What Drives In-App Purchase Intention in Video Games? An Examination of Patience and the Enjoyment of Routine Tasks

Completed Research

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Abstract

Developers of free-to-play games often depend on people's in-app purchases. In this article, I evaluate the potential influence of patience and the enjoyment of routine tasks on in-app purchase intention. After collecting 100 completed online questionnaires about the mobile video game Clash of Clans, and applying a structural equation modeling approach, I confirmed that patience is a negative predictor of in-app purchase intention in video games. In contrast, I could not confirm a corresponding influence of the enjoyment of routine tasks on in-app purchase intention. A potential explanation for this insignificance is provided and the other finding's practical implications as well as their limitations are discussed.

Keywords

Free-to-Play Games, Patience, Enjoyment of Routine Tasks, In-App Purchase Intention.

Introduction

In order to generate revenue, developers of free-to-play video games often use in-app purchases, i.e., the purchase of digital products or of services within the app. Despite these developers' strong dependence on in-app purchases, research regarding the factors driving this behavior is rather rare. In this article, I evaluate the potential influence of two factors on people's in-app purchase intention in video games: patience, and enjoyment of routine tasks.

After collecting 100 completed English-language online questionnaires about one specific video game, Clash of Clans, and applying a structural equation modeling approach, I confirmed that patience is a negative predictor of in-app purchase intention in video games. In contrast, I could not confirm a corresponding influence of the enjoyment of routine tasks on in-app purchase intention, which suggests that people perhaps find other means than video games to gratify their enjoyment of routine tasks, and, hence, do not intend to abstain from in-app purchases.

In the following section, I will describe previous studies' findings regarding in-app purchase behavior, and I will provide the theoretical background for the concept of patience and that of the enjoyment of routine tasks. Following this, I will present my research model and research design. I will then reveal and discuss my results before concluding my article.

Theoretical Background

In-App Purchase Behavior

In-app purchases have become a common value-capturing strategy in video games. They usually include: "1) permanent enhancements to the app usage experience (e.g. removal of advertisements or unlocking more options); 2) expendable updates such as buying extra lives, coins, and food in games; and 3) temporary subscriptions to content or services" (Hsu and Lin 2016, p. 42). Several studies have already contributed to our knowledge of the factors that drive people's in-app purchases.

Hsu and Lin (2015) did not directly evaluate the factors that influence in-app purchase behavior. Rather, they evaluated the drivers of the intention to purchase paid apps, which they defined broadly "as the user's willingness to purchase paid apps, pay to eliminate ads, implement in-app purchases or pay to secure additional functionality or content following an initial acceptance decision" (Hsu and Lin 2015, p. 46). They found that people's intention to purchase paid apps is negatively influenced by the existence of free alternatives to paid apps and positively influenced by their perception that the paid apps are good value for money. Additionally, in the case of people who have purchased apps in the past, satisfaction is also confirmed to be a direct influence factor of app purchase intention; In the case of people that have not made app purchases in the past, app ratings and social value are found to be additional drivers of their current app purchase intention.

Chen and Lin (2015) identified nine key factors that influence in-app purchases in video games: perceived ease of use, compatibility, result demonstrability, trial, mass media, interpersonal channels, perceived enjoyment, cognitive concentration, and perceived risk.

Hsiao and Chen (2016) found that people's loyalty to a video game as well as their perception of good value for money has a direct influence on their intention to make in-app purchases. Moreover, they found out that the perceived values of a video game – playfulness, access flexibility, connectedness, and reward – influence people's loyalty to the game, thus indirectly driving their intention to make in-app purchases. Finally, playfulness and reward were found to also directly influence the intention to make in-app purchases, but only in the case of actual players.

Hsu and Lin (2016) identified stickiness as a direct influence factor of people's in-app purchase intention. Moreover, they found social identification to be an indirect influence factor through stickiness. Finally, they also found social identification to be a direct influence factor of people's in-app purchase intention, but only for players who had already made in-app purchases in the past.

Lastly, Lin and Chakraborty (2017) identified six factors driving in-app purchase behavior in video games: social value, perceived enjoyment, affective involvement, animation, scenario, and innovativeness.

Patience

Intertemporal choice is comprised of options that spread out over time and vary in value (e.g., Ainslie 1975; Dai and Fishbach 2013). Imagine buying the current iPhone today vs. waiting until the release of the new model; or imagine ordering an iPad and either waiting for it to be delivered in three to five business days vs. paying extra for express next-day delivery. In this context, "patience is the preference for delayed over immediate consumption" (Dai and Fishbach 2013, p. 256). As a result, patient people tend to compromise on time to get better products or to save money (e.g., Ainslie and Haslam 1992; Dai and Fishbach 2013).

Patience has been shown to be a strong predictor of people's behavior in different contexts. For example, it has been shown that impatient people have more credit card debt than patient people do (Meier and Sprenger 2010). However, no study that I am aware of has, as of yet, evaluated the potential influence of patience on in-app purchase behavior.

Enjoyment of Routine Tasks

What people experience to be enjoyable is highly subjective. Whereas "*some* repetitive or monotonous tasks are experienced as boring by *some* people" (Shackleton 1981, p. 30), others might find them to be fun (e.g., Juniu et al. 1996; Robinson and Godbey 1997). Indeed, as Smith (1955) points out, jobs with varied tasks such as teaching are perceived by many people to be more boring than other jobs that appear to be repetitive. In other words, some people perceive repetitive and routine tasks to be enjoyable. Correspondingly, I define the enjoyment of routine tasks as the degree to which a person perceives fun, enjoyment, and other positive experiences when performing routine tasks or repetitive tasks.

Research Model

In the following section, I will present my research model (in Figure 1) and outline my corresponding hypotheses. Free-to-play video games are often characterized by repetitive tasks and waiting times.
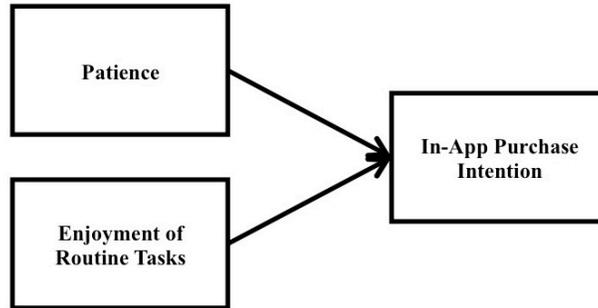
Figure 1. Research Model

Imagine playing a village-building game. In order to get to the next level, you have to build a church. To do that, you need a certain amount of gold, which needs to be mined by repeatedly ordering workers to go work in the mines. After collecting the required amount of gold, building the church may then take a building time of several hours to several days.

In-app purchases often allow players to avoid such in-game waiting times and repetitive tasks by enabling them, for example, to simply buy gold or buildings with real money. Hence, in-app purchases allow impatient people to consume according to their preference, which is to favor immediate consumption over delayed consumption (cf. Dai and Fishbach 2013). In contrast, patient people find no difficulty in waiting for something, and, hence, might not see any benefit in skipping waiting times by paying. I hypothesize that:

*Patience negatively predicts in-app purchase intention[1] in video games (**H1**).*

As explained earlier, some people find repetitive and routine tasks enjoyable. Various studies in multiple contexts have confirmed enjoyment to be an important antecedent of people's behavior (e.g., Van der Heijden 2004). Since in-app purchases in video games regularly enable players to avoid repetitive and routine tasks, it can be expected that people who enjoy these kinds of tasks might abstain from in-app purchases, since that would take away some of the game's fun. I hypothesize that:

*The enjoyment of routine tasks negatively predicts in-app purchase intention in video games (**H2**).*

Research Design

Data Collection

To empirically evaluate my research model, I surveyed players of the popular mobile online multiplayer video game Clash of Clans. In this game, each player has to build a village and, in order to get the required resources for this endeavor, they have to attack other players' villages. In order to speed up the time that specific in-game processes take (such as constructing a building), or in order to avoid having to do certain routine tasks over and over again (such as raiding other villages), players can use gems. These gems can be collected with extensive efforts or be bought via in-app purchases.

In order to recruit respondents for my survey, I posted a call on the developer's official Clash of Clans forum (http://forum.supercell.com/forumdisplay.php/4-Clash-of-Clans) and promised to include the participants in a raffle of two 50 € gift certificates for an online store of the participants' choosing. In this manner, I obtained 100 complete English-language online questionnaires. 94 respondents were male and 6 were female. The average age was 24.94 years (standard deviation: 10.29). 2 respondents were pupils, 2

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[1] Behavioral intention to use is a commonly accepted mediator between people's beliefs and their actual behavior. It "capture[s] the motivational factors that influence a [person's] behavior; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior" (Ajzen 1991, p. 181).

were apprentices, 55 were students, 32 were currently employed, 3 were unemployed, 2 were retired, and 4 selected "other" as a description of themselves.

Measurement

In order to measure in-app purchase intention, I used the two-item scale of Hsiao and Chen (2016). For patience, I used three reversed items suggested by Brockhoff et al. (2015), since they "measure different types of impulses to cope with a waiting situation", and since in-app purchase intention can also be seen as a kind of coping behavior (Brockhoff et al. 2015, p. 176). For enjoyment of routine tasks, I adapted the perceived enjoyment scale of Davis et al. (1992) to the context of routine tasks. Table 1 presents the resulting items with their corresponding sources. All items were measured using a seven-point Likert-type scale ranging from "strongly disagree" to "strongly agree".

Construct	Items (labels)	Adapted from
Enjoyment of routine tasks	I enjoy doing routine tasks at home, school, work, etc. (ERT1)	Davis et al. (1992)
	I have fun doing routine tasks at home, school, work, etc. (ERT2)	
	Doing routine tasks at home, school, work, etc. is pleasant (ERT3)	
Patience	Even if I have no pressing appointments, I try to avoid longer rail travel times (P1) [rev.]	Brockhoff et al. (2015)
	Even if I have no pressing appointments, I try to circumvent traffic jams on the highway (P2) [rev.]	
	I frequently switch lines when waiting in front of counters (P3) [rev.]	
In-app purchase intention	I intend to pay for the gems in "Clash of Clans" in the future (IAPI1)	Hsiao and Chen (2016)
	I predict that I will pay for the gems in "Clash of Clans" in the future (IAPI2)	

Table 1. Items of our Measurement Model

Results

I used the partial least squares approach via SmartPLS 3.2.4 (Ringle et al. 2015). With 100 datasets, I met the suggested minimum sample size threshold of "ten times the largest number of structural paths directed at a particular latent construct in the structural model" (Hair et al. 2011, p. 144). To test for significance, I used the integrated bootstrap routine with 5,000 samples (Hair et al. 2011).

Measurement Model

Tables 2 and 3 present the correlations between constructs together with the average variance extracted (AVE) and composite reliability (CR), and the items' factor loadings, respectively: AVE and CR were higher than .55 and .78, respectively, meeting the suggested construct reliability thresholds of .50/.70 (Hair et al. 2009). All but one item (P3: λ=.679, p<.01) loaded high (more than .70) and significant (p<.01) on their parent factor and, hence, met the suggested threshold of indicator reliability of .70 (Hair et al. 2011). Nevertheless, I kept P3 in my measurement model because "indicators with loadings between 0.40 and 0.70 should only be considered for removal from the scale if deleting this indicator leads to an increase in composite reliability above the suggested threshold value" (Hair et al. 2011, p. 145), and this was not the case in my analysis since all CRs already met their suggested threshold as indicated above. Finally, the loadings from the indicators were highest for each parent factor, and the square roots of the AVE of all constructs were larger than the absolute value of the constructs' correlation with each other, thus indicating discriminant validity (Fornell and Larcker 1981; Hair et al. 2011).

Structural Model

Figure 2 presents the path coefficients of my previously hypothesized relationships as well as the R^2 of the endogenous variable (** = p<.01, ns = non-significant): Patience was found to have a negative influence

on in-app purchase intention (β=-.277, p<.01), confirming hypothesis 1. In contrast, hypothesis 2 was not confirmed, since the enjoyment of routine tasks had no significant influence on in-app purchase intention.

The insignificance of this relationship suggests that people perhaps use other means to gratify their enjoyment of routine tasks, choose these instead, and, as a result, do not intend to abstain from in-app purchases due to their general enjoyment of routine tasks.

	ERT	P	IAPI
Enjoyment of routine tasks (ERT)	.853 (.946)		
Patience (P)	-.121	.550 (.785)	
In-app purchase intention (IAPI)	-.101	-.261	.975 (.987)

Table 2. Correlations between Constructs [AVE (CR) on the Diagonal]

	ERT	P	IAPI
ERT1	.943 (4.85)	-.152	-.110
ERT2	.891 (4.20)	-.128	-,028
ERT3	.936 (5.17)	-.064	-.096
P1	-.053	.723 (3.27)	-.110
P2	-.112	.817 (4.15)	-.237
P3	-.085	.679 (3.16)	-.192
IAPI1	-.116	-.251	.988 (174.17)
IAPI2	-.083	-.264	.987 (146.15)

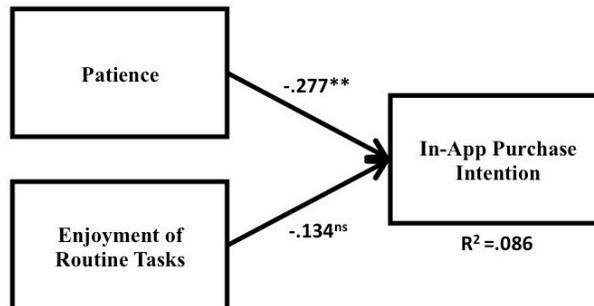**Table 3. Items' Loadings (T-Values)**

Figure 2. Findings

Conclusion

In this article, I studied two potential predictors of in-app purchase intention in video games: patience and the enjoyment of routine tasks. After surveying 100 English-language players of the video game Clash of Clans via an online questionnaire and applying a structural equation modeling approach, I confirmed patience to be a negative predictor of the in-app purchase intention in video games. In contrast, I was not able to confirm a corresponding influence of the enjoyment of routine tasks and presented a possible explanation for the insignificance of this relationship.

These findings have important practical implications. More specifically, they suggest that video game developers that provide in-app purchases should build and market their games to impatient people in particular. Past studies have shown that patience increases with age (Bettinger and Slonim 2007; Harbaugh et al. 2002; Levin et al. 2007). In other words, younger people tend to be less patient than older people and, hence, can be expected to be more prone to making in-app purchases in order to skip waiting times. As a result, young people should be an important target group for developers relying on in-app purchases.

However, my study has some limitations. First, the empirical findings are based on a single specific mobile video game: Clash of Clans. Therefore, different results might be found for other games. Moreover, my sample individuals were relatively young (mean: 24.94 years; standard deviation: 10.29) and were mostly English-speaking males (94 percent). Furthermore, most of the respondents were either employees (32 percent) or students (55 percent). Thus, my results might not hold true for women or for people from other age groups, countries, or social groups. Finally, the R^2 of .089 suggests that there are other, potentially stronger predictors, of people's in-app purchase intention in video games than patience.

As a next step, I plan to expand my research and address its limitations. More specifically, I would like to roll out my survey to other countries and in particular survey women as well as people that are older and younger than those in my sample. Furthermore, I plan to take a look at further potential influence factors of people's in-app purchase behaviors such as the personality trait conscientiousness, which "describes *socially prescribed impulse control* that facilitates task- and goal-directed behavior, such as … delaying gratification, [and,] following norms and rules …" (John and Srivastava 1999, p. 121).

References

Ainslie, G. 1975. "Specious Reward: A Behavioral Theory of Impulsiveness and Impulse Control," *Psychological Bulletin* (82:4), pp. 463-496.

Ainslie, G., and Haslam, N. 1992. "Hyperbolic Discounting," in *Choice over Time,* G. Loewenstein and J. Elster (eds.), New York, NY: Russell Sage Foundation, pp. 57-92.

Ajzen, I. 1991. "The Theory of Planned Behavior," *Organizational Behavior and Human Decision Processes* (50:2), pp. 179-211.

Bettinger, E., and Slonim, R. 2007. "Patience among Children," *Journal of Public Economics* (91:1-2), pp. 343-363.

Brockhoff, K., Margolin, M., and Weber, J. 2015. "Towards Empirically Measuring Patience," *Universal Journal of Management* (3:5), pp. 169-178.

Chen, L.-S., and Lin, M.-R. 2015. "Key Factors of in-App Purchase for Game Applications," *ICETET 2015 Proceedings*, pp. 91-95.

Dai, X., and Fishbach, A. 2013. "When Waiting to Choose Increases Patience," *Organizational Behavior and Human Decision Processes* (121:2), pp. 256-266.

Davis, F. D., Bagozzi, R. P., and Warshaw, P. R. 1992. "Extrinsic and Intrinsic Motivation to Use Computers in the Workplace," *Journal of Applied Social Psychology* (22:14), pp. 1111-1132.

Fornell, C., and Larcker, D. F. 1981. "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," *Journal of Marketing Research* (18:1), pp. 39-50.

Hair, J. F., Black, W. C., Babin, B. J., and Anderson, R. E. 2009. *Multivariate Data Analysis*, 7th ed., Upper Saddle River, NJ: Prentice Hall.

Hair, J. F., Ringle, C. M., and Sarstedt, M. 2011. "PLS-SEM: Indeed a Silver Bullet," *Journal of Marketing Theory and Practice* (19:2), pp. 139-151.

Harbaugh, W. T., Krause, K., and Vesterlund, L. 2002. "Risk Attitudes of Children and Adults: Choices over Small and Large Probability Gains and Losses," *Experimental Economics* (5:1), pp. 53-84.

Hsiao, K.-L., and Chen, C.-C. 2016. "What Drives in-App Purchase Intention for Mobile Games? An Examination of Perceived Values and Loyalty," *Electronic Commerce Research and Applications* (16:C), pp. 18-29.

Hsu, C.-L., and Lin, J. C.-C. 2015. "What Drives Purchase Intention for Paid Mobile Apps? – an Expectation Confirmation Model with Perceived Value," *Electronic Commerce Research and Applications* (14:1), pp. 46-57.

Hsu, C.-L., and Lin, J. C.-C. 2016. "Effect of Perceived Value and Social Influences on Mobile App Stickiness and in-App Purchase Intention," *Technological Forecasting & Social Change* (108), pp. 42-53.

John, O. P., and Srivastava, S. 1999. "The Big Five Trait Taxonomy: History, Measurement, and Theoretical Perspectives," in *Handbook of Personality: Theory and Research,* L. A. Pervin and O. P. John (eds.), New York, NY: Guilford Press, pp. 102-138.

Juniu, S., Tedrick, T., and Boyd, R. 1996. "Leisure or Work?: Amateur and Professional Musicians' Perception of Rehearsal and Performance," *Journal of Leisure Research* (28:1), pp. 44-56.

Levin, I. P., Hart, S. S., Weller, J. A., and Harshman, L. A. 2007. "Stability of Choices in a Risky Decision-Making Task: A 3-Year Longitudinal Study with Children and Adults," *Behavioral Decision Making* (20:3), pp. 241-252.

Lin, M.-R., and Chakraborty, G. 2017. "A Study of Crucial Factors for in-App Purchase of Game Software," in *New Frontiers in Artificial Intelligence,* S. Kurahashi, Y. Ohta, S. Arai, K. Satoh and D. Bekki (eds.), Cham, CH: Springer, pp. 176-187.

Meier, S., and Sprenger, C. 2010. "Present-Biased Preferences and Credit Card Borrowing," *American Economic Journal: Applied Economics* (2:1), pp. 193-210.

Ringle, C. M., Wende, S., and Becker, J.-M. 2015. "SmartPLS 3." http://www.smartpls.com.

Robinson, J. P., and Godbey, G. 1997. *Time for Life: The Surprising Ways Americans Use Their Time*, University Park, PA: Penn State University Press.

Shackleton, V. J. 1981. "Boredom and Repetitive Work: A Review," *Personnel Review* (10:4), pp. 30-36.

Smith, P. C. 1955. "The Prediction of Individual Differences in Susceptibility to Industrial Monotony," *Journal of Applied Psychology* (39:5), pp. 322-329.

Van der Heijden, H. 2004. "User Acceptance of Hedonic Information Systems," *MIS Quarterly* (28:4), pp. 695-704.