



The Trojan Player Typology: A cross-genre, cross-cultural, behaviorally validated scale of video game play motivations



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ABSTRACT

While many video game researchers have built scales to tackle the motivations that people have for playing video games, these scales are often limited by their focus on specific game genres or player cultures as well as their lack of behavioral validation. The present research offers a new scale for player motivations and then examines its validity across two distinct gaming genres and cultures, drawing from server-side data combined with survey data of 18,627 players of the Multiplayer Online Battle Arena *League of Legends* and 18,819 players of the Chinese Massively Multiplayer Online Game *Chevalier's Romance Online 3*. Six types of player motivations were found: socializer, completionist, competitor, escapist, story-driven, and smarty-pants. Consistent with previous research on player motivations, this typology offers new insights into why people play video games and how player motivations can be used to infer players' in-game behaviors.

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1. Introduction

Video and computer games are more popular and profitable than ever. According to the latest statistics from the [Entertainment Software Association \(2014\)](#), in the United States, 59% of Americans play video games, the average household has at least one system dedicated exclusively to gaming, and the computer and video game industry has made at least fifteen billion dollars a year, every year since 2009 (up from its previous record of twelve billion dollars in 2008). In 2012, *League of Legends* became the most played video game worldwide, with over one billion hours of the game played per month, surpassing *World of Warcraft* in the United States and *StarCraft* in Korea ([Riot Games, 2012](#)).

With all of the time individuals spend playing video games, it is important to understand why people play video games and how individuals may differ in their video game play. The uses and gratifications tradition in the study of media has a long history in the field of communication ([Rubin, 2009](#)), and it has more recently been an important point of inquiry from video game scholars ([Sherry, Lucas, Greenberg, & Lachlan, 2006](#)). There have been many attempts to design scales to measure individual differences as to how and why people play video games, but all have some weaknesses. For instance, some are too genre specific (e.g., [Yee, Ducheneaut, & Nelson, 2012](#)), while others only validate using other self-report measures (e.g., [Sherry et al., 2006](#)). Cross-cultural validation is minimal (a notable exception being [Yee et al., 2012](#)), and few try a validation across games (a notable exception being [Sherry et al., 2006](#)). The present article will contribute to this important area and address these gaps in the existing research by offering and testing a new measurement of player motivations that aims to apply across gaming genres and cultures.

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1.1. Existing taxonomies of game play motivations

Motivations to play video games, especially Massively Multiplayer Online Games (MMOs), are one of the most extensively studied research line in video game research (Yee, 2006a). Understanding video players' motivational differences is important because it sets the foundation for investigating social interactions in these environments beyond demographic segments alone (Williams, Yee, & Caplan, 2008). Starting from Bartle's (1996) player taxonomy of MUD players, researchers have developed multiple motivation taxonomies, and further explored how the motivational difference corresponds to different demographics (e.g., gender and age), and different in-game behaviors (e.g., Cassell & Jenkins, 1998).

Bartle (1996) inductively developed a taxonomy of Multi-User Dungeon players by summarizing four aspects that people most enjoyed about MUDs. Bartle classified MUD players into four categories based on two dimensions: action vs. interaction, and world-oriented vs. player-oriented. Achievers are motivated by in-game goals (e.g., rewards, points or levels); Explorers are motivated to find out more about the virtual world; Socializers care most about the game's communication functions and interactions with fellow players; and Killers mostly utilize the virtual facilitates to impose themselves over others and get satisfaction. Similarly, Sherry et al. (2006) analyzed focus group interview data and identified six dominant dimensions of video game use across game genres, including arousal, challenge, competition, diversion, fantasy, and social interaction. Bartle and Sherry et al.'s models intuitively reflect how people who are driven by different motivations interact in the virtual worlds, and provide a good starting point for other researchers to draw upon to test with empirical data.

Following Bartle's original model, Yee (2006b) conducted the first large scale survey to identify different motivations for MMO players. An exploratory factor analysis of self-reported measures from 30,000 MMO players revealed three broad types of motivations and each of them were further specified into subcomponents (10 subcomponents in total): achievement (the extent to which players want to feel powerful and in control in the virtual environment), social (the extent to which players desire to socialize with others in the game world), and immersion (the extent to which players enjoy becoming "someone else" or being in the virtual world). Also in the MMO context, Squire and Steinkuehler (2006) described the tension between power-levelers or role-players, the former being like Yee's (2006b) achievers and the latter like a combination of social- and immersion-driven players. Other researchers have developed player motivation taxonomies based on different game types (e.g., Jansz & Tanis, 2007; Lee, Lee, & Choi, 2012) and purposes (e.g., Hainey, Connolly, Stansfield, & Boyle, 2011). Jansz and Tanis (2007), for instance, examined players' motivations for First Person Shooter (FPS) games and found that competition and challenge scored higher than other motivational dimensions for committed players. Lee et al. (2012) explored motivations for playing causal games on social network sites and found a six-dimension motivation taxonomy: social interaction, self-presentation, fantasy/role-playing, passing/escapism, entertainment, and challenge/competition. In addition, Hainey et al. (2011) studied motivations for playing video games in a Higher Education context and found that in general, challenge is the most prominent motivators to play games and recognition, in contrast, scored the lowest. Also in an education context, Heeter (2008) examined the relationship between play style and learning style and offered a palette anchored by two anchored axes, extrinsic vs. intrinsic achievement motivation and pro- vs. anti-social motivation, to illustrate their relationship. This palette was validated in an experiment that used three versions of the same educational game with the intent of contributing to serious game

design and teaching through games. Also from a design perspective, Klug and Schell (2006) described how game designers view numerous player types: competitor, explorer, collector, achiever, joker, director, storyteller, performer, and craftsman. They argue that most players fall into multiple types and that game designers' choices ultimately affect which motivations are fulfilled within the games they build.

Researchers have examined how different motivations are related to differences in player demographics. For example, Yee (2006a) showed that male players generally were significantly higher on achievement and manipulation factors than female players, who scored higher on relationship, immersion, and escapism, though some of these differences (i.e., manipulation) decrease in size as player age increases. Similarly, Heeter (2008) found that gender interacted with play style in interesting ways. For example, boys who played alone were mostly classified as achievers (fast and accurate play) while boys who played in pairs were classified mostly as explorers, and solo vs. paired play made no difference for girl players. Yee et al. (2012) provided the first cross-cultural validation of online gaming motivation scale. The authors recruited 2071 American *World of Warcraft* (WoW) players and 645 WoW players from Hong Kong and Taiwan and thereby validated the Yee scale in a non-Western culture.

To further strengthen the validity of this motivation taxonomy of video game players, some researchers have compared players' self-reported motives to their in-game behaviors. For instance, Billieux et al. (2013) monitored 690 WoW players' avatars over 8 months and examined how their motivations (from Yee, 2006b) affected players' in-game behaviors. Results showed that self-reported motivations for game play generally predict in-game behaviors. Specifically, teamwork- and competition-focused motivations best predict players' in-game advancement.

While previous research has provided a rich resource pool of video game play motivations taxonomies, there are a few notable weaknesses of the existing research. Most previous taxonomies are genre dependent. Many were developed and validated in the context of MMOs, which is indeed an important genre of video games, but does not represent all video games. There are emerging games and genres that provide research opportunities for further validation and potential extension of previous taxonomies. Multiplayer online battle arenas (MOBA), such as *League of Legends*, have brought with them new game mechanisms and social interaction protocols that may influence player motivations. In addition, most taxonomies lack behavioral validation. Although some scholars have begun to validate motivations with in-game behaviors, these validations are still minimal and have exclusively examined data from WoW using MMO motivation scales (e.g., Billieux et al., 2013; Yee et al., 2012). Finally, as mentioned earlier, researchers have begun to provide cross-cultural and cross-game validation of motivations taxonomies (Yee et al., 2012); however, more empirical research is needed to form a solid conclusion about the ways that play motivations persist or differ across specific cultures. Taken altogether, the current study proposes a new motivation taxonomy and further validates it with in-game behaviors in a cross-cultural and cross-game context.

2. Pilot study

Drawing on personal experience and items from past scales developed in various video game genres (Sherry et al., 2006; Yee, 2006b), a team of seventeen video game researchers from the University of Southern California independently generated 246 statements related to why people may play video games. The authors then came together to review these statements and eliminated those that were redundant, unclear, or failed to conform to

other best practices in generating items for scale development (DeVellis, 2012). One hundred and four of items remained for pilot testing. Three hundred and eighty-one people were recruited, via snowball sampling, for an online survey, where respondents indicated on a five-point Likert scale the extent to which they agreed or disagreed with the statements describing why they play video games. This sample was 63.3% male, the average age was 27, and the average self-reported hours of *total* video game play per week was eight. Participants were also given the opportunity to provide open-ended feedback about the survey questions.

Exploratory factor analysis was conducted using principal axis factoring with a promax rotation. Using the scree test (Cattell, 1966), seven factors were extracted, explaining 41.34% of the variance. However, multiple participants noted in the open-ended feedback that many questions pertained to particular game genres and not games in general, and the sixth factor was composed items about a very particular game genre, so the factor was eliminated from further analysis. The six retained factors explained 38.41% of the variance. These six factors constituted players who played with social motives (socializers; 15.88% explained variance), players who enjoyed trying out every possible aspect of the game (completionists; 6.02% explained variance), players who are motivated to succeed in games (competitors; 5.78% explained variance), players who played to escape from real life (escapists; 4.63% explained variance), players who were motivated by game stories (story-driven; 3.61% explained variance), and players who are motivated by intellectual stimulation (smarty-pants; 2.48% explained variance). Using a loading of .45, the threshold for what is considered a fair loading in EFA (Comrey & Lee, 1992), this left a total of 37 items (thirteen items for socializers; nine items for completionists; six items for competitors; three items for escapists; three items for story-driven; and three items for smarty-pants).

DeVellis (2012) recommends that the final step in designing a scale is to optimize the scale length after factor analysis. Shorter scales are better than longer scales. This is especially true when surveying active video game players (the population which will be used for validation), as they are often skeptical of participating in research and are more likely to quit if they have to answer too many questions (Williams & Xiong, 2009). In the end, the 37 items were reduced to 20 items (four items for socializers, four items for completionists, five items for competitors, two items for escapists, three items for story-drivers, and two items for smarty-pants). This was done by first eliminating questions that did not seem like they could apply to all genres of games, in light of the comments provided by the pilot test participants. Then, following the guidelines set by DeVellis (2012), items were eliminated using reliability analysis. The 20 retained items were then validated in two studies, one using a North American players and one using Chinese players.

3. North American validation

3.1. Method

3.1.1. Game

Participants for the main study were recruited from *League of Legends* (LoL) with the assistance of its creators, Riot Games. As previously mentioned, it is the most played video game in the world by 2012. LoL is a multiplayer online battle arena (MOBA), a genre that is a hybrid between a real-time strategy game (RTS) and a massively multiplayer online game (MMO). In a MOBA, players compete as part of an ad-hoc team against another ad-hoc team. While the game world resembles an MMO in story and characters, the notable difference between a MOBA and an MMO is that MOBAs are non-persistent worlds.

In *League of Legends* in particular, players assume the role of a champion and compete on either a three-person or five-person team against a team of the same size. Players may know their team-members or be randomly assigned to a team based on an algorithm that pits teams of equal expertise against one another. A team's goal is to destroy the opposing team's base. Along the way, a player will likely need to engage in combat with opposing player and destroy turrets (towers that can deal damage to players) in order to reach the opposing team's base.

3.1.2. Participants

Riot games selected 113,579 LoL players at random from its North American server and invited them by email to participate in the study. The email included a link to an online survey. In exchange for completing the survey, participants would receive a code that would allow them to earn double the normal points for the next four victory matches. In one week, 25,996 (22.9%) of the players solicited opened the email, and 22,521 completed the survey. Duplicate responses, responses from invalid links, and surveys completed in less than 12 min (pretesting indicated this was "too fast"), 18,627 responses were deemed valid. This was a response rate of 16.4% of all emails sent and 71.7% of all emails opened. This sample was 95.9% male, and the average age was 23, and the average self-reported hours of *total* video game play per week was 20. According to server-side data, the individuals in the sample averaged 8.6 h of LoL per week.

3.1.3. Measures

Using the 20 items remaining from the pilot study, participants were asked on a five-point Likert scale the extent to which they agreed or disagreed with statements about why they played games (in general, not limited just to LoL). These questions were only one part of a larger survey. In addition to the survey measures, Riot Games provided the player logs for all of the participants who completed the survey. Relevant survey and server-side measures will be discussed in Section 3.2, as the process of validating the game typology was exploratory.

3.2. Results

3.2.1. Factor analysis and reliability

Using the 20 items, a confirmatory factory analysis (CFA) on the six factor solution was conducting using AMOS with a maximum likelihood estimation and oblique rotation. The hypothesized measurement model had fit indices $\chi^2(155, N = 18,672) = 9429.60$, $p < .001$, $\chi^2/df = 60.84$, CFI = .91, RMSEA = .06, SRMR = .06, Critical $N = 366$. Because the sample size exceeds Critical N , traditional χ^2 tests cannot be used. While RMSEA $\leq .06$ and SRMR $\leq .08$, CFI is not $\geq .95$, the recommended cutoff values for fit indices (Hu & Bentler, 1999). In examining modification indices, it did not appear that there would be any meaningful changes to parameter values by freeing them. Thus, to see if any nested measurement models might fit better, items were removed one-by-one until a model emerged with a CFI $\geq .95$. This 15 item, six factor model had fit indices of $\chi^2(75, N = 18672) = 4143.65$, $p < .001$, $\chi^2/df = 55.25$, CFI = .95, RMSEA = .05, SRMR = .04, Critical $N = 433$. The factor loadings and reliability can be found in Table 1. The percentage of players reporting greater than the midpoint for each dimension can be found in Table 2. To ensure the respecified model was consistent with the original pilot data, a CFA was run on the pilot sample using the 15 item, six factor model, and the fit indices indicated an excellent fit, $\chi^2(75, N = 381) = 125.17$, $p < .001$, $\chi^2/df = 1.67$, CFI = .98, RMSEA = .04, SRMR = .04, Critical $N = 293$, with no loading less than .63.

Table 1
The Trojan Player Typology, reliability and loadings.

Dimension	LoL	CR3
Socializers	$\alpha = .69$	$\alpha = .67$
I like to chat with my friends while playing a video game	.71	.71
I like to use voice communication when I play	.67	.73
It's important to me to play with a tightly knit group	.59	.55
Completionists	$\alpha = .67$	$\alpha = .75$
I like to master all elements of a game	.72	.71
I like to figure out how the game works inside and out	.65	.71
I like to try everything that is possible to do in a game	.57	.71
Competitors	$\alpha = .75$	$\alpha = .82$
Winning is a big reason for me to play video games	.77	.89
I play to win	.74	.89
It is important to me to be the fastest and most skilled person playing the game	.62	.59
Escapists	$\alpha = .70$	$\alpha = .63$
I like to do things in games which I cannot do in real life	.76	.76
Video games allow me to pretend I am someone/somewhere else	.71	.61
Story-driven	$\alpha = .70$	$\alpha = .84$
I like to do the feeling of being part of a story	.75	.89
I like stories in a game	.74	.82
Smarty-pants	$\alpha = .79$	$\alpha = .89$
Games make me smarter	.82	.91
I play games to enhance my intellectual abilities	.80	.90

LoL = *League of Legends* (MOBA), North America.
CR3 = *Chevalier's Romance 3* (MMO), China.

3.2.2. Construct validity

To establish construct validity, measures should positively relate to theoretically related concepts, be they self-report measures or actual behaviors. Due to the nature of the MOBA genre and the specific server-side measures that Riot Games actually records, it was not always possible to find behavioral measures to use in the validation process.

Because of the large sample size, the significance of statistical tests is artificially inflated, and thus effect size was added as a measure of whether or not there are relationships between dimensions and related constructs. In addition, because of the large amount of survey data and behavioral measures, it is necessary to correct for repeated tests. Thus, in order to consider that two variables correlated, there must (a) be a statistical significance less than .001, and (b) the absolute value of r must be greater than or equal to .1, Cohen's (1988) minimum threshold for a small effect size in social science research.

3.2.2.1. Socializers. Socializers play video games so that they can build and maintain social relationships. One would expect a socializer to have more social relationships in the game. LoL players can either play on teams of three players or five players, and either with a randomly assigned team or a prearranged team (which would imply some level of previous acquaintanceship,

either in-game or out-of-game). Server data records were used to calculate each player's average team size throughout playing career and the average "pre-arrangedness". The average pre-arrangedness was divided by the average team size to calculate the average percentage of teammates a player has known in all matches. As expected, there was a positive correlation between the socializer scale and the average percentage of teammates previously known, $r(17737) = .33, p < .001$.¹

Given this positive relationship, it would suggest that players high on the socializer scale have more social resources in the game and likely more in-game social capital. And given the strong relationship between online social capital and offline social capital (Williams, 2006), one would expect that there would be a positive correlation between the socializer scale and bridging and bonding social capital. Williams's (2006) social capital scale (not specific to online or offline social capital) was used to find such relationships. There was a positive correlation of between the socializer scale and bridging social capital ($\alpha = .89$), $r(16,438) = .31, p < .001$, and bonding social capital ($\alpha = .84$), $r(16,018) = .25, p < .001$.

One would also expect socializers to communicate frequently with other game players. Ten questions were asked about how frequently individuals communicate with other players via different channels both in and out of the game. A scale of overall communication was derived from these questions ($\alpha = .72$) and was found to be positively correlated with the socializer scale, $r(17,253) = .39, p < .001$.

Finally, one would expect socializers to frequently play with those whom they already have established friendships. Players were asked how frequently they played with friends they knew offline before joining the game and how frequently they played with friends they had made online. There was a positive correlation between the socializer scale and playing with offline friends, $r(18,058) = .28, p < .001$, as well as online friends, $r(18,067) = .27, p < .001$ (it should be noted that the correlations between the socializer scale and playing with romantic partners and playing with family members had significant negligible effect sizes, which would suggest that socializers are trying to socialize outside their strong ties). Furthermore, one would expect a socializer to want to bring others into the game. There was a positive point biserial correlation between the socializer scale and players reporting having successfully recruited other players to play LoL, $r(17,264) = .16$.

3.2.2.2. Completionists. Completionists like to explore every element of the game to the maximum extent. It would be expected that completionists would want to try out as many different champions as possible. Most champions at one time or another have been free-to-play, albeit sometimes only for a week. We determined that 59 of the 63 champions had been free at one point during the four months preceding the survey. For all of the players who had been signed-up for at least four months, we calculated how many champions the player had ever tried. As expected, there was a positive correlation between the completionist scale and number of champions tried at least once, $r(12,792) = .13, p < .001$.

3.2.2.3. Competitors. Our scale for competitors measures a player's desire to win the game and engage in behaviors that contribute to victory. Examining from the survey data, people who have a high desire to win would likely to describe themselves as competitive and be confident in their combat abilities. Using survey questions, players were asked how various adjectives describe themselves and their champions. For the adjective *competitive*, there was a

Table 2
Percentage of players averaging greater than the midpoint for each dimension.

Dimension	LoL	CR3	Pilot
Socializers	80	83.4	48.9
Completionists	83.6	77.7	58.4
Competitors	63.8	33.7	52.1
Escapists	55.4	51.2	56.8
Story-driven	68.5	86.9	78.8
Smarty-pants	52.7	39.4	42

LoL = *League of Legends* (MOBA), North America.
CR3 = *Chevalier's Romance 3* (MMO), China.
Pilot = Original pilot data with final version of scale.

¹ This analysis was restricted to the players who had played at least 86 matches (one standard deviation below the average number of matches played by the participants in the sample). This was done to ensure that players had played enough matches to establish social connections in the game.

positive correlation between the competitor dimension of the typology and the adjective when describing oneself, $r(17,651) = .45, p < .001$, and one's favorite champion, $r(17,534) = .19, p < .001$. In addition, there was a positive correlation between the competitor scale with offensive confidence (killing opposing champions), $r(18,105) = .20, p < .001$, and defensive confidence (defending one's base), $r(18,112) = .11, p < .001$.

In examining server-side measures, one would expect competitors to engage in behaviors that demonstrate their superiority to other players, such as killing other champions. There was a positive correlation between the competitor scale and number of opposing champions killed, $r(17,849) = .14, p < .001$, double kills (killing two opposing champions within 10 s), $r(17,849) = .15, p < .001$, triple kills (killing three opposing champions within 10 s), $r(17,849) = .12, p < .001$, number of killing sprees (number of consecutive kills without dying), $r(17,849) = .15, p < .001$, and largest killing spree, $r(17,849) = .14, p < .001$ (these statistics are based on an average per game).

3.2.2.4. Escapists. Escapist players are those that use games to escape from real life. While this resembles Yee's (2006b) immersion dimension and Sherry et al.'s (2006) fantasy dimension, it focuses on the element that one engages in fantasy as a mechanism to escape from real life. Due to the nature of *League of Legends*, there was no data recorded by Riot that one would expect to positively correlate with this sense of escapism. However, some survey measures helped to demonstrate how players feel while playing. Three questions were asked about how likely it is that players play video games after an exhausting task, after an annoying situation, or when under stress. Together, this formed a scale ($\alpha = .77$) to indicate to what extent video games were used as a coping mechanism. If escapist individuals play video games as a way to make up for issues going on in their real life, one would expect a positive correlation between the escapist scale and the coping scale, which there was, $r(17,608) = .13, p < .001$. Furthermore, if escapist are making up for something in real life, one might identify something specific they are lacking. There was a correlation between the escapist scale and the stating that playing games make a player feel powerful, $r(18,165) = .43, p < .001$.

3.2.2.5. Story-driven. The story-driven scale addresses players' desire for interesting stories in the gaming world, and to learn about the backgrounds of the game characters. While no server-side behavioral measures were found to relate to this concept, a series of self-reported behaviors were found to be positively correlated with the story-driven scale.

Players were asked a series of questions about how frequently they read into game world and champion backstories, how interesting they found these stories and characters in *LoL*, how much they identified with the champions, and how often they read the *Journal of Justice*, Riot's newsletter outlining the ongoing lore of the game.² Together, this five item-scale ($\alpha = .85$) was positively correlated with the story-driven scale, $r(18,382) = .57, p < .001$.

3.2.2.6. Smarty-pants. The smarty-pants dimension addresses players' desire to play video games in order to improve their brainpower and enhance their intelligence. Because *League of Legends* does not have any statistics relevant to intellectual enhancement, this dimension was harder to validate. While the game involves a lot of strategizing, it may not be the best exemplar of a game that smarty-pants players would use for the specific purpose of intellectual enhancement. The survey also had few relevant measures.

The one exception is that a personality scale that is unrelated to the present typology study asked players whether they would describe themselves as analytical. There was a positive correlation between the smarty-pants scale and self-description of being analytical, $r(17,333) = .16, p < .001$.

4. Chinese validation

4.1. Method

4.1.1. Game

Participants were recruited from *Chevaliers' Romance 3* (CR3) with the assistance of the game company, KingSoft. Launched in late 2009, CR3 is a popular fantasy-based Massively Multiplayer Online Game, the background and storyline of which is set in the Kung Fu traditions of ancient China. Although we could not obtain the official user count of CR3 at the time of study, the game has been consistently ranked among the top three most popular online game titles in the Chinese market (CGWR, 2014). As a typical MMO, CR3 is different from *LoL* and *MOBA* in that it provides a persistent game space in which players are able to explore the world and build semi-permanent relationships and communities. CR3 supports a wide variety of social play, including grouping, friendship, mentoring, and guild systems. The default mode of play for CR3 is the Player-versus-Player (PvP) mode, whereby players can directly engage each other in combat in addition to Non-Player Characters.

4.1.2. Participants

In October 2011, KingSoft announced the survey on the official website of CR3, as a collaboration between the game company and a multi-university research team. A virtual weapon desirable for all character classes was offered as an incentive for participation. The announcement contained a direct URL to the survey and participants were directed to the survey website. The survey remained active for approximately five weeks. Out of the 22,004 responses collected, 18,819 responses were considered valid and then used in further analysis. Female players consist of 25% of the total respondents, and the average age of respondents is 23.90 years (for more details about the survey, see Shen & Chen, 2015; Xiong, 2012).

In addition to survey data, KingSoft also provided the research team with behavioral server logs of CR3 players, including action logs from May to September 2010 and chat logs from October to November 2010. The behavioral dataset was then merged with the survey data using unique game character IDs. Because there is a considerable time gap between when behavioral logs and survey data were collected respectively, only a small subset of survey respondents (approximately 10%) also appear in the behavioral logs. On average, this particular group played CR3 for 2.89 h (SD = 5.29) per week.

4.1.3. Measures

Participants were asked on a five-point Likert scale to what extent they agreed or disagreed with the 15 statements remaining from the *LoL* validation about why they played games in general (not limited just to CR3). All the items were translated into Chinese and cross-checked by bilingual researchers. As mentioned above, for a small subset of survey respondents, some behavioral measures were also collected from the server logs provided by KingSoft.

² The *Journal of Justice* has since been discontinued but was still in existence at the time of data collection.

4.2. Results

4.2.1. Factor analysis and reliability

Using the 15 items, a confirmatory factor analysis (CFA) on the six factor solution was conducted using AMOS with a maximum likelihood estimation and oblique rotation. The hypothesized measurement model had fit indices $\chi^2(75, N = 18,819) = 8478.58$, $p < .001$, $\chi^2/df = 113.05$, CFI = .93, RMSEA = .07, SRMR = .07, Critical N = 236. This model was a moderately good fit, with an SRMR meeting the recommended cutoff value (Hu & Bentler, 1999) and just falling short of the recommended CFI and RMSEA cutoff values. Nonetheless, all of the items have loadings of at least .55, the threshold for what is considered a good loading (Comrey & Lee, 1992), and the scales appear to be reliable to varying degrees. The factor loadings and reliability can be found in Table 1. The percentage of players reporting greater than the midpoint for each dimension can be found in Table 2.

4.2.2. Construct validity

Similar to the *LoL* validation, construct validity was tested in the *CR3* study by examining the correlation between these motivation dimensions and theoretically related concepts, as measured by self-reports or actual behaviors. Again, a correlation is considered to exist if the absolute value of r is equal to or greater than 0.1, with p smaller than .001. Because the *CR3* survey was not originally designed to validate the player typology instrument, and the behavioral logs were collected more than a year before the survey took place, it was not always possible to find the appropriate measures in the validation process. Therefore, we were able to test the construct validity of three scales, competitors, socializers, and completionists, but not escapist, story-driven and smarty-pants.

4.2.2.1. Socializers. Socializers play video games so that they can build and maintain social relationships. Therefore, it is expected that socializers tend to have more in-game social capital (Williams, 2006), and our survey data indeed confirmed this expectation. Using the same social capital scale of the *LoL* study, we found a sizeable positive correlation between the socializer scale and bridging social capital ($\alpha = .93$), $r(16,242) = .38$, $p < .001$, and bonding social capital ($\alpha = .82$), $r(16,334) = .29$, $p < .001$.

Players were asked to rate on a five-point scale the extent to which they like playing in teams. As expected, socializers are more likely to enjoy team play, $r(17,811) = .33$, $p < .001$. Similarly, players were also asked whether their friends also play *CR3*. Players who have friends in *CR3* are more likely to play games for social reasons, $t(17,898) = 17.79$, $p < .001$.

There are several variables in the behavioral data that might correlate with the socializer player type, including the number of chat messages, the number of chat partners, and the number of times a player joined a team. However, none of these correlation tests were significant per our criteria.

4.2.2.2. Completionists. Because completionists like to explore every element of the game to the maximum extent, it might be expected that they would want to accept and complete as many quests in the game as possible. However, the number of the quests accepted and the number of quests completed captured in behavioral logs were not found to correlate with the completionist scale.

4.2.2.3. Competitors. It is expected that someone who has a high desire to win the game and engage in behaviors that contribute to victory tends to have higher leadership abilities. Our survey measured leadership skills in a six-item scale ($\alpha = .80$) from Northouse (2010). The correlation was positive and significant, $r(17,534) = .19$, $p < .001$. There was no data available from

behavioral logs that would be expected to correlate with the competitor scale.

5. Discussion

Existing approaches to the study of video game player motivations have focused on specific game titles or game genres popular in the West, and have primarily relied on self-reports with little validation from behavioral data. The current research attempts to create and validate a general scale to measure distinct dimensions of player motivation. Results from two validation studies within two different game genres (MOBA and MMO), in two different cultures (North American and Chinese), revealed six distinct types of motivations: socializer, story-driven, escapist, completionist, smarty-pants, and competitor.

The Trojan Player Typology share similarities with Yee's (2006b) taxonomy. The socializer dimension, which has been found in both taxonomies, records a persistent motivation in video game players for interacting with other players, bonding with existing friends, or even reaching out for new friends. The competitor dimension also parallels Yee's (2006b) scale, specifically, the competition subcomponent. The completionist dimension resembles Yee's discovery dimension to a large extent since both focus on exploring hidden areas with the game. Concurrently, the Trojan Player Typology's completionist dimension also taps into the mechanics subcomponent of Yee's taxonomy in the sense that players tend to combine both exploring the virtual world and the game mechanics in order to optimize their game performance. In other words, the completionist dimension not only resonates with the discovery dimension in Yee's scale, but also extends it to players' techniques or approaches of inquiry into the fantasy worlds.

More importantly, our typology contributes to the field by identifying three dimensions that extend previous scales. The escapist dimension, although similar to the escapism subcomponent from Yee's (2006b) scale, focuses solely on playing games to pretend they are somewhere other than real life. Past research has shown the some video game players desire to play games and escape from real world problems (Li, Liao, & Koo, 2011). The story-driven dimension calls attention to a relatively new aspect of game play. Yee's (2006b) role-playing subcomponent underscores the fantasy element in virtual worlds under the immersion category. The Trojan Player Typology's story-driven dimension, on the other hand, highlights that players can be driven to play not because they are totally immersed into the virtual worlds, but because they are eager to follow the story development, even though they are well aware that the online worlds are virtual. Put differently, the story-driven dimension emphasizes that players enjoy the gaming story as a story instead of treating it as a part of the reality. This difference might more accurately capture players' motives given that the ways that players interact with games have changed tremendously in the past decade.

Lastly, the smarty-pants dimension brings us a relatively new motive for playing video games. An increasing number of players, scholars and practitioners realize how gaming can help develop intelligence and cultivate certain skills, such as business knowledge management (e.g., Christoph, 2007) and military training (e.g., Artstein, Gandhe, Gerten, Leuski, & Traum, 2009). Hence, this dimension reflects players' emerging motives to hone transferable skills in the virtual worlds where the cost of errors is zero or less. For instance, when playing video games, players might develop their team collaboration skills, or coordination skills in the guild. Thus, the smarty-pants dimension brings us this unique motive that has been relatively neglected in previous research.

Another notable contribution of this study is that it creates and validates the motivation scale in two different genres of online games, MOBAs and MMOs. While both seeming similar for being fantasy themed, they have very different social architectures and group structures, making them very different virtual worlds (Williams, 2010). As a result, our scale may be applied to a wide spectrum of online games and provides a general yardstick for cross-game comparison. For example, quite different from MMOs, a significant task in MOBAs is to carefully design and deploy combat strategies in real-time. Such a difference is precisely reflected in player motivations in these two games. As shown in Table 2 and 52.7% of *LoL* players reported higher motivation to improve their intelligence, as compared to 39.4% of *CR3* players. *LoL* players are also more competition-driven, as 63.8% of *LoL* players showed higher “competitors” motivation but only 33.7% *CR3* players showed the same. Our generic motivation scale helped in discovering the qualitative nuances of player types in these two games.

While the current study conducted validation studies on two distinct game genres, MOBAs and MMOs, we believe that the Trojan typology may have wide applicability in various video game genres. First, the original items were based on an extensive review of literature on video game motivations from studies of various game genres, including MMOs, MUDs, first person shooter games, and games for education. Second, efforts were made in the pilot study to eliminate those items that pertain to specific game genres. Third, participants in the pilot study played a wide variety of game genres. Finally, in both *LoL* and *CR3* validations, the questions asked were explicitly about people’s motivations to play games in general, rather than *LoL* or *CR3* alone.

Further, our study examined relationships between players’ motives and their personality attributes, and in so doing it responds to a repeated call of previous research on mapping video game-related motives to people’s fundamental traits and behaviors in offline, real-world situations (e.g., the Big Five personality scale, Billieux et al., 2013). For instance, our *LoL* sample found a positive correlation between smarty-pants dimension and self-description of being analytical. Our Chinese validation showed that competitors scored higher on real world leadership scales. Due to limited data availability, our study did not provide a more systematic investigation on this issue; however, this research, as one of the few early attempts, opens the door for future research on association between players’ motivations to play games and their real-world attributes.

The current study also has several limitations. One limitation is that our game genres and cultures form a fault line and thus it becomes challenging to identify whether the difference in game motivations comes from the game genre difference or cultural difference. Thus, more future research is needed to further tease apart these distinctions. Second, the *CR3* survey was not specifically designed as a validation study of the motivation typology. Instead, we used the reduced 15-item scale remaining from the *LoL* study, rather than the 20-item scale. Therefore, the order of the *LoL* and *CR3* validations may have contributed to the specific item reduction patterns. Future research is needed to replicate our findings. Third, due to the limited availability of behavioral data, especially for the *CR3* study, it was not always possible to find behavioral validation for some motivational dimensions. This again calls for more future work to validate the current scale with diverse behavioral measures and in different genres and cultures. Finally, all three administrations of measures were disproportionately male (the pilot test less so though). But apart from these limitations, the present article represents a unique contribution to the study of player motivations and illustrates that this area of research still contains many important open questions.

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