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Impact of online gamers' personality traits on interdependence, network convergence, and continuance intention: Perspective of social exchange theory

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ABSTRACT

Interdependence and network convergence among users characterize strong online social networks and fuel continuance intention. However, little is known about what personality traits are related to interdependence and network convergence. This study answers this question by utilizing social exchange theory to develop the hypotheses. We survey 2212 online gamers and analyse the data with structural equation modelling. We find that extraversion and openness are positively related to interdependence and network convergence, while conscientiousness is negatively related to interdependence and network convergence. Moreover, agreeableness is positively related to interdependence, while neuroticism is negatively related to interdependence. Finally, both interdependence and network convergence are positively related to continuance intention. This study is the first to examine how personality traits are related to interdependence and network convergence, which fuel continuance intention of online gamers.

1. Introduction

Online games provide managers with various sources of revenues, including advertising, subscription, and selling digital items, generating global revenues of US$99.6 billion in 2016 (NewZoo, 2016), establishing that online games are important electronic commerce platforms. Moreover, it was reported that one online game provider collected a quarterly revenue of US$1.9 billion in 2015 (Osawa, 2015), warranting research on successful online games.

One potential reason for explaining online game success is the gaming communities, as supported by the link between social influence and continuance intention (or loyalty) (Chang, Liu, & Chen, 2014). Moreover, online gamers' community activities could be predictive of their spending (Kaptein, Parvinen, & Pöyry, 2015). Furthermore, gamers' communities help create online gamer loyalty (Teng & Chen, 2014), indicating that community issues are important for determining continuance intention of online gamers.

The pertinent literature (i.e., Teng, 2015) has indicated that online gaming communities have two important features, i.e., interdependence (the degree to which individuals depend on partners' opinions to make decisions) and network convergence (the degree to which individuals share friends with their partners). Specifically, need for affiliation, altruism, and social intelligence are associated with interdependence and network convergence among online gamers (Teng, 2015), while interdependence is related to online gamer loyalty (Teng, Chen, Chen, & Li, 2012). Moreover, personality traits are important in predicting gaming behaviour, e.g., predicting gaming addiction (Huh & Bowman, 2008). However, no studies have examined whether and how personality traits are related to interdependence and network convergence among online gamers, and the latter two constructs' links to gamers' continuance intention, leaving a research gap. Research filling this gap is new to online gaming studies by initiating to use personality traits to explain the formulation of gaming communities. Moreover, research filling this gap could help identify potential target populations who actively participate in gaming communities, providing novel means for creating strong gaming communities, and encouraging gamers' continuance intention and stabilizing game providers' revenues. If the gap is not filled, users' personality traits may not be

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effectively used as novel sources for creating game providers' revenues, incurring opportunity costs. Therefore, research filling this gap is academically unique and practically relevant.

In addition to identifying and filling an existing research gap, this study follows the suggestion of Alvesson and Sandberg (2011) to engage in problematization. Specifically, we identify that social exchange theory has an implicit assumption that reciprocity occurs among exchanges for all individuals, i.e., personality traits may not play a major role. However, we challenge this assumption and provide an alternative explanation, i.e., personality traits strongly influence the reciprocity of exchanges, so creating virtual communities (in terms of interdependence and network convergence herein).

Therefore, the purpose of this study is to examine what personality traits are related to interdependence and network convergence among online gamers and their continuance intention. Online communities involve intensive interpersonal exchanges that can be well explained by social exchange theory (e.g., Yan, Wang, Chen, & Zhan, 2016). Therefore, we adopt this theory for developing the research framework and hypotheses.

Compared with the pertinent literature, our study makes several contributions. First, recent studies have summarized reasons for playing online games, including enjoyment, usefulness (Hamari & Keronen, 2017), and service quality (Hamari, Hanner, & Koivisto, 2017). Moreover, reasons for playing online games can be categorized as hedonic, utilitarian, and social (Hamari & Koivisto, 2015). Our work is consistent with these recent studies in exploring the potential reasons for playing. However, our study is new in further exploring whether personality traits can be the origins for social activities in online games. Our findings will provide managers with further insights on the retention and conversion of online gamers.

Second, Worth and Book (2015) found that personality traits are associated with online gaming behaviour, including helping and aggressing, supporting that personality traits among online gamers are important in determining gamers' behaviour in virtual communities. Our study joins in the efforts examining the impact of online gamers' personality traits. However, our work is new in proposing and examining the impact of personality traits on two key features of virtual communities, i.e., interdependence and network convergence, and subsequently on gamers' continuance intention.

Third, Yan et al. (2016) used social exchange theory to explain *knowledge sharing* behaviour in online *health* communities. Also using social exchange theory to explain user behaviour in online communities, our study is new in explaining *social networking* behaviour in online *gaming* communities. The initiative of our study supports the usefulness of social exchange theory in explaining user behaviour across online platforms. Moreover, our work adds novel knowledge by examining the likelihood and the extent that social exchange theory may depend on the users' personality.

2. Theoretical background

2.1. Social exchange theory

Social exchanges refer to actions that are contingent and rewarding to the recipients (Blau, 1964). Such actions have been widely explained by the social exchange theory, which is one of the most influential theories in management (Cropanzano & Mitchell, 2005). Social exchange theory has been used to explain how perceived responsiveness leads to adoption of customer relationship management systems (Gefen & Ridings, 2002), why students add their faculty as Facebook friends (Sheldon, 2015), and why individuals tweet and retweet (O'Leary, 2016). In other words, social exchange theory can explain a wide array of user behaviour regarding information systems.

Social exchange theory posits that individuals exchange resources with one another owing to the expectation of receiving something in return, or so-called reciprocity (Emerson, 1976). Reciprocity is influential in motivating users to engage in group behaviour (e.g., group buying) in interdependent relationships (Shiau & Luo, 2012). Social exchange theory posits that social exchanges typically exist in *interdependent* relationships where outcomes depend on a combination of the involved parties' efforts (Cropanzano & Mitchell, 2005), i.e., individuals could obtain the maximum return if they consult one another before making the decisions. The tendency to consult one another for making decisions is defined as interdependence (Parks & Floyd, 1996), justifying our choice to include interdependence in our model. Moreover, social exchange theory has been applied to explain why individuals seek work advice and how individuals make networking decisions (Porath, Gerbasi, & Schorch, 2015; Porter & Woo, 2015), further justifying our choice to include interdependence in our framework.

Social exchange theory has been used to explain the impact of reputation enhancement concern in knowledge sharing in online health communities (Yan et al., 2016). The mechanism underlying such impact should be third-party influence, which is related to engaging in actions that benefit others, i.e., social exchanges (Bowler & Brass, 2006). That is, shared friends can act as third parties and thus enhance social exchanges. The extent to which individuals have shared friends is defined as network convergence (Parks & Floyd, 1996), indicating that network convergence facilitates social exchanges. Moreover, social exchange theory posits that parties contribute to a common (or shared) pool of benefits and take what they want when they need (Cropanzano & Mitchell, 2005). In online games, gamers can strongly impact the enjoyment obtained by other gamers, making gamers themselves as valuable sources of benefits. That is, introducing valuable gamers to friends should be a means of contributing benefits to a common pool, increasing the overlap of gamers' friends, justifying our choice of including network convergence in our model.

2.2. Interdependence and network convergence

Among issues regarding online gaming studies, interdependence and network convergence have been identified as important for fuelling virtual communities in online games (Teng, 2015; Tseng et al., 2015). The reason may be that interdependence measures how strong online gamers are connected and network convergence measures how much online gamers share their friends, assessing two important aspects of virtual communities.

Interdependence is defined as the degree to which individuals depend on partners' opinions to make decisions (Parks & Floyd, 1996). Interdependence has been applied for explaining how task interdependence reduces the effectiveness of the forced ranking system on job performance (Moon, Scullen, & Latham, 2016). When applied to online gaming, interdependence results in online gamer loyalty (Teng et al., 2012), suggesting that interdependence among online gamers likely has various gamer-specific sources. Among gamer-specific characteristics, personality traits have been recognized as influential in gaming behaviour (Huh & Bowman, 2008). However, no investigation has been performed to examine the link between personality traits and these two features, i.e., interdependence and network convergence, warranting research on this issue.

Network convergence is defined as the degree to which individuals share friends with their partners (Parks & Floyd, 1996). Therefore, network convergence may describe overlap of friendship networks among online gamers. In gaming studies, network convergence has been used for describing the overlap between gaming and gambling industries, i.e., at the industry level (Gainsbury, Russell, King, Delfabbro, & Hing, 2016), but not at the individual level. The studies at the individual level indicate that network convergence contributes to online gamers' loyalty (or continuance intention) (Teng, Huang, & Chen, 2015), while the mediators may be sense of community and relational switching cost (Tseng et al., 2015). The reason may be the link between investment size and online gamers' commitment (Uysal, 2016).