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The influences of psychological sense of brand community on mobile game loyalty: a case study research

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Abstract:
This thesis contributes to Carlson et al.'s (2008) findings on a brand-based community and its psychological aspects. The research aimed to investigate the influences of psychological sense of brand community (PSBC) on mobile game loyalty. Particularly, it attempted to, first, look at sense of brand community from the social identity viewpoint, and second, explore the influence of PSBC on game loyalty as well as the role PSBC plays in the satisfaction–loyalty relationship. The relevant studies from journals, books and internet sources were reviewed to form the theoretical framework and develop the hypotheses. A web-survey for mobile game players was conducted during 1 week in October 2016 with 192 usable responses collected. Each participant was asked to answer 15 questions on the Likert-scales to measure PSBC, game satisfaction and game loyalty. The measurements were adapted from previous related studies. Structural equation modeling (SEM) was used to assess the hypothesized relationships. The analysis was conducted in R environment, using mainly package 'lavaan'. The findings showed that PSBC directly contributes to players' loyalty regardless of the presence of their social interaction with one another. Mobile game satisfaction is still a more critical factor influencing loyalty, although PSBC is found to positively mediate the effect of game satisfaction on loyalty. The results also revealed that mobile game players care about the services provided by the gaming vendor, the ability the vendor handles opportunistic gaming behavior, and the account administration. To conclude this thesis, several recommendations for future PSBC-interest studies were given.

Keywords:	Psychological sense of brand community, brand loyalty, game satisfaction, marketing, mobile games, SEM
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LIST OF ABBREVIATIONS (OR) SYMBOLS

ANOVA   Analysis of variance

AVE   Average variance extracted

CFA   Confirmatory factor analysis

CFI   Comparative fit index

EFA   Exploratory factor analysis

e.g.,   "For example,"

i.e.,   "That is,"

LOY   Brand loyalty

PBC   Psychological brand communities

PSBC   Psychological sense of brand community

RMSEA   Root mean square error of approximation

SEM   Structural equation modeling

SAT   User satisfaction

SAT-LOY   Satisfaction–loyalty relationship

SBC   Social brand communities

SRMR   Standardized root mean square residual

TLI   Tucker-Lewis index

WTR   Willingness to recommend

1 INTRODUCTION

1.1 Research background

In the brand community literature, brand communities are widely viewed as "social networks of brand users in which individuals acknowledge their membership in groups of like-minded brand admirers" (Carlson et al., 2008, p.284). Accordingly, a *sense of brand community* has typically been defined upon brand users' social interaction experiences.

Carlson (2005) studied a sense of brand community under the social identity perspective. He found that a sense of brand community is not an outcome of social interactions between brand users. Instead, the appearance of a sense of brand community is driven by 2 psychological factors: identification with the brand and/or identification with the group. To emphasize on this psychological nature of a *sense of brand community*, Carlson et al. (2008) proposed another terminology for this perceived feeling: *psychological sense of brand community* (PSBC). PSBC is defined as "the degree to which an individual perceives relational bonds with other brand users" (Carlson et al., 2008, p.286), on the social identity theory premise.

Claiming that the existence of PSBC does not rely on the presence of interaction, Carlson et al. (2008) also suggested classifying brand communities into 2 types: social brand communities (SBC), and psychological brand communities (PBC). SBC represent brand communities in the "classic" literature, where participants acknowledge their membership and engage in some form of interaction with one another (e.g., Harley-Davidson owners' groups[1] and Starbuck consumer communities[2]). In contrast, PBC are unbound groups of brand users who have not interacted with one another but still perceive a PSBC. Intuitively, PBC do not necessary possess all the characteristics of SBC, yet both of them are found to have in common a PSBC and several

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[1] Harley-davidson.com. (2016). *Harley Owners Group® | Harley-Davidson USA*. [online] Available at: http://www.harley-davidson.com/content/h-d/en_US/home/owners/hog.html [Accessed 29 Sep. 2016].
[2] Starbucks Coffee Company. (2016). *Online Community*. [online] Available at: http://www.starbucks.com/coffeehouse/community [Accessed 29 Sep. 2016].

expressions of attitudinal brand loyalty (e.g., brand preference, willingness to attend brand events, word-of-mouth promotion and celebrating brand history) (Carlson et al., 2008).

Besides Carlson et al. (2008), many other studies have also acknowledged that a brand community is at first "imagined" (for example Anderson, 1983), and that a user can feel belonging to this "imagined" community without interacting with other like-minded users (for example Muniz and O'Guinn, 2001). However for many years, examination of a sense of brand community has been restricted to bound brand communities with some levels of social interaction. The fact that little research has considered the psychological aspect in its studies leaves room for improved investigations on brand communities in general, and a sense of brand community in particular. The knowledge needs to be expanded and encompass a broader range of brand communities. Moreover, a thorough search through the online game literature found almost no study on the PSBC's impacts on brand loyalty, or on PSBC alone.

1.2 Research aim and questions

This Bachelor thesis attempts to look at sense of brand community from the social identity viewpoint, and thus Carlson et al.'s (2008) proposed concept of PSBC and the unidimensional measure of PSBC were adopted. The PSBC measure is applicable in both SBC and PBC so it allows examining more diverse groups of brand users. The thesis aims to explore (1) the influence of PSBC on loyalty, and (2) the role PSBC plays in the satisfaction–loyalty relationship, specifically in the context of mobile games.

The research questions were:

Q1: Does a mobile game player's PSBC affect his loyalty to the game?

Q2. What role does PSBC play in the relationship between mobile game satisfaction and loyalty?

1.3 Research design

To address these questions, the quantitative method was applied. Primary data on mobile game players' PSBC, satisfaction and loyalty to the game were collected with an online self-administered survey. The scales were adapted from the previous related studies, particularly from Carlson (2005) for PSBC, Reichheld (2003) for brand loyalty, and Lu and Wang (2008) for mobile game satisfaction. The collected data were then analyzed with the structural equation modeling (SEM) technique. The analysis was conducted in R environment using mainly package 'lavaan'. Mobile game Pokémon GO was selected as a case study for this research.

1.4 Organization of the thesis

This thesis is organized in 7 chapters. A brief background regarding a sense of brand community and its psychological nature was addressed, followed by the research aims, questions and research design in this chapter 1. Chapter 2 both reviews the relevant literature and develops the hypotheses. The statements of hypothesis are put together in chapter 3, before proceeding to the research method in chapter 4. The data analysis procedure and research results are presented in chapter 5. Chapter 6 discusses the findings and limitations. Finally, chapter 7 concludes the thesis with several suggestions for future PSBC-interest studies.

2 LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

This section develops the hypotheses as well as reviewing the relevant studies on brand loyalty, satisfaction and PSBC. The theoretical framework for hypothesis development is established primarily on:

- Carlson et al.'s (2008) and Carlson's (2005) findings on a brand-based community and its psychological aspects,
- Solomon et al.'s (2013) brand community theories,
- The work on brand loyalty by Rundle-Thiele and Bennett (2001), Chaudhuri and Holbrook (2001) and Oliver (1999),

- Reichheld's (2003) 'willingness to recommend' metric, and
- The study on online game satisfaction by Lu and Wang (2008).

2.1 Brand loyalty

2.1.1 Definitions

First proposed by Jacoby (1971), the composite definition of brand loyalty has been the most popular brand loyalty definition in the marketing literature (Rundle-Thiele and Bennett, 2001). The composite definition considers that brand loyalty consists of consumers' repeat purchase, favorable attitudes and intentions (Berkowitz, Jacoby and Chestnut, 1978). Many researchers (e.g., Rundle-Thiele and Bennett, 2001, and Dick and Basu, 1994) took the composite approach and further described "true brand loyalty" as 1 construct of 2 dimensions: attitudinal loyalty and behavioral loyalty.

Some other researchers (e.g., Oliver, 1999) suggested that loyalty evolves in 4 sequential stages, namely cognition, affect, conation and action. Loyalty, in that way, should be viewed as a continuum of varying intensities. According to Oliver's (1999) definition, loyalty is "a deeply held commitment to rebuy or re-patronize a preferred product/service consistently in the future, thereby causing repetitive same-brand or same brand-set purchasing, despite situational influences and marketing efforts having the potential to cause switching behavior" (Oliver, 1999, p.34).

In 2001, Chaudhuri and Holbrook attempted to incorporate both the composite concept and the hierarchical concept of loyalty. They claimed that Oliver's (1999) definition of brand loyalty indeed emphasizes the 2 aspects of brand loyalty i.e., behavioral and attitudinal. Behavioral loyalty is defined as "the willingness of the average consumer to repurchase the brand", and attitudinal loyalty is "the level of commitment of the average consumer toward the "brand" (Chaudhuri and Holbrook, 2001, p.83). Lu and Wang (2008) adopted Chaudhuri and Holbrook's (2001) perspective to define online game loyalty.[3] Because a mobile game is a type of online games, this

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[3] See more in (Lu and Wang, 2008, p.504).

thesis adapts Lu and Wang's (2008) definition to define mobile game loyalty. Mobile game loyalty is then "the degree to which players have a favorable attitude or preference for a specific *mobile game* and intend to continue playing it."

2.1.2 Loyalty measurement: a lack of agreement

In the stream of research on composite loyalty, "ideally, all brand loyalty research should incorporate both attitudinal and behavioral measures" (Rundle-Thiele and Bennett, 2001, p.11) in predicting loyalty and its desirable outcomes, for examples: immunity to competitive communications and retention, positive word-of-mouth and referrals (Bennett and Bove, 2002, and Rundle-Thiele and Bennett, 2001).

In an attempt to seek the loyalty measures which have been most supported in the marketing and online game literature, the search found a lack of agreement in definitions, measurement approaches, and as a result, measures of brand loyalty. In fact, Bennett and Rundle-Thiele (2001) explained this inconsistency by the complexity of the brand loyalty concept itself, the limited resources in research, and the diversity in the very nature of market types. For these reasons, they believed that there would be no sole loyalty measure, but instead "a number of appropriate measures which are context specific" (p.3). In other words, "it is more likely that the characteristics of the product and market drive and shape brand loyalty" (p.3) so theorists and practitioners should identify the market type they are operating in, and base on that to consider appropriate measures. Therefore, table A1 in Appendix A summarizes the common loyalty measures used in recent online game research and related research.

While it may be true that there is no "a cure-all panacea"[4] and it depends on certain situation to adopt or develop a suitable measure, there is still a management need for timely and effective loyalty measuring instruments across industries (Reichheld, 2013).

Furthermore, a closer look at the tables A1, A2 and A3 in Appendix A suggests 2 points. First, like Bennett and Rundle-Thiele's (2001) opinion, the researchers in different industries have taken

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[4] (Rundle-Thiele and Bennett, 2001, p.3).

different approaches and developed different measuring scales for their loyalty studies. Second, despite all that, "willingness to recommend" may be the most common item used in the loyalty measures. "Willingness to recommend" measures have also been demonstrated to tightly correlate to company profits and growth in Reichheld (2003). He argued, "willingness to promote […] is a strong indicator of loyalty and growth, because when consumers recommend [a brand], they are putting their reputation on the line. And they will take that risk only if they are intensely loyal".

2.1.3 Willingness to recommend (WTR) metric

Reichheld (2003) demonstrated that willingness to recommend a brand to others is the strongest sign of brand loyalty and a good growth predictor in most industries. In his research (2003), 14 case studies were built on the data from 4000 consumers across 6 industries as: auto insurance, cable and telephony, e-commerce, financial services, Internet service providers and personal computers. Analytical results showed WTR had the strongest statistical correlation with repeat purchases, referrals and ultimate growth. More precisely, *"How likely is it that you would recommend [company X] to a friend or colleague?"* scored the first or second in 11 cases studies. In 2 out of the 3 other cases, WTR ranked third, which the author argued, was "so close behind the top 2 predictors that the surveys would be nearly as accurate by relying on the results of this single question [i.e., WTR]" (Reichheld, 2003, p.6). Yet in those industries where supply is controlled by monopolists or near monopolists, WTR metric is not applicable because the consumers have limited choices. In short, WTR metric can be used in most industries to assess loyalty and predict growth (Reichheld, 2003). As a simple tool to get arguably reliable and timely data to predict revenue growth as well as gauging loyalty, Reichheld's WTR method has been widely used by many big companies since its introduction, including Uber[5] and more than two thirds of Fortune 1000 companies (Bloomberg,.com, 2016).

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[5] "Uber". *View.et.uber.com*. N.p., 2016. Web. 16 Sept. 2016.

To dive deeper into this method, WTR is measured on an 11-point (0-10) rating scale in which 10 implies "extremely likely to recommend", 5 is neutral, and 0 means "not at all likely to recommend". Based on the scores, 3 clusters of consumers are sorted, namely:

- "Detractors" (0-6 rating) who are extremely unlikely to recommend,
- "Passively satisfied" (7-8 rating), and
- "Promoters" who give ratings of 9-10 to the question (extremely likely to recommend). This cluster also has the highest rates of repeat purchase and referral.

Figure 1 below summarizes Reichheld's WTR method.

Extremely unlikely							Neutral		Extremely likely	
0	1	2	3	4	5	6	7	8	9	10
		Detractor					*Passive*		*Promoter*	

Figure 1. A summary of Reichheld's (2003) WTR method

For practitioners, the outcome of this categorization suggests that one of the goals to grow - in numbers of loyal consumers and revenue - is to increase the number of promoters. This goal can be achieved in many ways, for instance by converting current passively satisfied users to promoters.

However, it is worth noting that the method only focuses on the most enthusiastic responses (i.e., promoters) of consumers to determine customers' loyalty to a brand. Even further, it bases on 1 single metric (which is attitudinal): *"How likely is it that you would recommend [company X] to a friend or colleague?"*.

Since it first appeared in the academic literature in the 40s (Rundle-Thiele, 2005), the loyalty concept has revealed itself a complicated multi-dimensional construct and enjoyed a great deal of debates. Meanwhile, the WTR method has challenged the importance of almost all other loyalty predictors, and even further, simplified the measurement down to 1 question. The disruption certainly sparked doubts - whether companies should establish their marketing and growth

strategies relying solely on 1 customer survey question.[6] It has been recommended that a loyalty measure should still comprise multiple predicting factors for better reliability.

With that suggestion in mind, an issue then was to find the other factors that could actually complement the WTR scale in measuring loyalty. Investigating Reichheld's (2003) study more carefully, there are 2 other top-ranked questions found effective in assessing loyalty in certain industries yet under-discussed. They are *"How strongly do you agree that [company X] deserves your loyalty?"* and *"How likely is it that you will continue to purchase products/services from [company X]?"*. Thus, altogether 3 top questions discovered in Reichheld (2003) were adapted to measure game player loyalty in this thesis.

2.2 Satisfaction and loyalty

"Satisfaction is defined as pleasurable fulfillment. Satisfaction is the consumer's sense that consumption provides outcomes against a standard of pleasure versus displeasure" (Oliver, 1999, p.34). In Lu and Wang (2008), satisfaction in the context of online games reflects players' "cumulative evaluation of the fulfillment provided by the specific online gaming vendor" (p.505).

Many researchers (e.g., Oliver, 1999, Zeithaml et al., 1996, and Lu and Wang, 2008) have agreed that satisfaction is the key to achieving consumers' loyalty. In that manner, the ACSI and the ECSI – the 2 most popular conventional customer satisfaction measures – have been widely used to predict brand loyalty in both academic and management. The ACSI (American Customer Satisfaction Index) was started in 1994 with the primary goal to provide information on consumer satisfaction with the quality of services and products offered to the markets. In the ACSI model, the drivers of customer satisfaction are customer expectations, perceived quality, and perceived value. The outcomes of consumer satisfaction are customer loyalty and customer complaints (Theacsi.org, 2016). The ECSI (European Customer Satisfaction Index) is a variation of the ACSI. There are some differences between the two, for instance customer complaints variable is

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[6] For examples, see more in the white papers Why, R.K.M. (2008). What Drives Loyalty?, and Burke (2008). The "Net Net" on the Net Promoter Score. PUB No. 0701.

eliminated in the ECSI. Yet, the constructs of customer satisfaction antecedents (i.e., customer expectations, perceived quality and perceived value), customer satisfaction, and customer loyalty remain modeled the same (Haaften, 2016). In both models, the fundamental relationship is increased satisfaction leading to increased loyalty.

However, much statistical evidence has revealed a loose cause–effect relationship between satisfaction and loyalty. Many researchers have addressed that mere satisfaction does not necessarily lead to loyalty and thus for measuring loyalty, satisfaction is not a reliable indicator. "Merely satisfying customers that have the freedom to make choices is not enough to keep them loyal" (Jones and Sasser Jr., 1995, p.91). Or as Stewart (1997, p.112) commented: "satisfaction and loyalty move in tandem is simply incorrect". Reichheld (1996) implied that measuring consumers' loyalty via their satisfaction is "the satisfaction trap"[7]. A review of Reichheld's papers and books on brand loyalty from 1996 till now also shows that he has consistently suggested abandoning customer satisfaction measures completely because they are "the wrong yardsticks"[8] of loyalty and growth. Oliver (1999, p.33) mentioned one of Reichheld's (1996) prominent illustrations: "in the automobile industry, in which 85% to 95% of customers report that they are satisfied, only 30% to 40% return to the previous make or model".

The satisfaction–loyalty relationship is likely to be moderated by many factors, thus varies under different conditions. For example, addiction to an online game can influence the impact of a player's satisfaction on his loyalty (Lu and Wang, 2008). To be more precise, "when a player becomes dependent on an online game, playing online game becomes more compulsive than volitional" (Lu and Wang, 2008, p.512), as a result, he could still be loyal to that game even when dissatisfied. Furthermore, the satisfaction–loyalty relationship can be different in different competition environments, according to Jones and Sasser Jr. (1995). In the markets where monopoly or near monopoly dominate, such as the local telephone industry, consumers remain (behaviorally) loyal despite their dissatisfaction. Whereas, in the markets where competition is

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[7] (Reichheld, 1996). Retrieved from https://hbr.org/1996/03/learning-from-customer-defections [Accessed 27 Sep. 2016].

[8] (Reichheld, 2003). Retrieved from https://hbr.org/2003/12/the-one-number-you-need-to-grow [Accessed 27 Sep. 2016].

tough like the automobile industry, a slight decrease in satisfaction can cause a significant decrease in loyalty. Appendix B demonstrates the effect of competitive environment on the satisfaction–loyalty relationship.

Particularly in the mobile context, nevertheless, the influence of satisfaction on loyalty is noticeable despite mediating factors. Regardless of the negative impact of addiction on the satisfaction–loyalty relationship, Lu and Wang (2008) identified satisfaction as the most prominent factor influencing loyalty in online games. Lin and Wang (2006) also found user satisfaction significantly influenced brand loyalty in mobile commerce.

In conclusion, satisfaction on one hand has been demonstrated being loosely associated with loyalty in many industries. On the other hand, its deep effect on loyalty has been shown in the mobile context. Oliver (1999) also argued that "satisfaction is a core concept of loyalty, without which loyalty cannot exist, and that it anchors loyalty" (p.34). Putting these previous findings together suggests a worthy examination of the satisfaction–loyalty relationship in this thesis. Hypothesis 1 is proposed as follows.

H1: In mobile games, players' satisfaction is positively associated with their loyalty.

2.3 Psychological sense of brand community (PSBC)

2.3.1 Brand community

Mentioned in various literature, a healthy community of consumers around a brand can make the brand more successful, so building such communities is something that relationship marketing[9] strives for (Carlson, 2005). Muniz and O'Guinn (2001) made the first attempt to propose the formal definition of brand community, in which a brand community is "a specialized, non-geographically bound community, based on a structured set of social relations among admirers of a brand" (p.412). In general, one often thinks of a brand community as "a set of consumers who share a set of social

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[9] Relationship marketing refers to "all marketing activities directed toward establishing, developing, and maintaining successful relational exchanges" (Morgan and Hunt, 1994, p.22).

relationships based on usage or interest in a product" (Solomon et al., 2013, p.322). Also, according to Solomon et al. (2013), whether in physical or virtual world, the central characteristic of all brand communities is that members experience a feeling of membership, a perceived sense of proximity to one another, and some interests in the community's activities.

A brand community that is built upon the interactions between members can be consumer-generated (i.e., organic) or marketer-driven. An organic community is not affiliated with the focal brand. It often forms when proactive consumers take initiatives to create events, clubs, forums, blogs, fan pages on social networks and so on in order to identify like-minded brand admirers, spread the buzz, share information about the brand, discuss with other consumers and enthusiasts, or feed the fandom world (Marfisi, 2015, Solomon et al., 2013, and Carlson, 2005). Two good examples are the websites r-bloggers.com dedicated to R users, and lugnet.com for Lego fans. Organic brand communities can also form as consumers come together for certain activities related to the brand (e.g., Running Room Clinic) or when consumers unite only by their disdain for the brand (i.e., anti-brand communities) (Solomon et al., 2013).

Meanwhile, the companies who understand the power of brand communities find ways to create communities of their users. In the virtual world, some examples are Lululemon's interactive blog site[10], Sony's PlayStation community[11], and H&R Block's "Get Answer" element on their website[12]. In the physical world, Harley-Davidson owners' groups stand out as some of the exceptional marketer-driven brand communities. Their traditional brandfest Million Mile Monday is organized every year for Harley owners to ride together. The 1-day event brings thousands of Harley owners from around the world together to celebrate the joy and freedom of motorcycle riding experience. These marketing activities construct the community of enthusiastic users by nurturing their bond with the fellow enthusiasts, and with the brand (Solomon et al., 2013).

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[10] blog.eu.lululemon.com. (2013). *yoga, running, goal setting & a healthy dose of inspiration | lululemon athletica*. [online] Available at: http://blog.eu.lululemon.com/ [Accessed 29 Sep. 2016].

[11] Community.eu.playstation.com. (n.d.). *English Forums - PlayStation Forum*. [online] Available at: http://community.eu.playstation.com/ [Accessed 27 Sep. 2016].

[12] Hrblock.com. (n.d.). *Tax Preparation Services Company*. [online] Available at: https://www.hrblock.com/ [Accessed 29 Sep. 2016].

Because a brand community facilitates conversations between its consumers, it can indeed make or break the brand. A positive recommendation from a real user is more reliable than recommendations got through marketing channels, and a negative user review is weighted much heavier than positive reviews are (Solomon et al., 2013). So for this reason, unfavorable opinions on the brand may not be displayed in marketer-driven brand communities. In online communities for instance, companies can use their admin power to remove or block these kinds of content depending on their community policy (Jang, Olfman, Ko, Koh, and Kim, 2008). However, the fact that a company can censor some content in certain communities does not necessarily help it appear better in public. This thesis does not focus on the negative happenings in game communities yet. It is instead concerned with the players' positive feelings and behavior towards the game, i.e., their PSBC and brand loyalty.

2.3.2 Psychological sense of brand community (PSBC)

As reviewed in the preceding section 2.3.1, much of marketing research has focused on investigating the brand communities where members have considerable levels of interaction, and they are often geographically close to each other (even in just short periods of time like Harley-Davidson's brandfests). As Solomon et al. (2013, p.342) commented, "after all, communities are social!".

These studies actually offer insight into how social interaction impacts both the focal brand (e.g., brand loyalty, brand commitment, word-of-mouth and new customers coming[13]), and the community members (e.g., their sense of community and positive self-esteem[14]). However, reliance upon brand users' interaction to explain the existence of a sense of brand community leaves other situations to be explored. Particularly, there are situations where a Brand X user already acknowledges the existence of the Brand X community and feels belonging to that group, even though he has never come to interact with any other Brand X user. Or as Muniz and O'Guinn (2001, p.419) put it, a Brand X user gets that "there are other members of the community, just like [him], in other faraway places". That is to say, the research that is built upon the premise "brand

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[13] (Solomon et al., 2013; Carlson et al., 2008).
[14] (Solomon et al., 2013).

communities are, after all, social" fails to explain the sense of brand community beyond the social networks of brand admirers.

Stepping away from the "classic" approach[15], Carlson et al. (2008) studied a sense of brand community from the perspective of the social identity theory[16]. Their research demonstrates that a brand user can indeed perceive a sense of brand community no matter if he engages in social interaction with other users or not. Moreover, a sense of brand community is psychological in essence. Consumers feel a sense of brand community because they (1) identify with a particular brand and/ or (2) identify with the group of others who also purchase or use that brand. In this explanation, identification refers to "the perceived overlap between an individual's self-definition and the identity of the focal object (brand or group)" (Carlson, 2005, p.19). In other words, a consumer identifies with the brand (the group) when he perceives the overlap between his own identity and the identity of the brand[17] (the identity of the brand's users). As the overlap becomes greater, so does his identification with the brand (the group). Figure 2 illustrates a sense of brand community driven by its 2 psychological factors (Carlson et al., 2008).
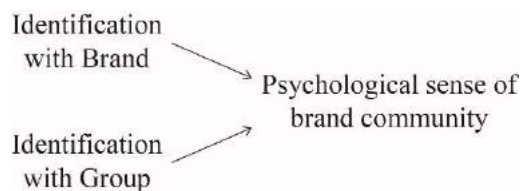
Figure 2. Antecedents of a psychological sense of brand community (Carlson et al., 2008)

To emphasize on the psychological nature of a *sense of brand community*, Carlson et al. (2008) proposed another terminology for this perceived feeling: *psychological sense of brand community*

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[15] meaning the approach that is restricted to the brand communities defined by social interaction

[16] "Social identity theory posits that individuals make sense of the world by categorizing themselves and others into groups […]. Such group-based identities require no direct interaction between group members […]; one must only perceive oneness with the group" (Carlson, 2005, p.5). As such, acknowledging membership in a collective group of the like-minded is psychological in nature. The degree to which an individual perceives membership in this kind of group is the *psychological sense of community*, or sense of belongingness (Carlson, 2005).

[17] "The brand identity represents what the brand aspires to be in the mind of the consumer. […]. Brand identity is exhibited when a consumer recognizes a brand and knows what the brand represents." (Carlson, 2005, p.37)

(PSBC). PSBC is defined as "the degree to which an individual perceives relational bonds with other brand users" (Carlson et al., 2008, p.286).

In "classic" brand community studies, brand communities are viewed as the social communities where members acknowledge their membership and have some level of interaction. However, a brand user can still perceive a sense of brand community when he does not interact with other users at all (That is, the appearance of his sense of brand community does not rely on the presence of his social interaction). For that result, Carlson et al. (2008) classified brand communities into 2 types: psychological and social in nature. Type 1 is social brand communities (SBC) – representing the "classic" brand communities in the brand community literature. In SBC, identification with the group has greater impact on PSBC than identification with the brand does. Type 2 is psychological brand communities (PBC). PBC are "unbound group[s] of brand admirers, who perceive a sense of community with other brand admirers, in the absence of social interaction" (p.285). Thus by definition, PBC do not fit into the viewpoints on "classic" brand communities. They are communities "that exists in the mind of the individual" (p.287). The case Snap-on Tools illustrated by Carlson (2005, p.22) perhaps best exemplifies PBC. "Auto technicians who use Snap-On Tools often feel a sense of community with other auto technicians who use Snap-On Tools (Hill & Rifkin 1999). In most cases, the auto technicians who use Snap-On Tools never come into direct contact with the other loyal users of the brand, yet they readily acknowledge the existence of a group of Snap-On users, as well as their own membership in the group". In PBC, identification with the brand drives PSBC because members have no connection with each other and the brand now becomes the rallying point.

While PBC and SBC are distinct in the presence of social interaction, they have in common the existence of PSBC. Moreover, PSBC also leads to brand commitment in both types of brand communities (Carlson, 2005). In the game playing context, this implies that PSBC and brand commitment can be perceived by those players who have not engaged in any form of interaction with other players of the game.

Many previous studies have acknowledged that a brand community is first of all "imagined" (e.g., Anderson, 1983), and that an individual can feel he belongs to this "imagined" community without

interacting with any like-minded brand users (e.g., Muniz and O'Guinn, 2001, and Carlson et al., 2008). Yet little research has considered this psychological aspect in its studies, and almost no research has been found examines it in the context of mobile games. This thesis attempts to look at the sense of brand community from the social identity viewpoints, and investigate its relationships with loyalty among mobile game players. Carlson et al.'s (2008) definition of PSBC, and Carlson's (2005) measure of PSBC were adopted. The PSBC measure is applicable in both SBC and PBC, meaning it allows investigating a sense of brand community in more expansive user groups. Hereafter, the term "brand community" means "a perceived social bond that exists among a collective group of users of a brand" (Carlson, 2005, p.45) which is based on the social identity theory, rather than just referring to SBC like in the "classic" brand community studies. The term PSBC refers to "the degree to which an individual perceives relational bonds with other brand users" (Carlson et al., 2008, p.286), which reveals itself in both SBC and PBC.

2.3.3 Psychological sense of brand community and loyalty

Firstly, in both types of brand communities, PSBC positively affects brand commitment (Carlson, 2005). Important to realize in this research Carlson deliberately used "brand commitment" in reference to "attitudinal loyalty"[18]. Also as reviewed prior, attitudinal loyalty together with behavioral loyalty are 2 dimensions of the one construct "true loyalty". Furthermore, Bandyopadhyay and Martell (2007) empirically demonstrated attitudinal loyalty influences behavioral loyalty. Putting all this knowledge together suggests a plausible assumption that PSBC positively influences "true loyalty". In other words, the stronger the PSBC, the higher the game loyalty. Therefore, the following hypothesis is proposed.

H2: Players' perceived PSBC is positively associated with their loyalty to the game.

Secondly, engaging more in social interaction can lead to stronger feelings of PSBC (Carlson et al., 2008). The association between interaction and PSBC is intuitive, as when consumers interact,

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[18] See more in (Carlson, 2005, pp.38-40).

they tend to get closer and enhance their perceived membership in the community (i.e., their PSBC) given the interactive experience is positive. *(Interaction may influence PSBC.)*

Meanwhile, much research has also proven that when members engage more in social interaction with one another, they tend to be more forgiving of product failures and less likely to switch brands, even if the quality of the competing brands becomes as good or better (Solomon et al., 2013, p.322). This implies that social interaction might weaken the impact of satisfaction on loyalty. *(Interaction may influence the satisfaction–loyalty relationship.)*

The 2 findings above spark a curiosity about the possible role of PSBC in the relationship between satisfaction and loyalty: whether or not it is the feelings of PSBC – rather than social interaction – that actually makes a consumer become forgiving of the product flaws and remain loyal to the brand. The reason behind this curiosity is that PSBC itself is an emotional state. It could be under the effect of emotions, brand preference is then an irrational decision rather than a decision based on rationally evaluating product quality. Particularly in the mobile game context, players could be less satisfied with the game, for example due to certain game defects, but less sensitive and still loyal once they experience a stronger feeling of belonging to the community centered around the game. Therefore, it is hypothesized that the stronger the PSBC, the weaker the impact of player satisfaction on their loyalty.

H3: Mobile game player's PSBC attenuates the relationship between satisfaction and loyalty.

3 STATEMENTS OF HYPOTHESES

The research framework is shown in figure 3. The hypotheses are put together as follows.

H1: In mobile games, players' satisfaction is positively associated with their loyalty.

H2: Players' perceived PSBC is positively associated with their loyalty to the game.

H3: Mobile game player's PSBC attenuates the relationship between satisfaction and loyalty.
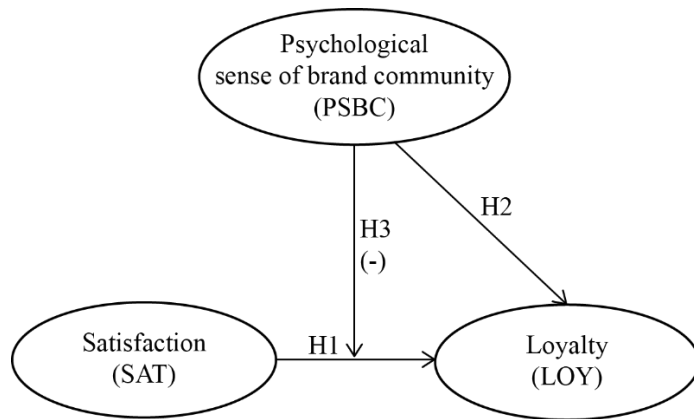
Figure 3. Hypothesized relationships

Notes:

Variable		Definition
PSBC	Psychological sense of brand community	"The degree to which an individual perceives relational bonds with other brand users" (Carlson et al., 2008, p.286).
LOY	Mobile game loyalty	The degree to which players have a favorable attitude or preference for a specific mobile game and intend to continue playing it (adapted from Lu and Wang (2008)).
SAT	Mobile game satisfaction	"Players' cumulative evaluation of the fulfillment provided by the specific online gaming vendor" (Lu and Wang 2008, p.505).

The sign (-) depicts the hypothesized negative effect of PSBC on the relationship between game satisfaction and loyalty. The other hypothesized relationships are positive.

4   RESEARCH METHOD

4.1   Case study

The mobile game selected for this research was Pokémon GO. The game has been a worldwide phenomenon since the latter half of 2016, enjoying players' word-of-mouth and commitment despite plenty of reported technical faults. Pokémon GO was chosen to test the hypotheses for several reasons. First, it was one of the rare mobile games that could actually get people out and bring them together for community activities in the real world. One of the game visions is indeed to develop a sense of community among its players. Second, the Pokémon GO "fever" could help collecting a good number of survey responses in limited time compared to other games. Finally, all the study constructs (i.e., PSBC, loyalty and satisfaction) were relevant in this Pokémon GO game context.

4.2   Data collection

Online self-administered questionnaire was used to collect the primary data. Self-administered e-surveys made the data collection process faster and cheaper while the participants could still answer at their convenience. No interviewer was present so it could also reduce the bias in the way the questions were asked. Besides, online surveys offered an access to a worldwide Pokémon GO player population that would otherwise be difficult to reach (Saunder, Lewis, and Thornhil, 2009). However, the number of the participants who failed to complete the survey would be unknown.

The questionnaire was designed in English and set up on Google Forms. Among many popular free survey platforms suggested by the researchers on researchgate.net, including SurveyMonkey, Zoomerang, Google Forms and SoGoSurvey, Google Forms was chosen for the purpose and requirements of this Bachelor thesis. Google Forms offered to free accounts unlimited numbers of questions, unlimited numbers of responses recorded, and an ease at designing different types of scales (i.e., the short answer, long answer, multiple choice and Likert questions used in this study). Data collected on Google Forms could be also exported for later statistical analysis in R. In order

to ensure the participants would fully understand the questionnaire, an early version was sent to a doctoral candidate at University of Economics Ho Chi Minh City (Vietnam) to confirm face validity. The final draft was adjusted based on his feedback.

The target population of this research was the whole population of the Pokémon GO players who signed up for at least 1 online community of the game. It is worth noting that whether a gamer ever engages in conversations and/ or activities of the community does not matter. The non-probability sampling technique to collect data was then implemented, meaning just any community member could participate in the survey. The link to the questionnaire and invitation messages were posted on the Facebook group "Pokemon Go Finland"[19] and 2 Reddit groups called /r/PokemonGO[20] and /r/SampleSize[21]. In addition, the link and messages were promoted on Arcada Entrepreneurship Society's Facebook page and on the student's personal social networks (i.e., Facebook, Instagram and Tumblr). The participants were told that the survey was only meant for Pokémon GO players to complete. Participation was voluntary and anonymous. It is also important to mention that the study did not implement a method to forbid multiple responses per IP address. In total 192 valid submissions were recorded from October 8, 2016 until October 15, 2016.

4.3 Measurement instruments

The 3-page questionnaire comprised a brief introduction to the survey on the first page, 15 questions to measure 3 variables on the second page, and 3 background questions, a hypothesis check question along with thanks on the third page. This section provides more details on the measures. The screenshots of the full questionnaire can be found in Appendix C.

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[19] Link to the group: https://www.facebook.com/groups/1748339302104870

[20] /r/pokemongo is one of the most active online Pokémon GO discussion groups with more than 767,000 subscribers (up till October 2016 when the survey was conducted). Link to the group: https://www.reddit.com/r/pokemongo

[21] /r/SampleSize is the community dedicated to scientific surveys (also other types of surveys) made for and by Reddit members. The SampleSize subreddit is the virtual place where people like to answer on surveys, discuss and leave comments on interesting topics. Link to the group: https://www.reddit.com/r/SampleSize

4.3.1 Measures

The measures of PSBC, game satisfaction and loyalty were adapted from the previous validated questionnaires. Minor modifications were made for these measures to fit the thesis context.

Loyalty (LOY)

The 3 top-ranking questions proposed by Reichheld (2003) were adapted to form the loyalty scale. The answers were scored based on a 0-10 rating scale, in which 10 meant "extremely likely" to recommend, 5 meant "neutral", and 0 meant "not at all likely" to recommend.

Satisfaction (SAT)

The satisfaction scale was adopted from Lu and Wang (2008). All 6 items were measured using 5-point Likert scales, ranging from "strongly disagree" (1) to "strongly agree" (5).

Psychological sense of brand community (PSBC)

The unidimensional scale to measure PSBC was taken from Carlson (2005). The 7-point Likert scale ranged from "strongly disagree" (1) to "strongly agree" (7).

Table 1 summarizes 3 adapted measures.

Table 1. Measures for the 3 variables

Scale		Source
Loyalty (LOY)		
loy1	How likely is it that you would recommend game Pokémon GO to a friend or colleague?	**Reichheld (2003)**
loy2	How strongly do you agree that Pokémon GO deserves your loyalty?	
loy3	How likely is it that you will continue to play this game and/or other games from Niantic[22]?	

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[22] Niantic is the publisher of game Pokémon GO.

Satisfaction (SAT)		**Lu and**
sat1	I like the game content of Pokémon GO.	**Wang (2008)**
sat2	I am pleased with the services provided by Niantic.	
sat3	Niantic performs well in handling opportunistic gaming behavior.	
sat4	I am satisfied with the account administration of Niantic.	
sat5	I am pleased with the networking quality provided by Niantic.	
sat6	Overall, I am satisfied with game Pokémon GO.	
Psychological sense of brand community (PSBC)		**Carlson**
psbc1	I feel strong ties to other Pokémon GO players.	**(2005)**
psbc2	I find it very easy to form a bond with other Pokémon GO players.	
psbc3	I feel a sense of being connected to other Pokémon GO players.	
psbc4	A strong feeling of camaraderie exists between me and other Pokémon GO players.	
psbc5	Playing Pokémon GO gives me a sense of community.	
psbc6	I feel a sense of community with other people who play Pokémon GO.	

4.3.2 Hypothesis knowledge check question

One open-ended question was included to check if the responses were biased because of guessing the research hypotheses. The question asked the respondents to state in their words what they thought the study was about.

4.3.3 Background questions

The profile questions asked about sex, age group and current country of residence information.

5 DATA ANALYSIS AND RESULTS

This thesis used the structural equation modeling (SEM) technique to test the hypotheses. SEM was conducted in R environment using primarily the 'lavaan' package. The fit of the model was

evaluated with goodness-of-fit indices. Reliability and validity of the scales were also established before examining the relationships between 3 latent variables LOY, SAT and PSBC. In this section, firstly, the background of the SEM technique, 'lavaan' package, fit statistics, validity, reliability, and mediation effect assessment was set. Secondly, the data analysis process and results were presented in details.

5.1 Setting the background

5.1.1 Structural equation modeling (SEM)

According to Hair et al. (1998), SEM is "a multivariate technique combining aspects of multiple regression (examining dependence relationships) and factor analysis (representing unmeasured concepts – factors – with multiple variables) to estimate a series of interrelated dependence relationships simultaneously" (p.583). Like other multivariate methods, SEM is based on 3 assumptions: "independent observations, random sampling of respondents, and the linearity of all relationships" (p.601). SEM was used in this thesis because of 3 reasons. First, SEM can incorporate latent variables into the analysis. Second, SEM can accommodate many interrelated dependence relationships in one model, and estimate their regression equations simultaneously. Third, SEM can "account for measurement error in the estimation process" (p.584).

In SEM technique, the sample size is necessarily large. A model with 10 – 15 indicators often has 200 – 400 cases. As Michell's (1993) rule of thumb, the number of cases should be 10 – 20 times the number of variables (e.g., 150 – 300 cases for 15 indicators). Another rule of thumb by Stevens (1996) states that a model should have at least 15 cases per indicators (e.g., at least 225 observations for 15 indicators). Through the literature, one rule of thumb is that the sample size should be at least 50 plus the number of variables in the model multiplied by 8 (e.g., with 15 indicators a model needs at least 170 cases). Whatever rule of thumb a researcher decides to follow, she should go beyond the recommended minimum sample sizes, especially in case the data are non-normal or incomplete (Stanford University, n.d.). Hair et al.'s (1998, p.605) approach is "always to test a model with 200 observations".

A structural equation model has 2 sub-models, namely the measurement model (or the outer model) and the structural model (or the inner model). The measurement model specifies the relationships between latent variables and their observed indicators. Whereas, the structural model represents the relationships between the independent and dependent variables (such variables in the structural model can be latent or observed). Figure 4 below illustrates the measurement and structural models (Wong, n.d.).
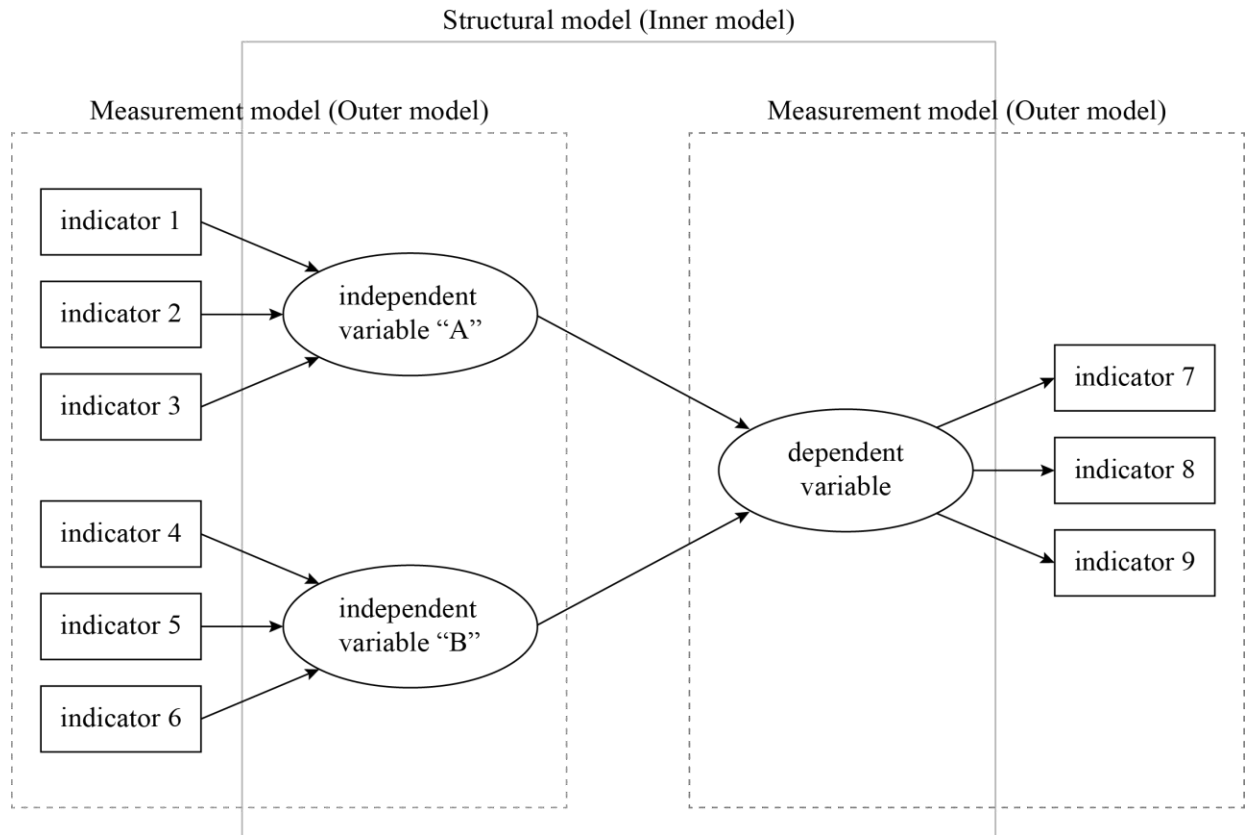
Figure 4. Measurement model and Structural model in a SEM diagram (Wong, n.d.)

Henseler, Ringle, and Sinkovics (2009) proposed a systematic assessment of the measurement and structural models. At first, a researcher should perform the measurement model assessment with the goodness-of-fit measures, validity test and reliability test. Only after the measurement model is valid, it makes sense to proceed with the structural model assessment.

5.1.2 Package 'lavaan' in R environment

In an attempt to utilize R environment in her statistical analysis, the student chose package 'lavaan' for SEM. 'Lavaan', standing for "latent variable analysis", was developed by Rosseel (2012) to provide R users with an open-source, easy-to-use but commercial-quality package for latent variable modeling. Estimating an SEM with 'lavaan' involves 3 main phases:

- First, to set up the model. This setup is referred to as modelx in this thesis.
- Second, to fit the model.
- Third, to examine the results after the model is fitted.

The primary formula types in 'lavaan' are summarized in table 2.

Table 2. The current set of formula types in 'lavaan' (Rosseel, 2012)

formula type	operator	mnemonic
latent variable definition	=~	is measured by
regression	~	is regressed on
(residual) (co)variance	~~	is correlated with
Intercept	~ 1	intercept

5.1.3 Goodness-of-fit indices in SEM

McDonald and Ho (2002) suggested considering several goodness-of-fit indices. "It is sometimes suggested that we should report a large number of these indices, apparently because we do not know how to use any of them" (McDonald and Ho, 2002, p.72). A literature search shows that different researchers tended to have their favorite sets of indices. However, a researcher should never select the indices that are most optimistic about the fit of their model. Hu and Bentler (1999) suggested using a combination of one of the relative fit indices, and the standardized root mean square residual (SRMR) or the root mean square error of approximation (RMSEA) (Newsom, n.d.). This thesis thus relied on chi-square, Tucker-Lewis index (TLI), comparative fit index (CFI),

SRMR and RMSEA to determine the model fit. Table 3 summarizes the recommended acceptable values of these fit indices.

Table 3. A summary of goodness-of-fit indices used in this thesis (Hu and Bentler, 1999)

Index	Value range	Criterion for acceptance
p-value (Chi-square)	[0;1]	p-value $\geq$ 0.05
Tucker-Lewis index (TLI)	[0;1]	TLI value $\geq$ 0.95
Comparative fit index (CFI)	[0;1]	CFI value $\geq$ 0.90
Standardized root mean square residual (SRMR)	[0;1]	SRMR $\leq$ 0.08
Root mean square error of approximation (RMSEA)	[0;1]	RMSEA $\leq$ 0.06

Notes:

As a note on the RMSEA value, according to Browne and Cudeck's (1992, p.154) interpretation, a model is "close approximate fit" if RMSEA $\leq$ 0.05, "reasonable approximate fit" if $0.05 <$ RMSEA < 0.08, and "poor fit" if RMSEA > 0.10. The model should not be employed if RMSEA > 0.10.

A structural equation model, according to Blunch (2015, p.316), can have many forms, but the null and alternative hypotheses are always:

- H0: the model fits the data exactly
- H1: the model does not fit the data

Thus as seen, while in much of psychological statistics, H0 is a hypothesis of "no effect" which researchers wish to refuse, in SEM the roles of H0 and H1 are switched. H0 is now the hypothesis the researchers attempt to defend. So, the chi-square is *not* significant (a p-value $\geq$ 0.05) is the evidence supporting the model when using chi-square statistic in SEM.

5.1.4 Validity and reliability

According to Hair et al. (1998), reliability refers to "the degree of consistency between multiple measurements of a variable" (p.117) and validity is "the extent to which a measure of set of measures correctly represents the concept of study" (p.90). Or in simple words, reliability answers the question "Does a scale yield consistent results when repeating the measurement?", and validity answers the question "Is the scale measuring what it is intended to measure?". Table 4 presents the validity and reliability items checked and reported in this thesis.

Table 4. Assessing reliability and validity of the reflective scales

Criterion	What to look for	Recommended values
RELIABILITY		
Indicator Reliability	Factor loadings	Factor loadings ≥ 0.45 (0.40) in a sample of at least 150 (200) observations: the loadings are statistically significant.[23]
	Squares of the indicators' standardized factor loadings (i.e., "indicator reliabilities")	Indicator reliabilities ≥ 0.50: indicator reliability exists.[24]
Internal Consistency Reliability	Cronbach's (1951) coefficient alpha, or Raykov's (2001) coefficient omega, or Bentler's (1972, 2009) coefficient omega, or McDonald's (1999) coefficient omega	Coefficients > 0.70: internally consistent Coefficients < 0.60: a lack of internal consistency reliability[25]

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[23] (Hair et al., 1998, pp.111-112)
[24] (Hair et al., 1998, p.612)
[25] (Nunnally, 1978, p.245)

VALIDITY		
Convergent validity[26]	Average variance extracted (AVE) of each latent variable	All AVE scores > 0.50: sufficient convergent validity[27]
Discriminant validity[28]	Square root of AVE, and latent variable correlations	Square root of AVE estimate for each latent variable (i.e., each factor) > the correlations between that factor and other factors: sufficient discriminant validity.[29]

5.1.5 Mediation effect assessment

Hypothesis 3 examined the mediating effect of PSBC on the satisfaction–loyalty relationship as illustrated in figure 5. The 3 latent variables set up the mediation model in which loyalty played the role of the dependent variable, satisfaction was the predictor, and PSBC was the mediator.
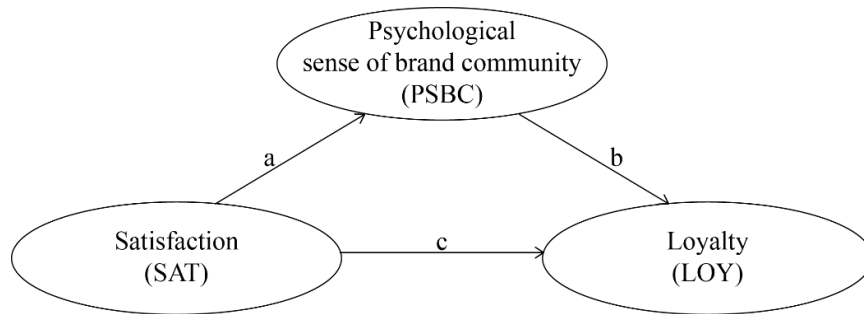
Figure 5. Path diagram showing the mediating effect of PSBC on the satisfaction–loyalty relationship

A general mediation model is demonstrated in figure 6.

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[26] Convergent validity assesses "the degree to which 2 measures of the same concept are correlated" (Hair et al., 1998, p.118).
[27] (Hair et al., 1998, p.118)
[28] Discriminant validity assesses "the degree to which 2 conceptually similar concepts are distinct" (Hair et al., 1998, p.118).
[29] (Fornell and Larcker, 1981)
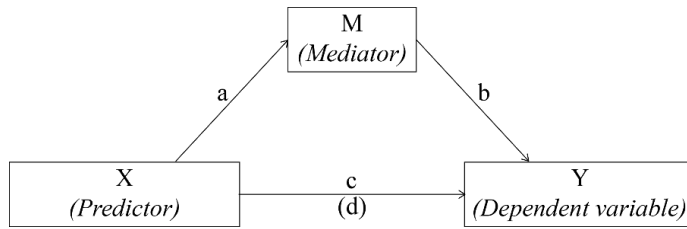
Figure 6. Path diagram showing the mediating effect of (M) on the (X)–(Y) relationship

The general model is expressed in the form of 3 regression equations as:

$$Y = i_1 + d*X + e_1, \qquad (1)$$

$$Y = i_2 + c*X + b*M + e_2, \qquad (2)$$

$$M = i_3 + a*X + e_3, \qquad (3)$$

Where:

- i_1 and i_2 and i_3 are intercepts,
- e_1, e_2, and e_3 are residuals,
- d is the coefficient relating X and Y (*total effect* from X to Y),
- c is the coefficient relating X to Y adjusted for M (*direct effect* from X to Y),
- b is the coefficient relating M to Y adjusted for X,
- a is the coefficient relating X to M.

Providing X and M are continuous, total effect (d) = direct effect (c) + indirect effect. The indirect effect explains the extent to which the effect of X on Y is mediated by M. So, if the indirect effect is statistically significant, the mediation has occurred.

Drawn from the equations (2) and (3), the size of the indirect effect from X to Y (i.e. the mediation effect of M) is (a*b). Then, there are several ways to test its significance, for examples: test of joint significance, Sobel test and bootstrapped confidence intervals. Of these methods, bootstrapping[30] is the most preferred because it does not require the normality assumption to be

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[30] "Bootstrapping involves repeatedly randomly sampling observations with replacement from the data set to compute the desired statistic in each resample. Over hundreds, or thousands, of bootstrap resamples provide an approximation of the sampling distribution of the statistic of interest." (Preacher and Hayes, 2004)

met, and it can be effectively utilized with smaller sample sizes (N < 25) (Hair et al., 1998). The bootstrapping method provides a researcher with point estimates and confidence intervals. If the confidence intervals do not cross zero (0), the researcher has a good reason to conclude that there is a significant mediating effect.

To wrap up, the indirect effect (a*b) was particularly in the interest in this study because it would show if PSBC negatively mediated the game satisfaction–loyalty relationship (hypothesis 3). The bootstrapping method was used to assess if the indirect effect was significant and negative.

5.2 Data analysis and Results

5.2.1 Sample

A total of 192 complete responses was collected. It was not possible to define the response rate with the online self-administered survey. Of all 192 participating Pokémon GO players, 113 were from Finland (58.85%), 30 were from the States and the rest were from 31 other countries around the globe. The average (median) age was 25.71 years (25 years). The youngest respondent was 12 years old, and the oldest was 69 years old. Approximately, 56.77% of the participants were men (104 men). The bar chart below presents the number of male and female players in each age group.

Number of males and females in each age group
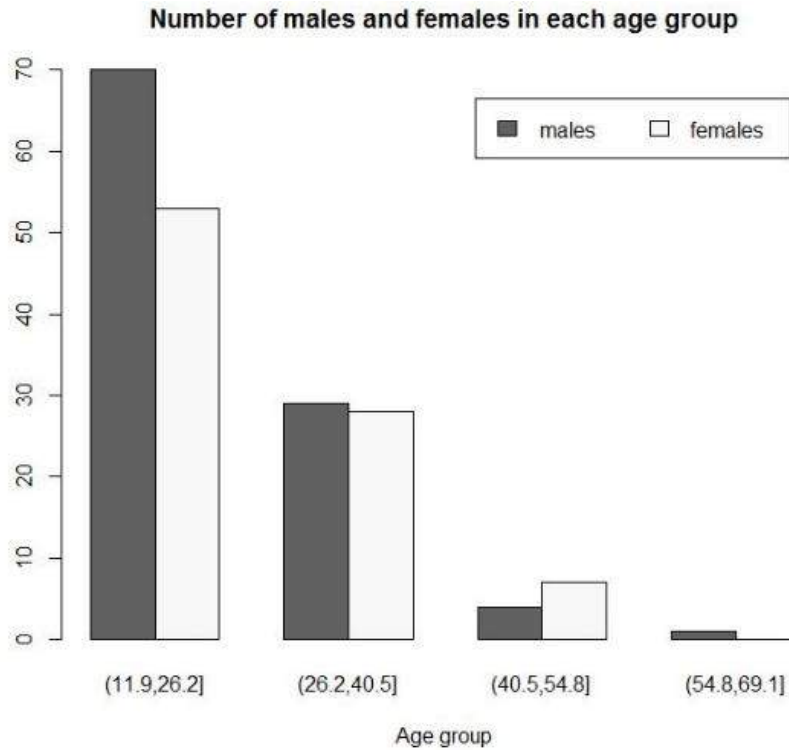
Figure 7. Number of male and female participants in each age group (n = 192)

5.2.2 Measurement model

The analysis was conducted in R environment with package 'lavaan'. The model was first set up with 15 items and 3 latent variables: SAT, LOY and PSBC; the model was labeled as model1. Next, model1 was then fitted with the cfa() function. After that, a summary of the fitted model was provided using function summary().

The syntax for model1 is shown as belows. To specify model1, latent variable LOY was measured by observed variables loy1, loy2 and loy3. SAT was measured by sat1, sat2, sat3, sat4, sat5 and sat6. And PSBC was measured by psbc1, psbc2, psbc3, psbc4, psbc5 and psbc6.

```
model1 = '  LOY =~ loy1 + loy2 + loy3
            SAT =~ sat1 + sat2 + sat3 + sat4 + sat5 + sat6
            PSBC =~ psbc1 + psbc2 + psbc3 + psbc4 + psbc5 + psbc6 '
```

The hypothesis path analysis model is presented in figure 8, in which the squares represent the observed variables and the ovals depict the latent variables. The dotted lines mean that the factor loadings of these indicators were fixed at 1.
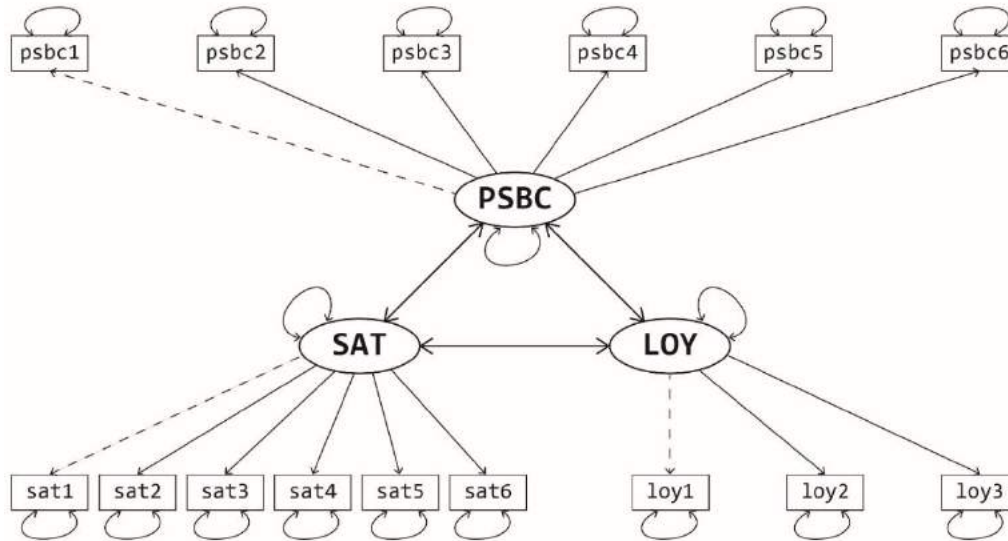
Figure 8. The hypothesized path analysis

5.2.2.1   Confirmatory factor analysis

<u>**Goodness-of-fit**</u>

An excerpt from the CFA summary output:

```
Number of observations                              192
Estimator                                            ML
Minimum Function Test Statistic                 234.328
Degrees of freedom                                   87
P-value (Chi-square)                              0.000
Comparative Fit Index (CFI)                       0.926
Tucker-Lewis Index (TLI)                          0.911
RMSEA                                             0.094
90 Percent Confidence Interval         0.080      0.109
P-value RMSEA <= 0.05                             0.000
SRMR                                              0.066
```

As seen, the goodness-of-fit indices revealed that 15 items were not loaded as expected. Precisely, the chi-square statistic was significant (i.e., chi-square = 234.328, p-value = 0.00, df = 87),

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RMSEA was very higher than the acceptable threshold value of 0.08 (i.e., 0.094) and TLI was lower than the recommended value of 0.95 (i.e., 0.911).

Reliability and validity

Reliability and validity of all the constructs LOY, SAT and PSBC had been already tested in the prior studies from which the scales were adapted. However, reliability and validity were checked again in this study to ensure the suitability of the scales in the current context. Further assessment of reliability and validity revealed indeed some problems in the scales SAT and LOY.

Indicator reliability

The examination of the factor loadings, standardized loadings squared and standardized variances of all 15 items suggested that the indicator reliability was established in the constructs LOY and PSBC; however, SAT might lack indicator reliability. 4 out of 6 items of SAT had weak (yet nevertheless considerable and significant) factor loadings, standardized factor loadings squared smaller than the recommended value of 0.5, and high standardized variances (specifically, higher than 0.541). The values of all 6 items in the construct SAT are shown below.

```
Latent Variable SAT:
                  Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all[31]
  SAT =~
    sat1            1.000                                0.512    0.592
    sat2            1.641    0.213    7.690    0.000     0.840    0.731
    sat3            1.502    0.206    7.280    0.000     0.770    0.673
    sat4            1.397    0.191    7.310    0.000     0.716    0.677
    sat5            1.257    0.187    6.739    0.000     0.644    0.604
    sat6            1.330    0.165    8.075    0.000     0.681    0.792
Variances:
                  Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
   .sat1           0.486    0.054    9.007    0.000     0.486    0.649
   .sat2           0.616    0.076    8.103    0.000     0.616    0.466
   .sat3           0.715    0.083    8.578    0.000     0.715    0.547
   .sat4           0.605    0.071    8.551    0.000     0.605    0.541
   .sat5           0.721    0.080    8.954    0.000     0.721    0.635
   .sat6           0.276    0.038    7.307    0.000     0.276    0.373
```

---

[31] The Std.all column shows the standardized factor loadings.

```
Factor loadings squared:
                Estimate
    sat1          0.351
    sat2          0.534
    sat3          0.453
    sat4          0.459
    sat5          0.365
    sat6          0.627
```

Internal consistency reliability[32]

```
            LOY         SAT        PSBC        total
alpha  0.7890639 0.8345323 0.9528185 0.9072505
omega  0.7903349 0.8352540 0.9527407 0.9442894
omega2 0.7903349 0.8352540 0.9527407 0.9442894
omega3 0.7903088 0.8285875 0.9503050 0.9456680
```

The coefficients of reliability of the constructs LOY, SAT and PSBC fell in the ranges of [0.7;0.8) , [0.8;0.9) and [0.9;1), respectively. Therefore, LOY, SAT and PSBC had, accordingly, "acceptably", "well" and "excellently" cohesive constructs.

Convergent validity

AVEs were computed to assess convergent validity. AVEs of the 3 constructs are presented as follows.

```
AVE
      LOY        SAT        PSBC
0.5560071 0.4647494 0.7712191
```

Noticeably, the AVE of SAT was lower than the threshold value at 0.5 (i.e., 0.465), which indicated a lack of convergent validity in the construct. In simple words, the 6 observed variables (sat1…sat6) did not correlate well within the parent factor SAT.

Discriminant validity

Discriminant validity was assessed according to the Fornell-Larcker criterion.

---

[32] In the following matrix, alpha means Cronbach's (1951) coefficient alpha, omega is from Raykov (2001), omega2 is from Bentler (1972, 2009) and omega3 is from McDonald (1999) (semTools Contributors, 2016).

```
      LOY    SAT    PSBC
LOY  0.746
SAT  0.782 0.682
PSBC 0.543 0.531 0.878
```

In this calculating result, the square root of AVE values are in bold on the diagonal, and the standardized correlations between the 3 variables are placed in the lower left triangle. As shown, √AVE for the factors LOY and SAT (i.e., 0.746 and 0.682 respectively) were smaller than the correlation between them (i.e., 0.782), meaning the insufficient discriminant validity of the 2 constructs. This proposed 2 scenarios: (1) a relationship between SAT and LOY was confirmed while in fact, there could be no real relationship, or (2) the strength of the relationship was overestimated. Though, the findings on the link between game satisfaction and loyalty in the literature suggested the second scenario.

The structural model could not be assessed until the discriminant validity was established (Fornell and Larcker, 1981). Consequently, in the next step, EFA was performed to improve the discriminant validity issue. Although there were several techniques to address the discriminant validity issue, such as: EFA, CFA, modification indices inspection, and correlated error terms inspection, EFA was particularly beneficial to investigate whether the insufficient discriminant validity was a result of the poorly performing items in the constructs SAT and LOY. Poorly performing items are weak items and complex items (those items that load significantly onto more than 1 latent variable). Removal of such items should improve discriminant validity; however, "during item removal tests, [it is] the trade-off between the number of scale items or measurement scales that perform well and discriminate" (Farrel, 2010, p.326).

To wrap up this CFA process before moving toward EFA,

- *First*, the construct SAT appeared to lack indicator reliability and convergent validity.
- *Second*, discriminant validity was not well established between the constructs SAT and LOY.
- *Third*, at this stage, the CFA result showed that a gamer's satisfaction (SAT) seemed to positively correlate with his loyalty to the game (LOY) (i.e., standardized covariance =

0.782, p-value < 0.001), yet the strength of the correlation might be overestimated due to the lack of discriminant validity.

- *Forth*, there seemed to be moderate correlations between PSBC and LOY (i.e., standardized covariance = 0.543, p-value < 0.001), and between SAT and PSBC (i.e., standardized covariance = 0.531, p-value < 0.001). More details follow.

```
Covariances:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
  LOY ~~
    SAT              0.670    0.121    5.523    0.000    0.782    0.782
    PSBC             1.272    0.241    5.283    0.000    0.543    0.543
  SAT ~~
    PSBC             0.381    0.077    4.941    0.000    0.531    0.531
```

5.2.2.2 *Exploratory factor analysis*

The 3 scales of SAT, LOY and PSBC were subjected to an EFA using an oblique rotation to identify weak items[33] and complex items. These items identified in EFA would be removed to improve discriminant validity. The EFA output is shown below.

```
Loadings:
      Factor1 Factor2 Factor3 Factor4
psbc1  0.784
psbc2  0.905
psbc3  0.905
psbc4  0.910
psbc5  1.105                   0.540
psbc6  0.993
sat1           0.545
sat6           0.652
loy1           0.740
loy2           0.661
loy3           0.946
sat2                   0.828
sat3                   0.908
sat4                   0.670
sat5                   0.372
```

---

[33] In the sample of 192 respondents, a factor loading of 0.45 was deemed acceptable for statistical significance (based on a 0.05 significant level) (Hair et al., 1998). So an item with loading lower than 0.45 would be considered "weak".

```
              Factor1 Factor2 Factor3 Factor4
SS loadings     5.351   2.657   2.176   0.411
Proportion Var  0.357   0.177   0.145   0.027
Cumulative Var  0.357   0.534   0.679   0.706
Factor Correlations:
        Factor1 Factor2 Factor3 Factor4
Factor1  1.000  0.4062  0.3952   0.593
Factor2  0.406  1.0000  0.0137   0.661
Factor3  0.395  0.0137  1.0000   0.269
Factor4  0.593  0.6606  0.2692   1.000
Test of the hypothesis that 4 factors are sufficient.
The chi square statistic is 68.5 on 51 degrees of freedom.
The p-value is 0.0514
```

Thus, the rotated factor structure identified 4 factors which accounted for 70.6% of the variance. However, factor 4 was not important (i.e., SS loading = 0.411). The p-value was insignificant (i.e., 0.0514).

At this point, a decision was to remove the complex item psbc5 and the weak item sat5. Later, all possible models were investigated in efforts to discriminate LOY from SAT, while still ensuring a theoretical sense, acceptable goodness-of-fit, reliability and validity. During the processes, multiple EFAs, CFAs and ANOVAs were conducted over again.

As a result, the "best" model achieved with this dataset was after removing the indicators sat1 ("I like the game content of Pokémon GO."), sat5 ("I am pleased with the networking quality provided by Niantic."), sat6 ("Overall, I am satisfied with game Pokémon GO.") and psbc5 ("Playing Pokémon GO gives me a sense of community.") from measuring SAT and PSBC. The improved model was labelled as model2 and established in 'lavaan' as follows.

```
model2 = '  LOY =~ loy1 + loy2 + loy3
            SAT =~ sat2 + sat3 + sat44
            PSBC =~ psbc1 + psbc2 + psbc3 + psbc4 + psbc6   '
```

In which, LOY was measured by the items loy1, loy2 and loy3. SAT was measured by the items sat2, sat3, and sat4. And PSBC was measured by the items psbc1, psbc2, psbc3, psbc4, and psbc6.

5.2.2.3 Confirmatory factor analysis for the improved model

Goodness-of-fit

The fit statistics indicated a good fit for the improved model. An excerpt from the CFA summary:

```
Minimum Function Test Statistic                46.007
Degrees of freedom                                  41
P-value (Chi-square)                             0.273
Comparative Fit Index (CFI)                      0.996
Tucker-Lewis Index (TLI)                         0.995
RMSEA                                            0.025
90 Percent Confidence Interval        0.000     0.057
P-value RMSEA <= 0.05                            0.883
SRMR                                             0.037
```

Reliability and validity

Indicator reliability

The LOY and PSBC constructs had established indicator reliability well. The construct SAT was improved. The item sat4 had loading of 0.684, but because the value was still much greater than the threshold value of 0.45, sat4 was remained in the model to ensure the number of items in each construct was at least 3.

Internal consistency reliability

```
             LOY       SAT       PSBC      total
alpha  0.7890639 0.8174209 0.9421529 0.8824445
omega  0.7893174 0.8239238 0.9423407 0.9304763
omega2 0.7893174 0.8239238 0.9423407 0.9304763
omega3 0.7885020 0.8245988 0.9419840 0.9302327
```

Thus, all the coefficients of reliability of 3 constructs exceeded the recommended 0.7 threshold, showing the evidence of internal consistency reliability.

Convergent validity

```
AVE
     LOY       SAT       PSBC
0.5554638 0.6053777 0.7666164
```

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The AVE of SAT was improved with its value higher than the recommended 0.5 (i.e., 0.61). All 3 constructs therefore had adequate convergent validity.

Discriminant validity

The calculating result for Fornell-Larcker criterion was:

```
      LOY    SAT    PSBC
LOY  0.745
SAT  0.584 0.778
PSBC 0.563 0.379 0.876
```

After the EFAs, the AVE of SAT was improved, resulting in an improvement in the discriminant validity between the LOY and SAT constructs. As seen in the calculating results, all standardized correlation values on the horizontal and the vertical were lower than √AVEs for 3 factors. Precisely √AVE for SAT (0.778) was higher than 0.584 in the row and 0.379 in the column. Similarly, √AVE for LOY (0.745) was higher than 0.584 and 0.563; √AVE for PSBC (0.876) was higher than 0.563 and 0.379. Discriminant validity of the measurement model was established.

5.2.3 Structural model and hypothesis test

SEM with bootstrapping standardized error was used to assess the structural model and test hypotheses 1, 2 and 3. First of all, the model was set up with the new set of 11 indicators, and was named model2b. The syntax in 'lavaan' and specification are shown below. Second, model2b was fitted and reassessed for model fit using the sem() function. Third, the summary() function provided a summary of the fitted model.

Setting up model2b:

```
model2b = ' LOY =~ loy1 + loy2 + loy3
            SAT =~ sat2 + sat3 + sat4
            PSBC =~ psbc1 + psbc2 + psbc3 + psbc4 + psbc6
                  PSBC ~ a*SAT
                  LOY ~ b*PSBC + c*SAT
                        indirect := a*b
                        direct := c
                        total := c + (a*b)'
```

Interpreting the syntax:

Latent variables

- SAT was measured by sat2, sat3 and sat4
- PSBC was measured by psbc1, psbc2, psbc3, psbc4, and psbc6
- LOY was measured by loy1, loy2, and loy3

Regressions

- PSBC was predicted by SAT
- LOY was predicted by SAT and PSBC

The effects from SAT to LOY

- Indirect effect value was a*b
- Direct effect value was c
- Total effect value was the sum of direct effect and indirect effect. Total = c + (a*b).

To begin with the fit of this model, the chi-square statistic was insignificant (chi-square = 46.007, p = 0.273, df = 41), RMSEA = 0.025, CFI = 0.996, TLI = 0.995, and SRMR = 0.037.

5.2.3.1 The coefficient of determination (R^2)

```
R-Square:
         Estimate
  LOY       0.477
  PSBC      0.143
```

According to Sarstedt et al. (2014), "the R^2 is a measure of the variance explained in each of the endogenous constructs and is thus a measure of the model's predictive accuracy (in terms of in-sample prediction)" (p.110). As a rough rule of thumb, in marketing research R^2 values of 0.75, 0.50, or 0.25 for an endogenous latent variable can be considered as "substantial", "moderate" or "weak", respectively. But when interpreting the R^2, a researcher should also take the R^2 values from related studies into consideration. The R^2 for LOY was 0.477, meaning that 2 variables SAT and PSBC explained 47.7% of the variance in LOY.

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5.2.3.2 Checking structural path significance in bootstrapping

The bootstrapped standard errors were obtained to test the significance of path coefficients in the structural model as well as in the measurement model. In this process, 1000 subsamples were taken from the original sample with replacement.

The path coefficients and the 95% confidence intervals are as shown.

```
Regressions:
          Estimate  Std.Err  z-value  P(>|z|)  Std.all ci.lower ci.upper
PSBC ~
  SAT  (a)   0.560   0.147    3.817    0.000    0.379   0.288    0.862
LOY ~
  PSBC (b)   0.473   0.128    3.691    0.000    0.399   0.228    0.741
  SAT  (c)   0.761   0.156    4.879    0.000    0.433   0.466    1.097
```

Zero did not fall between the confidence intervals [ci.lower; ci.upper] with 95% of confidence in 3 relationships PSBC–SAT, LOY–PSBC and LOY–SAT. Therefore,

- The PSBC–SAT path was significant, and positive at 0.379.
- The LOY–PSBC path was significant, and positive at 0.399.
- The LOY–SAT path was significant, and positive at 0.433.

5.2.3.3 Checking hypotheses in bootstrapping

First, the total effect of PSBC on LOY could be calculated as (b + a*c). Because a, b and c were significantly positive, the total effect from PSBC to LOY was significantly positive (standardized value = 0.563). Therefore, hypothesis 2 was supported.

Second, the indirect effect from SAT to LOY was examined. Below are the defined parameters and the 95% confidence intervals.

```
              Estimate  Std.Err  z-value  P(>|z|)  Std.all ci.lower ci.upper

indirect a*b  0.265     0.095    2.790    0.005    0.151   0.102    0.488

direct     c  0.761     0.156    4.876    0.000    0.433   0.466    1.097

total c+(a*b) 1.026     0.178    5.774    0.000    0.584   0.703    1.414
```

The indirect effect was 95% likely to range within [0.102; 0.488] after bootstrapping. The bootstrapped unstandardized indirect effect was 0.265, and the standardized indirect effect was 0.151. Thus, there was a significant *positive* mediating effect of PSBC on SAT–LOY with 95% confidence. The test of the *negative* mediating effect of PSBC on SAT–LOY (hypothesis 3) was *not* supported, hence the opposite hypothesis (that PSBC positively influences the SAT–LOY) was supported.

Third, the total effect value of SAT on LOY was significant at 0.584. Hypothesis 1 was supported.

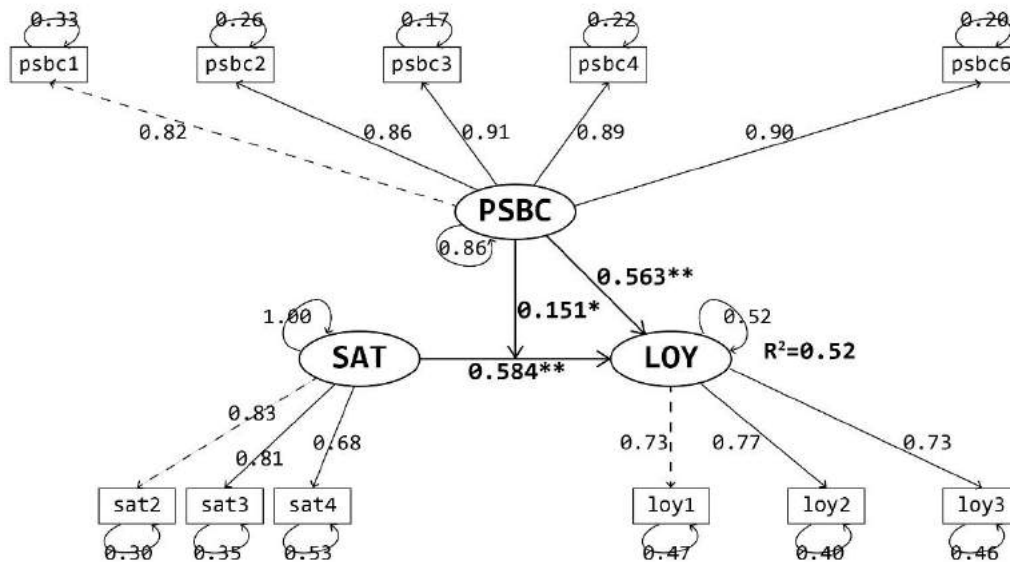The resulting diagram for model2b is shown in figure 9.

Figure 9. The resulting diagram of the SEM

Notes: **: total effects, *: mediating effect. Significant at the p<0.01 level.

6   DISCUSSION

6.1   Result discussion

Some findings on gamer satisfaction, loyalty to the game as well as PSBC are revealed in the results. First, the outcomes of measurement model assessment support Carlson's (2005) PSBC

measure in the context of mobile games. With loadings higher than 0.82, almost all the items (except psbc5) load significantly onto PSBC. psbc5 ("Playing Pokémon GO gives me a sense of community.") appears to be a complex item.

Second, mobile game players are found to care about the services provided by the gaming vendor (sat2), the ability the vendor handles opportunistic gaming behavior (sat4), and the account administration (sat5). With loading of 0.83, satisfaction with the game services (sat2) is the most important factor in the case of Pokémon GO. This finding is also backed by the previous studies (e.g., Lu and Wang, 2008, and Liu and Chou, 2006), in which online game players reported to be more sensitive to inadequate account protection, fraud prevention, and detection of opportunistic behavior.

Third, while many mobile gaming vendors work hard to create amusing game contents so that they would fascinate players, the results show that the content of game Pokémon GO (sat1) does not play a considerable role in developing gamers' satisfaction (SAT). This may be because the Pokémon theme has been something already very familiar with Pokémon gamers and fans for years. The players now want to experience the trendy augmented reality AR technology, or explore "what's new" in the latest version of the Pokémon gaming series. To generalize, for mobile games on popular themes, the players tend to care less about the contents, but more about the technology or technical elements.

Forth, game satisfaction has a greater influence on loyalty than PSBC does. This finding is consistent with the previous discussions by Lu and Wang (2008) and Lin and Wang (2006) that satisfaction still has the most critical influence on loyalty in the mobile context. Thus, to gain player's loyalty, gaming vendors should work hard to enhance quality, especially in those features the players tend to care the most, as: the services, the ability opportunistic gaming behavior is handled, and the account administration.

Fifth, in Reichheld (2003), the WTR question *"How likely is it that you would recommend [company X] to a friend or colleague?"* is ranked as the strongest loyalty predictor, followed closely by *"How strongly do you agree that [company X] deserves your loyalty?"* and *"How likely is it that you will continue to purchase products/services from [company X]?"*. The results of this

thesis show support for this set of questions in the mobile game industry. All 3 items loy1, loy2 and loy3 load significantly onto the construct game loyalty (LOY).

Sixth, females also tend to have higher levels of satisfaction and willingness to recommend the game than their male counterparts. Specifically, examining loy1 (i.e., WTR) reveals nearly half of the females are the promoters (47%), meanwhile only 31% of the males are the promoters. For every 10 males there are 3 detractors. The pie charts are shown in figure 10 below. Also, with higher average rating on sat6 ("Overall, I am satisfied with game Pokémon GO"), females report to be more satisfied with the game than males.
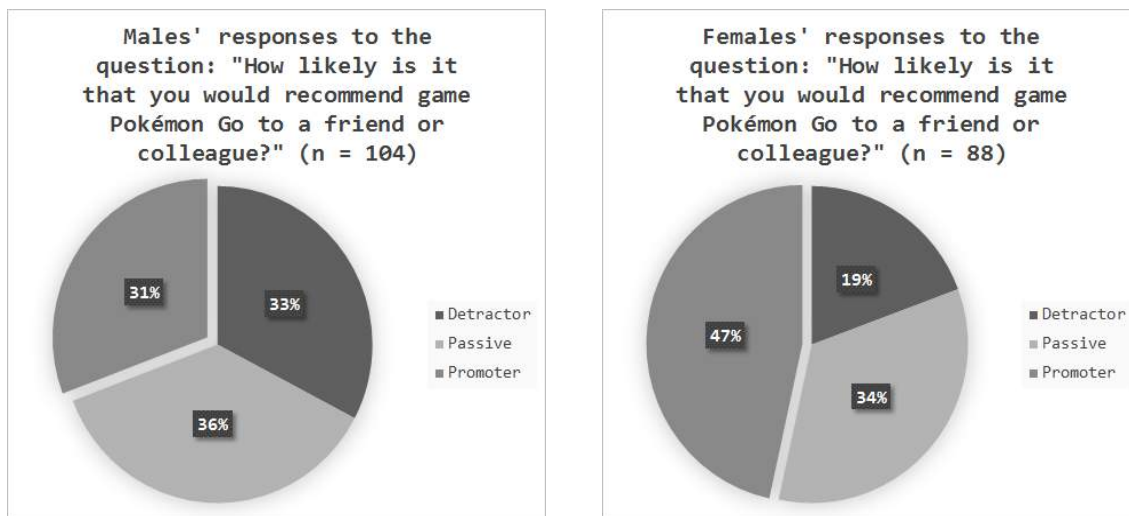

Figure 10. The pie charts of males' and females' responses to the WTR question

Seventh, in investigating the role of PSBC in the mobile game satisfaction–loyalty relationship, the results highlight that PSBC does not only directly influence gamer loyalty, but also enhances the effect of game satisfaction on loyalty. Thus, a gaming vendor can maintain players' loyalty to the game by creating and maintaining their PSBC. In SBC, identification with other brand users is a powerful condition of PSBC. So to boost PSBC in these brand communities, the gaming vendor should focus on developing the best images of their player community. In contrast, in PBC, increased identification with the brand is essential for increased PSBC. Therefore, the strategies of enhancing the brand attributes can be beneficial for PSBC in this type of brand communities.

6.2 Limitations

This thesis research has several limitations. Adapted from Lu and Wang (2008), the 6-item satisfaction (SAT) scale exhibited a lack of indicator reliability, convergent validity and discriminant validity in this research context. 3 items (i.e., sat1, sat5 and sat6) were removed in order to improve the measurement model. The reliability and validity issues of the original satisfaction (SAT) scale could be partially affected by the characteristics of the sample. First, although the average age of the sample was 25.71 years, which was close to the mean age of 25 years of the Pokémon GO player population[34], the age range between the participants was rather large (57 years). The youngest respondent was 12 years old, and the oldest was 69 years old. Second, a limitation could be the cultural diversity of the sample. Of all 192 participating Pokémon GO players, 113 were from Finland (58.85%), 30 were from the States and the rest were from 31 other countries around the world. The cultural diversity might affect the way the participants perceived quality, expectations, own loyalty and a sense of community. Third, the fact that the majority of the participants does not speak English as their mother-tongue could also be a minor issue. Besides the characteristics of the sample, one big limitation lies in the data collection procedure in which multiple responses per IP address could not be identified.

7   CONCLUSION

Brand community is one of the important topics of relationship marketing. Many studies have demonstrated that a brand community is at first "imagined", and that consumers can feel belonging to this "imagined" community without interacting with one another. However, much of the knowledge on the sense of brand community has been restricted to the brand communities with some levels of social interaction. In 2008, Carlson et al. examined a sense of brand community from the social identity theory perspective, and introduced the PSBC concept.

A follow-up of Carlson et al.'s (2008) study, this thesis investigated the influences of PSBC on brand loyalty in the mobile game industry. It used a more general game player population, instead

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[34] (Forbes.com, 2017)

of just the social networks of game players, as research subjects. Mainly, the research aimed to seek answers to 2 questions: *"Does a mobile game player's PSBC affect his loyalty to the game?"* and *"What role does PSBC play in the relationship between mobile game satisfaction and loyalty?"*. The student concentrated on 3 variables - PSBC, game satisfaction and game loyalty - and used the multivariate data analysis technique SEM to test the hypotheses. The mobile game selected for this research was Pokémon GO. The findings showed that (1) PSBC is positively associated with players' loyalty regardless of the presence of their interaction with one another, (2) satisfaction is still a critical factor influencing mobile game loyalty, and (3) the effect of game satisfaction on loyalty is positively mediated by PSBC. As a result, the student's hypotheses 1 and 2 were empirically supported, yet hypothesis 3 was not accepted.

There are several recommendations for future studies. First, the measurement instruments used in this thesis were adapted from previous studies. Although they were tested in the original papers and assessed again in this thesis for reliability and validity, the future studies which explore the relationship between satisfaction and loyalty in the mobile context should develop more rigorous scales, especially for the users' satisfaction construct.

Second, within the scope of this thesis, SBC and PBC are not separated. The research does not examine the social interaction as an explanatory variable. A major reason is the complexity of identifying (1) whether participants have some forms of connection with one another, (2) if they do, whether it takes place in the virtual world and/or the physical world, (3) how to measure the degrees of social interaction, and so on. Hence, future research should further examine interaction between members as a variable. Separating SBC and PBC may open up notable differences between these 2 brand community types in loyalty–related activities, as well as in the satisfaction–loyalty relationship.

Finally, due to the relatively small sample size, this research cannot make in-depth analysis across subgroups, for examples male versus female respondents, and Finland's players versus players in other cultures. Future research should increase the sample size in other to improve on the investigation.

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9 APPENDICES

Appendix A

Table A1. A summary of loyalty measures used in previous research on online games and relevant industries

Authors	Objects	Measuring items
Chaudhuri and Holbrook, 2001	146 products was randomly selected from the Standard Industrial Classification (SIC) manual (1987)	• I will buy this brand the next time I buy [product name]. • I intend to keep purchasing this brand. • I am committed to this brand. • I would be willing to pay a higher price for this brand over other brands.
Choi and Kim, 2004	Online games	• The online game was overall satisfactory enough to reuse later. • I would re-use this online game when I want to play online games later.
Hsu and Lu, 2007	Online game communities	• I will frequently re-participate in online game community in the future. • I intend to revisit the online game community.
Lu and Wang, 2008	Online games	• In comparison with other online games, I prefer this online game. • I would recommend this online game to others. • I would re-use this online game when I want to play online games later. • When I want to play online game, this game is my first choice.
Yang and Peterson, 2004	Online banking experiences	• I say positive things about the company to other people.

		• I would recommend the company to those who seek my advice about such matters. • I would encourage friends and relatives to use the company. • I would post positive messages about the company on some Internet message board. • I intend to continue to do business with the present company. • 6. I intend to do more business with the present company.
Brakus et al., 2009	Computers, water, clothing, sneakers, cars and newspapers	• In the future, I will be loyal to this brand. • I will buy this brand again. • This brand will be my first choice in the future. • I will not buy other brands if this brand is available at the store. • I will recommend this brand to others.
Yoo and Donthu, 2001	Athletic shoes, film for cameras, and color television sets	• I consider myself to be loyal to X. • X would be my first choice. • I will not buy other brands if X is available at the store.
Huang and Hsieh, 2011	Online games	• I will recommend the games I played to others. • I repeat playing those online games. • I frequently return to the online games that I participated before. • I will say positive things about the games I played to others.
Saeed et al., 2013	Telecommunication	• I would like to use this telecom operator again. • I will consider other services of this telecom operator.

		• I will recommend this telecom operator to my friends. • Even though other operators have cheaper rates, I won't switch.
Reichheld, 2003	Financial services, cable and telephony, personal computers, ecommerce, auto insurance, and Internet service providers	• How likely is it that you would recommend [company X] to a friend or colleague?

Table A2. A sample of empirical loyalty studies (Bennett and Bove, 2002, pp.15-16)

Author(s)	Object of Loyalty	Product/ service	Items	Source (survey, scanner data etc)	Approach
Andreassen (1999)	Organisation	Market research service	How probable or improbable is it that you will continue being a customer of x company in a year from now? In case a friend of your asks you for advice when choosing x company, how probable or improbable is it that you would recommend the person to choose x company?	Self-reported	Attitudinal
Ajzen and Fishbein (1980)	Brand	Various – stores, automobiles	I intend to buy XX brand for my own use next week Likely unlikely Buying XX brand next week would be Good bad	Self-reported	Attitudinal
Biong (1993)	Supplier	Grocery Trade	To which degree does the outlet want the company to continue as a supplier to this outlet?	Self-reported	Attitudinal
Caldow (1998)	Organisation	Services	Think of a firm that that you would consider yourself to be a loyal customer to? Describe in detail why you have stayed loyal.	Self-reported	Attitudinal
Cunningham (1956)	Brand	Various consumer goods	Proportion of total purchases represented by the two largest single brands used	Panel data	Behavioural
Ehrenberg and Uncles (1997)	Brand	Various fast moving consumer goods	Share of category	Panel data	Behavioural
Ganesh, Arnold and Reynolds (2000)	Service	Bank	Active loyalty (3 items) Passive loyalty (3 items)	Self-reported	Attitudinal & Behavioural
Guest (1944)	Brand	Consumer goods	Stated preference for a brand "Here are 5 kinds of coffee, put a cross through the kind you like best"	Self-reported	Attitudinal

| Author(s)	Object of Loyalty	Product/ service	Items	Source (survey, scanner data etc)	Approach
Jain, Pinson and Malhotra (1987)	Service	Retail banking	Propensity to switch banks (8 items)	Self-reported	Attitudinal
Macintosh and Lockshin (1997)	Store	Discount liquor stores	Store attitude (2 items) Repurchase intention (2 items) Proportion of total category purchase at the focal store	Self-reported	Attitudinal & Behavioural
Pritchard, Havitz and Howard (1999)	Service	Airline travel & Hotel	Attitude (4 items) combined with proportion of purchase to form a Loyalty Index.	Self-reported	Attitudinal & Behavioural
Reynolds and Beatty (1999)	Salesperson and Company	Clothing and accessories	I am very loyal to my sales associate at (company name) I don't plan to shop with my sales associate at (company name) in the future* I am very committed to my sales associate at (company name) I don't consider myself very loyal to my sales associate at (company name)	Self-reported	Attitudinal

* Reverse-scored

Table A3. Summaries of the loyalty research conducted and highlights the measurement approach taken by the researchers (Rundle-Thiele and Bennett, 2001, pp.4-6)

Author	Product	Multi-domain approach	Behaviourist approach	Attitudinal/ cognitive approach
Baldinger and Rubinson, 1996, 1997		*		
Bonfield, 1974	Soft-drink	*		
Day, 1969	Convenience food product	*		
Donthu 1974	Television programs	*		
Farr and Hollis	FMCG	*		
Harrell and Bennett	Medical prescriptions	*		
Jacoby and Kyner, 1973	Candy bars	*		
McConnell, 1968	Beer	*		
Rundle-Thiele et al.,1998	Services (Telecommunications)	*		
Sheth and Venkatesan 1968	Hair spray	*		
Bass 1974			*	
Bawa and Shoemaker 1987	Not stated		*	
Bucklin and Gupta 1992	Liquid laundry detergent		*	
Cooper and Nakanishi 1988			*	
Dall'olmo Riley et al., 1997			*	
Dekimpe et al.,1997	Condensed milk, dry cat food and beer			*
Donthu, 1994			*	
East and Hammond	Coffee, detergent and toothpaste and crackers		*	
Ehrenberg & Uncles, 1997			*	
Ehrenberg et al.,1990	Instant coffee, TV series, aviation fuel		*	
Ehrenberg et al.,1994	25 grocery products		*	
Fader and Schmittlein, 1993	Various grocery products		*	
Hoyer, 1984	Laundry detergent		*	

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Johnson, 1984	FMCG-20 product categories		*	
Massey and Frank 1965	Various- types not stated		*	
Neslin et al.,1985	Bathroom tissue and coffee		*	
Papatla and Krishnamurthi, 1996	Liquid and powder laundry detergent		*	
Raj, 1985	Various- 900 types		*	
Wright et al.,	Retail fuel, supermarket and department store purchases		*	
Azjen and Fishbein 1980	Various – stores, automobiles			*
Caldow, 1998	Services			*
Fournier and Yao, 1997	Coffee			*
Gwinner et al.,1998	Services			*
Jacoby, 1971	Cake mix			*
Kim et al.,1998	Pizza			*
Lichtenstein et al., 1990	Toothpaste, laundry detergent, deodorant, shampoo			*
Patterson et al., 1997	Consultancy (service)			*
Peter and Ryan 1976	Motor vehicles			*
Quelch and Ash 1981	Services (Professional services)			*
Ringham et al., 1994	Service			*
Sheth, 1968	Various-soft-drinks, toothpaste, food, detergents			*
Shimp and Dyer, 1981	Services (Accounting)			*
Smith and Swinyard 1983	Snack food items			*
Sproles and Kendall, 1986	Retail- various			*
Tucker, 1964	Bread			*
Westbrook and Oliver, 1981	Products and services			*

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Appendix B

How the competitive environment affects the satisfaction-loyalty relationship (Jones and Sasser Jr., 1995)
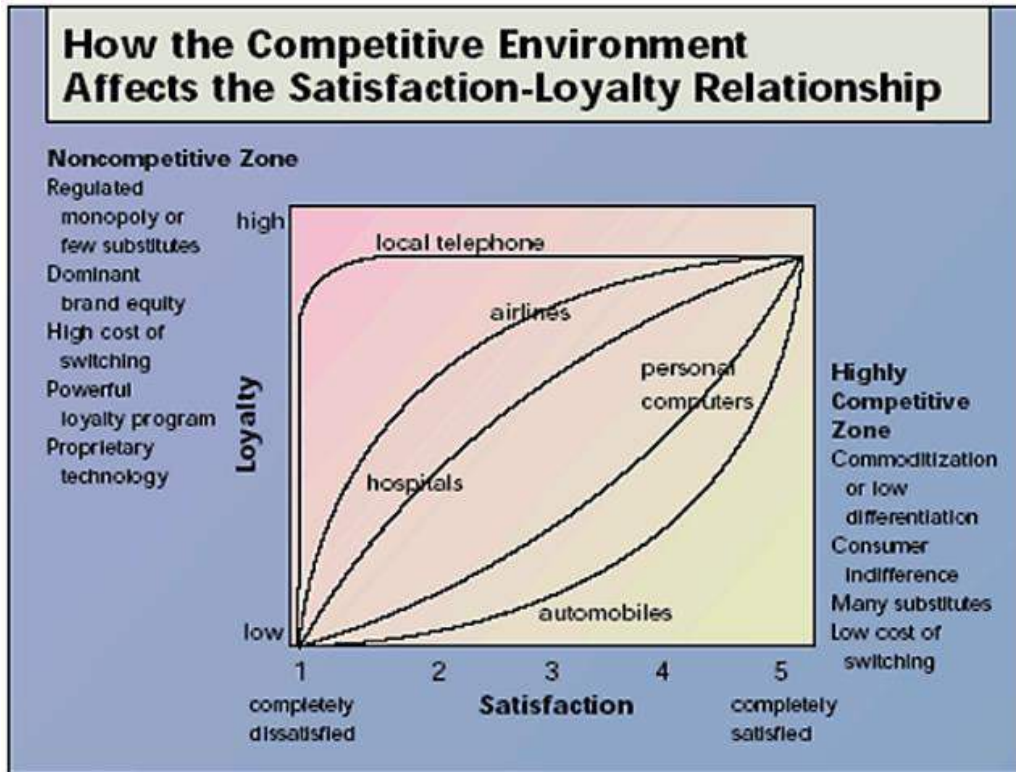
Appendix C

The screenshots of the online questionnaire

Pokémon GO game study

Welcome Pokémon GO players!

Thank you for your willingness to help out! This survey is a part of a research project conducted by Kim Duong (Arcada University of Applied Sciences). The research is not affiliated with or compensated by Niantic or any other organizations.

The purpose of this survey is to help understand the role that Pokémon GO plays in various gamer activities. Your responses are confidential!

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Pokémon GO game study

INSTRUCTIONS

For each item, choose the response that best describes how you frequently feel or act. There are no right or wrong answers. Just select the response that most accurately describes how you actually feel or act in your daily life, not how you wish you would act.

Please answer all questions!

1. How likely is it that you would recommend game Pokémon GO to a friend or colleague? *

	0	1	2	3	4	5	6	7	8	9	10	
Not at all likely	○	○	○	○	○	○	○	○	○	○	○	Extremely likely

2. How strongly do you agree that Pokémon GO deserves your loyalty? *

	0	1	2	3	4	5	6	7	8	9	10	
Not at all strongly	○	○	○	○	○	○	○	○	○	○	○	Extremely strongly

3. How likely is it that you will continue to play this game and/or other games from Niantic? *
(Niantic is the developer and publisher of the Pokémon GO mobile game.)

	0	1	2	3	4	5	6	7	8	9	10	
Not at all likely	○	○	○	○	○	○	○	○	○	○	○	Extremely likely

4. I like the game content of Pokémon GO. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

5. I am pleased with the services provided by Niantic. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

6. Niantic performs well in handling opportunistic gaming behavior. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

7. I am satisfied with the account administration of Niantic. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

8. I am pleased with the networking quality provided by Niantic. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

9. Overall, I am satisfied with Pokémon GO. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

10. I feel strong ties to other Pokémon GO players. *

	1	2	3	4	5	6	7	
Strongly disagree	○	○	○	○	○	○	○	Strongly agree

11. I find it very easy to form a bond with other Pokémon GO players. *

	1	2	3	4	5	6	7	
Strongly disagree	○	○	○	○	○	○	○	Strongly agree

12. I feel a sense of being connected to other Pokémon GO players. *

	1	2	3	4	5	6	7	
Strongly disagree	○	○	○	○	○	○	○	Strongly agree

13. A strong feeling of camaraderie* exists between me and other Pokémon GO players. *

*a feeling of friendship and trust among people who work or spend a lot of time together.

	1	2	3	4	5	6	7	
Strongly disagree	○	○	○	○	○	○	○	Strongly agree

14. Playing Pokémon GO gives me a sense of community. *

	1	2	3	4	5	6	7	
Strongly disagree	○	○	○	○	○	○	○	Strongly agree

15. I feel a sense of community with other people who play Pokémon GO. *

	1	2	3	4	5	6	7	
Strongly disagree	○	○	○	○	○	○	○	Strongly agree

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Pokémon GO game study

Please choose or fill in the appropriate response to the following questions for classification purposes.

Please choose your sex. *

○ Female

○ Male

Which country are you currently living? *

Your answer

What is your age? *

Your answer

Please tell in your words what you believe this study is about.

Your answer

THANK YOU FOR YOUR CONTRIBUTION TO THIS PROJECT!

Should you have any questions regarding this survey, please contact Kim Duong (duonthik(at)arcada.fi).

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