

Who Purchases and Why? Explaining Motivations for In-game Purchasing in the Online Survival Game Fortnite

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ABSTRACT

As a popular and free-to-play multiplayer online survival game, Fortnite not only offers novel game mechanics but also allows players to purchase special in-game items using real money. Based on an online survey of 215 Fortnite players, this paper investigates in-game behaviors that can be used to explain who is more likely to spend money in Fortnite. Specifically, players' motivations to spend real-life money were categorized; how the amount of spending was correlated with different motivations and behavioral factors was also analyzed. In contrast to prior virtual goods literature that associates in-game purchasing with social and task motivations, we found that motivations to make in-game purchases in Fortnite were less about assimilating with others and more about looking visually unique from others. We conclude by discussing how the survival genre of battle royale and other game affordances may explain these findings.

Author Keywords

Fortnite; in-game purchasing; social pressure; individuality; self-expression; free-to-play; virtual goods.

CCS Concepts

•Human-centered computing → User studies; Empirical studies in HCI;

INTRODUCTION

The business model of publishing a game for free and then making revenue from selling in-game items for real-life money (known as *free-to-play*) has been quite prevalent in Asian massively multiplayer role-playing online games (MMORPG) since the early 2000s. In the past decade, it has also gained popularity in Western games, starting with "casual" games or social network games [19, 23, 24]. In many *free-to-play* games, in-game items are often instrumental and can directly benefit players' gameplay— to enhance a certain skill, receive extra time to play the game, or unlock features that require social

reciprocation from other players (e.g., when one needs an item or favor from another player to proceed) [15, 19]. Some games also provide purely cosmetic items for purchasing, such as changing the clothes that one's avatar wears [24].

Though the *free-to-play* business model heavily relies on sales of virtual goods [2], it is obvious that not all players spend real-life money in games. In addition, little is known about the decision-making process of in-game purchasing— what are the differences between spenders and non-spenders? And among those who do spend money, why do some spend more than others?

In this paper, we use Fortnite as a case to explore the above-mentioned concerns. We choose Fortnite for two reasons. First, it is considered one of the most successful games to generate revenue from selling in-game items [16]. Second, in contrast to many games' success that focus on instrumental in-game items, Fortnite's success builds on only offering cosmetic and aesthetic in-game items (e.g., changing the appearance/clothing of one's avatar) that do not affect the game mechanics. In particular, we focus on three research questions:

- **RQ1:** *What factors are associated with the likelihood of spending money in Fortnite?*
- **RQ2:** *What are the reasons for players to buy in-game items in Fortnite?*
- **RQ3:** *How do these factors and reasons influence the actual amount of money players spend in the game?*

Our answers to these questions not only reveal the underlying psychology of in-game purchasing behaviors so as to design more desirable games, but also inform the future model of video game publishing.

BACKGROUND

An Overview: Fortnite

Fortnite is a third-person multiplayer online survival game (known as the battle royale game genre) released by Epic Games in July 2017. In this game, up to 100 players can conduct player-versus-player battle. Players have the options to play alone, as a duo, or a small team (usually three or four players). Once the game starts, they must compete with others to collect weapons, items, and resources for survival and combat with one another. One of the core game mechanics is to collect resources to build platforms and walls to either get

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a vantage point or hide from the enemy [9]. The last player, duo, or team alive would be the winner [13].

Like many popular multiplayer online games, Fortnite also uses the *free-to-play* business model. It is free to download and install the game. After creating an account, a player will be randomly assigned with an avatar skin during each game session. The avatar skin includes a standard backpack, emote (a movement that the avatar makes in the game that allows users to express themselves), pickaxe (allowing users to mine and break materials or cause damage against enemies), and glider (allowing users to fly while either jumping off the battle bus or using the launch pad) at the beginning of the game. Fortnite has more than 150 million players [13] and hit 318 million in revenue in May 2018 [14]. Most of its revenue is from players' small purchases of its in-game currency—V-Bucks, which can be used to buy virtual goods such as emotes, avatar skins, and accessories in the game. 1000 V-Bucks costs USD\$9.99. Therefore, the amount of V-Bucks that players own reflects the amount of real money they spend in the game.

It should also be noted that while in-game purchasing is certainly not new, Fortnite is unique in that its purchasable items are purely cosmetic and do not give players any tactical advantage [20], as we mentioned at the beginning of this paper. If anything, a flamboyant costume may make the player easier to detect from afar. In this sense, this game does not provide a disadvantage to those who are not spending real money, which is different from many mainstream multiplayer online games.

Factors Associated with Actual Purchase Behavior

In-game items in Fortnite can be conceptualized as a type of virtual good. Virtual goods refer to the subset of the virtual asset that can be mass-produced, bought, and sold like conventional consumer products, including items, characters, and currencies of massively multiplayer games. Very often, three attributes of such virtual goods would drive players to purchase: functional, hedonic, and social [11].

A comprehensive literature review about why people buy virtual goods reveals that research focuses more on purchase intention than on purchase behavior [6]. In addition, among the independent variables that can be applied to predict actual purchase behavior, both social and individual factors play significant roles. For example, social factors such as the exchange of virtual goods (given and received) in online social games increases the likelihood of spending real-life money; and giving virtual goods is the strongest factor associated with actual spending [24]. Similarly, Yee's [25] research on player motivations in multiplayer online games has identified ten player perceptions of spending real-life money on virtual assets, including three social factors (socializing, relationship, and teamwork) [10]. Other research also shows that players with intensive interaction in the game and longer total play-time are more likely to make the in-game purchase in the future [18], and that social interaction is positively associated with how much money players spend on in-game content [5].

Yet less research focuses on the individual perspective. Research has shown that people buy virtual items to present and customize a favorite image of themselves [6, 21]. Russell

Belk's 2013 work has especially framed digital consumption as self-expression [1]. He pointed out that avatars are now acting as the extended self, which can affect our offline behavior and sense of self; he also highlighted that traces of our digital consumption are acting as cues to personal and aggregate sense of past, leading to the more actively managed and co-constructed self [1]. In addition, a recent study of *League of Legends* suggests that identification with the virtual group and self-presentation affects players' purchase behavior [8]. Habit plays an essential role in spending real-life money in games as well. For example, studies of *Second Life* have shown that habit positively affects participants' actual purchase behavior in that virtual world [4].

As previous studies have shown, players' purchase behaviors may greatly vary across different gaming contexts, genres, and platforms. Representing a new game genre, Fortnite not only offers novel game mechanics (PvP multiplayer survival battle) but also focuses on cosmetic only in-game items. Therefore, who purchases and why in this game may be different from other games that have already been studied, such as *Second Life*, *Habbo Hotel*, and *World of Warcraft* (e.g., see the meta-analysis by [7]), leading to the importance and necessity to study in-game purchasing in this unique context.

METHODOLOGY

Participant Recruitment

We collected data using a 15-minute anonymous online survey with both closed and open-ended questions. Examples of open-ended questions include "*Why do you give money to a Fortnite streamer?*" "*What's the purpose of subscribing to a streamer?*" and so forth. However, since this study was part of a larger project on Fortnite players' different patterns of playing, spending in-game, viewing Fortnite live streams, and spending money on live streams, results of open-ended questions were not reported in this paper.

To recruit participants, we used multiple online and offline platforms, including Mechanical Turk, Facebook groups, Reddit, Twitter, and collegiate eSports clubs through direct contact. Participants were first asked whether they had played Fortnite in the past month and what their Fortnite IDs were (to make sure they indeed were Fortnite players). Only English-speaking adults (18 or above) who have played Fortnite in the past month were allowed to take the survey. As a result, we collected a total of 247 responses. After eliminating people who did not write legible responses to open-ended questions, 215 responses were used for analysis.

Survey Measures

All the survey items of measures were measured with a 5-point Likert Scale rating from 1 (Strongly disagree) to 5 (Strongly agree). For the question regarding reasons to purchase in-game items in Fortnite ("*why do you buy in-game items in Fortnite?*"), all potential answers (e.g., "*I want to look cool*" "*I want to be funny*" "*To coordinate my looks with teammates*") were developed based on pilot interviews with Fortnite players. The question regarding habit ("*When I start to play Fortnite, it is something...*") was adopted from prior literature with minor alterations to fit the context of this research and measured by

the self-reported habit index [22]. 12 potential answers were included, such as "That belongs to my daily/weekly/monthly routine," "That's typical 'me'," "That I do regularly," "I do frequently," "That I do consistently."

We also asked questions about play frequency to better understand players' gaming behavior. Example questions include "How long have you been playing Fortnite?" Potential answers were organized as "Under one month" "1-3 months" "4-6 months" "7-9 months" and "more than 9 months." Another example was "How many hours do you spend playing Fortnite per week?" and the participants had to type in a specific number.

Two dependent variables related to money spending were measured. One was the likelihood of purchasing in-game items ("Do you buy in-game items in Fortnite?"). The answers were treated as the categorical variable ("No" or "Yes"). The other was the amount of purchased V-bucks, an indicator of real-life money players spent in the game ("How many V-Bucks have you bought in the game?"). To answer this question, participants could enter the actual number of V-Bucks they purchased.

Demographic and financial information such as age, race, and monthly income were also collected. Since income was in a wide range and heavily skewed, we transformed income by using the log function for further analysis.

RESULTS

Descriptive Results

Our participants were aged 17 to 70 ($M = 28.67$, $SD = 7.77$), with 74.4% male and 25.6% female. Most participants self-identified as White (70.2%), followed by Asian (18.1%) and black (12.1%).

Some participants played Fortnite on multi-platforms, but the primary platform was PC (47.9%), followed by PlayStation 4 (20.9%), and Xbox One (18.1%). Around 30% of our participants have been playing Fortnite for four to six months, followed by for one to three months (27%) and more than nine months (21.4%). Most participants played alone-against strangers (69.1%) or in a team with friends (58.1%) (check all that apply). Participants played 0 to 35 hours per week ($M = 6.52$, $SD = 6.56$, Median = 4) and reported having an average score of 3.38 of habit, which is in the range between neutral and agree on a five-point scale ($SD = 0.96$, $\alpha = 0.91$).

Among the 215 responses, 60 participants bought in-game items, accounting for 27.9%. 56 of 60 participants spent V-bucks on outfits, followed by emotes (N=37), gliders (N=26), and harvesting tools (N=25) (check all that apply). The amount of purchased V-bucks widely ranged from 0 to 100,000 ($M=7,405$, $SD=17,254$, Median=1,000).

Modeling the Likelihood of In-Game Purchasing

To identify the factors that contributed to the likelihood of purchasing (any) in-game items (RQ1), we applied a Binomial Logistic Regression. Independent variables included behavioral factors associated with gameplay, such as habit, frequency of play, hours spent playing, and how long they

have played the game. We also included demographic characteristics such as age and income (Table 2 left). The dependent variable was if the person had spent any money (answer Yes, coded as 1) or no money (answer No, coded as 0).

The Omnibus Test showed that the binomial regression ($\chi^2 = 31.22$, $df = 5$, $p < .001$) was a significant model; moreover, the Hosmer and Lemeshow Goodness-of-Fit Test ($\chi^2 = 4.01$, $df = 8$, $p = .86$) indicated that the model fitted the data well. It predicted overall 76.1% of in-game purchasing correctly (Nagelkerke $R^2 = .21$). As can be seen in Table 1, people who have been playing longer were more likely to spend money ($\beta = .36$, odds ratio = 1.43), and younger people ($\beta = -.09$, odds ratio = .91) were more likely to spend money in the game.

Factor Analysis of Why Purchase in Game

To explore RQ2, we included the survey question "why do you buy in-game items in Fortnite?" and listed 21 possible answers. All possible answers were measured in a 5-point Likert scale ranging from strongly disagree to strongly agree. We applied a principal component analysis with the Varimax rotation method and the eigenvalue greater than one. As a result, we identified two factors with six items (i.e., social pressure and individuality; see Table 1) and removed other non-significant items such as "Because it is limited edition," "I want to look attractive," and "The item is fun (to me)." Social pressure ($M = 2.98$, $SD = 1.11$, $\alpha = 0.76$) measured players' perception towards being influenced by friends, and individuality ($M = 3.97$, $SD = 0.92$, $\alpha = 0.78$) measured participants' desire to be unique. These two factors explained 70% of the total variance.

	Items	Loadings
	To look unique	.84 .11
I want to look different from other people		.82 .24
I want to express my individuality		.80 .10
Because my friends bought it		.02 .88
Because it's popular		.15 .83
I want to show others I am a serious player		.40 .70

Table 1. Factor analysis of why users buy in-game items.

Modeling the Actual Purchase Behavior

To identify the factors that contributed to the actual money spending on V-bucks (RQ3), we applied a Negative Binomial Logistic Regression. This model is often used when the dependent variable is a count variable with a non-normal distribution. In our case, our dependent variable was the actual amount of V-bucks that the users purchased, and it was heavily skewed (Skewness = 3.65).

Independent variables included all the behavioral factors that were in the logistic model and the two motivational factors identified in the last section (i.e., social pressure and individuality) (Table 2).

The Omnibus Test (Likelihood ratio $\chi^2 = 62.32$, $df = 9$, $p < .001$) showed that the model was significant. In Table 2, individual motivation ($\beta = .46$) was positively related to the amount of purchased V-Bucks, yet the association between social motivation and the actual purchase amount was negative ($\beta =$

Model	Binomial Regression			Negative Binomial Regression	
	Variables	Beta	Wald	Exp (B)	Beta
Constant	.28	1.19	1.32	8.62***	63.94
Habit	.28	1.66	1.32	-.42*	4.13
Age	-.09**	9.89	.91	-.02	.56
Income (log)	-.25	1.01	.78	-.25	.89
Hours play	.03	1.27	1.03	.06*	4.73
Length play	.36*	6.04	1.43	.72***	16.14
Individuality				.46*	5.30
Social Pressure				-.72***	16.57
Model Chi-square [df]	31.22 [5] p<.001			62.32 [7] p<.001	

Dependent variables: Buy in-game items No/Yes; actual number of V-Bucks purchasing, *p<.05 ** p<.01 *** p<0.001

Table 2. Modeling likelihood of in-game purchasing (N=197) and the number of V-Bucks purchasing (Included 54) among players

-.72). In addition, the two frequency questions, namely, hours play ($\beta = .06$) and length play ($\beta = .72$), were positively related to the actual purchase amount. However, habit ($\beta = -.42$) was negatively associated with the amount of V-Bucks that players purchased.

DISCUSSION

Characteristics of In-Game Purchases in Fortnite

One significant finding of our study is the negative association between age and the likelihood of purchasing in-game items, which indicates that younger players are more likely to buy in-game items. In this sense, features or promotions to target younger players should be highlighted in designing free-to-play games.

In addition, while hours of play was not a significant predictor of the likelihood of in-game purchasing, the total length of staying with the game was. This finding suggests that it is the attachment to the game rather than the time spending in the game that affects players’ willingness to pay. However, hours of play was still positively related to actual purchase behavior, which indicates that players who spend more time will also spend more money.

Somewhat surprising, income was an insignificant predictor for both models. Therefore, the willingness to pay and how much players would pay are determined not by their financial capability but by the game itself.

Regarding habit, the negative correlation between habit to play and the actual spending behavior indicates that players who do not play regularly/consistently spend more money. A possible explanation is that players who spend more in the game are compulsive shoppers themselves and care more about the cosmetic value rather than the instrumental value of virtual goods.

The factor analysis also showed that players bought in-game items because they wanted to either look unique and stand out from the groups or to catch up on popular trends with other players. It appears that the design of virtual goods should take both social and individual attributes into account. Yet in Fortnite, individual attributes should be more critical because

individuality was positively while social pressure was negatively related to actual money spending. In this sense, players who want to differentiate them from their friends and other players will spend more money on in-game items.

The Digital Consumption (Spending) Motivated by Being Unique

In general, our findings are consistent with results reported in previous literature that players who buy aesthetic items intend to improve the avatar appearance rather than the game-play performance [12] because these adornments highlight the individuality and uniqueness [4].

Our findings also point to some aspects that may have been overlooked in other studies, especially regarding digital consumption (spending) and self-expression. For example, Belk seems to emphasize the social aspect of co-construction of self, explaining the shared digital possessions and aggregate self [1]. However, we found that digital consumption (spending) is motivated by being unique/separated from others rather than wanting to belong to a community/attach to others. In this sense, digital consumption is not for aggregating or co-constructing the self but for establishing a more distinctive self.

Therefore, due to Fortnite’s unique game mechanics (a survival game) and social dynamics (different type of collaboration mechanics and tendency to play with strangers), players’ avatars act as not only the extended self but also a more distinctive self than the offline self. Their digital consumption represents how the individual/aesthetic dimension of the online self somehow overweights its social/instrumental dimension. Since contextualization is an important factor of studying the virtual economy [17], we thus believe that our work also points to the importance of taking the specific online context and social dynamics into account when discussing digital consumption as self-expression.

In addition, social pressure, different from other social factors such as social interaction [5, 24] and social influence [3, 4] that have been discussed in previous literature, is rarely explored in the gaming context, perhaps the first time applying to Fortnite. Interestingly, the negative association between

social pressure and actual money spending is contradictory to previous research on social factors. One possible explanation is that, different from other games, Fortnite as a survival game requires limited collaboration (2 or 4 people as a group) but more killing since most participants reported that they played with strangers.

Limitation and Further Research

This study has several limitations that point to further research. First, since this is a quantitative study, we can identify the negative relationship between social pressure and money spending. Yet we are only able to provide a possible explanation based on the assumption that the team dynamic in Fortnite is different from other games. Further research that involves in-depth qualitative analysis is needed to validate this explanation. Second, more studies can be conducted to investigate the team dynamics in this special game genre (i.e., multiplayer PvP survival combat) so as to explain the contradictory findings of social factors. Third, this research only focuses one platform (i.e., Fortnite); future cross-platform studies can compare findings from this study to those from other popular platforms such as *Second Life* or *World of Warcraft*.

CONCLUSIONS

Using Fortnite as a case, we have identified several factors related to the likelihood of in-game purchasing. We also have introduced social pressure (a social factor rarely explored in the in-game context) and individuality (a clear individual factor) to explain why people purchase in-game items. We found that less social pressure and more individuality would cause more spending, which highlighted digital consumption as not for aggregating or co-constructing the self but for establishing a more distinctive self. We conclude that Fortnite's unique game mechanics (a survival game) and social dynamics (different type of collaboration mechanics and tendency to play with strangers) are possible explanations for these findings. We also point to future research directions including more qualitative and cross-platform studies to validate such explanations.

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