-building aspects of multiplayer video games discussed above, there is reason to expect that teamwork and community-building behaviors developed and practiced within multiplayer video games would spill over into offline life, much in the same way gaming social capital is theorized to be connected to social capital. Again, players may learn within multiplayer gaming communities to work together to accomplish in-game tasks or resolve issues and then apply these behaviors in their real-world communities.

H4: Gaming social capital is positively related to civic participation.

These four hypotheses fit together into a model focusing on gaming social capital as illustrated in Figure 1. Theory and rationale for each of the individual links has been provided, but it is also important to consider the model as a whole. We find little evidence to suggest that there will be a direct link between multiplayer gaming and offline social capital (Zhong, 2011). Zhong found a direct path to offline civic participation, but as this paper introduces the construct of gaming social capital, we expect the mediation strength of gaming social capital to eliminate that path given that gaming social capital captures the civic and community aspects of multiplayer gaming that theory suggests are necessary to produce a spillover effect and civic participation (Skoric & Kwan, 2011; Williams, 2010).

Given gaming social capital's conceptual similarity to the nature of offline social capital but set in a different context, and the fact that social capital has been shown to be an antecedent of civic participation (Gil de Zúñiga et al., 2012), it is possible that social capital would fully mediate the relationship between gaming social capital and civic participation. We expect that the direct path will remain significant because multiplayer gaming provides opportunities not just for social connections but for collaborative community building of the type expected to influence civic participation, which ultimately may be distinct (although related) to the opportunities achieved via social capital (face-to-face). For these reasons, this study proposes the following structural model.

Method

Data

The data for this study comes from the second wave of a two-wave U.S. national panel study conducted by the Digital Media Research Program at the University of Texas at Austin. The survey was administered online using Qualtrics, a Web survey software to which the authors have a University-wide subscription account. The initial survey panel was selected from among those who registered to participate in an online panel administered by media polling group AC Nielsen. This pool included more than 200,000 people, and respondents were recruited using stratified quota sampling. In order to overcome some limitations of surveying only Internet users, Nielsen established quotas based on age, gender, education, and income so that the sample would match as closely as possible the distribution of these variables as reported by the U.S. census bureau. (For more information about this data collection strategy, please see Iyengar & Hann, 2009; Bode et al., 2013; Holton et al., 2013).

The first panel was distributed to 5,000 individuals between 15 December 2013, and 5 January 2014. In total, 2,060 participants responded, and 247 cases were deleted for incomplete or invalid data (1,813 valid cases for Wave 1). The response rate was 34.6%, using the American Association of Public Opinion Research's response rate calculator (RR3) (AAPOR, 2011, p. 45). This response rate falls within acceptable parameters for web-based surveys (Chadha et al., 2012; Sax, Gilmartin, & Bryant, 2003). The second wave was collected from 15 February 2014, through 5 March 2014, yielding 1,024 valid cases in wave 2, for a retention rate of 57%. This retention rate falls within the normal parameters of data validity and representation integrity (see Watson & Wooden, 2006, for a discussion of retention rates for web panels).

Cross-lagged correlations were conducted as a test of causality using data from both waves of the survey. Regression tests and structural equation modeling were performed using cross-sectional data from the second wave[1]. For these tests, cases with missing data were excluded listwise, resulting in 666 cases with complete data on all the variables in this study. Respondents to the surveys were slightly older, more educated and included fewer Hispanics than the U.S. population at large. Still, the overall sample demographics were comparable to other surveys employing random collection methods (Pew Research Center for the People and the Press, 2013) and was comparable to the national population as whole (see full demographic breakdowns for this data set with Appendix table at Diehl, Weeks, & Gil de Zúñiga, in press; Saldaña, McGregor, & Gil de Zúñiga, in press).

Gaming variables

Multiplayer gaming.

Respondents were asked how often they played multiplayer games with others in person and with others online. This is regardless of platform and regardless of game content; the key element of this variable is that gamers have the opportunity to interact with one another while gaming. Responses were on a 10-point scale and were averaged to create an index (2 items; Spearman-Brown coefficient = .64, $M = 2.21$, $SD = 1.98$)[2].

Gaming social capital.

This is the central independent variable in this study. This index was created to focus on the connectedness aspects of social capital (Zhang & Chia, 2006; Williams, 2006b; Kahne et al., 2009; Gil de Zúñiga et al., 2012) as they might be applied in gaming communities according to previous literature (Zhong,

Table 1 Factor analysis of social capital and gaming social capital measures.

	Social Capital	Gaming Social Capital
I think people in my community feel connected to each other	**.934**	.129
In my community, people help each other when there is a problem	**.920**	.054
People in my community watch out for each other	**.913**	.058
In my community, we talk to each other about community problems	**.899**	.157
I think people in my community share values	**.878**	.100
People in my community feel like family to me	**.874**	.164
I feel like I am part of a community of gamers	.124	**.878**
I feel lonely when I go without playing multiplayer video games	.132	**.860**
I frequently write posts online about the games I play	.091	**.857**
I frequently read or visit websites and forums related to the games I play	.039	**.843**
I feel close to the people I play games with	.139	**.764**
I have offline relationships with the people I game with	.075	**.725**
Eigenvalues	5.718	3.394
Variance explained (%)	47.65	28.28

Note: Bolded values indicate items loading on the same factor.

2011; Williams, 2006a; Yee, 2006; Dalisay et al., 2014). The measure is similar to that used for offline social capital, but specifically captures the level of social connectedness and community ties gamers feel toward other gamers. Respondents were asked their level of agreement with six statements — four relating to social connectedness attitudes among gamers ("I feel close to the people I play games with," "I have offline relationships with the people I game with," "I feel lonely when I go without playing multiplayer video games," "I feel like I am part of a community of gamers") and two relating to behavioral forms of communication that maintain these connections ("I frequently write posts online about the games I play," "I frequently read or visit websites and forums related to the games I play.") Responses were on a 10-point scale and were averaged to create an index (6 items; $\alpha = .89$, $M = 2.05$, $SD = 1.73$).

To determine whether this variable was distinct from our measure of social capital, all items for each index were subjected to a factor analysis using varimax rotation. Table 1 shows that two factors emerged with eigenvalues greater than 1, the first including all the gaming social capital measures, and the second containing all the social capital measures. Together they explained 75.9 percent of the variance. Finally, confirmatory factor analysis shows that there are two distinct variables and that the data fit the theoretical assumption that these variables are distinct (Goodness of fit $\chi^2 = 1207.98$; $df = 43$; $p < .001$).

Civic variables

Social capital.

This index uses items validated in previous research (Bourdieu, 1983, Erickson, 1996; Lin, 2008;). Respondents were asked their level of agreement with six statements: "People in my community feel like family to me," "I think people in my community share values," "In my community, we talk to each other about community problems," "I think people in my community feel connected to each other," "In my community, people help each other when there's a problem," "People in my community watch

out for each other." Responses were on a 10-point scale and were averaged to create an index (6 items; $\alpha = .89$, M = 2.05, SD = 1.73).

Civic participation.
This index also uses items validated in previous research (Verba et al., 1995; Zukin et al, 2006). Respondents were asked how often they participated in seven activities: "Worked or volunteered for nonpolitical groups, such as a community project, hobby clubs, environmental groups, etc.," "Participated in a run/walk/bike for charity," "Donated money to a charity," "Attend a meeting to discuss neighborhood problems," "Bought a certain product or service because of the social or political values of the company," "Boycotted a certain product or service because of the social or political values of the company," "Attended/watched a public hearing, neighborhood or school meeting." Responses were on a 10-point scale and were averaged to create an index (7 items; $\alpha = .82$, M = 2.96, SD = 1.88).

Control variables

Demographic variables.
The following measures were adapted from a previous study that studied the relationships between game play motivations with social capital and civic engagement (Dalisay et al., 2014). Gamers tend to be younger, so age was included as a control variable. Respondents were asked their age on their most recent birthday (M = 52.9, SD = 14.65). Gender has effects on both gaming (males play slightly more) and civic engagement, so gender was included as a control variable. Males were assigned the value "0" and females "1" (Males = 51%). Race, income and education all have effects on civic engagement, so they were also included as control variables. The responses for race were collapsed into a binary variable where whites were assigned "0" and all minorities "1" (white = 79.1%). Annual household income was measured with an ordinal scale that ranged from 1 (less than $10,000) to 8 ($200,000 or more) (M = 4.47, Median = $50,000 to $99,999, SD = 1.43). Education was measured on an 8-point scale ranging from less than high school to a doctoral degree (M = 3.67, Median = Some college, SD = 1.44).

Gaming frequency.
Respondents were asked how often they played video games on the following three platforms: PC or computer, gaming console (such as Xbox, Wii) and mobile devices. They were also asked how often they play single-player games, as these games are not expected to produce the kinds of social interaction necessary for building gaming social capital. Together these measures of gaming frequency form a robust control variable that accounts for general gaming and single-player gaming. Responses were on a 10-point scale and were averaged to create an index (4 items; $\alpha = .72$, M = 3.65, SD = 2.22).

Discussion network size.
Two variables measured "how many total people have you talked to … about politics or public affairs" in both face-to-face (M = 3.55, Mdn = 2, SD = 5.92) and online (M = 5.06, Mdn = 1, SD = 12.97) contexts. Responses for both variables ranged from 1 to 100 with a final point being "more than 100."

News consumption.
We control for this because previous research shows a positive relationship between time spent consuming news and community knowledge and civic engagement (McLeod et al., 1996; Shah et al., 2001;

Gil de Zúñiga, Copeland, Bimber, 2014). A single general news consumption variable was created to account for a wide range of news consumption practices. The variable included 13 items measuring how often respondents used traditional media (newspapers, television and cable), online media (online news sites and news aggregators), social media (Facebook and Twitter) and news and apps on mobile devices (smartphones and tablets). Responses were on a 10-point scale and were averaged to create an index ($\alpha = .71$, M = 3.73, SD = 1.36).

Strength of Partisanship.
We control for this variable to be consistent with previous studies of civic engagement, as strong partisanship has been shown to be positively related with civic engagement (Holbert, 2005). Respondents were asked where they would place themselves on an 11-point scale ranging from "strong Republican" to "strong Democratic," with 6 being "independent." They were then asked where they would place themselves on social issues and economic issues, each on an 11-point scale ranging from "strong conservative" to "strong liberal." Because we expect strong party identification to lead to greater civic engagement (regardless of which party an individual is affiliated with), these three items were folded at the midpoint. Those who marked "independent" or were at the midpoint of the other two scales were coded as 1 and those who identified strongly with a party or liberal or conservative ideologies were coded as 6. These three items were then averaged to form an index ($\alpha = .79$, M = 2.15, SD = 1.57).

Political efficacy.
Consistent with previous literature on civic engagement, we controlled for political efficacy, which may be a predictor of participatory behavior (Kenski & Stroud, 2006). Respondents were asked their level of agreement with six statements: "People like me can influence government," "I consider myself qualified to participate in politics," "I have a good understanding of the important political issues facing our country," "People like me don't have any say in what the government does," "No matter whom I vote for, it won't make a difference," "Parties are interested in people's votes rather than their opinions." Responses were on a 10-point scale and were averaged to create an index ($\alpha = .68$, M = 4.98, SD = 1.65).

Life satisfaction.
Higher levels of life satisfaction are connected to greater interpersonal trust and reciprocity, the building blocks of social capital, and as such these variables may co-vary (Putnam, 2000). Respondents were asked their level of agreement with the statements, "I am satisfied with my life," and "In most ways my life is close to my ideal." Responses were on a 10-point scale and were averaged to create an index (2 items; Spearman-Brown coefficient = .92, M = 6.19, SD = 2.36).

Results

Hypothesis 1 predicted that multiplayer gaming would be positively related to gaming social capital. Gaming social capital was regressed on demographic variables, political antecedents and gaming frequency before adding multiplayer gaming in the final block (results in Table 2). Younger adults are more likely to have higher levels of gaming social capital ($\beta = -.186$, $p < .001$). News consumption is also a positive predictor of gaming social capital ($\beta = .139$, $p < .001$) and so is overall gaming frequency ($\beta = .145$, $p < .001$). The strongest predictor of gaming social capital, however, was multiplayer gaming ($\beta = .535$, $p < .001$). This single variable accounted for 18.4% ($p < .001$) of the total variance explained

Table 2 Prediction of gaming social capital, social capital and civic participation.

	Gaming Social Capital	Social Capital	Civic Participation
Block 1: Demographics			
Age	-.186***	.093*	.070
Gender (female)	-.042	.086*	.009
Race (nonwhite)	.018	-.074*	-.009
Income	-.054	-.002	.078*
Education	-.026	-.010	.121***
ΔR^2 (%)	16.7***	2.3*	5.6***
Block 2: Control variables			
Offline discussion network	-.009	.069*	.138***
Online discussion network	-.031	-.007	.079*
News consumption	.139***	.229***	.236***
Strength of Partisanship	-.017	-.049	.063
Political efficacy	.028	.175***	.081*
Life satisfaction	.028	.232***	.040
Gaming frequency	.145***	.038	-.053
ΔR^2 (%)	24.3***	21.6***	22.2***
Block 3: Multiplayer gaming			
Multiplayer gaming	.535***	-.022	.046
ΔR^2 (%)	18.4***	0.4	1.8***
Block 4: Gaming Social Capital			
Gaming social capital		.188***	.206***
ΔR^2 (%)		1.4***	2.3***
Block 5: Social Capital			
Social capital			.159***
ΔR^2 (%)			1.9***
Total R^2 (%)	59.3***	25.7***	33.7***

Note: Sample size = 666. Cell entries are final-entry OLS standardized Beta (β) coefficients.
*$p < .05$
**$p < .01$
***$p < .001$.

($R^2 = 59.3\%$, $p < .001$). These findings suggest that multiplayer gaming is the most important predictor of gaming social capital.

Hypothesis 2 posed that gaming social capital would be related to social capital. Social capital was regressed on demographic variables, political antecedents, gaming frequency, multiplayer gaming and finally gaming social capital (see Table 2). With all blocks entered, age ($\beta = .093$, $p < .05$) and gender (female, $\beta = .086$, $p < .05$) were significant predictors of social capital. Political efficacy ($\beta = .175$, $p < .001$) and news consumption ($\beta = .232$, $p < .001$) were the strongest predictors among the political antecedents. Gaming frequency and multiplayer gaming were not significant predictors of social capital, but gaming social capital was ($\beta = .188$, $p < .001$). Gaming social capital accounted for a small but significant portion of the variance in social capital beyond all the prior controls introduced by our

model ($R^2 = 1.4\%$, $p < .001$). These results support the proposition that gaming social capital is related to face-to-face social capital.

Hypothesis 3 predicted that gaming social capital would be related to civic participation. Civic participation was regressed on demographic variables, political antecedents, gaming variables and social capital (see Table 2). Among the demographic variables, education was the strongest predictor of civic participation ($\beta = .121$, $p < .001$). Among political antecedents, news consumption ($\beta = .236$, $p < .001$) and offline discussion network size ($\beta = .138$, $p < .001$ were the strongest predictors of civic participation. Neither gaming frequency nor multiplayer gaming were significant predictors of civic participation, but gaming social capital was ($\beta = .206$, $p < .001$). Gaming social capital accounted for a small but significant portion of variance in civic participation ($R^2 = 2.3\%$, $p < .001$). These findings lend support to the hypothesis that connected gaming social capital to citizens' levels of civi c engagement.

Hypothesis 4 replicates previous research finding a connection between social capital and civic participation. This relationship holds in this study as well. Social capital was a significant predictor of civic participation ($\beta = .159$, $p < .001$) and accounted for a significant portion of variance in civic participation ($R^2 = 1.9\%$, $p < .001$). Hypothesis 4 was also supported, remaining consistent with prior research (Uslaner, 1998; Scheufele & Shah, 2000).

Further analysis shows that the prosocial benefits of video gaming observed here exist only for multiplayer gamers. In our dataset, there were 212 respondents who reported playing single player games but not multiplayer games. The mean gaming social capital score for this group was $M = 1.39$, $SD = .95$. In other words, some solo gamers report having gaming social capital by our measure. Among these solo gamers, what gaming social capital they did report having was not associated with social capital ($\beta = .095$, $p = .18$) nor with civic participation ($\beta = .054$, $p = .42$). These figures are different for multiplayer gamers. In our dataset, there were only three cases that reported playing exclusively multiplayer games, but there were 279 cases that reported playing at least some multiplayer games. (There is no overlap between this group and the group of solo-only players described above.) The mean gaming social capital score for this group was $M = 3.52$, $SD = 2.09$. Among these multiplayer gamers, the relationships between gaming social capital and social capital ($\beta = .215$, $p < .01$) and civic participation ($\beta = .224$, $p < .01$) were about as strong as in the overall dataset. In summary, the spillover from gaming social capital to real-world social capital and civic participation exists only for multiplayer gamers.

To further understand the relationships between these variables, survey responses were analyzed using structural equation modeling to test the model presented in Figure 1. Results showed that connections between multiplayer gaming and the endogenous civic variables[3] were nonsignificant when gaming social capital was included in the model (see Figure 2), indicating a fully mediated relationship. That is, multiplayer video gaming will have a positive impact in social life only by giving players the opportunity to develop gaming social capital. Results also showed that the relationships between gaming social capital and the endogenous civic variables were robust. After considering other models (including those with direct paths from multiplayer gaming to the endogenous civic variables), the model theorized in this study was found to provide the best fit ($\chi^2 = 1.13$; $df = 2$; $p = .57$; $RMSEA \approx .000$, $NFI = .996$, $SRMR = .010$). Although the model is close to full saturation, the model not only yielded a good fit for the data but also was theoretically driven, which is one of the most important prerequisites to achieve generalizability for other data sets (Preacher, 2006). More importantly, there are two degrees of freedom in this model, which following Bentler's (1980) tight replication strategy allowed us to check a good fit — fixing free parameters to values estimated in one sample before fitting the model to a validation sample drawn from the same population via bootstrapping — and thus provide further empirical validation to our theoretically proposed model.

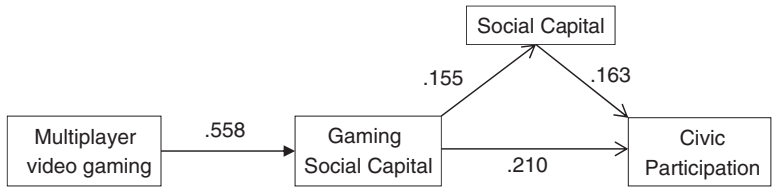

Figure 2 Results of SEM model testing multiplayer video gaming's effect on gaming social capital and real-world civic engagement.Note: Sample size = 666. Path entries are standardized SEM coefficients (Betas) at $p < .001$. The effects of demographic variables (age, gender, race, education, income and personality type), political antecedents (online and offline discussion network size, news consumption, political efficacy, life satisfaction and strength of partisanship), and gaming frequency on endogenous and exogenous variables have been residualized. Model goodness of fit: $\chi^2 = 1.13$; df = 2; p = .57; RMSEA ≈ .000, NFI = .996, SRMR = .010). Explained variance of criterion variables: Gaming Social Capital $R^2 = 59.2\%$ total model (31.1% residualized); Social Capital $R^2 = 21.2\%$ total model (2.4% residualized); Civic participation $R^2 = 33.5\%$ total model (8.1% residualized). Finally, mediation analysis using the PROCESS macro (Hayes, 2013) with 5,000 bootstrap samples lends support to H1, H2 and H4 by revealing two significant, positive indirect effects of 1) multiplayer video gaming on civic participation, through gaming social capital (point estimate = .11, 95% bias-corrected confidence interval = .05 to .17); as well as 2) multiplayer video gaming on civic participation, through gaming social capital and through social capital (point estimate = .02, 95% bias-corrected confidence interval = .01 to .03).

Finally, data from both waves of the survey were used to examine the relationship between gaming social capital and civic participation in order to make causal inferences. Causal inference analysis based on cross-lagged correlation tests (Locascio, 1982)[4] indicates that gaming social capital (t1) predicts civic participation offline (t2; cross-lagged r = .106) more strongly than the relationship that goes from civic participation offline (t1) to the proliferation of gaming social capital (t2; cross-lagged r = .025). The two items are associated with each other within one time, but this result suggests that gaming social capital is more likely to lead to the development of civic participation than the other way around.

Discussion

Video games are often seen as a waste of time at best; at worst, they may be a driver of aggressive or violent behavior (Limperos et al., 2013). But other research suggested that these were not the only effects of video games, but that they could have positive procommunity bonding effects as well (Kahne et al., 2009). Previous studies in this area were conducted on subsets of the population, so this study provides a look at population-wide video game use and its ties to social and civic outcomes.

This study empirically tested whether certain types of video games — multiplayer video games — can have positive social and civic effects. Results of several regression models showed that playing multiplayer video games is indeed associated with forming social ties within a community of gaming peers, a concept we call gaming social capital. This concept is distinct from but theoretically and empirically related to broader face-to-face social capital. Results suggest that gamers who develop gaming social capital are likely to develop face-to-face ties with others in their real-world community. Thus we observe a spillover effect from gaming social capital to social capital in the real world. In other words, gamers learn and develop social and civic attitudes and behaviors while interacting with other gamers, some of which are then applied in their real-world communities.

Furthermore, previous research found a relationship between social capital and civic participation, the practice of participating in community life. This study tested whether a similar connection would exist between gaming social capital and civic participation, and this hypothesis was supported. People who feel more connected to others (be they members of a gaming community or a geographical community) appear to be more likely to participate in community life. As people learn to associate communal cooperation with both communal and individual benefit, they are more willing to work with others in their communities. Having stronger ties to others encourages people to consider communal needs in addition to their own needs, which would logically lead them to participate in their community.

Together, these concepts — multiplayer gaming, social capital, and civic participation — were used to form a theoretical model of gaming social capital. All the relationships in this model hold true when carefully residualizing and controlling for demographics, gaming frequency, discussion network size, news consumption, partisanship, and political efficacy. Additionally, the study was developed using a nationally representative survey of U.S. adults, offering more generalizability than previous research based on surveys of specific groups such as teens or college students (Dalisay et al., 2014). Thus the results of the study encourage considering gaming communities as alternative pathways to promote offline prosocial and procivic behaviors.

Gaming social capital is the central component of the model presented here. Our results suggest that video gaming does not lead directly to greater involvement in civic life. Only gamers who develop the attitudes and behaviors that are part of belonging to a gaming community are likely to display these attitudes and behaviors in other areas of life. In this way, socialization in multiplayer gaming can be similar to other mediated social interactions, which can improve face-to-face social interactions. One of this study's main contributions is the creation of a measure of gaming social capital. This concept captures connections and interactions among multiplayer gamers that produce a sense of belonging to a common community of gamers.

Although multiplayer gaming was the strongest predictor of gaming social capital, not all multiplayer games may have the same effect. Different types of multiplayer games such as first-person shooters and role-playing games afford varying degrees of social and civic interactions. Games that support a sense of community and collaborative efforts to succeed are perhaps best suited to cultivating gaming social capital, but this is another area where further research is needed. Interestingly, this community building may happen in the game itself or in other online interactions outside the game (but related to it), including expressive behaviors such as posting in forums or contributing fan art. Our measure of multiplayer gaming potentially captured all types of multiplayer video games, civic or not, and results still suggested a strong positive relationship between multiplayer video games and gaming social capital. Refining this measurement to focus only on the types of video games most likely that specifically may promote gaming social capital would most likely strengthen this relationship by reducing any measurement error.

As promising as these results may be, there are some limitations. First, this study included cross-sectional data that does not make a strong case for causality or time order. Cross-lagged relationships are also included to further understand these relationships, but further analysis of panel data is warranted. Also, this study cast a wide net when recruiting participants and analyzed the population as a whole. It is certainly possible that subsets of the population (particularly different age groups) could exhibit different characteristics of both game play and gaming social capital. Young people, especially, are of interest as they come of age and become socialized into the citizenship. In fact, the overall effect of age tested in this study showed a linear relationship where younger people seem to build more gaming social capital, whereas the older subjects showed more (face-to-face) social capital and civic engagement levels. This should be a fruitful area of research for future studies.

It will also be important to learn which specific video game activities (such as working together in a team) might provide the greatest contributions to gaming social capital. Additionally, previous literature

has found that multiplayer gamers engage in a variety of interactions: developing personal ties with guild mates, speaking about nontask-based matters, revealing personal issues, and so on (Peña & Hancock, 2006; Williams, 2006a). The measures used to study gaming social capital and multiplayer video gaming should be improved to measure which types of game socializations and activities best predict offline social capital.

Overall, this study provides an alternative view of multiplayer video games — that they, like other forms of mediated social interaction, can give people opportunities to form bonds with one another in a virtual community. This sense of connectedness to others can lead people to form face-to-face bonds and participate in their real-world communities. The implication is that there are now multiple pathways for people (especially young people, who have traditionally been less engaged in civic life than their older fellows) to become better citizens. Those seeking to improve civic engagement would do well to embrace a broad range of media, including online media and video games, when communicating the importance of participation in civic life.

What is more, the findings presented here suggest that there may be many kinds of mediated social interaction that can lead to civic engagement. This refocuses civic engagement research on what appears to be its core component: the extent to which humans form bonds that allow them to work together. Meaningful social interactions may take place in a variety of contexts, so long as there is sufficient allowance for community and relationship building. This finding offers hope for building a more integrated, participatory public.

Notes

1 This is because the first wave of the survey did not measure multiplayer gaming.
2 In our dataset, about a quarter of respondents (26.2%) reported playing no video games at all, and many others played only occasionally, which explains the relatively low mean scores for multiplayer gaming and gaming social capital.
3 The bivariate correlations among the variables (a) multiplayer gaming, (b) gaming social capital, (c) social capital, and (d) civic participation are as follows: ab, $r = .717^{***}$; ac, $r = .166^{***}$; ad, $r = .224^{***}$; bc, $r = .234^{***}$; bd, $r = .292^{***}$; cd, $r = .358^{***}$.
4 Based on the following formula: $p_{y_1x_2x_1} = \frac{p_{y_1x_2} - p_{x_1y_1}p_{x_1x_2}}{\sqrt{(1-p^2_{x_1y_1})\left(1-p^2_{x_1x_2}\right)}}$

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