THE TRANSITION FROM 'PAID PC/CONSOLE GAMES' TO 'FREEMIUM MOBILE GAMES': FOCUSING ON USERS' REACTIONS TO AND PRICE TOLERANCE OF IN-APP PURCHASE ITEMS

by

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ABSTRACT

This study examines how customers react to online games that transition from being 'Paid PC/console Games to 'Freemium Mobile Games in the context of the game series "Diablo". In particular, this study focuses on three factors as customer reactions: behavioral intention to play a freemium mobile game, behavioral intention to make in-app purchases, and price tolerance of in-app purchases. The study adapts three relevant variables (expertise, experience, and social influence) from the unified theory of acceptance and use of technology (UTAUT2) and brand loyalty as independent variables to examine their impact on game users' reactions. An online survey was conducted among two groups of Diablo users: (1) current experienced users and (2) prospective online game users without Diablo experience. The theoretical contributions, practical implications, and limitations of the research are discussed based on the findings of this research.

CHAPTER 1 INTRODUCTION

With the development of PC and mobile technology, the electronic gaming industry's overall trend has shifted over the years. The central gaming platform has switched from PC-based only to multiple gaming platforms that compete synchronously. One of the successful gaming platforms is the mobile-based online game platform. Compared with playing video games on other gaming platforms that require game users to play at the specific location where the platform is stored, more and more game users now spend more time and money on mobile games that can be played in any location (Hsu & Lin, 2016).

In terms of payment options that online platforms provide to customers, while other platforms mainly offer game title purchases and game subscription purchases, which require game users to spend a decent amount of money to gain access to the game, the mobile game platform offers a different payment option for customers called the freemium model. The freemium payment option in mobile services refers to free initial access to mobile apps and services, with (in-app) payments required for premium elements, additional services, and upgraded experiences (Kumar, 2014). Liu et al. (2014) stated that offering a freemium version of a mobile app would generate more sales than the pay-to-download version of the mobile app.

Since mobile games also operate under mobile apps and mobile services, the Freemium payment option could also be applied to mobile games. Freemium mobile games, also called free-to-play (F2P) games, enable users to download and play the basic version of the game free of charge, but after certain progress and engagement with the game, additional payments are required to continue the game or to purchase specific in-app/virtual items that could help with their in-game progress (Koeder & Tanaka, 2017).

Online and mobile game adoption is a popular research topic that many previous studies have investigated from different perspectives. Perceived enjoyment has been identified as one of the key factors affecting customers' adoption of online/mobile games (Merhi, 2016; Ha et al., 2007; Nguyen, 2015). The influences of friends, family, and other social members are also key factors influencing customers' adoption of online/mobile games (Hsieh & Tseng, 2018; Kuan et al., 2014; Park & Chung, 2011).

The goal of this research is to understand how customers react to freemium mobile

games that are being transitioned from being paid PC/game console-based online games (hereafter paid PC/console games) and provide practical implications for game developers to set appropriate pricing and marketing strategies. In recent years, game developers of some traditional paid PC/console games announced that they will release new versions of their games on mobile platforms to play free of charge, with in-app purchases enabled, meaning that the way online game customers pay for the game service is changing (Koeder & Tanaka, 2017). Therefore, identifying the factors that influence the online game users who purchased titles of the previous versions in a game series to adopt and make in-app purchases in the new freemium version of these games will be relevant and informative for the field of the online game industry. To identify these influential factors, I developed a research model based on Venkatesh et al.'s (2012) unified theory of acceptance and use of technology (UTAUT2) for consumer information technologies (IT) and the literature on the brand loyalty.

This research therefore focuses on the online game users who previously purchased titles of the previous versions in a game series; however, it is equally important to explore the influence on potential new customers who have never purchased or played the previous versions of the game series. One of the main motivations for this research topic is the changing trends of the online gaming industry. I argue that it is important not only to investigate the factors that could attract potential game users who have never purchased or played any version of a game series to adopt and make purchases in the new freemium mobile version of the game but also to examine the impacts on the current users of the game series. Therefore, the main objective of this study is to address the following research questions:

(1) For players who have purchased and played the previous versions of a paid PC/console game (Group 1), what factors influence them to play and make in-app purchases in the next freemium mobile game of the paid game? What are the impacts of those factors on game users' behavioral intentions to play, make in-app purchases, and price tolerance of in-app purchases?

(2) For the individuals who did not purchase or play the previous versions of a paid PC/console game but who have played online games in general (Group 2), what are the impacts of those factors (identified for Group 1 users) on their behavioral intentions to play,

make in-app purchases, and price tolerance of in-app purchases?

(3) How do the impacts of the influencing factors differ among the three dependent variables and between the two groups of game users?

To address my research questions and provide a better understanding of the transition from 'Paid PC/console Games' to 'Freemium Mobile Games', I developed a research model based on existing literature on the adoption of mobile games and the freemium business models, as well as the UTAUT2 model (Venkatesh et al., 2012). I also introduce brand loyalty into my research model to address current users' reactions to the transition to freemium mobile games. Survey data collection is administered for two groups, followed by statistical analysis using the partial least squares (PLS) technique and Statistical Product and Service Solutions (SPSS). The tests of the research model are performed separately for the two groups and the three dependent variables (intention to play the freemium mobile game, intention to make in-app purchases in the game, and price tolerance of in-app purchases) to determine the unique impact of the identified independent variables on three dependent variables and for the two groups of users (experienced gamers vs. non-experienced gamers of a particular game series in its transition to a freemium mobile game). Theoretical contributions to academia and practical implications for several audience groups are discussed.

In the following sections of this paper, I first outlined the existing theoretical background that would support my argument about my study. I then provided my hypotheses development for every hypothesis in my research model and their reasoning. I also introduced my methodology for data collection and data analysis, which also included the results of my data analysis. I continued the paper by discussing each result and provided both theoretical contributions and practical implications of the study. I eventually concluded this paper by highlighting the limitation of this study and a brief conclusion.

CHAPTER 2 LITERATURE REVIEW AND THEORETICAL BACKGROUND

2.1. Literature Review on the Adoption of Online/Mobile Games

Previous studies have explored various factors under several theories that support online game adoption. For example, Merhi (2016) tested an integrated model that contains several factors that influence users' general intention to adopt online games. He found that the enjoyment of the game is extremely important for adopting online games (Merhi, 2016). Social interaction with others and achievement that players could make in the games are also key factors that determine whether customers would adopt an online game (Merhi, 2016). One of the main reasons for players to play online games is the social interaction with either the friends they have in real life or the friends they make in the game or virtual communities. In-game achievements can demonstrate the gamers' supreme expertise in gaming. Choi and Kim (2004) analyzed the factors that influence online game players' continued playing of online games. The results of their research indicate that customers who gain an optimal experience while they are playing the online game present higher brand loyalty to the game. The proper method of generating an optimal experience is to provide positive personal and social interactions in the game. Positive personal interaction could be achieved by providing customers with appropriate goals, operators, and feedback in the game, while social interactions could be enhanced through in-game communication places and tools (Choi & Kim, 2004).

Since my primary research interest is the transition from online paid PC/console games to freemium mobile games, the study of online game adoption is too broad. Ha et al. (2007) investigated the factors of mobile game adoption under mobile wireless access environments by extending the technology acceptance model (TAM) to include perceived enjoyment as one of the independent variables. Gender, age, and previous experience are included in their research model as moderators of mobile game adoption. Their results indicate that the perceived enjoyment that customers receive from mobile games is the most significant factor that makes customers adopt an online mobile game. Attractiveness is also extremely important for customers to adopt an online mobile game (Ha et al., 2007). In terms of my research focus, the game developer needs to create a similar or even better

quality of gaming experience and enjoyment in the mobile version of the game since the previous paid PC/console game versions are so successful with their high quality of gaming experience and enjoyment.

Nguyen (2015) explored the relationship between perceived enjoyment and continuance intention in mobile games. The research also highlights the key factors that would generate perceived enjoyment. The results of this study indicate that designed aesthetics, ease of use, and novelty are determining factors of perceived enjoyment in mobile gaming, while perceived enjoyment is positively related to the continuance intention to play mobile games. These findings are extremely important for freemium mobile games. Zhou (2013) also explored the effects of flow on mobile game adoption, which could also be considered an effect of perceived enjoyment. Previous research states that flow represents an optimal experience and has an extremely strong influence on users' adoption of mobile games.

Hsu and Lin (2016) examined mobile app stickiness and in-app purchase intention to determine what motivates users to make in-app mobile purchases. Their findings indicate that mobile app stickiness is positively related to in-app purchase intention and that potential users' intention to use and make in-app purchases in a mobile app is determined by stickiness (Hsu & Lin, 2016). However, the determinants of in-app purchase intention for users with experience include stickiness and social identification (Hsu & Lin, 2016).

The theory of social influence has been widely explored to understand customers' behaviors and their intention to purchase/use. For the social influence factor, informational social influence refers to individuals' deviation to reply to and agree with the opinions of others, which provides supporting evidence of the decisions and actions they make (Kuan et al., 2014). In this study, informational social influence could impact users' intention to play and make in-app purchases in the mobile-based game when they seek others' opinions that would help them make their decision. Another aspect of social influence theory that could support this study is normative social influence, which refers to individuals' deviation from achieving others' expectations, such as friends and families. Normative social influence usually occurs when individuals are attempting to be recognized and accepted by other individuals or groups (Lascu & Zinkhan, 1999). In terms of the impacts that normative social influence can make toward behaviors related to online games, one of

the main reasons that draws an individual to play and make in-app purchases in the mobile-based game is that their friends are doing so. By playing and purchasing in the games that they play with their friends, the individual feels accepted by their friends. I thus argue that the key social influences for the context of online and mobile games are close to the concept of normative social influences.

Cheng et al. (2012) investigated the theory of sense of virtual community from the perspective of its influences on customers' intention to purchase via online group buying. The sense of a virtual community refers to feelings of belonging, identity, and attachment among virtual community members in online-based communication. The sense of a virtual community separates the definition of virtual communities from similarly virtual groups and forums (Cheng et al., 2012). Almost every online game has its own virtual community and online forum. The influence that the virtual communities have on their community members directly impacts their members' behaviors and decisions, particularly in terms of other community members' comments on the next version of the game series or feedback from other community members on making in-game purchases. Such influences from the virtual communities to which customers belong significantly influence their members' decisions about whether to play and purchase in the next freemium version of the game.

Besides the previous studies related to online game adoption, I also found an interesting study about the different performance and revenue results of the same app on different mobile app platforms. Roma and Ragaglia (2016) tested the revenue performance of an app on Apple App Store and Google Play. The results indicate that both paid-to-download and freemium mobile apps performed equally on Apple App Store, whereas freemium mobile apps are less effective than paid-to-download apps on Google Play. The results also showed that in-app purchases are positively related to the app revenue performance on Apple App Store but are negatively related to the app revenue performance on Google Play. Therefore, pricing strategies for a mobile game need to be diversified based on the platform where it is released.

Based on the literature review conducted regarding online game adoption, I became familiar with the factors that determined users' adoption of online games. I also reviewed articles that specifically explored users' adoption of mobile games, including the effects of social influence factors. However, studies on game adoptions for game brands transitioning

from ‘Paid PC/console Games’ to ‘Freemium Mobile Games’ are extremely limited. This study aims to fill this gap in the existing literature.

2.2. Literature Review on Price Tolerance

According to Anderson (1996), price tolerance refers to the maximum price increase satisfied customers would tolerate or accept before choosing to use similar products or products with lower quality for lower costs. However, the definition of price tolerance provided by Anderson (1996) does not support my study accurately because customers have options to play a particular mobile-based freemium game for free with the freemium business model. Instead of accepting the maximum price increase, users can choose the maximum price they would pay for the game.

Later studies describe price tolerance as the reaction of customers to the price increase of a product and as price acceptance within the boundaries where consumers do not change their purchasing behaviors (Herrmann et al., 2004). In this way, the definition of price tolerance changes to the maximum price that a customer is willing to pay for a product (Herrmann et al., 2004). He et al. (2008) explored the relationships between price tolerance, customer satisfaction, and customers’ repurchase intention. However, they were unable to find a direct relationship between price tolerance and consumer repurchase intention. Their findings indicate that satisfied customers might not have a high price tolerance, while less satisfied customers might require greater discounts to purchase. It is more cost-effective for companies to keep satisfied customers than to attract new customers with less revenue.

Choi (2015) studied the pricing strategies of mobile apps and investigated how companies could avoid mobile app piracy through their pricing strategies. Their paper compared the difference between pay-to-download mobile apps and offering free versions of mobile apps. The results of their paper indicate that apps with higher prices tend to have more pirated app downloads, while free versions of mobile apps have fewer pirated app downloads (Choi, 2015). Most importantly, mobile apps with in-app purchase items do not impact the number of pirated app downloads. Liu et al. (2014) examined the freemium strategy in the mobile app market. They stated that offering freemium versions of a mobile

app would generate more sales than the pay-to-download versions of the mobile app (Liu et al., 2014). Meanwhile, by offering a high-quality free-to-trial version of a mobile app, the app would receive more positive ratings, which would be a great advertisement for the mobile app in return.

The literature review I conducted on price tolerance provided me with a deeper research background on price tolerance in general. I also confirmed that offering free-to-trial versions and freemium versions of mobile apps, including mobile games, were appropriate strategies for companies to generate higher revenue. However, few studies have examined customers' price tolerance to game brands transitioning from paid PC/console games to freemium mobile games. The effect of these transitioned mobile versions on new customers who have not played the previous versions before is still to be determined as well.

2.3. Literature Review on Brand Loyalty for Game Series

In terms of brand loyalty for games, the definition of brand loyalty in general is suitable for this study. True brand loyalty refers to an individual's commitment to a particular brand. The individual insists on purchasing the same series of products under the same brand repeatedly, where the degree of brand commitment determines the degree of brand loyalty (Bloemer & Kasper, 1995). In the gaming industry, brand loyalty is considered to be loyalty to specific game series or game developers. For game users who previously purchased and played the titles of previous games in the series, their previous gaming experience and their loyalty toward the particular game series would have a strong influence on their intention to play and make in-app purchases in the next mobile-based version of the game. Chaudhuri and Holbrook (2001) examined two main aspects of brand loyalty: purchase brand loyalty and attitudinal brand loyalty. Purchase brand loyalty represents customers' repeated purchase of a specific brand. Attitudinal brand loyalty includes a high level of emotional commitment in terms of the specific value of the brand. Their study indicates that purchase loyalty and attitudinal loyalty could be determined by combining the influence of brand trust and brand affect, which eventually generates greater market share and higher emotional connection between customers and the brand (Chaudhuri & Holbrook, 2001).

Balakrishnan and Griffiths (2018) specifically explored online mobile in-game purchases from the perspective of loyalty toward online games, gaming addiction, and purchase intention. Their findings indicate that mobile game players with higher mobile game addiction would present higher online mobile game loyalty (Balakrishnan & Griffiths, 2018). With higher game addiction, players tend to be more willing to make in-app purchases when they play online mobile games. Therefore, both online game loyalty and online game addiction positively influence customers' intention to purchase in-app items of online mobile games. Hsiao and Chen (2016) also explored the relationship between customers' loyalty toward mobile games and customers' in-app purchase intention for mobile games. They not only found that users' loyalty to the mobile game is positively related to their in-app purchase intention of mobile games, as in previous studies, but they also analyzed the factors that affected users' in-app purchase intention between the paying group and the non-paying group (Hsiao & Chen, 2016). Paying users' purchase intention is mostly determined by playfulness, good price, and rewards in the game, while non-paying customers mostly focus on the good price. According to this study, pricing and game quality are essential factors that influence users' in-app purchases of mobile games (Hsiao & Chen, 2016).

Hew et al. (2016) examined the relationship between mobile social commerce and brand loyalty and found that if users could confirm their expectations of mobile social commerce, they would consider mobile social commerce as the main platform they would use in the future. The positive experience would then generate continuance intention.

The literature review I conducted provided me with a deeper understanding of brand loyalty in general and in terms of mobile games. There was no doubt that brand loyalty played an important role in terms of online mobile games. However, research on brand loyalty with regard to famous game brands that are transitioning from paid PC/console games to freemium mobile games is still limited. The effects of such a transition also require further research.

2.4. Literature Review on UTAUT2

My research model is established based on Venkatesh et al.'s (2012) UTAUT2 model, which introduces seven independent variables to study customers' acceptance and use of technology: performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, and habit. Several other studies have applied UTAUT2 into the perspective of online games and mobile online games. For example, Baabdullah (2020) employed UTAUT2 to examine the factors that impact mobile game adoption in the Saudi Arabia region; however, he replaced the habit factor from the model with the concept of awareness. Ramírez-Correa et al. (2019) applied UTAUT2 to the adoption of mobile online games to highlighting the importance of habit and its influences on users' intention to play mobile games. Xu (2014) studied users' continued use of the online game in the China region, and he highlighted that social influence is the strongest influencing factor among others.

Like the previous studies, my research model is established on the foundation of UTAUT2 and incorporates effort expectancy, social influence, habit, and experience. However, I removed performance expectancy from my research model. As established by Venkatesh et al. (2012), performance expectancy is related to the benefits a consumer generates by using new technology to complete a set of activities. As this study focuses on online games for entertainment, performance expectancy is not relevant; it only applies to professional gamers who play online/mobile games for a living. I also excluded facilitating conditions. Because facilitating conditions refer to the organizational and technical infrastructures that exist to support the use of a system or technology (Venkatesh et al., 2003), and I do not anticipate much variability of this variable in my research context. I also exclude hedonic motivation from my study, as it refers to the fun or pleasure derived from using technology (Brown & Venkatesh, 2005). Since the target population of this study includes those who currently play the game and those who would be interested in the game series, the variability for the perceived enjoyment of one particular game would not be high. The price value factor is also excluded from my model because this factor is a part of price tolerance, which is included in this study as a dependent variable.

The literature review I conducted provided me with a deep understanding of

UTAUT2 and its application in online and mobile gaming. Although many previous studies have investigated UTAUT2 and its extended use in the gaming industry in different regions, studies of gaming brands and series transitioning from being ‘Paid PC/console Games’ to ‘Freemium Mobile Games’ are still limited. I thus hope to fill this research gap.

CHAPTER 3 RESEARCH MODEL AND HYPOTHESES

3.1. Summary of the Research Model

I propose three dependent variables—behavioral intention to play the game, behavioral intention to pay for the in-app purchase items, and price tolerance for in-app purchases—and I assume that the mobile version of the game is available to download and play free of charge, but that users can make in-app purchases to buy paid items within the mobile game; this setup reflects the definition of the freemium mobile game'. Since the research purpose is to examine the differences in the hypothesized relationships between current paid online game users (Group 1, hereinafter) and non-users of the game (Group 2, hereinafter), I propose three research models with five independent variables (brand loyalty for game series, social influence in games, social influence of purchase, expertise level, and experience level) for the two groups. As shown in Figure 1, five hypotheses are developed based on UTAUT2 (Venkatesh et al., 2012) and the existing literature on brand loyalty (Bloemer & Kasper, 1995; Chaudhuri & Holbrook, 2001) for each of the three dependent variables.

As shown in Figure 1, I have included age, gender, education, occupation, and habit in the research model as control variables to test whether my hypothesized relationships hold in the presence of these control variables. Habit is included in the UTAUT2 model as an independent variable, which is a perceptual construct that reflects the result of prior experiences (Venkatesh et al., 2012). As one of my recognized customer groups (Group 1) contains players who have experience playing previous versions of a game series, their habit of playing this game could provide us with insights that could impact the results of my study. However, as the other customer group (Group 2) contains prospective users who have never played or purchased any previous version of this game series before, habit is irrelevant in their case. Therefore, I adopt habit as a control variable in my research model.

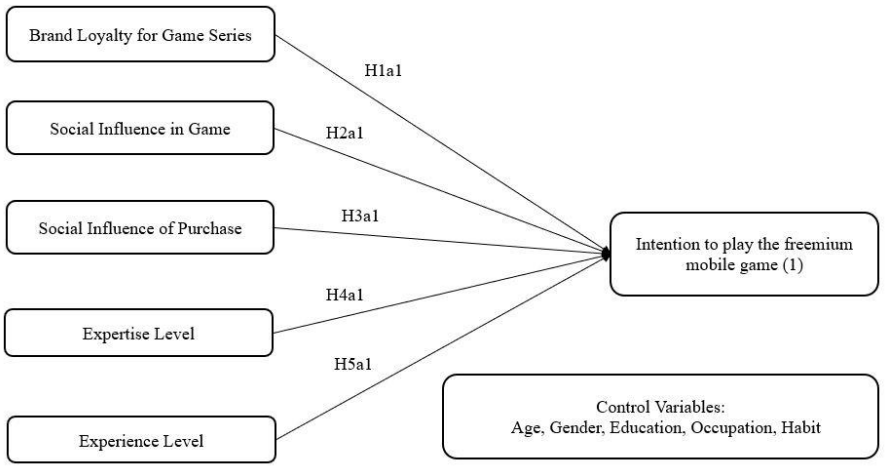

Figure 1.1. Research model: Behavioral intention to play as DV.

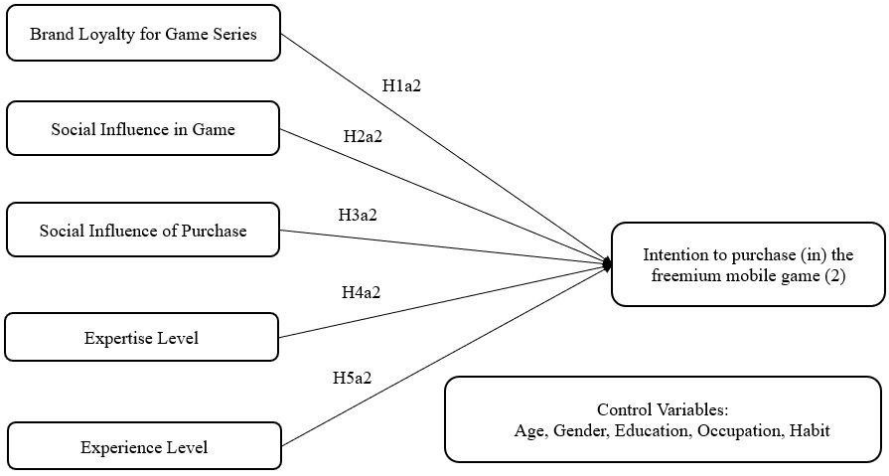

Figure 1.2. Research model: Behavioral intention to in-app purchase as DV.

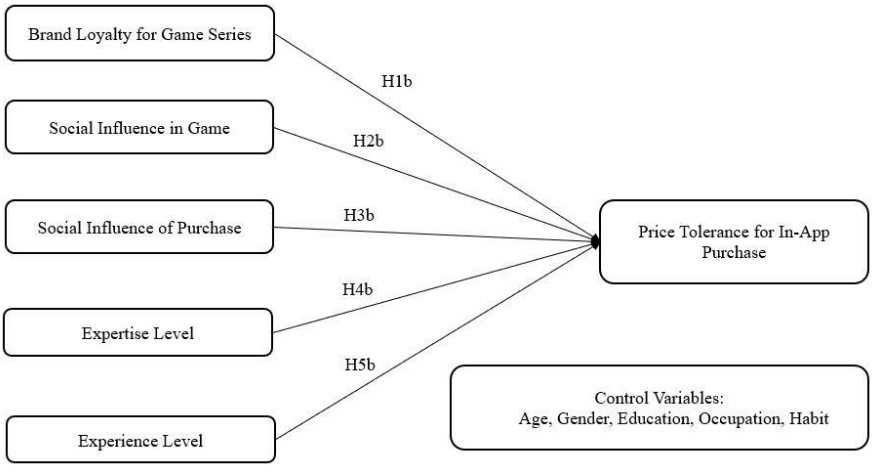

Figure 1.3. Research model: Price tolerance amount in-app as DV.

3.2. Brand Loyalty for Game Series

I add brand loyalty to my research model to address the reaction of current users of a particular game series and to determine the impact of brand awareness on prospective users. Among the many online and mobile game developers, there are some big-name game developers who have built their reputations and brand loyalty, and brand loyalty has been studied as an important factor for online game adoption (Balakrishnan & Griffiths, 2018). Since this study focuses on the transition from a paid PC/console game to a freemium mobile game of a rather big-name game developer, it is necessary to include and investigate the impact of brand loyalty on users' adoption and price tolerance.

Brand loyalty refers to an individual's commitment to a particular brand so that the individual insists on purchasing the same series of products under the same brand over and over again (Bloemer & Kasper, 1995). Chaudhuri and Holbrook (2001) claimed that purchase brand loyalty represents customers' repeated purchase of a specific brand, which could be considered loyalty for specific game series or game developers in the gaming industry. Balakrishnan and Griffiths (2018) also found that mobile game players with a mobile game addiction would present higher online mobile game loyalty. With a higher game addiction, players tend to be more willing to make in-app purchases when they play online mobile games.

Since I examine a specific game series, I anticipate variability in the brand loyalty of current users to the particular game series, and the brand loyalty could influence the adoption intention of current users. I also argue that brand loyalty to the game developer of the particular game series could influence the online game users to some extent to adopt and make in-app purchases in a freemium mobile version of the game series based on the positive relationships found between brand loyalty and online game adoption (Balakrishnan & Griffiths, 2018). For customers who previously purchased and played the title of the previous games in the series, their loyalty toward a game series would have a strong influence on their intention to play and make in-app purchases in the mobile-based freemium version of the game. Even among those non-users of the particular game series, if they have a strong loyalty toward the developer of the particular game due to the widely known name values of the developer company, the non-user groups who have not played

the game for various reasons (e.g., the price point of the paid-game series) would welcome playing and making some in-app purchases in the free-to-play version. Therefore, this study proposes the following hypotheses and argues that these hypotheses hold for both current and prospective user groups.

H1a1: Customers' brand loyalty to a paid-game series is positively related to their behavioral intention to play the freemium version of this game.
H1a2: Customers' brand loyalty to a paid-game series is positively related to their behavioral intention to make in-app purchases in the freemium version of this game.
H1b: Customers' brand loyalty to a paid-game series is positively related to their price tolerance for in-app purchases in the freemium version of this game.

3.3. Social Influence in Game and Social Influence of Purchase

Based on the UTAUT2 model (Venkatesh et al., 2012), I incorporate social influence in the research model, but I modify the concept to fit the context of online or mobile games. In the UTAUT model, social influence is defined as the extent to which individuals perceive that important social members believe or are convinced that they should purchase and use a particular product (Venkatesh et al., 2003). Social influence can be classified as informational or normative (Kuan et al., 2014). Informational social influence refers to individuals' deviation to reply to and agree on the opinions of others, thus providing supporting evidence for the decision and actions they take, while normative social influence refers to individuals' deviation to achieve expectations of others, such as friends and families (Kuan et al., 2014). Normative social influence usually occurs when individuals are attempting to be recognized by other individuals or groups (Lascu & Zinkhan, 1999). The influence of the virtual community to which the customers belong also has an impact on customers' intention to purchase online (Cheng et al., 2012). Therefore, I argue that the key social influences in the context of online and mobile games are close to the concept of normative social influences.

I propose two aspects of social influence in the online/mobile game environment, both of which can be considered normative social influences. First, users can perceive

social influence by seeing that others within online/mobile games possess the game items or levels that could influence their behavioral intention to possess or purchase what others have, which is referred to as social influence in games. Second, users can perceive social influence, especially in the context of mobile in-app purchase items, by seeing their peers make frequent purchases of in-app items specifically in mobile games, and they could then believe that they should do the same as others; this is referred to as social influence of purchase. I argue that these two social influences will affect the behavioral intention to play and make in-app purchases in the freemium mobile game series based on the significant impact of normative social influence in other contexts (Lascu & Zinkhan, 1999; Venkatesh et al., 2012), and that the social influences, whether based on what others possess within games or others' behaviors of making in-app purchases, will affect users' price tolerance of in-app purchases. I also argue that this influence holds for both current users of a particular game series and prospective users who can also possibly perceive these two social influences not only within the online game they have been playing but also among their peers who show the behaviors of making in-app purchases of mobile games. In sum, I hypothesize that these two social influences will be positively associated with three dependent variables for both groups as below.

H2a1: Social influence in games is positively related to customers' behavioral intention to play the freemium version of this game.
H2a2: Social influence in games is positively related to customers' behavioral intention to make in-app purchases in the freemium version of this game.
H2b: Social influence in games is positively related to customers' price tolerance for in-app purchases in the freemium version of this game.

H3a1: Social influence of purchase is positively related to customers' behavioral intention to play the freemium version of this game.
H3a2: Social influence of purchase is positively related to customers' behavioral intention to make in-app purchases in the freemium version of this game.
H3b: Social influence of purchase is positively related to customers' price tolerance for in-app purchases in the freemium version of this game.

3.4. Expertise Level

I consider expertise level the proxy of effort expectancy from Venkatesh et al.'s (2003) UTAUT. Effort expectancy refers to the ease with which customers can use the technology. Effort expectancy conforms to the perceived ease of use ideology in the TAM construct, which refers to the degree to which people believe that a program can be used free of effort (Venkatesh et al., 2003). In the mobile-commerce field, effort expectancy refers to the conception that a program will complete business transactions with minimal effort from the user (Verkijika, 2018). Previous studies have found that effort expectancy or game skills are positively associated with the adoption of a system in general (Venkatesh et al., 2012) and the adoption of online games in particular (Baabdullah, 2020).

In this research context, customers who have a high level of expertise in playing previous games, whether they are particular games from a game series or other online games, have a higher possibility of playing and making in-app purchases in the freemium version of the game. Therefore, this study posits the following hypotheses:

H4a1: Customers' expertise level of this game series is positively related to customers' behavioral intention to play the freemium version of this game.
H4a2: Customers' expertise level of gaming is positively related to customers' behavioral intention to make in-app purchases in the freemium version of this game.
H4b: Customers' expertise level of gaming is positively related to customers' price tolerance for in-app purchases in the freemium version of this game.

3.5. Experience Level

For experience level, I borrow the factor of experience from Venkatesh et al.'s (2012) UTAUT2. However, instead of using it as a moderating factor, I consider experience an independent variable in my study. Experience is recognized as opportunities to use technology and is operationalized as the passage of time from the first attempt at using this technology (Kim & Malhotra, 2005; Venkatesh et al., 2012).

In this research context, experience level refers to customers' recognition of their experience playing the previous games from a specific game series or any other online games. I argue that customers who have a high level of experience in playing the previous games, whether they are particular games from a game series or other online games, have a higher possibility of playing and making in-app purchases in the next freemium version of the game. I therefore propose the following hypotheses:

H5a1: Customers' experience level of this game series is positively related to customers' behavioral intention to play the freemium version of this game.
H5a2: Customers' experience level of gaming is positively related to customers' behavioral intention to make in-app purchases in the freemium version of this game.
H5b: Customers' experience level of gaming is positively related to customers' price tolerance for in-app purchases in the freemium version of this game.

CHAPTER 4 RESEARCH METHODOLOGY

4.1. Measurement

To test my research model, I adopted and modified the extant measures from previously validated survey items to fit this study. I also developed new items about online games and mobile games, specifically those not covered by existing measures from previous studies. Before conducting the actual survey, I conducted a pilot test to check the face validity of the survey items and confirmed the time required to complete the survey. Of more than 20 invitation links sent out, I received 11 responses. The questionnaires were revised and modified based on their feedback. The survey items in my questionnaires were measured using seven-point Likert scales, with scale item responses ranging from 1 (strongly disagree) to 7 (strongly agree); 1 (do not admire) to 7 (greatly admire); 1 (not important at all) to 7 (very important); and 1 (not any better) to 7 (much better).

To measure the variables for Group 1, which included current users of a selected game series, the measures for extant studies were adopted and developed for this study in the following ways. The survey items for behavioral intention to play and make in-app purchases were adopted from some extant studies on IT adoption (Davis, 1989; Luarn & Lin, 2005; Hsieh & Tseng, 2018). For price tolerance, I created an item that measured users' potential price tolerance for in-app purchases in the upcoming freemium mobile version of the selected game series. For the brand loyalty factor, I borrowed survey items from Lu and Wang (2008), making slight adjustments to the survey items to fit the context of this study. For social influence measures, I focused on two aspects: (1) social influence within an online/mobile game focusing on the game items that others have, and (2) social influence of purchase behaviors for the in-app items within mobile games by peers of the respondents. The survey items for social influence variables were adopted from previous studies (Marakas et al., 1998; Park & Chung, 2011). I created a survey item that investigated users' previous experience level of the previous versions of the selected game series by asking the number of months spent playing a particular paid PC/console game (for Group 1) or online paid games in general (for Group 2). The survey items for expertise level were adopted from the previous study of UTAUT2 (Venkatesh et al., 2012), with

slight adjustments made to the survey items to fit the context of this study. The survey items measured customers' beliefs in their expertise level for the selected game series.

To measure the variables for Group 2, which included current/prospective users of online paid games but not any version of the selected game series, the measurement items for three dependent variables and two social influence measures were exactly the same as those for Group 1; however, the measurement items for brand loyalty, experience, and expertise were slightly different. Compared with survey items for brand loyalty in Group 1, survey items for brand loyalty in Group 2 measured prospective customers' preferences for game series developed by Blizzard Entertainment compared with game series developed by other online game developers (Lu & Wang, 2008). Additionally, the survey item for experience level asked Group 2 participants about how long (in months) they had been playing online/mobile games. Finally, the survey items for expertise level in Group 2 measured their belief in their online/mobile gaming skills in general (Venkatesh et al., 2012). Appendix A presents the survey items and their original sources in detail.

4.2. Research Site Selection

My target population was twofold: (1) game users who had been playing a particular paid PC/console game that could respond to and potentially play its new freemium mobile version, and (2) game users who had not played that type of paid PC/console games but could potentially download and play the freemium version of the game. To conduct my research, it was essential to select a game series that was transitioning from being a 'Paid PC/console Game to a 'Freemium Mobile Game' and that was widely known by gamers and the public. The Diablo game series developed by Blizzard Entertainment fit this requirement and was thus selected.

I selected the current Diablo game series users (Group 1) and online game users who had not played the Diablo game series (Group 2) to meet the conditions for my research context. With the previous gaming experience of those in Group 1, these users would have a much better and more precise understanding of the game than those in Group 2.

Among all of these game developers and publishers, Blizzard Entertainment was

an excellent example to explore because Blizzard Entertainment recently started its attempt to expand into the mobile gaming market by developing mobile versions of their games under its famous game brand name. In late 2018, Blizzard Entertainment announced that their next version in the Diablo series, Diablo Immortal, would be developed as a mobile-based game only. Overall, this news prompted negative reactions from the Diablo fan communities. The game trailer posted on YouTube received more 'dislikes' than 'likes,' which forced them to delete the video on YouTube and re-upload it. At the time of writing (December 2020), the re-uploaded game trailer had received 30,000+ likes and 750,000 dislikes (https://www.youtube.com/watch?v=RtSmAwpVHsA&t=75s). This particular event motivated this research, which explores the current and prospective users' reactions to and price tolerance of new mobile freemium games.

The original Diablo developed by Blizzard Entertainment was a well-known paid online game series available on multiple gaming platforms. According to Statista (2020), the most recent version of Diablo (Diablo III) sold 5.26 million units as of February 2019. On the PlayStation 4 platform, Diablo III sold more than 0.83 million units in the North America region, more than 1.48 million units in Europe, more than 0.08 million units in Japan, and more than 0.44 million units in other regions (VGchartz, 2019). As mentioned above, Blizzard Entertainment recently announced that their new version of Diablo called Diablo Immortal would be released on mobile platforms (i.e., Android or IOS) as free-to-play with in-app purchases.

4.3. Sample and Survey Administration

To collect the data to test the proposed hypotheses, I conducted an online survey among the target populations described above. The online survey was generated and conducted using the Qualtrics survey system. Two separate surveys were administered for the two groups (current Diablo users - Group 1 and prospective users - Group 2). The participants for both groups were recruited through Amazon Mechanical Turk (MTurk), which is one of the dominant crowdsourcing markets that has been broadly used by academic researchers in North America in over 15,000 papers published between 2006 and 2014 (Chandler & Shapiro, 2016). I also posted the invitation link to the survey on some online

game forums, which prompted online gamers to have online discussions and post about the online games they played. To guide the participants toward the relevant survey for the target customer group to which they belonged, I asked the following screening question: "Have you purchased any game products from the Diablo Series before (in the form of a CD, DVD, or game serial code)?" Participants who answered "Yes" to this screening question proceeded to the survey questionnaire for Group 1, and those who answered negatively were directed to the survey questionnaire for Group 2.

The data collection was administered between September 3 and 15, 2020. Of 1,243 respondents, data from 477 usable responses with no missing values were collected, resulting in a valid response rate of 38.4%. Of those 477 participants, 291 belonged to Group 1, and 186 participants belonged to Group 2. Tables 1.1 and 1.2 present the descriptive statistics for the two groups.

Table 1.1. Descriptive Statistics of Group 1 (N = 291)

Variable	Category	Count	Percentage
Gender	Male	243	83.51%
	Female	43	14.78%
	Not listed	5	1.72%
Age	In teens	11	3.78%
	In 20s	93	31.96%
	In 30s	145	49.83%
	In 40s	34	11.68%
	In 50s	8	2.75%
	In 60s (and over)	0	0.00%
Education	Middle school degree or equivalent	7	2.41%
	High school degree	66	22.68%
	Vocational college degree	29	9.97%
	Undergraduate (University) degree	88	30.24%
	Graduate (University) degree	101	34.71%
Occupation	Student	40	13.75%
	Employed	196	67.35%
	Homemaker	7	2.41%
	Self-employed	30	10.31%
	Other	18	6.19%

Table 1.2. Descriptive Statistics of Group 2 (N = 186)

Variable	Category	Count	Percentage
Gender	Male	119	63.98%
	Female	67	36.02%
	Not listed	0	0.00%
Age	In teens	0	0.00%
	In 20s	26	13.98%
	In 30s	100	53.76%
	In 40s	37	19.89%
	In 50s	14	7.53%
	In 60s (and over)	9	4.84%
Education	Middle school degree or equivalent	2	1.08%
	High school degree	16	8.60%
	Vocational college degree	20	10.75%
	Undergraduate (University) degree	94	50.54%
	Graduate (University) degree	54	29.03%
Occupation	Student	6	3.23%
	Employed	131	70.43%
	Homemaker	8	4.30%
	Self-employed	36	19.35%
	Other	5	2.69%

CHAPTER 5 RESEARCH RESULTS

To test the hypotheses, I conducted PLS analysis using Smart PLS software. PLS analysis was considered an appropriate method to test the structural model used in this study because my model contains a variable that cannot be assumed to be normally distributed (e.g., price tolerance) (Hair et al., 2016).

5.1. Testing the Measurement Model

Since the intention of this study was not to have three dependent variables in one model, as illustrated in Figure 1, to examine the relationships between the five identified independent variables and each of the three dependent variables for both groups separately, the measurement model testing was done six times (three DVs with two groups).

I tested the measurement properties of my data with a confirmatory factor analysis to assess the reliability and validity of the proposed measurement model (Tables 2.1 - 2.6). First, I measured the internal reliability using Cronbach's α. The values of all variables exceeded 0.80, which was higher than the required minimum value of 0.70, indicating that the measures had satisfactory internal reliability (Gefen & Straub, 2005). Second, for convergent validity, I measured the item loadings for all items, which exceeded the ideal threshold value of 0.7 (Hair et al., 2010). Third, for reliability, the composite reliability (CR) values of most latent variables were greater than the threshold value of 0.7, indicating good internal consistency of my variables (Aguirre-Urreta & Ellis, 2013). The dependent variables in Group 2 (behavioral intention to play and behavioral intention to make in-app purchases) and brand loyalty were highly correlated with brand loyalty and social influence. Social influence in games was also highly correlated with brand loyalty when testing for price tolerance in Group 2. These high correlations were something I expected when I built the research model for this study, but I still kept them because their face values for the items are very different. The average variance extracted (AVE) values were greater than or equal to 0.50, which indicated that the latent variables captured enough variance over the amount of variance from measurement errors (Fornell & Larcker, 1981). Fourth, for discriminant validity, the square roots of the AVEs (bold numbers in Tables 3.1 - 3.6) for

all constructs exceeded their inter-correlations with other constructs, indicating satisfactory discriminant validity of my constructs (Chin et al., 1997). Fifth, I measured the dependent variables before the independent variables to minimize the chance of common bias in my survey research; however, since my research was done using cross-sectional survey data, there was still a risk of common-method bias. I thus conducted the full collinearity test to check whether there were any issues of common-method bias (Kock, 2015). Tables 4.1 - 4.6 show that most VIFs from my full-collinearity tests were lower than the threshold value of 3.3, except brand loyalty and behavioral intentions in the case of using behavioral intention variables as the dependent variables for the test model in Group 2, as illustrated in Table 4.4 and 4.5. The results suggested that while there were no serious concerns with common method bias in the variables for Group 1, there was a possible concern with common method bias for Group 2 when the behavioral intentions were used as the dependent variables.

Table 2.1. Measurement Validity and Reliability for Group 1 with BI to Play as DV (N = 291)

	Cronbach's α	Average Variance Extracted	Composite Reliability	Item Loadings
Behavioral Intention to Play (BIPlay)	0.8957	0.8255	0.9341	0.8862
				0.9356
				0.9031
Brand Loyalty (BrandLT)	0.8353	0.6627	0.8869	0.8354
				0.7793
				0.7717
				0.8661
Experience (ExpMonDS)	1.0000	1.0000	1.0000	1.0000
Expertise (ExpDSEE)	0.8808	0.7548	0.8572	0.9949
				0.7209
Social Influence in Games (SIGame)	0.8621	0.7841	0.9159	0.9603
				0.9670
				0.9632
Social Influence of Purchase (SIAppPur)	0.9615	0.9284	0.9749	0.9038
				0.8488
				0.9028

Table 2.2. Measurement Validity and Reliability for Group 1 with BI to In-App Purchase as DV (N = 291)

	Cronbach's α	Average Variance Extracted	Composite Reliability	Item Loadings
Behavioral Intention to Purchase (BIAppPur)	0.9316	0.9359	0.9669	0.9649
				0.9699
Brand Loyalty (BrandLT)	0.8353	0.6429	0.8769	0.8404
				0.7138
				0.7218
				0.9135
Experience (ExpMonDS)	1.0000	1.0000	1.0000	1.0000
Expertise (ExpDSEE)	0.8808	0.8918	0.9428	0.9595
				0.9289
Social Influence in Games (SIGame)	0.8621	0.7838	0.9158	0.8963
				0.8639
				0.8955
Social Influence of Purchase (SIAppPur)	0.9615	0.9284	0.9749	0.9595
				0.9685
				0.9627

Table 2.3. Measurement Validity and Reliability for Group 1 with PT amount In-App as DV (N = 291)

	Cronbach's α	Average Variance Extracted	Composite Reliability	Item Loadings
Brand Loyalty (BrandLT)	0.8353	0.6436	0.8773	0.8329
				0.7207
				0.7249
				0.9141
Experience (ExpMonDS)	1.0000	1.0000	1.0000	1.0000
Expertise (ExpDSEE)	0.8808	0.8390	0.9117	0.9978
				0.8260
Price Tolerance for In-App Purchase (PTAmtDInApp)	1.0000	1.0000	1.0000	1.0000
Social Influence in Games (SIGame)	0.8621	0.7838	0.9158	0.8963
				0.8551
				0.9038
Social Influence of Purchase (SIAppPur)	0.9615	0.9284	0.9749	0.9593
				0.9687
				0.9627

Table 2.4. Measurement Validity and Reliability for Group 2 with BI to Play as DV (N = 186)

	Cronbach's α	Average Variance Extracted	Composite Reliability	Item Loadings
Behavioral Intention to Play (BIPlay)	0.9529	0.9139	0.9696	0.9595
				0.9589
				0.9495
Brand Loyalty (BrandLT)	0.9455	0.8595	0.9607	0.9398
				0.9271
				0.9202
				0.9211
Experience (FreqOGMon)	1.0000	1.0000	1.0000	1.0000
Expertise (ExpOGEE)	0.8629	0.8786	0.9354	0.9485
				0.9261
Social Influence in Games (SIGame)	0.9549	0.9173	0.9708	0.9614
				0.9382
				0.9733
Social Influence of Purchase (SIAppPur)	0.9523	0.9129	0.9692	0.9527
				0.9537
				0.9599

Table 2.5. Measurement Validity and Reliability for Group 2 with BI to In-App Purchase as DV (N = 186)

	Cronbach's α	Average Variance Extracted	Composite Reliability	Item Loadings
Behavioral Intention to Purchase (BIAppPur)	0.9471	0.9498	0.9742	0.9737
				0.9754
Brand Loyalty (BrandLT)	0.9455	0.8595	0.9607	0.9388
				0.9282
				0.9212
				0.9201
Experience (FreqOGMon)	1.0000	1.0000	1.0000	1.0000
Expertise (ExpOGEE)	0.8629	0.879	0.9356	0.9454
				0.9297
Social Influence in Games (SIGame)	0.9549	0.9173	0.9708	0.9609
				0.9389
				0.9732
Social Influence of Purchase (SIAppPur)	0.9523	0.9129	0.9692	0.9528
				0.9538
				0.9598

Table 2.6. Measurement Validity and Reliability for Group 2 with PT amount In-App as DV (N = 186)

	Cronbach's α	Average Variance Extracted	Composite Reliability	Item Loadings
Brand Loyalty (BrandLT)	0.9455	0.8594	0.9607	0.9408
				0.9269
				0.9183
				0.9220
Experience (FreqOGMon)	1.0000	1.0000	1.0000	1.0000
Expertise (ExpOGEE)	0.8629	0.8794	0.9358	0.9412
				0.9342
Price Tolerance for In-App Purchase (PTAmtDInApp)	1.0000	1.0000	1.0000	1.0000
Social Influence in Games (SIGame)	0.9549	0.9171	0.9707	0.9611
				0.9363
				0.9751
Social Influence of Purchase (SIAppPur)	0.9523	0.9129	0.9692	0.9528
				0.9531
				0.9604

Table 3.1. Correlation Matrix and Discriminant Validity for Group 1 with BI to Play as DV (N = 291)

	BInPlay	BrandLT	Experience	Expertise	SIGame	SIAppPur
BInPlay	**0.9086**					
BrandLY	0.4087	**0.8141**				
Experience	-0.2001	0.1269	**1**			
Expertise	-0.0333	0.0706	0.2195	**0.8688**		
SIGame	0.3552	0.2515	-0.1902	0.0084	**0.8855**	
SIAppPur	0.4398	0.1847	-0.3424	-0.1253	0.4040	**0.9635**

Note. The bold numbers on the diagonal are the square roots of the AVEs. The off-diagonal numbers are the intercorrelations among constructs.

Table 3.2. Correlation Matrix and Discriminant Validity for Group 1 with BI to In-App Purchase as DV (N = 291)

	BIAppPur	BrandLT	Experience	Expertise	SIGame	SIAppPur
BIAppPur	**0.9674**					
BrandLY	0.3391	**0.8018**				
Experience	-0.3511	0.1095	**1**			
Expertise	-0.1002	0.1098	0.2447	**0.9444**		
SIGame	0.4108	0.2597	-0.193	0.0059	**0.8853**	
SIAppPur	0.6315	0.21	-0.343	-0.1223	0.4045	**0.9635**

Note. The bold numbers on the diagonal are the square roots of the AVEs. The off-diagonal numbers are the intercorrelations among constructs.

Table 3.3. Correlation Matrix and Discriminant Validity for Group 1 with PT amount In-App as DV (N = 291)

	BrandLT	Experience	Expertise	PTAmtDInApp	SIGame	SIAppPur
BrandLT	**0.8022**					
Experience	0.1082	**1**				
Expertise	0.0846	0.2347	**0.9160**			
PTAmtDInApp	0.3234	-0.3663	-0.0320	**1**		
SIGame	0.2595	-0.1921	0.0065	0.4322	**0.8853**	
SIAppPur	0.2105	-0.3430	-0.1264	0.6007	0.4052	**0.9635**

Note. The bold numbers on the diagonal are the square roots of the AVEs. The off-diagonal numbers are the intercorrelations among constructs.

Table 3.4. Correlation Matrix and Discriminant Validity for Group 2 with BI to Play as DV (N = 186)

	BInPlay	BrandLT	Experience	Expertise	SIGame	SIAppPur
BInPlay	**0.9560**					
BrandLY	0.8478	**0.9271**				
Experience	-0.3400	-0.3241	**1**			
Expertise	0.2964	0.3499	-0.0354	**0.9373**		
SIGame	0.7568	0.7085	-0.3036	0.4172	**0.9578**	
SIAppPur	0.6429	0.6535	-0.2134	0.4088	0.6607	**0.9555**

Note. The bold numbers on the diagonal are the square roots of the AVEs. The off-diagonal numbers are the intercorrelations among constructs.

Table 3.5. Correlation Matrix and Discriminant Validity for Group 2 with BI to In-App Purchase as DV (N = 186)

	BIAppPur	BrandLT	Experience	Expertise	SIGame	SIAppPur
BIAppPur	**0.9746**					
BrandLY	0.8627	**0.9271**				
Experience	-0.3596	-0.3236	**1**			
Expertise	0.3129	0.3500	-0.0348	**0.9375**		
SIGame	0.7334	0.7084	-0.3034	0.4170	**0.9578**	
SIAppPur	0.7189	0.6537	-0.2134	0.4085	0.6609	**0.9555**

Note. The bold numbers on the diagonal are the square roots of the AVEs. The off-diagonal numbers are the intercorrelations among constructs.

Table 3.6. Correlation Matrix and Discriminant Validity for Group 2 with PT amount In-App as DV (N = 186)

	BrandLT	Experience	Expertise	PTAmtDInApp	SIGame	SIAppPur
BrandLT	**0.9270**					
Experience	-0.3246	**1**				
Expertise	0.3477	-0.034	**0.9378**			
PTAmtDInApp	0.6947	-0.2921	0.2967	**1**		
SIGame	0.7094	-0.3049	0.4161	0.5898	**0.9577**	
SIAppPur	0.6535	-0.2135	0.4082	0.618	0.6614	**0.9555**

Note. The bold numbers on the diagonal are the square roots of the AVEs. The off-diagonal numbers are the intercorrelations among constructs.

Table 4.1. Full Collinearity Test (VIF) on Endogenous Variables for Group 1 with BI to Play as DV

	BIPLDM
BrandLT_T	1.328
SIAppPur_T	1.292
SIGame_T	1.487
ExpDSEE_T	1.083
FreqPLOG	1.280

Table 4.2. Full Collinearity Test (VIF) on Endogenous Variables for Group 1 with BI to In-App Purchases as DV

	BIAppPur
BrandLT_T	1.300
SIAppPur_T	1.283
SIGame_T	1.458
ExpDSEE_T	1.083
FreqPLOG	1.266

Table 4.3. Full Collinearity Test (VIF) on Endogenous Variables for Group 1 with Price Tolerance

	PTAmtDInApp
BrandLT_T	1.142
SIAppPur_T	1.259
SIGame_T	1.345
ExpDSEE_T	1.083
FreqPLOG	1.248

Table 4.4. Full collinearity test (VIF) on endogenous variables for Group 2 with BI to Play as DV

	BIPLDM
BrandLT_T	4.169
SIAppPur_T	2.607
SIGame_T	2.356
ExpDSEE_T	1.370
FreqPLOG	1.171

Table 4.5. Full collinearity test (VIF) on endogenous variables for Group 2 with BI to In-App Purchases as DV

	BIAppPur
BrandLT_T	3.913
SIAppPur_T	2.848
SIGame_T	2.105
ExpDSEE_T	1.365
FreqPLOG	1.154

Table 4.6. Full collinearity test (VIF) on endogenous variables for Group 2 with Price Tolerance

	PTAmtDInApp
BrandLT_T	2.358
SIAppPur_T	2.478
SIGame_T	2.086
ExpDSEE_T	1.358
FreqPLOG	1.143

5.2. Testing the Structured Model

Since all hypotheses in my research model were direct relationships (H1 - H5), I measured the explained variance (R2), path coefficients (β), and their levels of significance (t-values) using a bootstrapping method with re-sampling (Group 1: 800 re-samples, greater than two times the sample size = 391; Group 2: 600 re-samples, greater than two times the sample size = 186) to assess the significance of the hypothesized relationships. Figures 2.1 - 2.6 present the explained variances (R2), the path coefficients (β), and their levels of significance (based on t-values). For Group 1, all hypotheses, except H4 and H5, are supported at the a = 0.1, 0.05, 0.01, or 0.001 levels of significance, as shown in Figures 2.1 - 2.3. For Group 2, all hypotheses, except H3a1, H4a1, H5a1, H2a2, H4a2, H5a2, H2b, H4b, and H5b, are supported at the a = 0.05, 0.01, or 0.001 levels of significance, as shown in Figures 2.4 - 2.6.

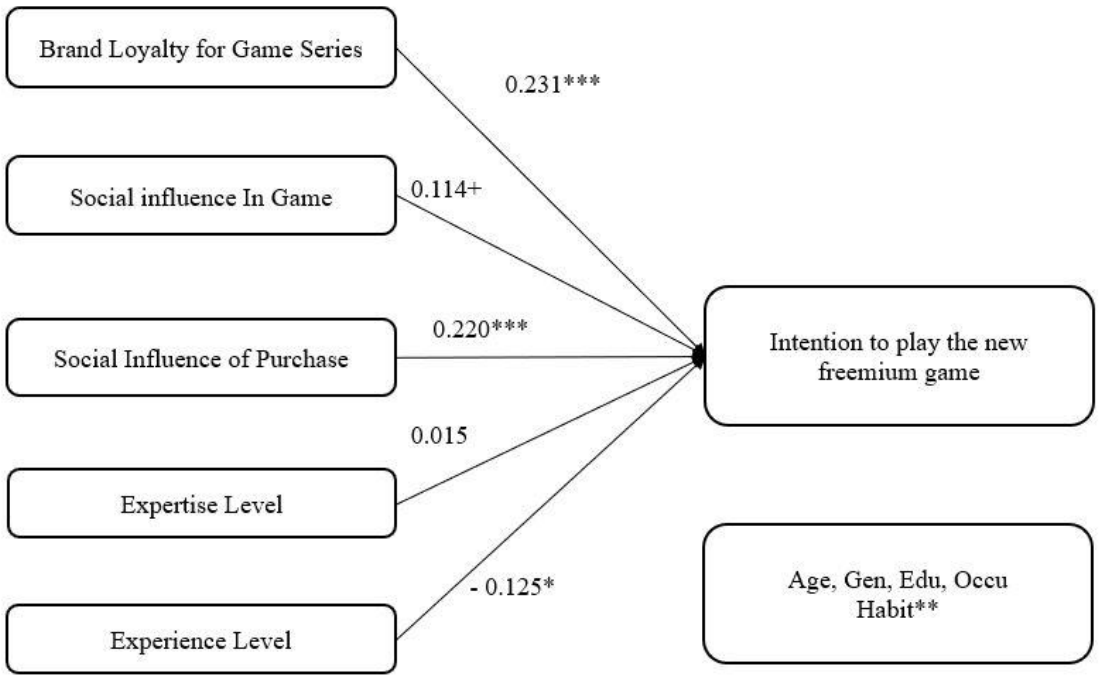

Figure 2.1. Structural test results for Group 1 with BI to Play as DV (N = 291)

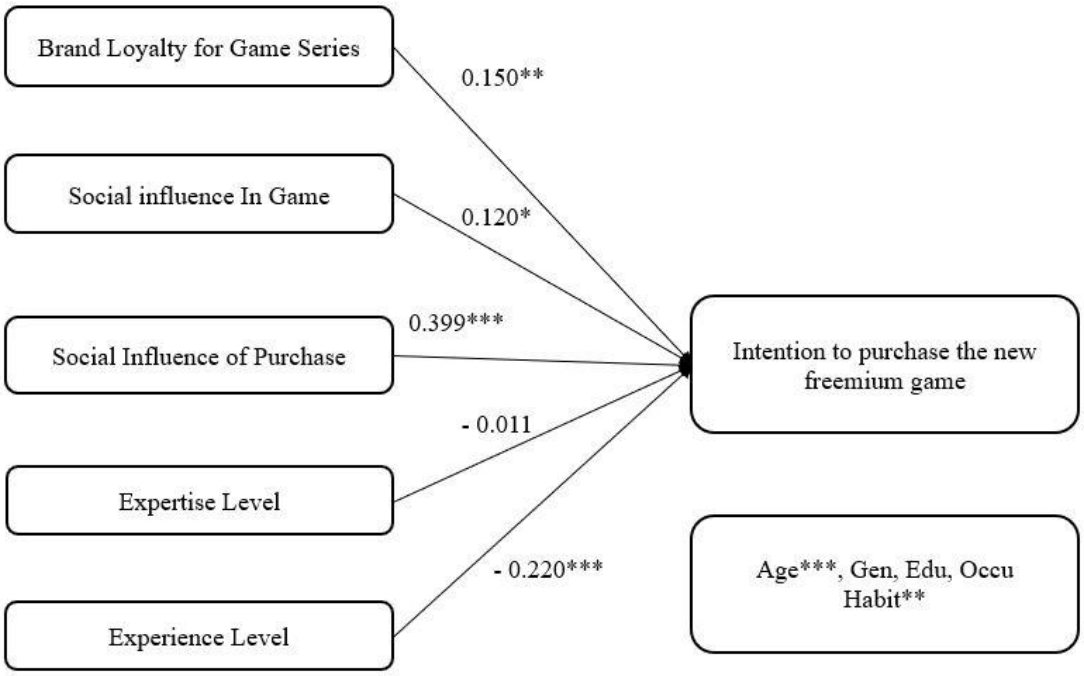

Figure 2.2. Structural test results for Group 1 with BI to In-App Purchase as DV (N = 291)

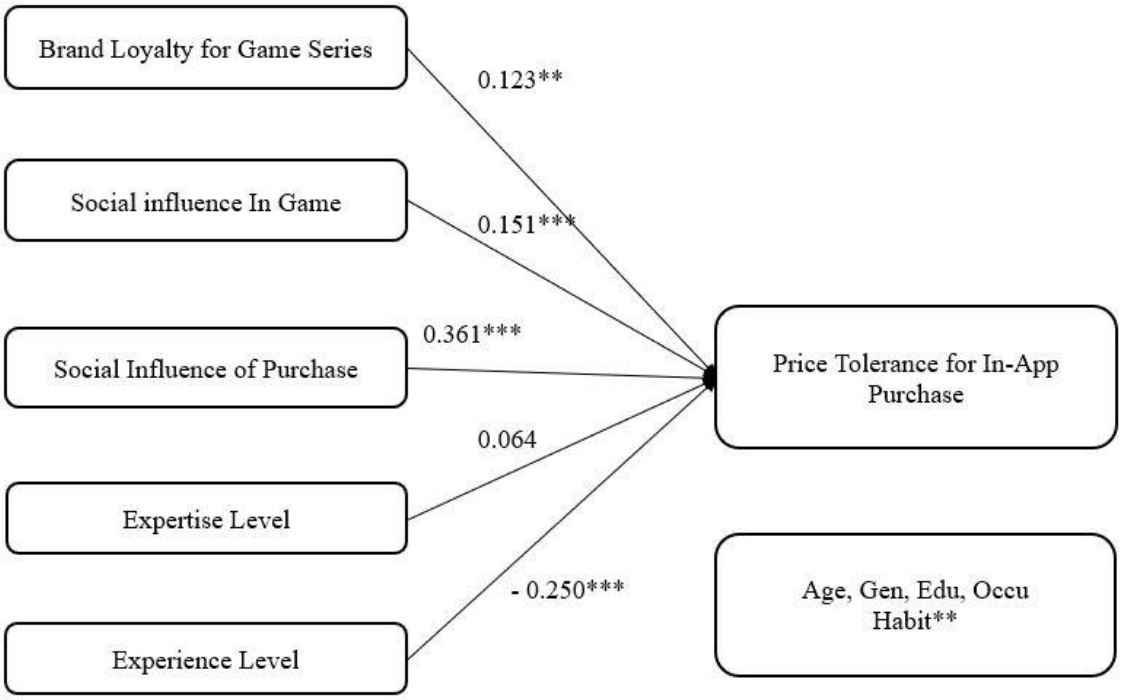

Figure 2.3. Structural test results for Group 1 with PT amount In-App as DV (N = 291)

For Group 1, first, brand loyalty for game series is significantly (and positively) related to both intention to play the new freemium game and intention to make in-app purchases in the new freemium game (H1a1: $\beta = 0.231$, $t = 3.906$ at the 0.001 level; H1a2: $\beta = 0.150$, $t = 2.870$ at the 0.01 level). The results from the tests for H1a1 and H1a2 indicate that, as hypothesized, if customers have a high level of brand loyalty toward a game series, they would be most likely to play the upcoming freemium mobile version of the game and make in-app purchases. In terms of price tolerance, as hypothesized, brand loyalty for game series is also significantly (and positively) related to customers' price tolerance for in-app purchases in the new freemium Diablo mobile game (H1b: $\beta = 0.123$, $t = 2.688$) at the 0.01 level. The results from the test of H1b indicate that customers with a higher level of brand loyalty toward a game's brand are more likely to spend more money purchasing the in-app purchases in the next freemium Diablo mobile game.

Second, social influence in games is significantly (and positively) related to both intention to play the new freemium game and intention to make in-app purchases in the new freemium game. (H2a1: $\beta = 0.231$, $t = 1.893$ at the 0.01 level; H2a2: $\beta = 0.120$, $t = 2.401$ at the 0.05 level). The results for H2a1 and H2a2 indicate that the in-game playing

and purchasing behavior of social members who are close and important to the customers could make the customers conduct similar game playing and purchasing behavior for the same online game product. Compared with intention to play, the impact of social influence in games is stronger on intention to purchase the in-app items. Social influence in games is also significantly (and positively) related to customers' price tolerance for in-app purchases (H2b: $\beta = 0.151$, $t = 3.691$) at the 0.001 level, indicating that the in-game behavior of friends and other game players could significantly affect the amount customers are willing to pay for in-app items.

Third, social influence of purchasing is significantly (and positively) related to both intention to play the new freemium game and intention to make in-app purchases in the new freemium game (H3a1: $\beta = 0.220$, $t = 3.464$; H3a2: $\beta = 0.399$, $t = 7.720$) at the 0.001 level. The results for H3a1 and H3a2 indicate that friends and other online game players' purchasing behavior in online games could encourage the customer to play and make purchases in the same online games to access the same level of the gaming experience as others who have already purchased similar items. Compared with intention to play, the impact of social influence of purchase is also stronger on intention to purchase in-app items. Social influence of purchasing is also significantly (and positively) related to customers' price tolerance for in-app purchases in the new freemium game (H3b: $\beta = 0.361$, $t = 8.105$) at the 0.001 level, which means that the higher the price that other social members are willing to pay for in-app items in a game, the higher the chance that the customer will also pay a higher price for the same product.

Fourth, expertise level of the game is not significantly related to either intention to play the new freemium game or intention to make in-app purchases in the new freemium game (H4a1: $\beta = 0.015$, $t = 0.240$; H4a2: $\beta = -0.011$, $t = 0.224$). Such results indicate that customers' expertise level of the previous game in the game series does not influence their future behavior in terms of playing and purchasing in the next freemium mobile version of the game. Expertise level of the game is also not significantly related to customers' price tolerance for the in-app purchase in the new freemium game (H4b: $\beta = 0.064$, $t = 1.084$). These results indicate that customers' expertise level of the previous game in the game series does not influence the amount they are willing to spend on in-app purchases in the next freemium mobile version of the game.

Fifth, experience level of the game is significantly (and negatively) related to both intention to play the new freemium game and intention to make in-app purchases in the new freemium game (H5a1: $\beta = -0.125$, $t = 2.003$ at 0.05 level; H5a2: $\beta = -0.220$, $t = 4.065$ at 0.001 level). The results from the tests for H3a1 and H3a2 indicate that the more gaming experience of a previous version of a game series a customer has, the lower the chance that this particular customer will play and make in-app purchases in the freemium version of this game. Compared with a lower intention to play, the impact of the customer's experience level lowers the intention for customers to purchase the game's in-app items. Experience level of the game is also significantly (and negatively) related to customers' price tolerance for in-app purchases in the new freemium game (H5b: $\beta = -0.250$, $t = 6.188$) at the 0.001 level, indicating that the more gaming experience on a previous version of a game series a customer has, the lower price this customer will be willing to pay for in-app items in the next freemium version of this game.

Among the five control variables examined by the model, habit is significant for all three research models for Group 1 at the 0.01 level, and age is a significant factor for the second model using behavioral intention to make an in-app purchase as the dependent variable at the 0.001 level. The other control variables have no significant relationships with the dependent variables for Group 1.

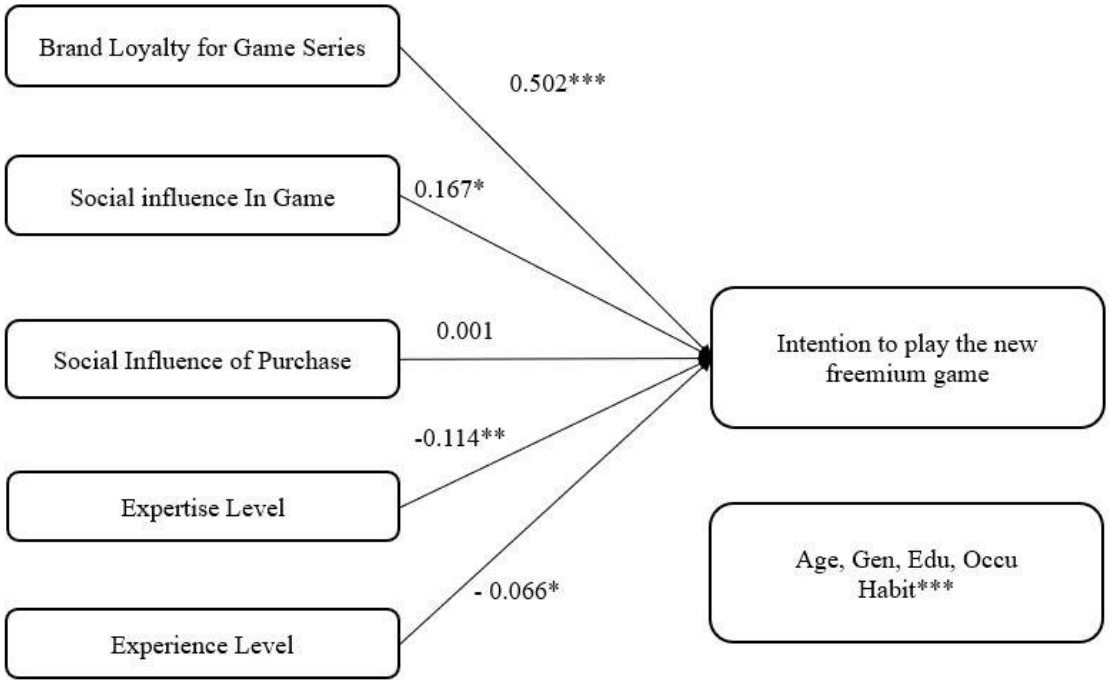

Figure 2.4. Structural test results for Group 2 with BI to Play as DV (N = 186)

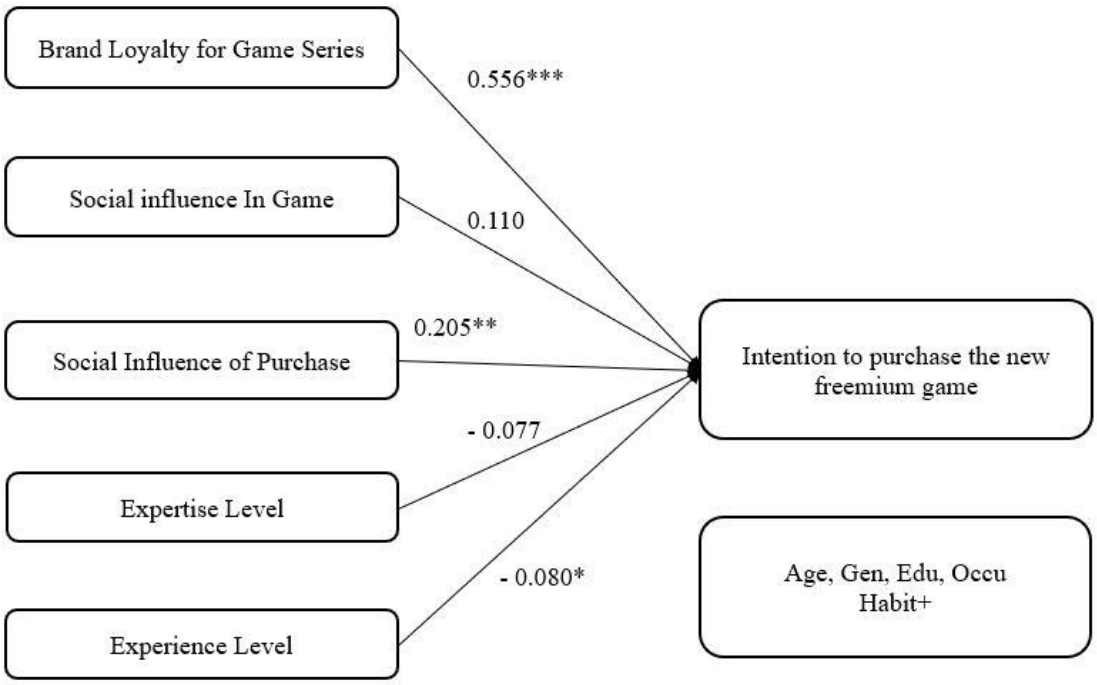

Figure 2.5. Structural test results for Group 2 with BI to In-App Purchase as DV (N = 186)

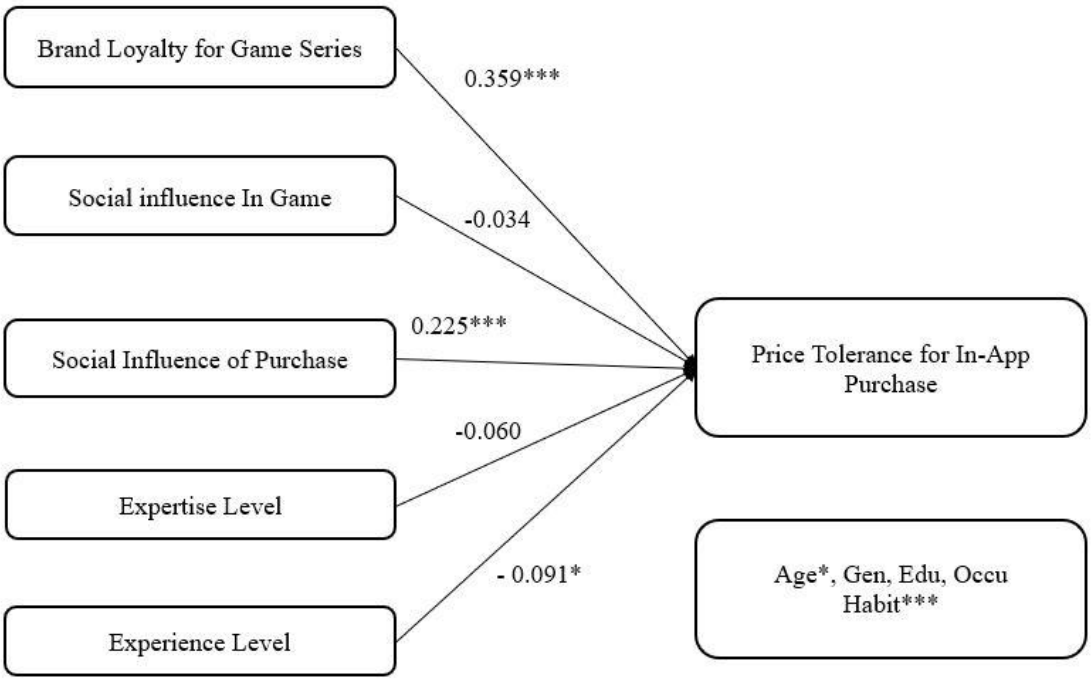

Figure 2.6. Structural test results for Group 2 with PT amount In-App as DV (N = 186)

For Group 2, first, brand loyalty to a game series is significantly (and positively) related to both intention to play the new freemium game and intention to make in-app purchases in the new freemium game (H1a1: $\beta = 0.502$, $t = 6.806$; H1a2: $\beta = 0.556$, $t = 8.073$) at the 0.001 level. The results from the tests for H1a1 and H1a2 are the same as Group 1. Brand loyalty for game series is also significantly (and positively) related to customers' price tolerance for the in-app purchase in the new freemium game (H1b: $\beta = 0.359$, $t = 5.406$) at the 0.001 level. The results from the test for H1b2 are also similar to those for Group 1.

Second, social influence in games is significantly (and positively) related to intention to play the new freemium game (H2a1: $\beta = 0.167$, $t = 2.067$) at the 0.05 level, but it is not significantly related to intention to make in-app purchases in the new freemium game (H2a2: $\beta = 0.110$, $t = 1.544$). The results for H2a1 and H2a2 indicate that the in-game playing and purchasing behavior of social members who are close and important to the prospective customers could make them conduct similar game playing behavior for the same online game product, but not similar purchasing behavior. The significance level of H2a1 is higher than that for Group 1, indicating that compared with current Diablo users,

the impacts of social influence in games for prospective customers are stronger on their intention to play the game. Social influence in games is not significantly related to customers' price tolerance in-app purchases (H2b: $\beta = -0.034$, $t = 0.448$), indicating that the in-game behavior of friends and other game players would not motivate customers to spend more on in-app items.

Third, social influence of purchase is not significantly related to intention to play the new freemium game (H3a1: $\beta = 0.001$, $t = 0.022$), but it is significantly (and positively) related to intention to make in-app purchase in the new freemium game (H3a2: $\beta = 0.205$, $t = 2.802$) at the 0.01 level. The results for H3a1 and H3a2 indicate that friends and other online game players' purchasing behavior in online games would not lead customers to play a game, but it could lead the customer to purchase the same online/mobile games so that they can access the same level of gaming experience as others who have already purchased specific in-app items. Social influence of purchase is significantly (and positively) related to customers' price tolerance for the in-app purchase in the new freemium game (H3b: $\beta = 0.255$, $t = 3.924$) at the 0.001 level. The results from the test for H3b are similar to those for Group 1, but the impacts from social influence of purchase to customers' price tolerance for in-app purchases in Group 2 are weaker than those in Group 1.

Fourth, expertise level of the game is significantly (and negatively) related to intention to play the new freemium game (H4a1: $\beta = -0.114$, $t = 2.792$) at the 0.01 level, but not significantly associated with intention to make in-app purchases in the new freemium game (H4a2: $\beta = -0.077$, $t = 1.527$). These results indicate that the more skilled customers think they are at other online/mobile games, the lower the chance they will play the freemium mobile version of Diablo. Expertise level of the game is not significantly related to customers' price tolerance for in-app purchases in the new freemium mobile game (H4b: $\beta = -0.060$, $t = 1.036$), which provides the same test result as Group 1.

Fifth, experience level of the game is significantly (and negatively) related to both intention to play the new freemium game and intention to make in-app purchases in the new freemium game (H5a1: $\beta = -0.066$, $t = 2.096$; H5a2: $\beta = -0.080$, $t = 2.290$) at the 0.05 level. The results from the tests for H3a1 and H3a2 indicate that the more prior gaming experience a customer has, the less this particular customer would like to play or make in-

app purchases in an upcoming freemium game. Experience level of the game is significantly (and negatively) related to customers' price tolerance for in-app purchases in the new freemium game (H5b: $\beta = -0.091$, $t = 2.175$) at the 0.05 level, which is the same test result as that obtained for Group 1.

Among the five control variables, habit is a significant factor for all three research models for Group 1 and Group 2 at the 0.001, 0.01 and 0.1 levels, while age is also a significant factor for the second model using behavioral intention to make in-app purchases as the dependent variable for Group 1 at the 0.001 level and the third model using price tolerance amount for in-app purchases as the dependent variable for Group 2 at the 0.05 level. The other control variables have no significant relationships with the dependent variables for Group 1 and Group 2.

PTInApp_G1	PTInApp_G2
13.05498	25.6828

Figure 2.7. Mean Difference in Price Tolerance

Last, I compared the mean difference in price tolerance of in-app purchases between the two customer groups. The results showed significant differences (p-value < .01) between Group 1 (current Diablo users) and Group 2 (prospective users) for the price they are willing to pay for in-app purchases in the upcoming freemium mobile version of Diablo. However, Group 2 (prospective users) users have a higher price tolerance.

CHAPTER 6 DISCUSSION

6.1. Discussion of Results

The goals of this research were to (1) understand how current paid PC/console game customers and new mobile game customers adopt the new freemium mobile games that are transitioning from traditional paid PC/console games, (2) explore the effects of identified factors on customers' behavioral intention to play and make in-app purchases in an upcoming freemium mobile game and their price tolerance for purchases of in-app items, and (3) provide practical implications for key audiences, such as online/mobile game developers and current/prospective game users. To achieve these goals, I developed a research model based on the UTAUT2 for consumer goods (Venkatesh et al., 2012) and the existing literature on brand loyalty. Survey data collected from 477 respondents were analyzed using PLS to test the hypotheses. Data analysis was performed two times with three dependent variables (behavioral intention to play the freemium game, behavioral intention to make in-app purchases in the freemium game, and price tolerance for in-app purchases of the game) and two groups (current and prospective users of the specified game—the freemium mobile version of Diablo). Based on a comparison of the results from the data analysis, the following points were considered interesting results.

First, for the customers' price tolerance for potential in-app purchases within the freemium game, the results showed that customers with no experience of the previous version of the Diablo game series were willing to pay on average $12.6 more than the amount that the current customers were willing to pay for the mobile game. We could interpret this result in the following ways: (1) customers with no experience of previous versions of the paid online game have lesser knowledge and understanding of the paid games, and/or (2) most current gamers of the paid games had already spent a decent amount of money on the previous versions and had a good understanding and knowledge of the previous version of the paid games in general, resulting in a much lower expectation for the upcoming mobile version in general. As such, it would be understandable that current customers for paid online games were unwilling to pay as much for the mobile versions of the games as the prospective customers of mobile games.

Second, when comparing the impact of experience on users' behavioral intention to make in-app purchases and play between the current online Diablo (paid) users and prospective users, several interesting findings were noticed. For current users (Group 1), their level of experience, which was measured by the number of months they had played the paid versions of Diablo, was significantly and negatively related to customers' intention to play or make in-app purchases in the upcoming mobile game. These findings indicated that the more gaming experience on a previous paid version of a game series a customer had, the less likely they would play and make in-app purchases in the next mobile (freemium) version of this game. Intuitively, people would assume that customers with a high level of experience with the previous versions of a game series would have a higher intention to play and make in-app purchases in the next mobile version, but the results indicated otherwise. The same reason given for the relationship between current paid users' level of experience and their price tolerance above could be applied to interpret this result. As most experienced gamers had already spent a decent amount of money on the previous versions and they also had a good understanding and knowledge of the previous versions, they likely had lower expectations of the upcoming mobile version of the game in general (with a small screen and probably less familiar gaming user interfaces). Customers' negative reactions to the trailer for the upcoming mobile version of Diablo on YouTube (https://youtu.be/RtSmAwpVHsA) was a convincing demonstration of this research result. Most experienced customers were more familiar and comfortable with the previous versions of the game series on other gaming platforms (PC/console). Instead of switching platforms and playing the upcoming mobile version that they might enjoy, some of these customers might choose to ignore this mobile version and wait for the later versions of the game series available on the platforms with which they are familiar. Although measured with slightly different questions, the level of gaming experience among those in Group 2 (i.e., the number of months they have played paid versions of any online games) was similar to Group 1's results. The prospective customers' level of experience was significantly and negatively related to their intention to play and intention to purchase in-app purchase items within the next freemium mobile version of Diablo, with a higher beta coefficient and level of significance compared with current Diablo users. Overall, a significantly negative influence of experience level of other online game users might indicate that the level of

experience of other game users has a negative impact on gamers' adoption and amount of in-app purchases equaling that of the current Diablo game players.

Third, in terms of whether brand loyalty was specific to the Diablo games or online games from the same company (i.e., Blizzard), brand loyalty was a strong factor for both intention to play and make in-app purchases and price tolerance of in-app purchases. For Group 1, the test results indicated that current customers with a high level of brand loyalty toward the game series would be most likely to play, make in-app purchases, and spend more money in the upcoming freemium mobile version of this game. For Group 2, the test results were similar to those of the current users. Therefore, for most online/mobile game players, good loyalty to the game developer of the Diablo game series (i.e., Blizzard) was highly likely to have a strong impact on their intention to play, make in-app purchases, and spend more money in the upcoming freemium mobile version of this game. Compared with other independent variables, brand loyalty was the strongest factor influencing prospective customers to play, purchase, and spend more money in the upcoming freemium mobile version of Diablo. A comparison of the effects showed that the beta coefficients of the relationships from Group 2 were consistently higher than those from Group 1 (for both behavioral intentions and price tolerance), thus indicating that it would be more effective to attract prospective users who have good brand loyalty to the developer company but have not played the specific online version of the paid game (i.e., Diablo series) to play and pay a higher price for in-app purchases in the mobile (freemium) version of the game.

Fourth, expertise level had no significant relationship with intention to play, intention to make in-app purchases, or price tolerance for Group 1. From the perspective of current users, compared with the current versions of Diablo they had been playing, the upcoming mobile freemium version would be quite different in terms of the gaming interface, screen size, and pricing strategy. As a result, their expertise level on previous versions of Diablo might not be relevant for their adoption and price tolerance of the freemium mobile game. The expertise level of Group 2 was significantly and negatively related to intention to play, but it was not a significant factor for intention to make in-app purchases and price tolerance. For prospective customers, the higher their expertise level on other online/mobile games, the lower their intention to play the upcoming mobile version of Diablo. One interpretation might be that because highly skilled gamers of other

games already have their favorite game series that they were good at, they might not want to spend too much time and effort exploring other game series.

Fifth, a comparison of the impacts of social influences on users' behavioral intention to make in-app purchases and play between the current online Diablo (paid) users and prospective users raised several interesting findings. For Group 1 users, social influence in games, measured by a gamer's perception of the items their peers possessed, and social influence of purchase, measured by a gamer's perception that their peers were willing or likely to make many in-app purchases, were both significantly and positively related to customers' intention to play and make in-app purchases in the upcoming mobile version of Diablo. These results indicate that social influences in terms of gained or purchased items possessed by others, whether the items were within the game of the focus (i.e., Diablo series) or within other mobile games, would positively affect the current gamers' intention to play and make in-app purchases in the upcoming freemium mobile game. Further, these two social influence measures should also positively affect users' price tolerance in the upcoming freemium mobile game. The influence of these social influences on all three variables was stronger in Group 1 than Group 2, except for the impact of social influence in games on their intention to play the freemium mobile game. These results could be interpreted in the following ways. Because other players' purchasing behavior in-game would give them a better gaming experience and performance, customers would naturally want to have the same level of enjoyment with the same items, leading them to purchase several in-app items. For Group 2 customers, social influence in games was significantly and positively related to customers' intention to play but was not significantly related to customers' intention to make in-app purchases in the upcoming mobile version of Diablo. Notably, social influence of purchase had no significant relationship with intention to play, but it was significantly related to intention to make in-app purchases. The findings suggest that other players' purchasing behavior in-game would not trigger prospective customers' interest in playing this game because they were not familiar with this game series. It did not matter whether other players were making in-game purchases until they had started to play the game. Additionally, the beta coefficients of the relationship between social influence of purchase and price tolerance for in-app purchases in Group 1 were consistently higher than in Group 2. These results indicated that current

users were more likely to pay more if other players in the game paid more on in-app items and out-performed them.

6.2. Theoretical Contribution

This study contributes to some theories and literature in the following ways. First, this study contributes to the existing literature on the adoption of online/mobile games. Although some extant studies have examined the adoption of online games or mobile games, to the best of my knowledge, this study is one of the first studies to examine the current and potential users' reactions to a game series that is transitioning from being a paid PC/console game to a freemium mobile game in terms of their intention to play and make in-app purchases, as well as their price tolerance of in-app purchases. This study finds that brand loyalty, social influence in terms of users' perception of their socially connected peers possessed or purchased items, and their level of experience in playing particular paid-game series or other paid-game series have an effect on users' adoption and price tolerance. Current customers' expertise level (the proxy of effort expectancy) for a specific game/game series has no relationship with customers' intention to play, make in-app purchases, or how much they would spend on the upcoming mobile version of the game series. Prospective customers' expertise level (the proxy of effort expectancy) for other game/game series has no relationship with customers' intention to make in-app purchases or how much they would spend on the upcoming mobile version of the game series, while their expertise level has a negative impact on customers' intention to play the game. In addition, this study also compares the effect of the identified variables on users' adoption and price tolerance of upcoming freemium games between current users of the paid PC/console game and prospective users of the freemium mobile games. The identified variables and findings in this study could be further used to investigate the other research contexts involving the online/mobile game adoption or, broadly, the freemium apps.

Second, this study contributes to the literature on brand loyalty. While extant studies have explored the effects of brand loyalty, to the best of my knowledge, this study is among the first to compare the effect of brand loyalty toward an online game series that is transitioning from being a paid PC/console game to a freemium mobile game with the

effect of brand loyalty toward the online/mobile game developer on users' adoption of the upcoming freemium mobile version of a particular game series. The findings on brand loyalty from this study show that brand loyalty to a game series is significantly (and positively) related to customers' intention to play the new freemium game, intention to make in-app purchases in the new freemium game, and their price tolerance of in-app purchases in the upcoming freemium mobile game. Meanwhile, brand loyalty is a strong factor in the context of the transition from paid PC/console games to freemium mobile games, among the other independent variables, including social influence, expertise level, and experience level. The research model of this study is developed based on the UTAUT2 model (Venkatesh et al., 2012), which does not include a brand loyalty factor as an independent variable. The results from this study thus show that brand loyalty is a strong factor compared with other factors in the UTAUT2 model. The findings of brand loyalty in this study could be a great addition of knowledge to the literature on brand loyalty.

Third, this study contributes to the literature on UTAUT2. Although some extant studies apply UTAUT2 to the adoption of online/mobile games, to the best of my knowledge, this study is one of the first studies to apply UTAUT2 to the adoption of an online game series that is transitioning from being a paid PC/console game to a freemium mobile game. Based on the foundations of previous studies, this study highlights the impact of social influence on customers' adoption of mobile games and purchase intention for in-app purchases (Xu, 2014). The differentiated impact of social influence (social influence in game and social influence of purchase) on two different customer groups (current users and prospective users) is one of the key findings in this study. For current users, social influence in games and social influence of purchase are both significantly and positively related to customers' intention to play and make in-app purchases in the upcoming freemium mobile version of Diablo and to users' price tolerance in the upcoming freemium mobile version of Diablo. For prospective customers, social influence in games is significantly and positively related to customers' intention to play, but it is not significantly related to customers' intention to make in-app purchases in the upcoming freemium mobile version of Diablo. Social influence of purchase has no significant relationship with intention to play, but it is significantly related to intention to make in-app purchases. However, for current customers, expertise level has no significant relationship with

intention to play, intention to make in-app purchases, or price tolerance, while experience level is significantly and negatively related to customers' intention to play and make in-app purchases in the upcoming freemium mobile version of Diablo and users' price tolerance in the upcoming freemium mobile version of Diablo. The findings of the extended use of UTAUT2 on the adoption of online/mobile games could thus contribute to the literature of UTAUT2.

6.3. Implications for Practice

One of my overall goals is to provide practical implications for game developers to set appropriate pricing and marketing strategies for online and mobile game developers. Based on the discussion of my results (Section 6.1), this study provides the following implications.

First, in terms of pricing strategy, the results of this study provide beneficial insights for online/mobile game developers and publishers to set their pricing strategies. If the upcoming mobile version of Diablo chose the freemium payment option, customers with no experience of the previous versions of the game series would be willing to pay $25.68 on average for the in-app purchases, whereas the current Diablo customers would be willing to pay $13.05 on average. Online/mobile game developers should thus consider these findings thoughtfully when setting up their pricing strategies for in-app purchases for both groups. The results of this study show that while we can expect average in-app purchase revenue of $25 from non-Diablo (prospective) users, we can expect only about half that from current Diablo users. This finding might affect which target customers the game developer wants to attract. Offering monetary benefits (e.g., a form of loyalty coupon for current online game title owners) amounting to over $12 could attract current Diablo customers to the new freemium mobile game.

Second, in terms of advertising, since brand loyalty is found to be a strong significant factor in terms of the impact (beta-coefficient) on all three dependent variables, game developers should conduct appropriate advertising strategies that specifically target loyal customers. Game developers should also post updates on online game forums about their developments and provide information about upcoming mobile freemium games to attract loyal customers to the game and strengthen their loyalty to the game developer

company. Meanwhile, based on the impact of brand loyalty to the developer by Group 2, online/mobile game developers could offer free in-game rewards in their games that game users could use in other games the company developed as company-specific loyalty rewards. By doing so, these game developers could effectively increase the chance that their gamers would play and make in-app purchases in upcoming freemium mobile games.

Third, social influence in games has been found to positively impact current customers' intention to play and make in-app purchases and their price tolerance for in-app purchases. Based on these findings, it would be necessary to prepare targeted promotion events for the upcoming mobile freemium version of the game for those who are socially connected to players with many game items. In this way, normative social influence will come into play when attracting new users for upcoming mobile freemium games.

Last, from the customers' perspective, the findings show that the level of experience with the current version of paid game is negatively associated with behavioral intentions and price tolerance. This finding provides a good explanation as to why current Diablo users are not satisfied with the upcoming mobile freemium version of Diablo. Most current Diablo users are more familiar and comfortable with their current gaming platform (PC- or console-based). Most of these users already have a good understanding and knowledge of the previous version, which could thus result in a much lower expectation of the upcoming mobile version overall. These findings could thus explain the negative reaction to the trailer for the upcoming mobile version of Diablo on YouTube. Most importantly, since in-app purchases of current Diablo users are much lower than new and potential users, the primary target population for the upcoming mobile version of Diablo might not be the current Diablo users.

6.4. Limitations

This study has several major limitations. First, the scope of the study is only applicable to online game series that are transitioning from being paid PC/console games to freemium mobile games. This study also targets the current and prospective users of the Diablo game series specifically. Future research could therefore investigate the adoption and price tolerance of users of other online/mobile game series or online/mobile games.

Second, this study addresses the transition from 'Paid PC/console Games' to 'Freemium Mobile Games', which could be two simultaneous transitions: (1) PC/console to mobile and (2) paid to freemium. As such, technically, we could doubt whether the study has to do separate transition studies to examine the transitions from (1) PC/console to mobile and (2) paid to freemium. However, it is rare that a particular online game will charge the same price on every game platform the game is issued. Prices for a particular game vary across different game platforms for many reasons; one of these reasons is that game platforms have different pricing policies toward game developers that issue games on their platforms. Therefore, I combine these two simultaneous transitions in this study.

Third, other factors could impact the customers' intention to play, make in-app purchases, and price tolerance of freemium mobile games. The original UTAUT2 model contains seven independent variables, which include performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, and habit, with experience as one of its moderators (Venkatesh et al., 2012). This study focuses on effort expectancy, social influence, and experience, and brand loyalty is brought in as an additional independent variable. Although I have provided reasons for excluding the other factors in the UTAUT2 model, it might be worthwhile investigating the impacts of the other factors on mobile game adoption in future research.

Fourth, I have used the factors derived from UTAUT2 and brand loyalty literature to examine the phenomena related to users' adoption and price tolerance; however, for the price factor, there could be other theoretical backgrounds to identify key factors, such as compliance literature. Therefore, future research could investigate compliance literature to identify and examine the impact of influencing factors for price tolerance for in-app purchases in freemium mobile games.

Fifth, this study is conducted with a freemium mobile game that does not exist yet; thus, after it is released, a future study could be conducted using some factors identified in this study and additional factors that can be collected with actual users of freemium mobile games on platforms of mobile games (e.g., iOS vs. Android).

Finally, the survey data of this study were collected using a cross-sectional approach with self-reported measures based on the perceived understanding of the context of this study. Although I have attempted to address this issue by placing the dependent

variables first in the sequence of survey questionnaires, this cross-sectional survey design may prohibit the conclusion of causality. Under such a survey design, we might only conclude that the significant relationship among the independent variables and three dependent variables could be associative but not causal. Meanwhile, self-serving bias could occur due to the self-reported measures in this study.

CHAPTER 7 CONCLUSION

The research model used in this study provides reasonable relationships between variables for factors that influence customers' intention to use and make in-app purchases for mobile games that transitioned from being 'Paid PC/console Games' to 'Freemium Mobile Games' with customers' price tolerance for in-app purchases based on the UTAUT2 model. The research model also provides empirical evidence that brand loyalty can be applied as a key independent variable with relevant variables from the UTAUT2 model for online/mobile gaming.

The findings of this study indicate that brand loyalty to a game series has a significant impact on customers' intention to play, make in-app purchases, and price tolerance of in-app purchases on the upcoming mobile game for both current and prospective customers. Social influence in games also has a significant influence on customers' intention to play and make in-app purchases and price tolerance for current customers, but it only significantly influences customers' intention to play for prospective customers. Social influence of purchasing has a significant influence on current customers' intention to play, make in-app purchases, and price tolerance of in-app purchases in the game, but it only has a significant influence on customers' intention to make in-app purchases and price tolerance of in-app purchases for prospective customers. For current customers, expertise level has no impact on customers' intention to play, make in-app purchases, and price tolerance of in-app purchases in the upcoming mobile game. While expertise level has a negative impact on customers' intention to play for prospective customers, it has no significant relationship with customers' intention to make in-app purchases and their price tolerance of in-app purchases. For current customers, the more gaming experience on a previous version of a game series a customer has, the less chance that this particular customer would play or make in-app purchases at a lower price in the next freemium version of this game. For prospective customers, their experience in other game series has a negative impact on customers' intention to play and make in-app purchases and price tolerance of in-app purchases in the upcoming Diablo mobile game.

Overall, this study strengthens the understanding and knowledge in terms of customers' intention to play and make in-app purchases for online mobile games that

transitioned from being ‘Paid PC/console Games’ to ‘Freemium Mobile Games’ with customers’ price tolerance of both game title purchases and in-app purchases.

Appendix A: Measurement items

Common Items for both groups

Behavioral Intention to Play (Davis, 1989).

BlPLDM01: I intend to download 'Diablo Immortal' when it is released. BlPLDM_01

BlPLDM02: In the future, 'Diablo Immortal' is one of the first mobile games to download, when I need to find certain kinds of mobile game.

BlPLDM03: I will download 'Diablo Immortal' faster than anyone else.

Behavioral intention to Make In-app Purchase (Luarn, & Lin, 2005; Hsieh & Tseng, 2018)

BlPurDM02: Assuming that I have downloaded the 'Diablo Immortal', I intend to pay for the in-app purchase items if necessary.

BlPurDM03: When the game is available, I will purchase at least one item offered by this game.

Price Tolerance for In-App Purchase (item developed)

PTAmtDInApp: If you are willing to pay for in-app purchase items on 'Diablo Immortal', how much are you willing to spend?
Slider (0$ - over 100$ USD) _____

Social influence in game (Zhang & Kim, 2013)

SIGame01: I pay attention to the game items that the top rankers are using in online/mobile games

SIGame02: I pay attention to the game items that my friends are using in online/mobile games

SIGame03: I pay attention to the game items that others are using in online/mobile games, every time when I play the online/mobile games.

Social influence of purchase (Marakas et al., 1998)

SIAppPur01: Many of my friends usually pay for the in-app purchase items within mobile games.

SIAppPur02: Many people around me usually pay for the in-app purchase items within mobile games.

SIAppPur03: I think that most people around me are willing to pay for the in-app purchase items within mobile games.

Items for some Independent Variables for Group 1:

Brand Loyalty (Lu & Wang, 2008)

BrandLT01: In comparison with other online games, I prefer the Diablo game series.

BrandLT02: I would recommend the Diablo game series to others

BrandLT03: I would re-use the Diablo game series when I want to play online games later

BrandLT04: When I want to play online game, the Diablo game series are my first choice

Expertise Level (Venkatesh et al., 2012)
ExpDSEE01: Learning how to play Diablo games is easy for me
ExpDSEE02: My interaction with Diablo game series is clear and understandable.

Experience (item developed)
ExpMonDS: How long have you been playing Diablo games as the number of months?
_____ Months

Items for some Independent Variables for Group 2:

Brand Loyalty (Lu & Wang, 2008)
BrandLT01: In comparison with other online games, I prefer the Diablo game series or online games from Blizzard Entertainment.
BrandLT02: I would recommend the Diablo game series or online games from Blizzard Entertainment to others
BrandLT03: I would re-use the Diablo game series or online games from Blizzard Entertainment when I want to play online games later
BrandLT04: When I want to play online game, the Diablo game series or online games from Blizzard Entertainment are my first choice.

Expertise Level (Venkatesh et al., 2012)
ExpOGEE01: Learning how to play online/mobile games is easy for me
ExpOGEE02: My interaction with online/mobile game is clear and understandable.

Experience (item developed)
FreqOGMon: How long have you been playing online games as the number of months?

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