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Promoting sales of online games through customer engagement

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ABSTRACT

With keen competition in the online game industry, game developers and publishers are finding new ways to induce players' to spend money on subscriptions and virtual items. As the online game itself provides a highly engaging environment, this study examines online sales from the perspective of customer engagement. We propose a research model that examines why game players actively engage in playing online games, and how such engagement can contribute to sales of online games, empirically testing the model using 377 online game players. The results support our research hypotheses and illustrate the effect of customer psychological engagement on stimulating game players' spending in online games. In particular, both psychological and behavioral engagement exerted a positive influence on online sales, and the dimensions and antecedents of psychological engagement were also identified. The findings of this study are expected to provide some suggestions for game developers and publishers on promoting the sales of digital items/goods. This study also adds to the current understanding of customer psychological engagement by identifying its antecedents and consequences in the context of online games.

1. Introduction

The advent of high-speed broadband services, personal computers, and mobile technology has cultivated a fertile ground in which online games have flourished. The online game business is a compelling domain that attracts a huge level of investment. A recent global games market report predicted a growing upward trajectory of the online game market, with the number of gamers worldwide set to rise from 1.21 billion to 1.55 billion, and global games market will grow to $86.1 billion in 2016, using a compound annual growth rate (CAGR) of 6.7% (de Heij et al. 2013).

Although the online game industry has a huge market potential, competition within the industry is fierce due to the many product substitutes. With the global popularity of and growing demand for online games, there are hundreds of companies competing with each other, offering a wide variety of games ranging from text-based to massively multiplayer online games (MMOGs). There are many options in almost every online gaming domain. To dominate the competition in the online game industry, online game developers and publishers are seeking new ways to offer the best gaming experience for players, and to induce players to spend money on subscriptions and virtual items.

Previous studies have explored possible strategies to deal with the increasing competition in the online game industry by focusing on the operation and marketing of online games (Chan et al. 2014, Guo and Barnes 2012, Hamari and Järvinen 2011, Paavilainen et al. 2013). However, a long-term competitive advantage is inseparable from a firm's ability to sustain and expand its customer base and develops a solid customer relationship with the game players. It is also necessary to note that the online game itself provides a highly engaging environment for many game players, who can lose track of the amount of time and money they spend while playing. In this regard, the operation and marketing strategies are built around an understanding of how to improve game players' engagement in the game-specific activities, which until recently was rarely examined in online game-related research. Although customer engagement has not been systematically explored in this area, the concept has recently attracted increasing attention from some marketing scholars (Brodie et al. 2013, Hollebeek et al. 2014, Kabadayi and Price 2014), and is regarded as an effective retention and acquisition strategy for establishing and maintaining the competitive advantage, and a predictor of future business success.

Recently, research interest in understanding the nature and scope of customer engagement has increased. However, most research studies are descriptive and qualitative analyses (Brodie et al. 2011, Hollebeek 2011, Mollen and Wilson 2010, Van Doorn

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et al. 2010), rather than empirical and quantitative. Of the few studies including empirical work, the research focuses primarily on customer engagement with brands (Hollebeek et al. 2014, Laroche et al. 2012) and brand communities (Brodie et al. 2013, Gummerus et al. 2012). Empirical research of customer engagement with the products (such as online games) is rarely reported. Considering the importance of customer engagement in helping game developers and publishers to attain strategic goals, such as a growth in the market share and an increase in game sales, this study represents an initial attempt to (1) conceptualize and operationalize customer engagement in the context of online games, (2) identify the antecedents of customer engagement with online games, (3) examine the relationship between psychological engagement and behavioral engagement, and (4) understand the role of customer engagement in contributing to players' spending in online games.

The remainder of this paper is structured as follows. In the next section, we address the concept of customer engagement. We then present the research model and research hypotheses, followed by a description of the research design and the methodology used in the study. In the fifth section, we present the results of our empirical study and conclude the paper with a discussion of the implications for both research and practice.

2. Theoretical foundation

2.1. Purchase decisions in online games

The sustainability and success of an online game has always hinged on game players who are willing to constantly invest their time and money in the game. Thus, concern over how and why game players purchase virtual items/goods becomes a more fundamental and challenging issue. Research has investigated the issue from different points of view. Ho and Wu (2012) and Park and Lee (2011a,b) used consumption value theory to examine virtual item purchase decisions in online games. Guo and Barnes (2012) examined how perceived value, game customization, and perceived enjoyment strongly affected the purchase intention and actual purchase behavior within World of Warcraft. Similarly, Kim (2012) explored the relationship between user satisfaction and repurchasing behavior in social virtual worlds. Recently, research has demonstrated that customer engagement can be considered as an effective strategy to improve customer relationships in the online environment (Brodie et al. 2013, Cheung et al. 2011, Chan et al. 2014). The role of customer psychological engagement in purchasing decisions in online games remains unknown.

2.2. Prior research on customer engagement

The concept of "engagement" has been widely explored by a variety of scholars from different disciplines, including management, social psychology, marketing, and information systems (Bowden 2009, Hollebeek 2011, Mollen and Wilson 2010, Vivek et al. 2012). In particular, customer engagement, as a sub-concept under the umbrella term of "engagement", has been investigated in the marketing literature. Brands (Sprott et al. 2009), products and organizations (Patterson et al. 2006), and brand communities (Algesheimer et al. 2005) are the key objects of customer engagement cited in the literature. Although the consensus is that customer engagement is essential to the success of marketing and sales activities (Calder et al. 2009, Hollebeek et al. 2014, Solis 2010), this concept suffers from a lack of agreement on the definition, dimensionality, and operationalization, as illustrated in Table 1.

Table 1
Conceptualization of customer engagement in prior literature.

Author (year)	Operational definitions
Algesheimer et al. (2005)	The consumer's intrinsic motivation to interact and cooperate with community members
Baldus et al. (2014)	The compelling, intrinsic motivations to continue interacting with an online brand community
Bowden (2009)	A psychological process that leads to consumer loyalty to the service brand
Brodie et al. (2011)	A psychological state, which occurs by virtue of interactive customer experiences with a focal agent/object within specific service relationships
Calder et al. (2009)	A collection of experiences with the site, and they defined experience as experience as a consumer's beliefs about how a site fits into his/her life
Chan et al. (2014)	The level of a person's cognitive, emotional and behavioral presence in brand interactions with an online community
Cheung et al. (2011)	The level of a customer's physical, cognitive, and emotional presence in connections with a particular online social platform
Hollebeek (2011)	The level of a customer's motivational, brand-related and context dependent state of mind characterized by specific levels of cognitive, emotional and behavioral activity in brand interactions
Hollebeek et al. (2014)	A consumer's positively valenced cognitive, emotional and behavioral brand-related activity during, or related to, specific consumer/brand interactions
Mollen and Wilson (2010)	The cognitive and affective commitment to an active relationship with the brand as personified by the website or other computer-mediated entities designed to communicate brand value
O'Brien and Toms (2010)	A psychological process that leads to the formation of loyalty
Patterson et al. (2006)	The level of a customer's physical, cognitive and emotional presence in their relationship with a service organization
Sprott et al. (2009)	Individual difference representing consumers' propensity to include important brands as part of how they view themselves
Van Doorn et al. (2010)	The customer's behavioral manifestation toward the brand or firm, beyond purchase, resulting from motivational drivers
Vivek et al. (2012)	The intensity of an individual's participation and connection with the organization's offerings and activities initiated by either the customer or the organization.
Webster and Ahuja (2006)	A subset of flow and a more passive state representing the extent of pleasure and involvement in an activity

According to Table 1, the interpretation of customer engagement is still mired in vagueness and controversy. However, it is also worthwhile to note that customer engagement is a complex and multifaceted concept, which can be conceptualized in different ways. Despite all these different definitions, there are three primary perspectives from which scholars have investigated and defined the concept of customer engagement, i.e., the psychological process, the behavioral manifestation, and the motivational psychological state.

- Customer engagement as a psychological process: for example, Bowden (2009) postulated customer engagement as a psychological process that leads to the formation of customer loyalty and returns.
- Customer engagement as behavioral manifestation: for example, Van Doorn et al. (2010) defined customer engagement as the behavioral manifestation of a customer toward a brand or a firm which goes beyond purchase behavior.
- Customer engagement as motivational psychological state: for example, Patterson et al. (2006) defined customer engagement as a psychological state that is characterized by a degree of vigor, dedication, absorption, and interaction.

Chan et al. (2014) have further developed three key dimensions of customer psychological engagement, including vigor, absorption, and dedication for research in the IS discipline. This echoes what has been claimed by Patterson et al. (2006), who drew on a variety of parent disciplines, including social psychology and organizational behavior, and defined customer engagement as a psychological state that is characterized by a degree of vigor, dedication, absorption, and interaction. In fact, it is also commonly agreed that a multidimensional view of engagement can best capture the breadth and complexity of this construct (Newman and Harrison 2008). Following Patterson et al.'s (2006) work, three key dimensions of customer psychological engagement in an online game were identified as follows.

- Vigor refers to the customer's level of energy and mental resilience while playing an online game, and the willingness to invest time and effort in his/her role as a game player.
- Absorption refers to the customer concentrating fully, being happy, and being deeply engrossed in an online game, whereby time passes quickly.
- Dedication refers to the customer's sense of significance, enthusiasm, inspiration, pride, and challenge towards an online game.

Recently, researchers have begun to explore the concept of customer engagement in the online environment. We notice that a majority of research studies are conducted in the context of social networking sites and online brand communities (e.g., Brodie et al. 2013; Calder et al. 2009; Hollebeek et al. 2014; Tsai and Men 2013, 2014). Empirical studies on engagement with products are rarely reported. In this study, we attempt to examine the concept of customer engagement in the context of online game.

3. Research model and hypotheses

In this study, we built on the conceptual framework of customer engagement (Van Doorn et al. 2010) and identified three major types of antecedent variables of customer engagement in the context of online games. Van Doorn et al. (2010) proposed a conceptual framework by suggesting that customer engagement is affected by three major types of factors, including customer characteristics, firm initiatives, and the contextual environment. Customer characteristics, such as satisfaction, brand commitment, brand attachment, consumption goals etc., represent the attitudinal antecedents of customer engagement. Among factors in this category, customer satisfaction is one of the most commonly cited in studies associated with customer relationship management (Anderson and Mittal 2000, Bowden 2009, Palmatier et al. 2006). Firm initiatives refer to actions undertaken by a focal firm to enhance customer engagement. These actions may include building a consistent brand image, producing high-value and customizable products, forming a positive firm reputation, etc. As a superior user experience with a product will engender higher levels of customer engagement in the context of online games, it is important to consider product characteristics (game customization, in particular, in this study), which may create a better consumer experience (Teng 2010). The contextual environment is related to the context within which firms and customers exist. Such contexts can be either at the macro (e.g., political, economic, and social) or micro (e.g., organizational climate, group norms, and social interaction among the customers) level. As this study examines customer engagement at an individual level, and social interaction is frequently observed in MMOG, we have chosen social interaction among game players to capture the contextual influence. It is also necessary to note that, as a parsimonious consideration, the research model is built with the above three identified factors, but Van Doorn et al.'s (2010) conceptual framework provides a foundation to enrich and expand future research. Based on the above discussion, we attempt to explore how customer satisfaction with an online game, game customization, and social interaction among online game players can influence the formation and development of psychological engagement. Fig. 1 depicts our research model.

3.1. Antecedents of customer engagement

Game satisfaction is defined as a positive affective state resulting from game players' overall evaluation of their experience within an online game. In particular, satisfaction in the context of online games has been viewed as "cumulative satisfaction" as opposed to "transaction-specific satisfaction" (Olsen and Johnson 2003). Cumulative satisfaction is a more abstract construct that describes a user's overall evaluation of his/her experience (Homburg et al. 2005). According to the conceptual model proposed by Van Doorn et al. (2010), attitudinal factors are among the most important factors affecting customer engagement. Thus, a higher level of user satisfaction with an online game will lead to a higher level of players' engagement toward the focal game (Bowden 2009). In particular, we believe that when users are satisfied with their playing of an online game, they will be more likely to devote their time, effort, and energy to the game, and further will be deeply engrossed in and highly enthusiastic about the game.

Hypothesis 1. Game satisfaction is positively associated with psychological engagement.

Customization is an important element in establishing a psychological connection between the players and the game (Bailey et al. 2009), and is recognized as the key of driving immersive and compelling game experience (Dickey 2006). With the increasingly sophisticated game designs, players are now able to customize almost every single aspect in the game, such as appearance of their avatars, skills and abilities. For example, in World of Warcraft (WoW), players can customize their avatars with the built-in character creation toolkits. They could modify the race, facial characteristic, clothing and body of the initial character, making the avatar truly represents them. When players are in game, these customized avatars align with their psychological resources and their game playing experiences (Oulasvirta and Blom 2008), acting as the vessels through which episodic game memories can be formed, stored, and retrieved later as experiences that happened not to the avatars, but to the players (Ng and Lindgren 2013). As the result, this attribution of personal relevance allows players to feel the sense of being an origin, transform the game to 'my game', and engage them into the game psychologically (Oulasvirta and Blom 2008).

Empirical results have also provided support to the relationship between customization and psychological engagement. For example, Ng and Lindgren (2013) explored the impact of customization in a video game and found that the feeling of engagement increased when respondents were allowed to create their own avatars. Turkay et al. (2013) further indicated that these customization tasks heavily influenced players' sensory, imaginative immersion and flow experiences. In the same vein, we expect that if online game players are allowed to customize every single details of the game system, they are more likely to be psychologically engaged with the game.

Hypothesis 2. Game customization is positively associated with psychological engagement.

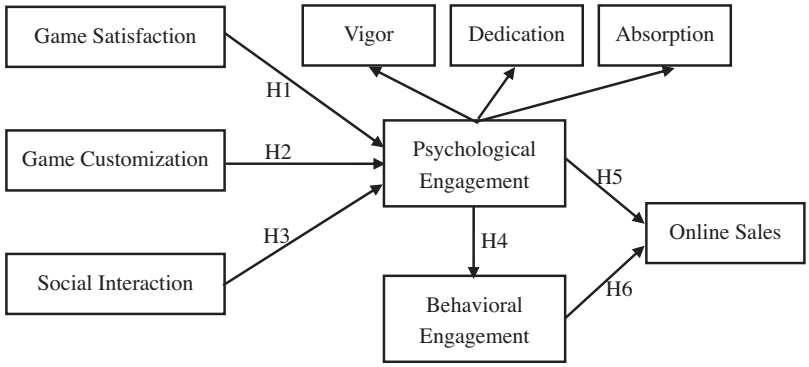

Fig. 1. Research model.

Social interaction refers to interactions between game players. It is considered as an important contextual element of an online game (Van Doorn et al. 2010), and is one of the central aspects related to optimal game experience (Lewinski 2000). Particularly, online game designers cultivate a competitive yet sociable environment to bond players from different backgrounds together. For example, they make the quests difficult to be accomplished alone to encourage players to form groups and exchange ideas. By carefully crafting the reward system, players would be able to experience teamwork, encouragement and fun, and eventually engage with the game.

The relationship between social interaction and psychological engagement was evidenced in prior literature. For instance, Lee et al. (2012) reported that social interaction is a salient factor of players' intention to engage in social network games. They also suggested that players engage in socializing and building relationships with others in the game. Similarly, we expect that cohesive and rewarding social interactions among online game players will enhance their feelings of engagement towards the game.

Hypothesis 3. Social interaction is positively associated with psychological engagement.

3.2. Customer engagement in online games

To fully understand the role of customer engagement in promoting sales in online games, this model incorporates both psychological and behavioral engagement. As discussed above, customer engagement is a complex and multifaceted concept, and it would be valuable to include multiple perspectives of this construct (Brodie et al. 2013, De Vries and Carlson 2014). In the current study, psychological engagement has been modeled as a second-order latent construct and operationalized as a "motivational psychological state" that is characterized by vigor, dedication, and absorption (Cheung et al. 2011).

This psychological state of customer engagement is expected to bring about behavioral engagement, including duration, frequency, and recentness of game participation. If a player is willing to invest his/her personal energy and time into an online game, or even immerse himself/herself in the game, he/she will be more likely to increase the frequency and intensity of game participation. Some recent studies have made the similar argument that psychological engagement should have a positive effect on engagement behavior in an online social platform (Cheung et al. 2011) or in brand virtual communities (De Vries and Carlson 2014). Based on the discussion above, we believe that game players' psychological engagement leads to their behavioral engagement in the online games.

Hypothesis 4. Psychological engagement in an online game is positively associated with behavioral engagement.

Customer engagement has been found to be associated with a number of positive outcomes. For example, in the organization literature, engagement is closely related to organizational citizenship behavior and organizational commitment (Macey and Schneider 2008, Saks 2006). In the service literature, Patterson et al. (2006) have argued that customer engagement is a superior predictor of customer loyalty. In the marketing literature, Algesheimer et al. (2005) empirically showed how brand community engagement affects membership continuance intentions, community recommendation intentions, and community participation intentions. In line with these viewpoints, we believe that engagement in online games will produce positive behavior in the game players, such as purchase behavior (Hennig-Thurau et al. 2010, Malthouse et al. 2013). It is not difficult to understand that, if game players are heavily engaged in an online game, they will invest more energy, time and effort into the game, with a high engrossment and a lot of enthusiasm, and further they will have a greater propensity to purchase in the online game. Furthermore, when game players increase the duration, frequency, and recentness of participation in an online game, it is likely that they will spend more money (e.g., purchasing virtual items, etc.) in the particular game.

Hypothesis 5. Psychological engagement in an online game is positively associated with the amount of money spent in the game (online sales).

Hypothesis 6. Behavioral engagement in an online game is positively associated with the amount of money spent in the game (online sales).

4. Methodology

4.1. Survey measurement

All measurement items used in this study were adapted from the existing literature, with minor changes in the wording so as to fit into the context of the current investigation of online games (see Table 2). The face validity of the preliminary measures was first assessed by an expert panel of IS researchers, who have prior experience of several MMOGs, such as World of Warcraft and League of Legends. We then pilot-tested the measurement items for comprehensiveness, clearness, and psychometric properties (Churchill 1979). Multi-item perceptual scales were used, when possible, to ensure the validity and reliability of the constructs.

Table 2
List of measurement items.

Construct	Reflective measure	Mean	S.D.	Factor loading
Vigor (Cheung et al., 2011)				
VIG1	I can continue playing this game for very long periods at a time	5.24	1.44	0.81
VIG2	I feel strong and vigorous when I am playing this online game	5.45	1.30	0.87
VIG3	I feel very resilient, mentally, as far as this online game is concerned	5.17	1.38	0.83
VIG4	In this game, I always persevere, even when things do not go well	5.40	1.29	0.81
VIG5	I devote a lot of energy to this online game	5.52	1.30	0.84
VIG6	I try my hardest to perform well on this game	5.84	1.15	0.75
Dedication (Cheung et al., 2011)				
DED1	I am enthusiastic in this online game	5.65	1.25	0.85
DED2	This online game inspires me	5.52	1.20	0.89
DED3	I found this online game full of meaning and purpose	5.35	1.24	0.83
DED4	I am excited when playing this online game	5.54	1.28	0.90
DED5	I am interested in this online game	5.72	1.17	0.87
DED6	I am proud of playing this online game	5.28	1.31	0.78
Absorption (Cheung et al., 2011)				
ABS1	Time flies when I am playing this online game	5.99	1.10	0.73
ABS2	Playing this game is so absorbing that I forgot about everything else	5.61	1.25	0.81
ABS3	I am rarely distracted when playing this online game	5.57	1.17	0.82
ABS4	I am immersed in this online game	5.28	1.41	0.80
ABS5	My mind is focused when playing this online game	5.70	1.20	0.86
ABS6	I pay a lot of attention to this online game	5.62	1.18	0.82
Game satisfaction (Park and Lee, 2011a)				
GS1	I am satisfied with this game	5.73	1.11	0.87
GS2	I am satisfied with my decision to play this game	5.72	1.08	0.89
GS3	I think that this game is very good	5.71	1.20	0.87
GS4	My choice to play this game is a wise one	5.67	1.18	0.87
Social interaction (Chow and Chan, 2008)				
SI1	In general, I have a very good relationship with my group members	5.86	1.17	0.84
SI2	In general, I am very close to my group members	5.59	1.21	0.90
SI3	I always hold a lengthy discussion with my group members	5.24	1.26	0.83
Construct	Formative measure	Mean	S.D.	Weight
Online Sales				
OS1	In the past 3 month, how much have you spent on this game per month on average?	3.66	1.96	1
Behavioral engagement (Van Doorn et al., 2010)				
DUR1	In the past 3 month, how long have you played this game per visit on average?	4.55	1.26	0.59
FRE1	In the past 3 month, how many times have you played this game per week on average?	3.59	1.65	0.46
REC1	How long ago was your most recent game-playing?	1.91	1.34	0.34
Game customization (Park and Chung, 2011)				
GC1	I am allowed to select the avatars (characters) of this online game according to my taste	5.80	1.18	0.33
GC2	I am allowed to adjust the settings of this online game according to my taste	5.68	1.20	0.30
GC3	I am allowed to select the sounds of this online game according to my taste	5.83	1.21	0.50

Notes: [1]Single-item constructs.

The operationalization of the constructs can be either reflective or formative, based upon if each measure captures differing aspects of a focal construct (Petter et al. 2007). Freeze and Raschke (2007) have summarized seven key differences between reflective and formative constructs, including causal priority, measurement error, internal consistency, corrections, identification, error terms and measurement interchangeability. Based on these differences, in this study, online sales, behavioral engagement and game customization are conceptualized as formative constructs. All other constructs are modeled as reflective.

All reflective measures and the measures of game customization were measured on a seven-point Likert scale. In addition, online sales and behavioral engagement were measured using seven-point continuous scales of money, time, and frequency. Particularly, online sales was measured with a scale including seven continuous cluster categories (⩽20, 21–40, 41–60, 61–100, 101–150, 151–200 and >200 RMB). Behavioral engagement was measured from the duration, frequency and recentness perspectives, and the respondents were asked to indicate their answers on a continuous scale, for example from "1 = less than 10 min" to "7 = more than 4 h" for duration in an online game. Table 2 presents a summary of constructs and measures used in the current study.

4.2. Data collection

The current study used a survey design requiring participants to respond to an online questionnaire. The target respondents of this study were players of MMOGs, such as World of Warcraft, League of Legends, etc. MMOGs are multiplayer video games, which can simultaneously support cooperation and competition among a large number of players, and thus facilitate social interaction among online gamers. For a better gaming experience, the game players often purchase virtual items/goods in MMOGs using real money. These virtual goods may include coins, weapons, gems, and other rare items.

To improve the response rate and sample quality, we used a marketing research firm for data collection. The marketing research firm offered an online research panel in China. We used screening questions to filter active gamers who have played MMOGs in the last three months. Only eligible respondents could attempt the rest of the online questionnaire. To increase the participation, the firm awarded the panel members points that could be accumulated in exchange for prizes. In total, we received 377 valid responses. Of the 377 valid respondents, 61.5 percent were male and 38.5 percent were female. The majority of respondents were aged between 21 and 25 (40.6 percent) and between 26 and 30 (29.7 percent). The respondents who had played online games for 3–5 years accounted for 30.5 percent, 23.1 percent had played for 5–7 years, and 14.6 percent had played online games for 7–10 years. In addition, 55.7% percent had spent more than 60 RMB (about 10 USD) in online games per month. Table 3 describes the demographic profiles of the respondents.

4.3. Common method bias

As all of the data were self-reported and collected from a single source, we performed the Harman's single-factor test to assess common method bias (Podsakoff et al. 2003). Five factors with eigenvalues greater than 1.0 (ranging from 1.14 to 14.45) emerged from the principal components factor analysis. The total percentage of variance explained by these five components is 65.32. Meanwhile, the results also suggest that the first component

Table 3
Demographic profile of the respondents.

Characteristics	Number (n = 377)	Percentage (%)
Gender		
Male	232	61.5
Female	145	38.5
Age		
⩽20	34	9.0
21–25	153	40.6
26–30	112	29.7
⩾31	78	20.7
Gaming experience		
<1 year	22	5.8
1–3 years	78	20.7
3–5 years	115	30.5
5–7 years	87	23.1
7–10 years	55	14.6
>10 years	20	5.3
Money spent per month (RMB)		
⩽60	167	44.3
60–100	77	20.4
101–150	61	16.2
>150	72	19.1

Note: 1 RMB = 0.16 USD.

accounts for less than 50% of the total variance, indicating that common method bias is not a serious threat in this study.

5. Data analysis and results

We used partial least squares (PLS), which has been widely adopted in IS research, to test the research model. PLS was used in the current study for several reasons. First, it is necessary to recognize that the consideration on reflective and formative models is a critical determinant for the choice of analytic techniques. Compared to the covariance-based (CB) SEM (i.e., LISREL and AMOS), component-based SEM approach (i.e., PLS) can easily handle formative and reflective models (Hair et al., 2009, 2013; Lohmüller 1989), and is preferred when the research model incorporates formative constructs, which is the case of our study. Second, identification problems would occur in CB-SEM when estimating a model with single-item and/or two-item constructs. In this regard, PLS is robust with fewer statistical identification issues when modeling single-item constructs (e.g., online sales in this study) (Hair et al., 2009, 2013). Third, PLS places minimal restriction on sample size and data distribution, and it is capable to assess the measurement model and structural model simultaneously in one operation (Chin 1998a,b). Based on this reasoning, we have chosen PLS as the primary data analysis technique. Using the two-step analytical approach, we first conducted a psychometric assessment of the measurement model, and then an evaluation of the structural model. This allows for more confidence in concluding that the structural relationships are drawn from a set of measurement instruments with desirable psychometric properties (Hair et al. 1998).

5.1. Measurement model

The test of the measurement model involves an estimation of internal consistency and convergent and discriminant validity of the instruments. However, assessments of the measurement model of formative constructs and reflective constructs follow different guidelines.

5.1.1. Reliability and Validity of Reflective Constructs

Convergent validity refers to the extent to which the items on a scale are theoretically related. Convergent validity is assessed using three criteria, (1) the composite reliability (CR) should be at least 0.70 (Chin 1998a), (2) the average variance extracted (AVE) should be at least 0.50 (Fornell and Larcker 1981), and (3) all item loadings should be greater than 0.70 (Chin 1998a). As shown in Table 4, all criteria of convergent validity were met, with CR values ranging from 0.89 to 0.94, AVE values ranging from 0.65 to 0.77, and item loadings higher than 0.70.

5.1.2. Reliability and validity of formative constructs

Formative items are those that *cause* variance in the construct under scrutiny (Bollen 1984). Formative items neither correlate with one another nor exhibit internal consistency (Chin 1998b). Traditional statistics for assessing internal consistency (e.g., Cronbach's alpha, composite reliability, and average variance extracted) are therefore inappropriate (Wixom and Watson 2001). As formative constructs are predicted by multiple indicators jointly in an analogous fashion, multicollinearity becomes the major concern. Multicollinearity was not an issue in the current study because (1) none of the bivariate correlations exceeded 0.90 (Tabachnick and Fidell 2012), (2) tolerance values averaged more than 0.30, and (3) the maximum variance inflation factor (VIF) was 1.25 and well below the prescriptive diagnostic of 5.0 or 10.0 (Hair et al. 1998, Mathieson et al. 2001).

We examined item weights of formative constructs to establish construct validity (Petter et al. 2007). As shown in Table 5, weights for all items are statistically significant, indicating that all the measurement items have important and relative contributions to both behavioral engagement and game customization, and suggesting that all the formative items should be retained for subsequent model analyses (Cenfetelli and Bassellier 2009).

5.2. Structural model

The results from the PLS analysis of the structural model, including path coefficients and the corresponding statistical significance, are illustrated in Fig. 2. As expected, the taxonomic properties for the second-order construct (i.e., psychological engagement) are upheld by the empirical evidence. The paths of three psychological engagement dimensions are found to be statistically significant, vigor ($\beta = 0.90$, $p < 0.001$), dedication ($\beta = 0.88$, $p < 0.001$), and absorption ($\beta = 0.90$, $p < 0.001$).

Table 4
Reliability and validity of reflective constructs.

Construct	Composite reliability	AVE	Correlation matrix				
			ABS	DED	GS	SI	VIG
Absorption (ABS)	0.92	0.65	0.81				
Dedication (DED)	0.94	0.73	0.69	0.85			
Game satisfaction (GS)	0.93	0.77	0.69	0.73	0.87		
Social interaction (SI)	0.89	0.73	0.58	0.56	0.61	0.86	
Vigor (VIG)	0.92	0.67	0.74	0.66	0.60	0.62	0.82

Table 5
Item weights and loadings of formative constructs.

Construct	Item	Weight	t-Value	Loading	t-Value
Online sales	OS	1	n.a.[1]	1	n.a.[1]
Behavioral Engagement	Frequency	0.46	5.12	0.77	13.20
	Duration	0.59	6.94	0.83	16.93
	Recency	0.34	4.63	0.47	5.45
Game customization	GC1	0.33	3.07	0.87	22.78
	GC2	0.30	3.11	0.87	26.45
	GC3	0.50	6.01	0.90	27.05

[1] Single-item construct.

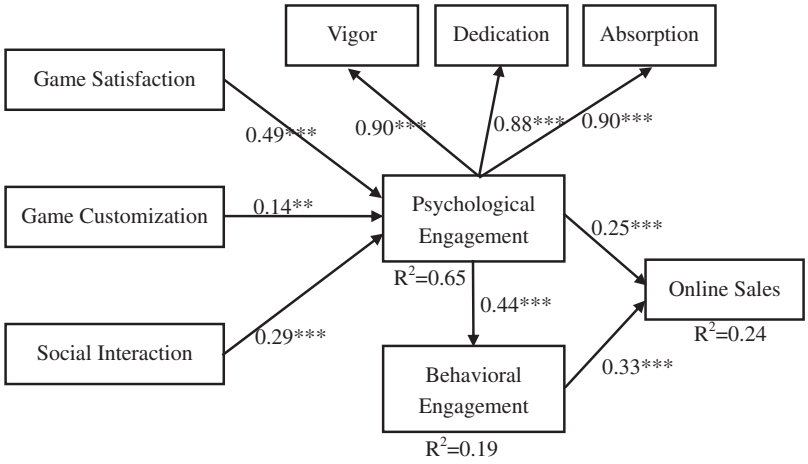

Fig. 2. Results of the structural model analysis. *Note:* $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

Therefore, the validity of the second-order construct lays the foundation for further interpretation of empirical findings for hypotheses testing.

All hypotheses are supported. Game satisfaction ($\beta = 0.49$, $p < 0.001$), game customization ($\beta = 0.14$, $p < 0.01$), and social interaction ($\beta = 0.29$, $p < 0.001$) are positively associated with psychological engagement. Together, the three factors explain 65% of the variance for psychological engagement, substantiating Hypotheses 1, 2, and 3. Psychological engagement has a positive association ($\beta = 0.44$, $p < 0.001$) with behavioral engagement, explaining 19 percent of the variance in the latter and corroborating Hypothesis 4. Both psychological engagement ($\beta = 0.25$, $p < 0.001$) and behavioral engagement ($\beta = 0.33$, $p < 0.001$) are positively associated with online sales. The two customer engagement factors, in turn, account for 24% of the variance in online spending, thus corroborating Hypotheses 5 and 6.

We further tested the mediation effects with the four-step approach advocated by Baron and Kenny (1986) and the Sobel test. Table 6 summarizes the results of mediation analyses. Game satisfaction, game customization and social interaction correlate with online sales, with total effects at 0.21, 0.15 and 0.29, respectively. Psychological engagement partially mediates the effects of game satisfaction and game customization on online sales, and fully mediates the effect of social interaction on online sales. Behavioral engagement partially mediates the effect of psychological engagement on online sales. Furthermore, results of Sobel tests indicate that psychological engagement significantly mediates the effects of game satisfaction ($z = 4.67$, $p < 0.001$), game customization ($z = 2.68$, $p < 0.01$), and social interaction ($z = 3.86$, $p < 0.001$) on online sales. Behavioral engagement significantly mediates the effect of psychological engagement ($z = 4.72$, $p < 0.001$) on online sales.

Table 6
Results of mediation analyses.

IV	M	DV	IV → DV	IV → M	IV + M → DV		Mediating
					IV → DV	M → DV	
GS	PE	OS	0.21***	0.77***	−0.21**	0.55***	Partially
GC	PE	OS	0.15***	0.64***	−0.18**	0.51***	Partially
SI	PE	OS	0.29***	0.67***	0.03$^{N.S.}$	0.38***	Fully
PE	BE	OS	0.41***	0.46***	0.26***	0.32***	Partially

Notes: (1) IV, independent variable; M, mediator; DV, dependent variable; GS, game satisfaction; GC, game customization; SI, social interaction; PE, psychological engagement; BE, behavioral engagement; OS, online sales. (2) $^{N.S.}$non-significant; $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

6. Discussion

6.1. Discussion of key findings

The current study conceptualizes and operationalizes "customer engagement" in the context of online games, and examines its role in contributing to business success. To address the research objectives introduced at the beginning of this paper, we have advanced a theoretical model that captures the antecedents and consequences of customer engagement in online games. All hypothesized relationships in the model were substantiated by the empirical evidence. The findings demonstrated that both psychological and behavioral engagement determined the amount of money spent in online games. Thus, if people are engaging in online games, psychologically and/or behaviorally, they have a higher propensity to explore in-game features, leading to increased spending on prolonging subscriptions, purchasing virtual items, etc. In addition, the results of this study also revealed that psychological engagement is a key factor that induces game players' behavioral engagement. It is easy to understand that if players engage in an online game psychologically by a degree of vigor, dedication, and absorption, they tend to play online games more frequently and increase the time spent for each episode.

This study also identified the antecedents of customer engagement in online games from three different aspects. In particular, game satisfaction, game customization, and social interaction all had statistically significant effects on psychological engagement, with a large proportion (65%) of explained variance. It is common for online game players who experience an overall positive feeling about the target game, to be more likely to devote their energy to the game, and be enthusiastic and immersed in the game. It is also necessary to note that the three factors exert statistically significant total effects on online sales, and their relationships with users' spending in online games are either fully or partially mediated by psychological engagement.

Overall, the findings of this study support all hypothesized relationships and demonstrate the antecedents and consequences (with a special focus on online sales) of customer engagement in online games, as well as the direct relationship between customer psychological and behavioral engagement.

6.2. Implications for research

This study is expected to contribute to existing research in the following three ways. First, although customer engagement is

believed to be vital to the retention of existing customers and the acquisition of new ones (Brodie et al. 2013), few studies on online games have investigated the role of customer engagement in building game players' loyalty and promoting sales of virtual items. It is necessary and important to note that the online game itself provides a highly engaging environment, and therefore, customer engagement during the course of gameplay would help to advance our current understanding of why game players spend money on subscriptions and virtual items. In this study, we present an attempt to examine the relationship between customer engagement and online sales of virtual game items/goods. Both types of customer engagement, psychological and behavioral, increased the amount of money spent in the online games. Thus, this study enhances our current understanding of online game sales using the new focus of customer engagement. Future work could extend this line of research by exploring the role of customer engagement in driving game loyalty and co-creating game products.

Second, customer engagement has been conceptually reviewed and empirically examined, and regarded as one of the most important contributions that this study makes to the literature (Brodie et al. 2013, Hollebeek et al. 2014, Kabadayi and Price 2014). In particular, this study examines the concept of customer engagement by defining it as both a psychological state (psychological engagement) and a behavioral manifestation (behavioral engagement). The relationship between psychological and behavioral engagement were further empirically verified. This is consistent with the complex and multifaceted nature of customer engagement and will fill a gap in the existing literature (Bowden 2009, Hollebeek 2011, Mollen and Wilson 2010, Vivek et al. 2012), which mainly focuses on one perspective of customer engagement. This study also contributes to the engagement literature by empirically examining customer engagement with products (online games in particular), complementing current research that mainly focuses on customer engagement with brands and brand communities. We also call for more research on customer engagement with the object, which is characterized by products or experience goods.

Third, the results of this study also add new insights into customer engagement literature by exploring its antecedents in the context of online games. We empirically identified the three key antecedents of psychological engagement, including game satisfaction, game customization, and social interaction. The three factors together explained 65% of the variance in psychological engagement, and thus further contribute to the existing knowledge of customer engagement. As such, this study will stimulate more research on the mechanisms involved in the formation and development of customer engagement.

6.3. Implications for practice

In recent years, the popularity of online games has grown substantially, and at the same time, competition in the game industry has become increasingly fierce. Many game companies invest heavily in game development and marketing, and sometimes the costs cannot be offset by monthly subscriptions and virtual item sales. Although the findings of this study are expected to contribute to the existing literature with several theoretical implications, the practical implications of this study are also discussed below.

First, this study concentrates on one of the major topics concerned by game developers and publishers, that is, how to increase game players' spending on subscriptions and virtual items. We investigate online sales from the perspective of customer engagement because online games often provide a highly engaging environment. However, psychological and behavioral engagement together explained 24% of the variance in online sales, indicating that there are some other important influencing factors have not been included in the model. Even so, we also noted that both psychological and behavioral engagements were found to be influencing factors of online sales. Thus, it is necessary for the game companies to keep track of customer engagement, both psychological and behavioral, and to make sure that both psychological and behavioral engagement maintain at a relatively high level. Particularly, behavioral engagement was measured in terms of the intensity of game use. Game publishers may target those heavy users, as they are more likely to spend more money in the subscriptions and virtual items.

Second, practitioners may also consider the marketing tactics proposed in this study to enhance customer engagement. In particular, we found game satisfaction, game customization, and social interaction together explained a large variance (65%) in psychological engagement, which in turn exerted a positive effect on online sales. Among the three antecedents of psychological engagement, customer satisfaction plays the most critical role. Practitioners could conduct regular online surveys that aim to understand user satisfaction, customize online gaming experiences with add-ons for game characters and gameplay, and facilitate group interaction within gaming clans. Social interaction also exerts a significant impact on psychological engagement, it is thus advisable for the game companies to design in-game features, such as special guild chat channels and guild forums, to promote social interactions with other game players.

6.4. Limitations and future research

Although this study provides some suggestions and implications for both research and practice, it also has several limitations, which can be addressed in future research. First, the selection of respondents is bound to the Asian region, while online game players are often worldwide. Future research may extend our current study to other regions and explore how culture plays a role in the online game industry. Second, the generalization of the findings should be made with caution because only 24% of the variance in online sales was explained. Although this is solely explained by the concept of customer engagement, it implies that other important factors may have been neglected. In particular, future research should consider factors untested in this study, such as consumption values and relational factors, which may provide additional insights for predicting online sales.

Third, the antecedents of psychological engagement were examined with a special focus on game satisfaction, game customization, and social interaction. However, it is important to recognize that Van Doorn et al.'s (2010) conceptual model is a very useful and thought provoking framework that allows identification of the antecedents, the moderators, and the consequences of customer engagement. In this regard, future research could incorporate other factors in the three categories of customer, firm and context, to better explain the development of customer engagement in online games. For example, Van Doorn et al.'s (2010) model presents 13 possible variables which may affect the development of customer engagement, and in the meanwhile, there is a subset of factors that can affect customer engagement and moderate the relationships between customer engagement and its antecedents. Game customization is used in this study to capture one dimension of the perceived characteristics of online games, it is also necessary to recognize that other game characteristics, such as game complexity and game familiarity (Li et al. 2014), and other firm-based factors, such as brand reputation and the actions/processes performed by game companies to facilitate specific gameplay actions are also important motivational drivers of customer engagement, as demonstrated in previous studies (Schau et al. 2009, Van Doorn et al. 2010). In addition, engagement is a complex concept. In this study, we only focus on the conceptualization of

the psychological engagement, by identifying and testing its dimensions in the research model. The conceptualization and operationalization of behavioral engagement is simplified and, we only captured one aspect of behavioral engagement, namely intensity of usage. Future studies should continue to explore the various dimensions of behavioral engagement in the context of online games.

Furthermore, the negative direct effects between game satisfaction/game customization and online sales reported in mediation analyses have heuristic value for future theory building. The negative direct effects may be caused by several possible reasons. One of the most likely reasons is that if players are already satisfied with the game, or the game is customized enough, game players will have less motivation to spend on the game. Conversely, if people are not satisfied with the game as much, or the game is designed to provide more customized offerings with extra spending, game players will be incentivized to spend money on the game (Hamari 2015). This phenomenon also can be explained with status quo bias, which refers to a preference for the current state of affairs. If people are satisfied with the status quo, any changes may be perceived as a loss. In addition, the direct effect can be the net effect of two or more omitted mediators of different signs (Zhao et al. 2010).Therefore, the unexpected negative direct effects in this study provoke theoretical progress by encouraging future researchers to look for alternative mediation mechanism that is negative in sign and mediates the effects of game satisfaction/game customization on online sales. Due to the negative direct effects, another explanation regarding the mediating effects proposed by an anonymous reviewer, whom we thank, is that psychological engagement does not mediate the relationships between game satisfaction/game customization and online sales. The two factors may increase some portion of psychological engagement that does not contribute to online sales, even though we have combined the Baron & Kenny's method & Sobel test method to examine the mediating effects. In view of this, we recommend future research to further look into this issue.

To conclude, the concept of customer engagement is still evolving and empirical research on customer engagement in products is relatively limited. This study is expected to enhance our current understanding of the concept of customer engagement by including multiple perspectives of this construct and identifying its antecedents and consequences in the context of online games. We believe that this study also provides new insights for scholars and practitioners regarding the role of customer engagement in the online environment.

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