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Why do people buy virtual goods? Attitude toward virtual good purchases versus game enjoyment

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ABSTRACT

In this study we investigate purchase behavior for virtual goods in three free-to-play game environments. In the modern free games, publishers sell virtual goods in order to generate revenue. However, game publishers face dire negative attitudes toward the business model as it can entice publishers to degrade the enjoyment of the game in order to sell more virtual goods that address the artificial gaps in the game. This study focuses on this looming question in the game industry whether people buy virtual goods because they enjoy the game and want to keep on playing it or rather because their attitudes toward virtual goods are favorable and they believe it is also accepted in the peer-group. Player responses ($N = 2791$) were gathered from three different game types: social virtual world (Habbo) ($n = 2156$), first-person shooters ($n = 398$), and social networking games (Facebook games) ($n = 237$). The results support both main hypotheses (1) enjoyment of the game reduces the willingness to buy virtual goods while at the same time it increases the willingness to play more of the game. Continued use, however, does positively predict purchase intentions for virtual goods. (2) Attitude toward virtual goods and the beliefs about peers' attitudes strongly increase the willingness to purchase virtual goods. Beyond these interesting results the paper points to several further lines of inquiry.

1. Introduction

Games and virtual environments are increasingly developed and maintained like services as well as published online (DFC Intelligence, 2007, 2011). This shift has implied many new challenges to the business models, game design and marketing of games. Furthermore, the number of companies developing games has dramatically increased due to cost efficient publishing. This development has led to a fierce competition for not only potential players, but also for product visibility (e.g. in Apple Appstore and Facebook). This increased competition has effectively led to a situation where most games are now offered for free to the customers. In fact, today most online games are "free-to-play" and those which still rely on older business models are increasingly converting their business models toward this approach. For example, Valve (one of the biggest PC game publishers) transformed one of their most popular retail online games called Team Fortress 2 (also investigated in this study), into a free game, effectively multiplying their customer base (GeekWire, 2011). Most games developed on social networking services (SNS) are free-to-play (such as FarmVille and Clash of Clans). However, it is clear that no game can survive without some kind of a revenue stream and thus game publishers have started to sell virtual goods inside their games not only to generate revenue, but also to better meet the wider willingness-to-pay spectrum (Hamari & Järvinen, 2011). In this context, virtual goods refer to digital in-game objects which are only usable within the game environment. These may include for example, extra lives, clothes for an avatar, more powerful weapons or tools (Hamari & Lehdonvirta, 2010; Lehdonvirta, 2009).

Selling virtual goods entails problems of its own (only 2% from registered users convert into buying customers according to Forbes, 2013). Free-to-play developers have faced the problem of how to create demand for the virtual goods, or in other words, how to create situations in the game which would justify and create value for the virtual goods in order for the players to perceive them as desirable. This has led to a balancing act between making the game as enjoyable as possible, but at the same time, trying to create caveats in the gameplay that would make players more likely to purchase virtual goods (Hamari, 2011; Hamari & Järvinen, 2011; Hamari & Lehdonvirta, 2010). The idea is that, if a customer already enjoys the game enough, then there might be no reason for the customer to pay additional money for augmenting virtual goods. One of the

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methods to entice players to pay for virtual goods has been to create artificial obstacles. This may happen by making the game mechanics burdensome, and then offering virtual goods with which the players can circumvent the inconvenience (Hamari & Lehdonvirta, 2010). These methods of artificially creating demand for virtual goods have further fueled negative attitude toward the free-to-play business model.

Moreover, opening one's wallet and using real money within a gameplay experience has been regarded highly incompatible. Previous studies have discussed how such transactions could decrease the engagement, immersion and flow of the game as well as skew the competition between players (Alha, Koskinen, Paavilainen, Hamari, & Kinnunen, 2014; Bartle, 2004; Hamari & Lehdonvirta, 2010; Lin & Sun, 2011; Paavilainen, Hamari, Stenros, & Kinnunen, 2013). As such, a lot of negative attitudes toward virtual goods have been voiced in popular discussion. For example, Wired Magazine covered this phenomenon and quoted from a player interview: "*You are buying your way to the top of the leaderboard with no gaming skill required*" (Wired Magazine, 2012).

From these highly practically relevant problems arise two main research questions: (1) how does the enjoyment of the game and intention to continue playing the game predict purchases of virtual goods sold within and/or (2) whether the positive/negative attitudinal aspects and beliefs about using purchased virtual goods are more important predictors. This study aims to address these looming questions by investigating the phenomenon with a survey data across three different free-to-play game types. Player responses ($N = 2791$) were gathered from three different game types: social virtual world (Habbo) ($n = 2156$), first-person shooters ($n = 398$), and social networking games (Facebook games) ($n = 237$).

2. Background and hypotheses

2.1. The role of enjoyment and use continuance in purchase intentions for virtual goods

The connection between perceived enjoyment of the game and purchase intentions has been shown in general in different environments (Guo & Barnes, 2011; Lin & Lu, 2011; Park & Lee, 2011). However, previous studies on purchase behavior for virtual goods provide an inconclusive understanding (see e.g. Guo & Barnes, 2011, 2012; Hamari, 2011; Hamari & Järvinen, 2011; Hamari & Lehdonvirta, 2010; Kim, 2012; Kim, Chan, & Kankanhalli, 2012; Lin & Sun, 2011; Mäntymäki & Salo, 2011, 2013; Paavilainen et al., 2013), mainly due to five reasons: (1) purchase intentions for virtual goods are modeled only as a consequence of continuous use (e.g. Mäntymäki & Salo, 2011); (2) other factors (such as attitude and self-presentation) are used as mediators and no indirect effects are reported (e.g. Kim, 2012; Kim et al., 2012); (3) some studies focus on the player-to-player trade of virtual goods (e.g. Guo & Barnes, 2011) instead of the sale of virtual goods by the game developer; (4) the environments under study employ a wholly different business model (Guo & Barnes, 2012), which is here theorized to be the cause for the theorized phenomena; (5) the studies are more oriented toward qualitative/conceptual description (Alha et al., 2014; Hamari, 2011; Hamari & Lehdonvirta, 2010; Lehdonvirta, 2009; Paavilainen et al., 2013).

We argue that in such freemium business model, the relationship of enjoyment of the core product (the game) and purchases may be more complex than in situations where the customer would be buying more of the same product. Previous literature (e.g. Alha et al., 2014; Hamari & Järvinen, 2011; Hamari & Lehdonvirta, 2010; Hamari, 2011; Lin & Sun, 2007, 2011; Paavilainen et al., 2013) and general developer discourse (e.g. Wired Magazine, 2012) support the notion that in order for firms to sell virtual goods they may be enticed to negatively affect the value of the game by creating artificial obstacles and gaps in the game which can further be reflected in the lower perceived enjoyment of the game. The mechanism behind this rationale is that the purchasable content can then fill the gaps intentionally left in the game. This is especially a pertinent strategy for freemium products where the core product is free of charge and the revenue is strictly generated through the sales of augmenting products. Given these observations, it could be fathomed that in some situations lesser enjoyment may lead to more purchases. The situation is interesting, since the companies at the same time attempt to increase the value of the core product in order to improve the longevity of the service.

The relationship between the enjoyment of the game and its use continuance, on the other hand, can be seen to be more straightforward. For utilitarian systems, *usefulness* has been regarded as the primary driver for use of such systems (Davis, 1989). Conversely, for hedonic systems, such as games, *enjoyment* has been regarded as the primary driver of use (van der Heijden, 2004). Within the studies on hedonic systems, perceived enjoyment has been shown to be a strong predictor for outcome variables, such as use continuance and purchase intentions (van der Heijden, 2004; van der Heijden, Verhagen, & Creemers, 2003). As done in other studies on games, we also operationalize the value aspects of game systems as *perceived enjoyment*. Previous studies on games have shown a positive association between perceived enjoyment and continuous use in a variety of environments (See Hamari, Keronen, & Alha, 2015 for a review): for example online games (Hsu & Lu, 2004), web 2.0 (Shin & Kim, 2008), and Facebook games (Shin & Shin, 2011). In the same vein, the relationship between enjoyment and purchase intentions has been studied in different online environments: Second Life (Guo & Barnes, 2011), social networking sites (Lin & Lu, 2011) and when generally surveyed in Internet Cafes (Park & Lee, 2011). All the studies find a significant positive effect between perceived enjoyment/satisfaction and purchase intentions.

In order for customers to purchase augmenting products, they also have to have, firstly, already adopted the core service, and secondly, evaluated how long they will use the service in the future (Venkatesh & Agarwal, 2006). If a customer thinks her time with the service will be short, then also the life-cycle of the augmenting products could be short since virtual goods are commonly locked into the specific game in which they are purchased. Therefore, we should see a continuum from continued use intentions of the game to the purchase intentions toward virtual goods, since the adoption and evaluation of continued use intentions happens before determining the individual purchase intentions.

Previous literature on purchase behavior also posits that the greater the amount of time customers spend in an environment where related products are being sold, the more likely they become to purchase those products (Jarboe & McDaniel, 1987; Rosen, 2001). Related to the environments in the present study, this association has been demonstrated in electronic channels (Venkatesh & Agarwal, 2006) and in social virtual worlds (Mäntymäki & Salo, 2011). The relationship between these constructs is of special interest with regards to Facebook games, as they are often found to have a short customer lifetime, although the customers still use money to buy virtual goods.

Therefore, pertaining to the role of enjoyment and use continuance in purchase behavior for virtual goods, we hypothesize the following:

H1. Perceived enjoyment of the game is positively associated with continuous use intentions for the game.

H2. Perceived enjoyment of the game is negatively associated with purchase intentions for virtual goods.

H3. Continuous use intention for the game is positively associated with purchase intention for virtual goods.

2.2. The role of attitudinal and normative beliefs toward purchase intentions for virtual goods

Attitude refers to a person's salient beliefs about the consequences of a particular behavior (Ajzen & Fishbein, 1980) and the beliefs and perceptions about the target of those attitudes. Attitudes are formed by past experiences and other available affective and cognitive information (Zanna & Rempel, 1988). Attitudes have a further impact on the behavior toward the activity, service or products to which the attitudes are related (e.g. Fishbein & Ajzen, 1975; Karahanna, Straun, & Chervany, 1999).

As noted in the outset of this study, free-to-play/freemium business model and the use of purchasable virtual goods have faced strong negative attitudes. These negative attitudes have been regarded as one of the major reasons why people do or do not buy virtual goods all the while the players could have a positive attitude toward the core game. This is especially the case in free-to-play environments because: (1) introducing decisions about the use of money in games may break the so called "magic circle" and effectively worsen the immersive enjoyable experience of playing games and further have a detrimental effect on attitude (Alha et al., 2014; Bartle, 2004; Hamari & Lehdonvirta, 2010; Lin & Sun, 2007, 2011; Paavilainen et al., 2013). (2) Selling virtual goods in a competitive environment can skew the competition between players and hence put them in an unequal standing in the game (Alha et al., 2014; Bartle, 2004; Hamari & Lehdonvirta, 2010; Lin & Sun, 2007, 2011; Paavilainen et al., 2013). As such, a lot of negative attitudes toward virtual goods have been voiced in popular discussion. There is a plethora of popular technology and business newspapers/blogs mentioning this phenomenon. For example, Wired Magazine covered this phenomenon and quoted from a player interview: "*You are buying your way to the top of the leaderboard with no gaming skill required*" (Wired Magazine, 2012).

In general, attitude is regarded as a major determinant for behavioral outcomes including purchase intentions (van der Heijden et al., 2003). In the context of online games and virtual worlds, many studies have investigated the relationship between the attitude toward the platform and use intentions toward the platform (See Hamari et al., 2015 for a review). Such platforms include a game (Hsu & Lu, 2004), a virtual world (Fetscherin & Lattemann, 2008; Shin & Kim, 2008), a social virtual world (Mäntymäki & Salo, 2011) and a virtual store (Lee, 2007). However, currently there is a dearth of studies investigating the attitude toward purchasable virtual goods and its impact on purchase behavior. Lin and Sun (2007, 2011) have studied player perceptions about the pros and cons of free-to-play games by investigating player forum posts. They found that the possibility for players to trade in free-to-play games was the only reason for supporting the free-to-play business model, whereas especially perceived game quality, fairness, balance, reduction in immersion (or 'magic circle') were main reasons to detest free-to-play games. Prior qualitative studies suggest that both players and developers have voiced concerns over the business model and about its negative impact on player attitudes through decreased fairness and immersion (see Alha et al., 2014; Paavilainen et al., 2013). However, outside these studies, in the context of selling virtual goods, attitudes have mainly been investigated toward the core game rather than toward the virtual goods being sold there. We could find only one study where the relationship between the attitude toward buying content and the use of virtual currency was investigated (see Shin, 2008).

The theory of reasoned action is widely applied to explain behavioral intentions as predicted by attitudinal beliefs and social influence (Ajzen, 1991; Ajzen & Fishbein, 1980; Davis, Bagozzi, & Warshaw, 1989). The TRA is highly applicable for the study of the phenomenon theorized herein as it highlights the attitudes as well as opinions of important others toward the business model which are relevant in the studied context. Since the main objective of this study is to investigate purchase behavior in a context that has received less attention, it is important to focus on similar models in order to enable comparisons across the results.

Subjective norm refers to a perceived social influence from important others to perform or not perform a certain behavior (Ajzen, 1991; Fishbein & Ajzen, 1975). Previous studies give an inconclusive picture of whether social influence or subjective norm is positively associated with the purchase intentions for virtual goods. Shin (2008) found a positive association with participants of Second Life, There Inc. and Cyworld, whereas Guo and Barnes (2011) could not find a significant association in Second Life. Furthermore, in the subscription-based MMO World of Warcraft, no significant association could be established (Guo & Barnes, 2012). In the game environment, beliefs about the opinions and attitudes of peers are important for a couple of main reasons (1) online games (as many other online environments) command strong network effects and therefore users are exposed to a lot of normative information. (2) Many online games, such as the ones investigated in this study, are used by a rather young demographic which is shown to be more strongly affected by normative beliefs (e.g. Visser & Krosnick, 1998) (Fig. 1).

Pertaining to attitudinal and normative beliefs in purchase behavior for virtual goods, we hypothesize the following:

H4. Subjective norms toward buying virtual goods is positively associated with attitudes toward buying virtual goods.

H5. Subjective norms toward buying virtual goods is positively associated with buying virtual goods.

H6. Attitude toward buying virtual goods is positively associated with purchase intentions for virtual goods.

3. Data and methods

3.1. Data collection

We surveyed players from three different types of free-to-play games. The data was collected using the same survey for all of the three different free-to-play game types. The respondent data for SVW players was collected in cooperation with Sulake Corporation, the developer of Habbo. A link to the survey was sent to a sample of users who had been active in Habbo during the last seven days. This way we could ensure that all the respondents would have a current understanding of the virtual goods and the features currently available in Habbo. Data for the first-person shooters was mainly collected through related discussion forums. Similarly, for social networking games, forums and Facebook groups were used to spread the survey link. The goal was to reach current active players that had been suitably exposed to purchasable virtual goods. Table 1 shows that we were able to reach a sample of players with a suitable range in their lengths of experience. A 50 euro Amazon gift certificate was raffled among the respondents who had entered their email address.

Prior to the main data collection, the survey was piloted with test users to acquire qualitative feedback on their experience of completing the survey and to ensure no technical difficulties would occur in the actual data collection phase. The survey was also commented on by five senior academic experts on the subject matter. All items of the latent variables were measured on a 7-point Likert scale. To ensure data integrity, only fully completed responses were included in the analysis. For some unknown reason the pre-screened data had approximately 100 responses that were

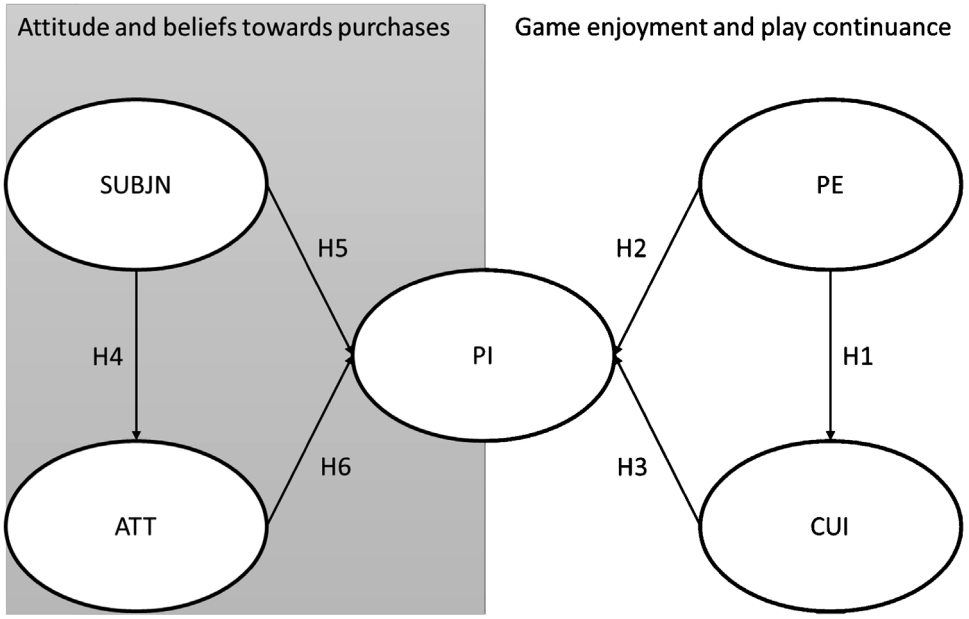


Fig. 1. Research model.

partially blank. We concluded that this was due to the survey software saving responses that were not completely filled, although it was set to only accept completely filled questionnaires. This bug does not seem to have affected the data otherwise. We also omitted suspicious cases that had exaggerated in their responses (for example, age 9999). The final data set had no missing data and thus no imputation methods were used. Total of 2791 usable answers were acquired: social virtual worlds (Habbo) ($n = 2156$), first-person shooters ($n = 398$), and social networking games (Facebook games) ($n = 237$).

3.2. Social virtual world (SVW)

The first category ($n = 2156$) includes respondents from Habbo which is one the largest free-to-play social virtual worlds. It was launched by the Sulake Corporation in 2000 in Finland but has quickly spread to over 150 countries world-wide. Although Habbo can be categorized as a social virtual world, Habbo includes games and game-like elements such as a mission, badges and prizes, affording a large set of different possible activities for the users. According to Sulake (June, 2012): "*there has been over 268 million registered accounts, more than 9 million unique visitors monthly, around 90% of the users are between 13 and 18 years of age (in our data 80% were within that range), and an average visit on the site lasts for 41 minutes*."

3.3. First-person shooter (FPS)

The second category ($n = 398$) includes first-person shooter games: Team Fortress 2 (334), World of Tanks (31) and Tribes: Ascend (24), Global Agenda (9). Majority of respondents in this category are from Team Fortress 2 (334/398). Team Fortress 2 (TF2) is a team-based first-person shooter game published by Valve in 2007. Originally a retail game, it turned free-to-play in June 2011, but had already started selling virtual goods in September 2010. Henceforth, the game has sold various items such as weapons, hats, and keys that unlock chests that can be found in the game. The game also allows trading these items with other players. Currently, TF2 is one of the most played online PC games.

3.4. Social network game (SNG)

The third game category ($n = 237$) includes games played on social network services. The survey included respondents from the following 13 Facebook games: Army Attack (12), Castle Age (58), CastleVille (11), CityVille (20), FarmVille (28), Galaxy Life (19),

Table 1
Demographic information of the respondents.

	SVW ($n = 2156$)		FPS ($n = 389$)		SNG ($n = 237$)	
Gender	Female	971	Female	15	Female	77
	Male	1185	Male	383	Male	160
Age	lower quartile	15	lower quartile	16.8	lower quartile	16
	median	16	median	18	median	21
	upper quartile	18	upper quartile	21	upper quartile	33
	Mean	16.5	Mean	19.5	Mean	25.4
Tenure (months)	lower quartile	13	lower quartile	9	lower quartile	3
	median	36	median	22.5	median	9
	upper quartile	60	upper quartile	36	upper quartile	23.5
	Mean	40.13	Mean	24.5	Mean	13.4

Gunshine (15), Hidden Chronicles (3), Millionaire City (3), Might & Magic Heroes Kingdoms (9), MMA Pro Fighter (5), The Sims Social (35), and Zombie Lane (19).

Even though our Facebook data consisted of respondents from several different games, they mostly only differ from each other based upon the game's theme. Otherwise, they all mostly share common basic principles and gameplay mechanics based on the social interaction and social network of Facebook. Unlike the two other game categories, social network games have a strong focus on word of mouth, reciprocity and exposure to what others do in the game (see Paavilainen et al., 2013 for more details on social network games).

3.5. Validity and reliability – the measurement model

The descriptive demographic data were analyzed in SPSS 22 and all of the model testing was conducted using component based PLS-SEM in SmartPLS 2.0 M3 (Ringle et al., 2005). The advantages of the component-based PLS (PLS-SEM) estimation, when compared to co-variance based structural equation methods (CB-SEM), is that it is non-parametric and therefore makes no restrictive assumptions about the distributions of the data. Secondly, a minimum sample size for PLS-SEM is ten times the number of structural paths to any given construct in the structural model, whereas with co-variance based methods the minimum sample sizes can be ten times larger. Thirdly, PLS-SEM is considered to be a more suitable method for prediction oriented studies, whereas co-variance based SEM is better suited for testing which models best fit the data (Anderson & Gerbing, 1988; Chin, Marcolin, & Newsted, 2003). Fourthly, PLS-SEM can provide a more accurate measurement of the path coefficient in the model, whereas it has been demonstrated that CB-SEM can inflate path coefficients (Chin et al., 2003). For these reasons, we selected PLS-SEM estimation over CB-SEM. However, we also assessed the measurement model fit indices with CB-SEM methods in order to show that the model also has acceptable model fit (CMIN/DF = 6.10; GFI = 0.969; AGFI = 0.954; RMSEA = 0.048; RMR = 0.084; CFI = 0.983; NFI = 0.979) (see e.g. Bagozzi & Yi, 1988; Fornell & Larcker, 1981; Jöreskog & Sörbom, 1996 for thresholds).

Convergent validity was assessed with three metrics: average variance extracted (AVE), composite reliability (CR), and Cronbach's Alpha (Alpha). All of the convergent validity metrics were clearly greater than instructed in relevant literature – AVE should be greater than 0.5, CR greater than 0.7 (Fornell & Larcker, 1981), and Cronbach's Alpha should be greater than 0.8 (Nunnally, 1978).

Discriminant validity was first assessed by comparing the square root of the AVE of each construct to all of the correlations between it and other constructs (see Fornell & Larcker, 1981), where all of the square root of the AVEs should be greater than any of the correlations between the corresponding construct and another construct (Chin, 1998; Jöreskog & Sörbom, 1996). Secondly, we assessed discriminant validity by confirming that all items corresponding to a specific construct loaded higher than with any other construct. Thirdly, in accordance to (Pavlou, Liang, & Xue, 2007), we determined that no inter-correlations between constructs were more than 0.9 in the correlation matrix (Table 2 – discriminant validity). All three tests indicated that discriminant validity and reliability were acceptable.

In addition, in order to reduce the likelihood of common method bias, we randomized the order of the measurement items on the survey to limit the respondent's ability to detect patterns between the measurement items (Cook et al., 1979). The common method bias refers to a situation when the "*variance that is attributable to the measurement method rather than to the constructs the measures represent*" (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Nevertheless, we tested whether common method bias existed in our data by "*controlling for the effects of an unmeasured latent methods factor*" as proposed by Podsakoff et al. (2003) in the same manner as practically demonstrated in the PLS-SEM environment by Liang, Saraf, Hu, and Xue (2007). According to Williams, Edwards, and Vandenberg (2003), if the loadings of the "method factor" are statistically insignificant and/or considerably low in comparison to indicator loadings of the substantive factors, there is no evidence of the common method bias. In addition, the square of the loadings represents the percentage of the variance explained. We found that common method bias is not an issue.

The sample size satisfies different criteria for the lower bounds of sample size for PLS-SEM: (1) ten times the largest number of structural paths directed at a particular construct in the inner path model (therefore for the model tested here the sample size threshold for the model in this study would be 40 cases) (Chin, 1998) and (2) according to Anderson and Gerbing (1988), a threshold for any type of SEM is approximately 150 respondents for models where constructs comprise of three or four indicators. (3) Moreover, the samples sizes from different games also satisfy the stricter threshold ("the rule of ten" – 10 cases per observed variable (minimum of 170 would be needed for the model tested here) relevant for variance-based SEM.

4. Results

4.1. Overall results

The path model accounted for 55% of the variance of purchase intentions as well as 56% of the attitude toward virtual goods and 71.2% of continued use intentions. The results of the analysis supported all of the hypotheses. Perceived enjoyment was positively associated with continuous use intentions (H1). Subjective norm was positively associated with attitude (H4), and purchase intentions directly (H5). Attitude was positively associated with purchase intentions (H6). The hypothesis that perceived enjoyment would be negatively associated with purchase intentions (H2) was also supported, however, the effect is quite small but still significant (Fig. 2 and Table 3).

4.2. Moderating role of game type

In this study we gathered data from players of differing game types, therefore, analyzing whether the model differs across game types should afford an interesting moderator analysis especially concerning the interesting negative association between PE and PI. The data is split into three game types: social virtual worlds (SVW), first-person shooters (FPS) and to social networking games (SNG). We should expect to find that in some game types the coefficients are larger or smaller than in the baseline overall results.

The path model accounted for roughly the same amount of variance in all of the studied games (Fig. 3). The model accounted for 55.6% of the variance of purchase intentions in SVW, 42.3% in FPS and 54.9% in SNGs. The model could account for 71.4% of variance of continuous use intentions in SVW, 75.4% in FPS, and 60.4% in SNGs. Finally, the model could explain 55.2% of the variance of attitudes toward virtual goods SVW, 49.0% in FPSs, and 61.6% in SNGs. These results are summarized in Fig. 3.

Interestingly, here the relationship between PE and PI was not significant separately for any of the game types which most probably stems from the smaller sample size caused by the three-way splitting of the data. However, comparing these figures to the one obtained in the overall results we can conclude that in FPS and

Table 2
Convergent and discriminant validity.

Platform	Constructs	Convergent validity			Discriminant validity				
		AVE	CR	Alpha	ATT	CUI	PE	PI	SUBJN
SVW	ATT	0.823	0.949	0.928	**0.907**				
	CUI	0.880	0.936	0.864	0.560	**0.938**			
	PE	0.831	0.951	0.932	0.632	0.845	**0.912**		
	PI	0.843	0.942	0.907	0.709	0.459	0.493	**0.918**	
	SUBJN	0.707	0.906	0.861	0.743	0.432	0.481	0.676	**0.841**
FPS	ATT	0.845	0.956	0.939	**0.919**				
	CUI	0.892	0.943	0.879	0.224	**0.944**			
	PE	0.858	0.960	0.945	0.176	0.868	**0.926**		
	PI	0.862	0.949	0.920	0.631	0.186	0.114	**0.928**	
	SUBJN	0.666	0.888	0.832	0.700	0.170	0.085	0.545	**0.816**
SNGs	ATT	0.810	0.944	0.922	**0.900**				
	CUI	0.871	0.931	0.852	0.340	**0.933**			
	PE	0.796	0.940	0.914	0.361	0.777	**0.892**		
	PI	0.876	0.955	0.929	0.705	0.252	0.217	**0.936**	
	SUBJN	0.753	0.924	0.890	0.785	0.276	0.271	0.690	**0.857**

Bolded figures on the diagonals are square roots of average variance extracted of the corresponding construct. ATT: attitude toward purchasable virtual goods; CUI: continuous use intentions; PE: perceived enjoyment; PI: purchase intentions; SUBJN: subjective norm.

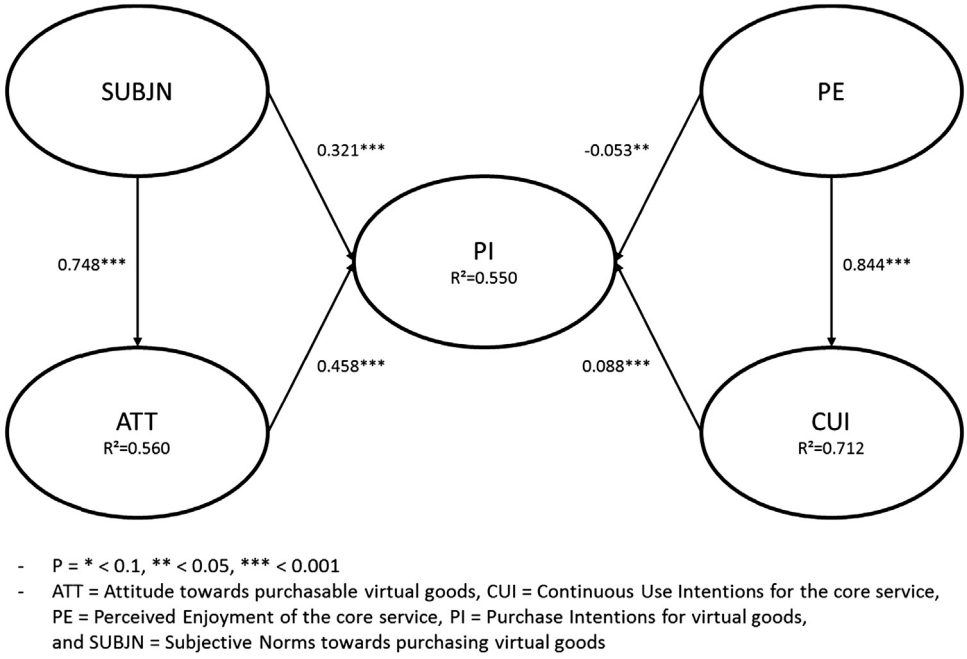


Fig. 2. Results of the main analysis.

SNG game categories the relationship does seems to be more negative than in the baseline model, whereas for social virtual worlds the relationship is practically non-existent zero. Therefore, this moderation analysis seems to also lend support for the overall results about the negative association between PE and PI at least for the two categories which are generally regarded as games more than the social virtual worlds.

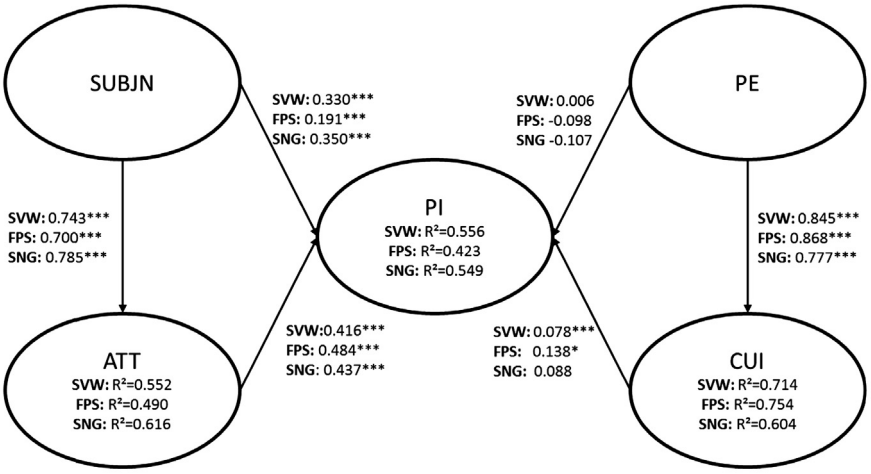
4.3. Moderating role of friends in the game

As the attitudes toward virtual goods are not formed in a vacuum but rather in the social communities within these games, the amount of friends and social activity might be an interesting moderator. In other words, those people who have more peers in the game could be more affected by the opinions of others in their decision

Table 3
Confirmation of hypotheses.

H#	Hypothesis	Support
1	Perceived enjoyment of the game is positively associated with continuous use intentions for the game.	Yes
2	Perceived enjoyment of the game is negatively associated with purchase intentions for virtual goods.	Yes
3	Continuous use intention for the game is positively associated with purchase intention for virtual goods.	Yes
4	Subjective norms toward buying virtual goods is positively associated with attitudes toward buying virtual goods.	Yes
5	Subjective norms toward buying virtual goods is positively associated with buying virtual goods.	Yes
6	Attitude toward buying virtual goods is positively associated with purchase intentions for virtual goods.	Yes

ATT: attitude toward purchasable virtual goods; CUI: continuous use intentions; PE: perceived enjoyment; PI: purchase intentions; SUBJN: subjective norm.



- P = * < 0.1, ** < 0.05, *** < 0.001
- SVW = Social Virtual World (Habbo), FPS = First Person Shooter, and SNG = Social Networking Games (Facebook games)
- ATT = Attitude towards purchasable virtual goods, CUI = Continuous Use Intentions for the core service, PE = Perceived Enjoyment of the core service, PI = Purchase Intentions for virtual goods, and SUBJN = Subjective Norms towards purchasing virtual goods

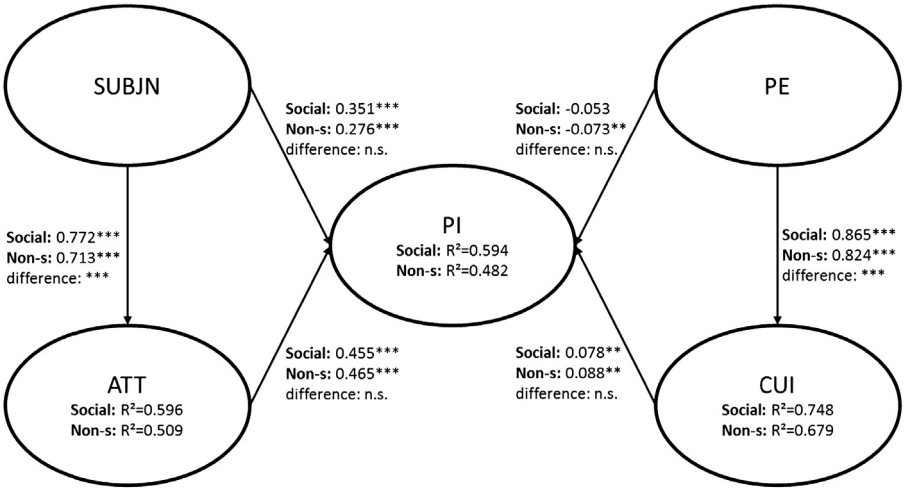
Fig. 3. Results by game type.

making to buy virtual goods. Therefore, we wanted to investigate the issue. We split the data according to the median of amount of friends.

The results are presented in Fig. 4. The results of the moderation analysis reveal expectedly that for those people having more friends in the game the role of subjective norms is increased both as a predictor of attitude and purchase behavior (as indicated by larger path coefficients and effect sizes (for purchase intentions 59.4% versus 48.2% and attitude toward virtual goods 59.6% versus 50.9%)). However, the difference in path coefficients between subjective norm and purchase behavior was not statistically significant although close to the threshold of 0.1 ($p = 0.13$). Conversely, the impact of perceived enjoyment and continued use intention on purchase intentions is larger for those who have less friends in the game. However, the difference is very small and not significant. However, the interesting negative relationship between perceived enjoyment and purchase intentions remained significant for the "non-social" group. The relationship between perceived enjoyment and continuous use intention of the game was significantly stronger for the social group.

5. Conclusion, discussion and avenues for further research

This study investigated purchase intentions for virtual goods in three free-to-play games. We specifically focused on investigating two main explanations in the general discussion around why so few people buy so few virtual goods in free-to-play games: (1) factors related to enjoyment of the game and play continuance as well as (2) factors related to attitude toward buying virtual goods and beliefs about other people's opinions. The results supported the



- p = * < 0.1, ** < 0.05, *** < 0.001
- S = People who have above median amount of friends, Non-S = people who have below median amount of friends
- ATT = Attitude towards purchasable virtual goods, CUI = Continuous Use Intentions for the core service, PE = Perceived Enjoyment of the core service, PI = Purchase Intentions for virtual goods, and SUBJN = Subjective Norms towards purchasing virtual goods

Fig. 4. The moderating role of amount of friends in the game.

both main hypotheses (1) enjoyment of the game reduces the willingness to buy virtual goods and (2) attitude toward virtual goods and the beliefs about peers' attitudes strongly increase the willingness to purchase virtual goods. Moreover, the continued playing intention was positively associated with purchase intentions for virtual goods. Roughly similar results repeated across the three different game types: social virtual worlds, first-person shooters and social networking games as well as when exploring differences across degrees of social interaction.

The finding pertaining to the relationship between game enjoyment and purchase intention (as also discussed in the outset of the study) affords more discussion. In earlier research on the same area, enjoyment has mostly been measured as a predictor for either the attitude toward the platform or continuous use of the platform (Guo & Barnes, 2011; Lin & Lu, 2011; Mäntymäki & Salo, 2011; Park & Lee, 2011), rather than as a direct predictor for virtual good purchases. For example, Mäntymäki and Salo (2011) study these variables in Habbo (also investigated in this study), however they do not report the direct or the indirect association between perceived enjoyment and purchase intentions. One study investigating this relationship in a game environment has been conducted by Guo and Barnes (2012), where a weak, but positive (0.088) association between these constructs could be found. World of Warcraft was investigated, but is not directly comparable to the free-to-play games investigated in this study. World of Warcraft is a retail game in which players are also required to pay a monthly fee (around $15) in order to play and thus their revenue logic is primarily based on the retention of users. The results here indicate that in online game environments where virtual goods are the primary source of revenue, enjoyment from playing the game is negatively associated with purchase intentions for virtual goods.

There are several possible reasons for this phenomenon, all of which afford potential further lines of inquiry: (1) if players already enjoy the game enough, there might not sufficient additional reason to buy virtual goods, conversely, those people who do not enjoy the game as much might thus be incentivized to buy virtual goods. (2) Perhaps virtual goods generally address different needs than the core game and therefore the player who enjoy them do not feel they can further enhance the enjoyment of the game with purchases of virtual goods. (3) Conversely, those player who do not enjoy the game as much might indeed feel that virtual goods do increase the enjoyment of the game, and therefore, those players would be willing to buy virtual goods. (4) Another explanation might stem from the notion that in attempts to create demand for virtual goods, games developers, may intentionally or not decrease the quality of the game in order to create caveats in the game that can be addressed by purchasing virtual goods (Hamari, 2011; Hamari & Lehdonvirta, 2010). For example, many Facebook games are based on mechanics that require the player to excessively and exhaustively click objects in order to keep their virtual farm running. To ease this burden, the developers offer a tractor for sale that automatically harvests the crops. Similarly in Team Fortress 2, the most sold item is a key that players are required to purchase in order to access some the virtual goods that they have already earned in the game, but cannot use without the further use of real money. Another popular purchasable item in the game is a backpack expander that expands the artificially limited inventory. Seen in this context, these mechanics seem to entice purchases based on the intentional design of inconvenience. This might further obscure the relationship between enjoyment and purchase intentions and would warrant further studies. If indeed the game developers do create artificial obstacles in the game and then offer virtual goods that address those obstacles, it logically follow that at least some of those purchases would be motivated by frustration or other form of negative enjoyment. (5) Another reason could be that those people who report higher enjoyment, could already have purchased enough virtual goods and would therefore be less willing to purchase more virtual goods in the future.

Further studies are required in order to fully investigate factors that moderate the relationship between enjoyment of the game and the purchase intentions for virtual goods. The relationship between these factors is probably more complex. For instance, it might be that a customer would have to at least spend some time in the service, before any likelihood of purchasing value-adding products (also see Venkatesh & Agarwal, 2006). Most likely, in order to increase the likelihood of users buying virtual goods, the game has to be enjoyable enough for players to be retained and thus develop a practical possibility for them to purchase virtual goods. However, it seems that beyond retention, the hedonic aspects of the game seem to negatively associate with virtual goods purchases. This notion is in line with the conception and design of free-to-play games where developers are actively balancing between retention and monetization in order to maximize both (Hamari & Järvinen, 2011; Hamari & Lehdonvirta, 2010).

Previous studies have measured the attitude toward the platform (rather than the business model) and used it as a predictor variable for continuous use and purchase intentions (e.g. Mäntymäki & Salo, 2011; Shin & Shin, 2011). However, attitude and intentions should be measured toward the same system or products (Ajzen, 1991) especially because there is reason to believe that the attitudes toward the game and toward purchasable virtual goods can differ dramatically, as also this study partly implies. Within this study we investigated the attitudes toward purchasable virtual goods instead of the platform. The results show a strong positive relationship between these two variables, whereas previous findings between the attitude toward the platform and the intentions to purchase virtual goods have not shown a strong relationship. This relationship was the strongest in first-person shooter games, which could be regarded as the most competitive setting of the three game types. This might be due to perceptions related to the beliefs that purchased virtual goods may skew the competition and decrease fair play (as also suggested by Lin & Sun, 2007, 2011). It could be fruitful to study the antecedents of attitudes toward purchasable virtual goods, such as perceived fairness, perceptions of whether the purchased virtual goods can break the balance of gameplay, whether they are perceived to increase or decrease the feeling of flow (Csíkszentmihályi, 1990) and aspects of playfulness (see e.g. Martocchio & Webster, 1992; Webster & Martocchio, 1992). Future studies could also investigate whether different player characteristics (e.g. Hamari & Tuunanen, 2014; Yee, 2006) with differing experience levels or perhaps different gaming mentalities (hardcore versus casual players) are affected differently.

Beliefs regarding the opinions of others toward purchasable virtual goods were also found to be a strong predictor, not only for purchase intentions but also for the player's own attitude toward virtual goods. This relationship was strongest in "social games", which heavily rely on social interaction and thus might afford more exposure to the behaviors and opinions of others. Expectedly, the effect was also stronger for those having more friends in the game. In other closely related environments, previous studies on the effect of social influence have been elusive. Some studies have demonstrated a positive relationship (Shin, 2008) while others have not been able to demonstrate a significant relationship (Guo & Barnes, 2011, 2012).

Naturally, any one study cannot be regarded as definitive. Consequently, in addition to previous suggestions for further research, more studies would need to be conducted on the phenomenon in order to gauge it more reliably. However, the strength of the present study was that it studied the phenomenon in three different game types and could establish similar results across them. Further studies should look deeper into less abstract factors. For example, which beliefs and experiences about the free-to-play business

model affect the overall attitudes and beliefs. Similar studies could also be conducted on the enjoyment and play continuance although there already exists relatively more research on the adoption and continued use of games in general.

As is commonplace with research conducted by online surveys, the data of this study is self-reported and the respondents are self-selected. Use of self-reported data may affect the results as the users responding are most presumably actively engaged with the service and eager to participate in activities related to it. Therefore, the results possibly represent perceptions and intentions of active users of the games and disregard less active and unengaged players. Future research should seek to combine survey data with actual usage data as well as proper experiments in order to diminish the effects of self-reported and selected data. First-person shooter game respondents were predominantly male. Therefore, we were not able to conduct any multi-group analyses based on gender. Furthermore, it could be possible (although unlikely), that the differences between the services in our final results could stem from the large proportion of males in the FPS sample.

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