

How Do Workplace Frustration and Need Satisfaction Motivate Online Gamer Loyalty?

Research-in-Progress

Gen-Yih Liao

Thi Tuan Linh Pham

Tzu-Ling Huang

T. C. E. Cheng

Ching-I Teng

Abstract

Online games are prevalent in the field of e-commerce and are known for satisfying the various needs of users. Nonetheless, little is known about whether online games could be a resort for users encountering workplace frustration. Explaining how workplace frustration and users' need satisfaction affect loyalty of online gamers, we formulate hypotheses and develop a framework based on self-affirmation theory (SAT) and self-determination theory (SDT). We will use online surveys to collect responses from online gamers and use structural equation modelling to test the hypotheses. This study will be the first to use SAT and SDT to identify three antecedents and a moderator of online gamer loyalty. Our findings may offer e-commerce managers useful insights to understand their gamers' workplace frustration and inform them that playing games may alleviate the associated negative feelings.

Keywords: Online game, frustration, loyalty, survey, structural equation modelling

Introduction

Online games own potential to create huge revenues. For instance, online games generated revenues of RMB\$ 26.8 billion (US\$ 4.14 billion) to Tencent, China's e-commerce giant, in the third quarter of 2017 (Song 2018). Online games are also popular as the number of worldwide gamers was 575 million in 2017 and is expected to grow to 645 million by 2021 (Plarium 2017). Online games could generate stable revenues if gamers demonstrate loyalty to online games. Loyalty drives players' purchase of in-game content (Hamari et al. 2017a). Besides, games provide advertising opportunities, generating extra revenues (Vashisht and Sreejesh 2017), indicating the importance of research on online gamer loyalty.

The literature has investigated various antecedents to online gamer loyalty, including ease of use, usefulness (Hamari and Keronen 2017), consumption values (Teng 2018), service quality (Hamari et al. 2017b), achievement, social interaction (Merhi 2016), and social identity in the guild (Moon et al. 2013). The antecedents represent means to fulfil gamers' various needs, e.g., needs for autonomy, competence,

and relatedness. Such needs can be fulfilled in users' daily life, including the workplace, which frequently frustrates employees (Olafsen et al. 2018), suggesting the possibility that workplace frustration could increase gameplay. However, the literature has hardly examined workplace frustration as a potential source of online gamer loyalty, indicating a research gap. Frustration has been confirmed as having an impact on IS user responses (Moody and Galletta 2015) and could determine continuance of playing online games and expectancy uncertainty (Liao et al. 2016). These studies on frustration pertain to IS use but not to workplace, indicating that this gap remains open to further research.

Research filling the gap is important as it could clarify how workplace frustration drives gamers to play games and how games help fulfill their needs. To fill the identified research gap, we begin with online gamer loyalty. Loyalty should originate from satisfying important human needs (Tseng et al. 2018). Satisfying human needs has been well explained by self-determination theory (SDT) (Deci and Ryan 2000), which posits that individuals are strongly motivated to meet autonomy need satisfaction, competence need satisfaction, and relatedness need satisfaction. Moreover, SDT has been frequently applied in various online contexts (Herodotou et al. 2014; Johnson et al. 2016), indicating its applicability in our research context and justifying its adoption in our work.

Workplace frustration threatens individuals' self-concept, which is typically preserved by individuals. The preservation of self-concept is the core of self-affirmation theory (SAT) (Sherman and Cohen 2006), indicating the aptness of using SAT in our study. SAT posits that individuals' need to maintain a positive self-image would motivate them to respond to threats to their self-worth (Sherman and Cohen 2006). Both SAT and SDT focus on needs satisfaction. Specifically, SDT focuses on satisfaction of three important human needs, while SAT focuses on fulfilling the need to preserve self-concept. Given their individual and shared focuses on needs satisfaction, we apply both theories as the theoretical guide to develop the research framework and formulate the hypotheses.

Hence, our study seeks to explain the mechanism underlying the impact of workplace frustration on satisfaction of the needs of autonomy, competence, relatedness, and online gamer loyalty. We adopt SDT to identify key need satisfaction and use SAT to develop the hypotheses. Overall, we contribute to knowledge advancement by clarifying how workplace frustration moderates the impacts of the three basic human needs satisfaction on online gamer loyalty, offering future research a platform to investigate the potential of negative real-world perceptions to affect the loyalty of online gamers.

Literature Review

Online Gamer Loyalty

Loyalty may be variously defined in multiple areas. To fit the research context, this study adopts the definition in online gaming studies (Liao and Teng 2017), i.e., continuance intention to play a specific online game. IS studies have proposed numerous antecedents to loyalty, such as trust (Kamboj et al. 2018), community participation (Kamboj et al. 2018), word-of-mouth participation, site identification (Yoo et al. 2013), site quality (Luo and Chea 2018), functional value and social value (Tseng et al. 2018), suggesting that gamer loyalty could be associated with satisfaction of various needs. Precisely, gamers can communicate with one another and fulfil their autonomy need satisfaction (Tseng et al. 2018). In addition, loyalty of online gamers may stem from goal proximity and motivation to obtain gaming goals (Teng 2017a), showing that the sense of goal attainment or competence is vital to gamers. Furthermore, online gamer loyalty may be related to social interaction (Merhi, 2016). These studies suggest the necessity of adopting a theory explaining humans' basic needs, i.e., SDT.

Loyalty in the marketing field has been defined using multiple aspects (Dick and Basu 1994), including the continuance intention, which is widely used for representing loyalty in online gaming context. The reason may be that continuance intention is the core to loyalty intention. Moreover, the three needs in SDT cover a wide range of basic human needs, thus should cover gamers' needs. However, future works could dig further gamers' unique needs in the light of SDT. Furthermore, need satisfaction could predict gamers' time spent playing (Johnson et al. 2016), i.e., *present* gaming behavior, but not *future* gaming behavior. Loyalty concept in this study could be used to assess whether need satisfaction predicts *future* gaming behavior.

Self-Determination Theory

SDT posits that satisfying humans' essential needs strongly motivates individuals (Ryan and Deci 2000). Three needs have been identified, i.e., the needs of competence, relatedness, and autonomy. These basic psychological needs can explain motivational differences (Akbari et al. 2015). SDT includes both intrinsic and extrinsic motivations. We focus on intrinsic motivations because: (1) intrinsic motivations are at the centre of SDT (Ryan and Deci 2000), (2) typically, playing online games is intrinsically satisfying (Ryan and Deci 2000), and (3) playing online games unlikely creates extensive extrinsic monetary rewards. Various intrinsic motivations can be fulfilled in online gaming. Gamers can freely choose avatars (Li et al. 2018), for representing and expressing themselves, which satisfies gamers' autonomy need (Tseng et al. 2018). Online gamers can obtain various achievement values, including victory and adventure (Lin et al. 2015), thus satisfying gamers' competence need. Moreover, online games exhibit inherent sociability (Wu et al. 2018), thus satisfying gamers' relatedness need.

Online gaming studies have examined the effects of the three psychological needs. Gamers having low satisfaction of autonomy need are found to be more interested in achievement preferences. In contrast, low satisfaction of relatedness need induces gamers' interest in social preferences for play (Herodotou et al. 2014). Moreover, all three needs satisfaction are found to be associated with more time spent playing (Johnson et al. 2016). However, few studies have examined the relationships between basic psychological needs satisfaction and gamer loyalty, warranting the inclusion of this link in our study.

Self-Affirmation Theory

SAT suggests that individuals desire to maintain a positive self-image, so a psychological threat can endanger a global sense of self-worth (Sherman and Cohen 2006). Information content perceived as congruent with users' self-image renders users exposed to mobile advertisements (Shareef et al. 2017). Information content perceived to enhance users' self-image heightens their repurchase intention (Filiari et al. 2017). These findings reveal the importance of users' self-perception to designing e-commerce services, which suggests the necessity for academic exploration. Moreover, SAT identifies threats that endanger a global sense of self-worth (Sherman and Cohen 2006). Such self-threats reduce self-worth and induce frustration (Chen et al. 2015), warranting the following review on frustration.

We did not include self-worth, as it is a changing variable in the research process. Our framework posits that workplace frustration reduces one's self-worth; need satisfaction in gaming motivates them to seek recovery of self-worth during playing games. The changing nature of self-worth justifies its exclusion.

Frustration and Workplace Frustration

Frustration indicates limited advancement in achieving goals owing to a lack of skills and daunting challenges, or expensing over-invested resources (such as time) (Attard et al. 2016). Frustration has been examined in IS studies (e.g., Xu and Topi 2017), justifying the inclusion of frustration in our study.

Frustration is typically context-specific (Xu and Topi 2017). One context where frustration can be observed regularly is the workplace (Fox and Spector 1999; Olafsen et al. 2018). Frustration among workplace employees likely elicit counterproductive behavioural responses (Fox and Spector 1999), e.g., spreading rumours or causing direct harm to colleagues (Bennett and Robinson 2000), indicating the importance of studying workplace frustration. Workplace frustration could lead employees to play video games in order to recover from the stressful situations (Reinecke 2009). As literature suggests that frustration is negative to self-worth (Vines et al. 2017), supporting the adoption of SAT to account for the impact of workplace frustration and its link to online gaming continuance behaviour. To clarify the concept definitions, we list them in Table 1.

Table 1. Definitions of the Study Constructs

Construct	Conceptual Definition
Loyalty	the intention to repeatedly play a game

Workplace frustration	individuals' perception of failure in achieving workplace tasks
Autonomy need satisfaction	fulfillment of the desire for being generally free and self-congruent over time
Competence need satisfaction	fulfillment of the desire for feeling capable of engaging in a certain activity
Relatedness need satisfaction	fulfillment of the desire for being socially connecting with others

Development of Hypotheses

Workplace frustration indicates the degree to which individuals' perception of failure in achieving workplace tasks (Reinecke 2009). According to SAT (Sherman and Cohen 2006), individuals who encounter frustration have strong motivation to seek alternative sources to affirm their self-image. The alternative sources could include playing online games because online games are easily accessible after work/school and highly popular. To support gamers' value in online games, gamers are required to repeatedly play games, i.e., having enhanced loyalty (Teng 2017a). Hence, we hypothesize:

H1: Workplace frustration is positively related to loyalty.

Individuals have three major needs to satisfy, i.e., needs of autonomy, competence, and relatedness, as posited by SDT (Deci and Ryan 2000). Individuals who encounter strong frustration in the workplace encounter threats to their positive value in the workplace. SAT posits that individuals encountering threats to their positive value would seek means to maintain such value (Sherman and Cohen 2006). Accordingly, after work, such frustrated individuals would seek means to maintain their positive value. One appealing means is playing online games, as gamers can freely use avatars to present and express themselves, i.e., self-expressiveness, which could satisfy gamers' autonomy need (Tseng et al. 2018). Therefore, such individuals would find online gaming attractive, motivating them to repeatedly playing online games, i.e., have strong online gamer loyalty (Hamari et al. 2017a).

However, individuals who do not encounter strong workplace frustration would not greatly appreciate satisfaction of autonomy need, so they are not motivated to play online games as a means for satisfying their autonomy need. In this case, workplace frustration would not significantly strengthen the positive link between autonomy need satisfaction and their intention to repeatedly play online games, i.e., loyalty (Hamari et al. 2017a). We thus hypothesize:

H2: Workplace frustration enhances the positive link between autonomy need satisfaction and loyalty.

Strong workplace frustration refers to individuals' failures to achieve workplace tasks (Reinecke 2009). Failures to achieve tasks imply insufficient competence in the workplace. According to SAT (Sherman and Cohen 2006), individuals who encounter strong workplace frustration would seek alternative means to affirm their self-worth. That is, such individuals should greatly appreciate the activities satisfying their competence needs. Among potential activities, playing online games is one appealing alternative, as playing online games may be strongly motivated by need for achievements (Yee 2006) and attaining gaming goals (Teng 2017a). That is, playing online games could provide a sense of achievement, thus affirming the positive value of those who feel highly frustrated in the workplace, further attracting them to repeatedly play online games, i.e., have enhanced online gamer loyalty (Hamari et al. 2017a).

On the other hand, individuals who do not experience strong workplace frustration would not be motivated to seek means to affirm their self-worth (Sherman and Cohen 2006). Hence, such individuals would not appreciate the competence need satisfaction by playing online games, so they are not motivated to repeatedly play online games for satisfying competence need. We thus hypothesize:

H3: Workplace frustration enhances the positive link between competence need satisfaction and loyalty.

Workplace frustration reflects individuals' frequent failures in achieving tasks in the workplace (Fox and Spector 1999). Frequent failures in achieving one's own tasks in collaborative projects would hinder close cooperation, which provides social well-being (Araújo and Pestana 2017). Hence, individuals who

encounter strong workplace frustration would perceive a lack of social well-being. According to SAT (Sherman and Cohen 2006), such individuals would have strong motivation to seek means to enhance their social well-being, or satisfying their relatedness need. The easily available means include playing online games. Playing online games could provide support for interactions with friends (Wu et al. 2018), thus satisfying relatedness need satisfaction. That is, such individuals should greatly appreciate relatedness need satisfaction by playing online games, motivating them to repeatedly play online games, or have strong loyalty (Hamari et al. 2017a).

However, individuals who do not encounter strong workplace frustration unlikely experience the strong motivation to seek to satisfy relatedness needs. Hence, such individuals unlikely emphasise the value of playing online games in satisfying relatedness need. Accordingly, such individuals would not have enhanced intention to repeatedly play, i.e., loyalty (Hamari et al. 2017a). We thus hypothesize:

H4: Workplace frustration enhances the positive link between relatedness need satisfaction and loyalty.

Figure 1 illustrates the research framework. All the hypotheses are new to the literature.

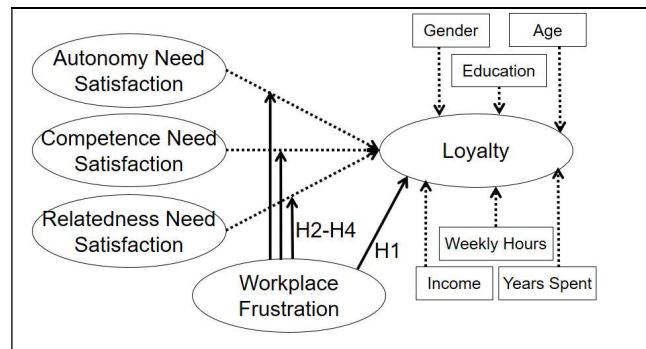


Figure 1. Modified Research Model

Note. Dotted lines indicate the non-hypothesized paths.

Methods

Sample and Data Collection Process

We will collect data through an online survey. The cover page will indicate that it is a study on personality and use of League of Legends (LoL) gamers, because LoL is one of the most popular online games (Steemit 2017). Moreover, LoL enables individual decisions in competing teams. By being team members, gamers perceive autonomy; by jointly forming effective teams, gamers perceive competence; by teamed up together, gamers perceive relatedness. In short, LoL could satisfy gamers' needs of autonomy, competence, and relatedness, justifying the suitability of surveying LoL gamers. Recruiting participants playing a single game is widely observed and acceptable in the literature (Donaldson 2017). Use of a single game would restrain the scope, warranting future research on other games.

We will invite the consented participants to rate the game, i.e., LoL, based on the study items. We plan to drop the responses that would fail to pass the attention check, provide duplicative email addresses, provide non-existing gamer accounts, and the respondent has not played the game in the recent month, to increase data validity, leaving all the rest responses for further analysis.

Measurement

We will use three items from Liao et al. (2016) to measure workplace frustration; seven items from La Guardia et al. (2000) to measure autonomy, competence, and relatedness need satisfaction; and two items from Liao and Teng (2017) to measure loyalty. We will invite each participant to provide information about their gender, age, education level, income, weekly game time, and the number of years spent playing the game.

We plan to use a five-point response option, ranging from 1 (strongly disagreeable) to 5 (strongly agreeable). We will reversely code the negatively worded items and average the scores of the items

measuring the same construct to denote the level of the construct. Therefore, a higher score will indicate a higher level of the construct. The Appendix displays all the items in this study.

Expected Results, Contributions, and Implications

We expect to observe that online gamers' satisfaction of autonomy, competence, and relatedness needs will be positively related to their loyalty to the game. Moreover, workplace frustration will strengthen the positive impact of three need satisfaction on online gamer loyalty.

Our study should be the first to introduce workplace frustration as an antecedent to online gamer loyalty. This introduction would provide novel means for e-commerce managers to promote their applications. That is, e-commerce managers may target gamers encountering workplace frustration and design their products to satisfy such gamers' three needs, enhancing their loyalty, which indicates the practical importance of our study. We will also initiate to theorize workplace frustration as a threat to one's self-identity, which evokes the self-affirmation response, supporting the theoretical contribution of our work.

The recent online gaming literature has verified various antecedents to continuance intention (or online gamer loyalty), such as relational cohesion (Huang et al. 2018), goal proximity, motivation to attain gaming goals (Teng 2017a), social presence, and avatar identification (Teng 2017b). Differing from those studies, the present one will be innovative in proposing and examining how workplace frustration and its interactions with needs satisfaction affect online gamer loyalty, indicating the present study's novelty and contribution.

We will use in our study a popular online game, i.e., LoL, the currently most popular game genre among gamers, which requires gamers to engage in role-playing. Therefore, our findings will be generalizable to other online game genres, as most game genres enable the gamers to immerse in the virtual worlds of the gaming storylines, so satisfying their psychological needs.

References

- Araújo, J., and Pestana, G. 2017. "A Framework for Social Well-Being and Skills Management at the Workplace," *International Journal of Information Management* (37:6), pp. 718-725.
- Attard, C., Mountain, G., and Romano, D. M. 2016. "Problem Solving, Confidence and Frustration When Carrying Out Familiar Tasks on Non-Familiar Mobile Devices," *Computers in Human Behavior* (61), pp. 300-312.
- Bennett, R. J., and Robinson, S. L. 2000. "Development of a Measure of Workplace Deviance," *Journal of Applied Psychology* (85:3), pp. 349-360.
- Chen, B., Vansteenkiste, M., Beyers, W., Boone, L., Deci, E. L., Van der Kaap-Deeder, J., ... and Ryan, R. M. 2015. "Basic Psychological Need Satisfaction, Need Frustration, and Need Strength Across Four Cultures," *Motivation and Emotion* (39:2), pp. 216-236.
- Cohen, J. 1992. "A Power Primer," *Psychological Bulletin* (112:1), pp. 155-159.
- Deci, E. L., and Ryan, R. M. 2000. "The "What" and "Why" of Goal Pursuits: Human Needs and the Self-Determination of Behavior," *Psychological Inquiry* (11:4), pp. 227-268.
- Dick, A. S., and Basu, K. 1994. "Customer Loyalty: Toward an Integrated Conceptual Framework," *Journal of the Academy of Marketing Science* (22:2), pp. 99-113.
- Donaldson, S. 2017. "Mechanics and Metagame: Exploring Binary Expertise in League of Legends," *Games and Culture* (12:5), pp. 426-444.
- Filieri, R., Chen, W., and Lal Dey, B. 2017. "The Importance of Enhancing, Maintaining and Saving Face in Smartphone Repurchase Intentions of Chinese Early Adopters: An Exploratory Study," *Information Technology & People* (30:3), pp. 629-652.
- Fox, S., and Spector, P. E. 1999. "A Model of Work Frustration-Aggression," *Journal of Organizational Behavior* (20:6), pp. 915-931.
- Hamari, J., Alha, K., Järvelä, S., Kivikangas, J. M., Koivisto, J., and Paavilainen, J. 2017a. "Why Do Players Buy in-Game Content? An Empirical Study on Concrete Purchase Motivations," *Computers in Human Behavior* (68), pp. 538-546.

- Hamari, J., Hanner, N., and Koivisto, J. 2017b. "Service Quality Explains Why People Use Freemium Services But Not If They Go Premium: An Empirical Study in Free-to-Play Games," *International Journal of Information Management* (37:1), pp. 1449-1459.
- Hamari, J., and Keronen, L. 2017. "Why Do People Play Games? A Meta-Analysis," *International Journal of Information Management* (37:3), pp. 125-141.
- Herodotou, C., Kambouri, M., and Winters, N. 2014. "Dispelling the Myth of the Socio-Emotionally Dissatisfied Gamer," *Computers in Human Behavior* (32), pp. 23-31.
- Huang, H.-C., Cheng, T. C. E., Huang, W.-F., and Teng, C.-I. 2018. "Who are Likely to Build Strong Online Social Networks? The Perspectives of Relational Cohesion Theory and Personality Theory," *Computers in Human Behavior* (82), pp. 111-123.
- Johnson, D., Gardner, J., and Sweetser, P. 2016. "Motivations for Videogame Play: Predictors of Time Spent Playing," *Computers in Human Behavior* (63), pp. 805-812.
- Kamboj, S., Sarmah, B., Gupta, S. and Dwivedi, Y. 2018. "Examining Branding Co-Creation in Brand Communities on Social Media: Applying the Paradigm of Stimulus-Organism-Response," *International Journal of Information Management* (39), pp. 169-185.
- La Guardia, J. G., Ryan, R. M., Couchman, C. E., and Deci, E. L. 2000. "Within-Person Variation in Security of Attachment: A Self-Determination Theory Perspective on Attachment, Need Fulfillment, and Well-Being," *Journal of Personality and Social Psychology* (79:3), pp. 367-384.
- Li, K., Nguyen, H. V., Cheng, T. C. E., and Teng, C.-I. 2018. "How Do Avatar Characteristics Affect Avatar Friendliness and Online Gamer Loyalty? Perspective of the Theory of Embodied Cognition," *Internet Research* (28:4), pp. 1103-1121.
- Liao, G.-Y., Huang, H.-C., and Teng, C.-I. 2016. "When Does Frustration Not Reduce Continuance Intention of Online Gamers? The Expectancy Disconfirmation Perspective," *Journal of Electronic Commerce Research* (17:1), pp. 65-79.
- Liao, G.-Y., and Teng, C.-I. 2017. "You Can Make it: Expectancy for Growth Increases Online Gamer Loyalty," *International Journal of Electronic Commerce* (21:3), pp. 398-423.
- Lin, C.-Y., Hung, W.-H., Fang, K., and Tu, C.-C. 2015. "Understanding Players' Achievement Values from MMORPGs: An Exploratory Study," *Internet Research* (25:5), pp. 829-851.
- Luo, M. M., and Chea, S. 2018. "Cognitive Appraisal of Incident Handling, Affects, and Post-Adoption Behaviors: A Test of Affective Events Theory," *International Journal of Information Management* (40), pp. 120-131.
- Merhi, M. I. 2016. "Towards a Framework for Online Game Adoption," *Computers in Human Behavior* (60), pp. 253-263.
- Moody, G. D., and Galletta, D. F. 2015. "Lost in Cyberspace: The Impact of Information Scent and Time Constraints on Stress, Performance, and Attitudes Online," *Journal of Management Information Systems* (32:1), pp. 192-224.
- Moon, J., Hossain, M. D., Sanders, G. L., Garrity, E. J., and Jo, S. 2013. "Player Commitment to Massively Multiplayer Online Role-Playing Games (MMORPGs): An Integrated Model," *International Journal of Electronic Commerce* (17:4), pp. 7-38.
- Olafsen, A. H., Deci, E. L., and Halvari, H. 2018. "Basic Psychological Needs and Work Motivation: A Longitudinal Test of Directionality," *Motivation and Education* (42:2), pp. 178-189.
- Plarium.com 2017. Trends in online gaming in 2017 and beyond. Retrieved from: <https://plarium.com/en/mmo-games/trends-online-gaming-2017/>. Accessed on December 6, 2018.
- Reinecke, L. 2009. "Games and Recovery: The Use of Video and Computer Games to Recuperate from Stress and Strain," *Journal of Media Psychology* (21:3), pp. 126-142.
- Ryan, R. M., and Deci, E. L. 2000. "Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being," *American Psychologist* (55:1), pp. 68-78.
- Shareef, M. A., Dwivedi, Y. K., Kumar, V., and Kumar, U. 2017. "Content Design of Advertisement for Consumer Exposure: Mobile Marketing Through Short Messaging Service," *International Journal of Information Management* (37:4), pp. 257-268.
- Sherman, D. K., and Cohen, G. L. 2006. "The Psychology of Self-Defense: Self-Affirmation Theory," *Advances in Experimental Social Psychology* (38), pp. 183-242.
- Song, J. 2018. China's mobile games market posts \$15b revenue in 2017. Retrieved from: <http://www.chinadaily.com.cn/a/201801/12/WS5a5851a0a3102c394518edcc.html>. Accessed on December 6, 2018.

- Steemit 2017. By the numbers: Most popular online games right now. Retrieved from: <https://steemit.com/gaming/@daryl/by-the-numbers-most-popular-online-games-right-now>. Accessed on December 6, 2018.
- Teng, C.-I. 2017a. "Strengthening Loyalty of Online Gamers: Goal Gradient Perspective," *International Journal of Electronic Commerce* (21:1), pp. 128-147.
- Teng, C.-I. 2017b. "Impact of Avatar Identification on Online Gamer Loyalty: Perspectives of Social Identity and Social Capital Theories," *International Journal of Information Management* (37:6), pp. 601-610.
- Teng, C.-I. 2018. "Look to the Future: Enhancing Online Gamer Loyalty from the Perspective of the Theory of Consumption Values," *Decision Support Systems* (114), pp. 49-60.
- Tseng, F.-C., Pham, T. T. L., Cheng, T. C. E., and Teng, C.-I. 2018. "Enhancing Customer Loyalty to Mobile Instant Messaging: Perspectives of Network Effect and Self-Determination Theories," *Telematics & Informatics* (35:5), pp. 1133-1143.
- Vashisht, D., and Sreejesh, S. 2017. "Effect of Nature of the Game on Ad-Persuasion in Online Gaming Context," *Internet Research* (27:1), pp. 52-73.
- Vines, J., McNaney, R., Holden, A., Poliakov, I., Wright, P., and Olivier, P. 2017. "Our Year with the Glass: Expectations, Letdowns and Ethical Dilemmas of Technology Trials with Vulnerable People," *Interacting with Computers* (29:1), pp. 27-44.
- Wu, Y., Cui, T., Liu, N., Deng, Y., and Guo, J. 2018. "Demystifying Continuous Participation in Game Applications at Social Networking Sites: A Social Playfulness Design Perspective," *Internet Research* (28:2), pp. 374-392.
- Xu, J. J., and Topi, H. 2017. "A Conceptual Model for User-System Collaboration: Enhancing Usability of Complex Information Systems," *Communications of the Association for Information Systems* (41:1), pp. 775-800.
- Yoo, C. W., Sanders, G. L., and Moon, J. 2013. "Exploring the Effect of E-WOM Participation on E-Loyalty in E-Commerce," *Decision Support Systems* (55:3), pp. 669-678.

Appendix. Study Items

Please indicate whether the following items accurately depict your feelings during gameplay of League of Legends.

	Item	Source
Loyalty	I intend to continue playing this game rather than discontinue. My intentions are to continue playing this game than other games.	Liao and Teng (2017)
Workplace Frustration	My workplace/school is too frustrating. My workplace/school is too complex. My workplace/school has jobs/tasks that are too difficult.	Liao et al. (2016)
Autonomy Need Satisfaction	When I play this game, I feel free to be who I am. When I play this game, I have a say to what happens and can voice my opinion.	La Guardia et al. (2000)
Competence Need Satisfaction	When I play this game, I feel like a competent person. When I play this game, I feel very capable and effective.	La Guardia et al. (2000)
Relatedness Need Satisfaction	When I play this game, I feel loved and cared about. When I play this game, I feel a lot of closeness and intimacy. When I am with my gaming partners, I feel a lot of distance in our relationship.*	La Guardia et al. (2000)

Note. All the items have anchors: 1 denotes "strongly disagreeable", 2 denotes "disagreeable", 3 denotes "neutral", 4 denotes "agreeable", and 5 denotes "strongly agreeable". * denotes a reversely coded item.