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Cushioning the Pain of Paying through Microtransactions in Online Gaming

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Abstract

The microtransaction model has been one of the main revenue drivers in the global video game industry in the last half of the 20th century. This study examines the application of virtual currencies implemented in the microtransaction model. We argue that companies can enhance their value by creating technology-based interactions via virtual currencies, which in turn could constitute significant revenue streams. Our goal was to prove that the application of virtual currencies would lead to increased spending behaviour, when compared to the application of local currencies. Through an online gaming simulation experiment, we discovered that the utilization of virtual currencies increased consumers' spending on microtransactions. This relationship was mediated by the pain of paying notion, as respondents reported a lower pain of paying when paying in virtual currencies, and as a consequence, purchasing increased when payments were made in virtual currencies compared to local currencies. In exploring the underlying mechanisms of whether implementation of virtual currencies via the microtransaction model could influence spending behaviour, we also controlled for the personality characteristics of gambling severity, impulsivity, competitiveness and reward sensitivity. We were able to prove a positive linear relationship between spending on microtransactions, and the personality traits of gambling severity, and competitiveness. Finally, we discussed how managers can implement the microtransaction model as a reliable means to increase business profitability in the future.

Keywords: Online Video Games; Microtransactions; Virtual Currencies; Pain Of Paying; Spending Behaviour; Gambling Severity; Impulsivity; Competitiveness; Reward Sensitivity

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1.0 Introduction

New technologies are dramatically transforming the customer experience by influencing how consumers search, evaluate, choose, and consume products and brands (Hoyer, Kraume, Kroschke, Schmitt & Shankar, 2020; Libai et al., 2020). Emerging technologies are creating new value to customers, and the most successful companies are enhancing their value by constantly and carefully shaping technology-based interactions in a customer centric way (Rangaswamy et al., 2020). New mobile channels such as mobile devices, branded apps, connected objects, and social media have transformed the consumer buying process (Melero, Sese & Verhoef, 2016; Mosquera & Murillo, 2016, Verhoef et al., 2015), and as a result, the proliferation of different payment modes offered consumers a myriad of payment options to choose from when making purchases (Bettman, Chartrand, Eisenkraft & Shah, 2016, Raghubir & Srivastava, 2008). As companies have been urged to comply with higher customer expectations, several companies drew upon the *microtransaction model* as a reliable means to increase business profitability (Caetano, 2017). The microtransaction model is particularly prominent in online gaming, and it often exploits virtual in-game currencies to offer virtual items for small amounts of money (Hollingshead, Kim & Wohl, 2017). Such microtransactions constitute a significant stream of revenue for the global video game industry (Li, Mills, & Nower, 2019).

The global video game market has outgrown all other entertainment industries, and in the process created an industry with an estimated market value of $259,97 billion by 2025 (McCaffrey, 2019; Mordor Intelligence, 2019). However, the industry success did not come without criticism and calls for regulations (McCaffrey, 2019). In-game purchasing systems have been criticized for resembling gambling-like mechanisms, and encouraging predatory monetization schemes (Delfabbro & King, 2018).

Monetization schemes in online video games have evolved rapidly, and become increasingly reliable income streams for publishers (Delfabbro, 2018). In-game purchasing systems often conceal the true long term costs of consumers' spending behaviour until they are financially, and psychologically committed. The monetization schemes in online video games have been

accused of utilizing tactics that involve limited disclosure of products, intrusive and unavoidable solicitations; and systems that manipulate reward outcomes to reinforce purchasing behaviours (Delfabbro, 2018). The same games also exploit virtual in-game currencies that players can redeem - games use these exchanges to shroud the real value of what players may receive in return, and indicate that purchases of increasingly substantial quantities appear like better deals (Agarwal, 2017). We have chosen to approach these in-game currencies under the collective term "virtual currencies", to consolidate the various kinds that share most, if not all of the same characteristics.

Virtual currencies can be purchased by exchanging small sums of real-life money for a medium - virtual currency - a token that consumers receive as an immediate reward for their effort (payment). The token has no value in itself, but it can be traded for a desired outcome (loot boxes, skins, cosmetics, characters). Thus, the application of the microtransaction model is not dogmatic in terms of which mediums should be employed to achieve the desired results. Even so, game developers continue to utilize mediums in forms of "points", "diamonds", "cards", and "chips" in order to facilitate significant revenue streams (Li, Mills & Nower, 2019).

Many of today's online video games are initially free to play, however players are encouraged to make microtransactions to collect a randomized assemblage of virtual items, ranging from lesser customizations to intricate cosmetic features (Delfabbro & King, 2018). This monetization scheme is called *"the freemium model"*, combining the words *"free"* and *"premium",* providing customers with basic features for free, and richer functionality access for micro payments (Kumar, 2014). These transactions provide players with virtual currencies that can be spent in the given games economies, and in turn these small purchases might generate billions of dollars in revenue for video game companies at minimal production costs (Fransson, 2015). Publishers of both offline and online video games have begun to sequence their games into smaller installments with different parts being charged separately through minor digital transactions - virtual currencies implemented into the microtransaction model (Tomic, 2018).

To the best of our knowledge, the effects from having customers utilize artificially created virtual currencies, relative to other currencies, has not been studied extensively. There is, however, extensive research on the psychology of money, where literature provides studies of its effects on medium maximization (Fang Zhang, Hsee & Zhang, 2003; Hsee, Li & Yang, 2019), perceived value of money (Chattopadhyay, Soman & Wertenbroch, 2007; Prokopec & Wilcox, 2019), and the relying on nominal rather than real value when assigning monetary value to goods and services (Diamond, Shafir & Tversky, 1997), pain of paying on consumer self-regulation to keep spending in check (Loewenstein & Prelec, 1998), the effect of face value on product valuation in foreign currencies (Raghubir & Srivastava, 2002; Raghubir & Srivastava, 2008) and the effect of payment coupling and form on spending behavior (Raghubir & Srivastava, 2008).

The increasing prevalence of virtual currencies makes the observation of spending behaviour a focus of our thesis. We aim to study if spending behaviour changes when a payment is made in a virtual currency, rather than a local currency. An example of this would be whether consumers spend more when they pay with a virtual medium such as “points” or “bucks” than in the form of an established local currency, such as the Norwegian krone. This research addresses these matters, with aims to provide managers with insight on how to facilitate for increasing customer expectations, and how to create new value to consumers through possible implementation of artificially created currencies via the microtransaction model. Even though virtual currencies in video games are regularly presented in arbitrary values, and the validity of the currencies only correspond in the given games, this should not interfere with the realness of the currencies (Yamaguchi, 2004). Inspired by Raghubir and Srivastava (2008) article on monopoly money, we argue that virtual currencies, despite their real world value, are more easily spent or treated as “monopoly money” compared to established local currencies such as Norwegian Kroners or US Dollars. Our goal is to dissertate whether a customer's propensity to spend money on virtual goods through microtransactions can be affected through manipulating the applicable tender.

Inspired by relying on nominal rather than real value when assigning monetary value to goods and services (Diamond, Shafir & Tversky, 1997), we also wanted to examine whether consumers spend money differently depending on one payment method relative to another.

We aim to explore the differences in spending behaviour depending on payment modes with different face values, but identical real values (e.g., $5 or 650 points with the same value as $5). Previous research on payment modes has shown that spending as a function of payment mode differs in transparency with the feeling of outflow of money, where cash is considered the most transparent payment mode compared to gift-certificates, credit cards and debit cards (Loewenstein & Prelec, 1998; Raghubir & Srivastava, 2008).

Further research on payment modes used in transactions indicates that payment modes influence pain associated with payments (Bettman, Chartrand, Eisenkraft & Shah, 2016; Desai, Seenivasan & Thomas, 2011; Raghubir & Srivastava, 2008; Soman 2001, 2003). As microtransactions with implemented virtual currencies come in less transparent payment forms, we found it relevant to study the pain of paying notion, in relation to implemented virtual currencies into the microtransaction model.

Finally, as some in-game purchasing systems have been criticized for resembling gambling mechanisms, we found it to be of relevance to control for personal characteristics related to problem-gambling. Indeed, many researchers have revealed common characteristics among those who engage in microtransactions and those who possess gambling-like characteristics (Hollingshead, Kim & Wohl, 2016). In the present research, we have therefore decided to control for individual character traits such as impulsivity, reward sensitivity, competitiveness, and gambling severity, to better predict how individuals may vary in their spending behaviour.

1.1 Research Question

The growth of microtransactions has attracted substantial interest from both gamers, academics, and policymakers (Ballou, Mneyer & Zendle, 2019), one particular aspect of this development was the integration of in-game purchases and gambling-like elements in video games (Delfabbro, Gainsbury, King & Russell, 2016).

The microtransaction model has been criticized for encouraging predatory monetization schemes that disguise the long-term costs and captures players in a belief that frequently

spending money is a justified means that increases the likelihood of obtaining valuable items (Delfabbro & King, 2018). In order to purchase virtual items, consumers often pay "hidden prices" in the form of virtual currencies, which makes it difficult to assign real monetary values to virtual goods and services, and keep track of real costs of purchases (Donnelly, 2018; Gilardoni, Ha & Ringland, 2014). Therefore, the main aims of this research are to understand how spending changes when a payment is made in a virtual currency, relative to a local currency, and how the microtransaction model helps cushion the pain of paying. Hence, the research questions of our study are:

Is there a systematic difference in consumers' spending behaviour when using virtual currencies compared to local currencies? Do virtual currencies as a part of the microtransaction model cushion the pain of paying?

Assuming that the relationship between the application of virtual currencies into the microtransaction model would have an influence on the act of spending on microtransactions, we wanted to understand the underlying mechanisms that drive the relationship, as the body of literature does not fully cover the effects from having customers utilize artificially created currencies. Because of this, we decided to explore if the "pain of paying" notion could influence the relationship between the application of virtual currencies into the microtransaction model, and spending on microtransactions. The pain of paying notion has been extensively studied when it comes to payment modes (Belmont & McCall, 1996; Feinberg, 1986; Gipe, McCall & Trombetta, 2005; Hirschman, 1979; Loewenstein & Prelec, 1998; Prelec & Simester, 2001; Raghubir & Srivastava, 2008; Soman, 2001, 2003), the perception of unfairness in relation to cost to seller (Holden & Nagle, 1995; Kahneman, Knetsch & Thaler, 1986; Zellermayer, 1996), transaction utility (Biswas & Burton, 1994; Holden & Nagle, 1995; Kahneman, 1992; Thaler, 1980, 1985; Tomic, 2018), consumer self-regulation (Loewenstein & Prelec, 1998), and loss aversion (Bettman, Chartrand, Eisenkraft & Shah, 2016; Kahneman & Tversky, 1979; Schindler & Pfattheicher, 2016; Zellermayer, 1996). However, it is yet to be studied if the pain of paying would be affected if the publisher were to utilize virtual currencies rather than local currencies. We therefore predicted that the effect of virtual currencies implemented in the microtransaction model on purchasing of microtransactions would be dependent on the pain of paying notion. The

impact has been tested within valuations of foreign currencies (Raghubir & Srivastava, 2002, 2008), but there is limited evidence as to how pain of paying could be derived from virtual currencies, and further affect purchasing on microtransactions.

In studying the underlying mechanisms of whether implementation of virtual currencies via the microtransaction model could influence spending behaviour, we suspected that personality characteristics could be a moderator in the process. Although the influence of personality characteristics on consumers perception of value, prices and money has been studied (Hollingshead, Kim & Wohl, 2016; Manoj, Morwitz & Santana, 2020; Raghubir 2006), it is yet to be explored how personality characteristics regulate the effect of virtual currencies implemented in the microtransaction model on purchasing, and how the characteristics might influence this relationship. As a result we decided to control for personal characteristics.

Our study contributes to the general body of literature in economic psychology by supplying understanding and insights into the mechanisms that companies can utilize to enhance their value by shaping technology-based interactions, and enabling significant alternative revenue streams via virtual currencies. We revealed whether, and to which extent consumers' spending patterns changed when they paid in a virtual currency compared to a local currency. Further, we disclosed the underlying influence of the pain of paying notion, and how it manifests itself on consumers' spending. For managerial purposes, we believe that a good understanding of the impact of these mechanisms will aid companies to review their current monetization schemes, by integrating virtual currencies to extend subscriptions, sell virtual items, and customize user experiences. Finally, our study determined whether personality traits associated with problem gambling could affect the effectiveness of virtual currencies on spending via the microtransaction model. Particularly whether those traits can help predict how individuals may vary in their spending behavior, and most importantly if recommending the microtransaction model with implemented virtual currencies for future managers would be an ethical suggestion.

2.0 Literature Review

In this section, we first aim to introduce the general focus of our paper - virtual currencies and their interrelation with the microtransaction model. We further present the role of virtual currencies in driving intention to spend money on microtransactions - the main independent variable in our study. Secondly, we explore the notion of 'pain of paying' to explain the mechanisms through which virtual currencies may influence spending on microtransactions. Lastly, we explore and control for four dimensions of personal characteristics (impulsivity, reward sensitivity, competitiveness, gambling severity) as these are suspected to condition the effect of pain on paying on likelihood to spend money on microtransactions. By covering these topics we aim to understand if there is a systematic difference in consumers' spending behaviour when using virtual currencies compared to established local currencies, and if virtual currencies as a part of the microtransaction model can help cushion the pain of paying.

2.1 The history of supplementary income streams in video game publishing

This subsection shortly summarizes the history of supplementary income streams in online video game publishing, in order to provide a theoretical framework for further reading. To fully understand the concept of the microtransaction model as a strategic model for long-term economic development, one has to be mindful of the historic backdrop that follows from the culture, knowledge and technology of the time (Nuun, 2009).

The video game industry went through fundamental changes in the 1990s and early 2000, as profits were previously isolated to the one-time sale of copies of games (Ballou, Meyer & Zendle, 2020; Chou, Cruea, Cuff, Liboriussen & O'Donnell, 2017). These copies conventionally took the form of plastic cartridges, discs of various formats or digital downloads. The physical copies enabled consumers with complete ownership of a product, while digital copies usually worked as a license to play potentially forever (Consalvo & Paul, 2015). Ownership could also occur as a result of subscription, where a recurring monthly charge enabled one to play until the termination of said subscription. This was commonplace in online multiplayer video games, where maintenance costs such as server fees demanded a more steady revenue stream.

Microtransactions arose as a new and supplemental method for publishers to generate additional revenue from premium content. This happened around the same time consumers started expressing interest in payment models where users did not need to pass paywalls or manage several subscriptions (Fransson, 2015). Subscription-based services were for a long time the only major monetization alternative to adverts, as consumers often wanted to merely utilize one product or service rather than enter into a subscription. Products and services that were non-tangible were often considered very expensive relative to their value, and subscriptions represented a mental cost for consumers (Fransson, 2015).

The gaming industry shifted from a niche to a leviathan business, and video games emerged as the fastest growing category of mass media (Eisingerich, Fritze & Marchand, 2019; Hennig-Thurau & Marchand, 2013). The industry was not only characterized by growth, but also by a high degree of innovation and dynamic solutions which bridged into, and spurred innovation in other industries (Eisingerich, Fritze & Marchand, 2019; Hennig-Thurau & Marchand, 2013). The means in which the video game industry made money was particularly interesting, as it had undergone severe changes in the recent decades (Ballou, Meyer & Zendle, 2019; Lizardi 2012). Online videogames had their own economies that were entirely virtual, but in the 1990s the first substantial multiplayer online role playing games entered the arena and gave rise to the phenomenon of players trading real money for virtual goods (Lehdonvirta, 2019). This phenomenon gave life to the "freemium" model, which grew to become the most dominant pricing strategy for software games (Barnes & Guo, 2009; Buxmann & Lehmann, 2009; Lehdonvirta, 2019). The model allowed companies to suppress, and sometimes eliminate entry barriers, and in return attract greater audiences than paid services did (Wagner, 2014).

The development that caused the widespread application of microtransactions in video games can be identified through five factors (Tomic, 2018). The first factor that contributed to the microtransaction breakthrough in the videogame market, was the expanded use of mobile phones and other portable devices that relied on mobile operating systems (Filipovic, 2013). It was inconceivable to charge the same prices for mobile games as for PC or console games, so developers needed to find a way to put their games on the market without losses. The

solution came with the development of the "freemium model" (Barnes & Guo, 2009; Buxmann & Lehmann, 2009; Lehdonvirta, 2019), which offered users a basic version of the game for free. Developers relied on certain game genres which could offer a lot of optional content for sales and exceed the earnings of a single charge for the full version of the game (Filipovic, 2013; Tomic, 2018).

The second factor that contributed to the rise of microtransactions was the wider commercial use of the internet that changed the publisher-user relationship (Tomic, 2018). The internet provided the infrastructure for selling and distributing games directly to consumers, and also functioned as a payment channel as most microtransactions were performed through online electronic payments. The internet also changed the way players interacted with each other by introducing multiplayer online role playing games (Lehdonvirta, 2019). The third factor that contributed to the microtransaction breakthrough was the increase in data transfer speed that led to the development of multiplayer game modes, making playing in groups possible (Pelkonen, 2005). The innovation did not erase single player modes, but it changed users' preferences, and steered it towards multiplayer games. As a result, publishers noticed that players were more willing to spend money on multiplayer games rather than single player games (Pelkonen, 2005; Tomic, 2018).

The fourth factor that contributed to the rise of microtransactions was the evolution from first person shooter (FPS) games which were intended for single player, to multiplayer online battle arenas (MOBA) and massive multiplayer online (MMO). The latter two were based on the simultaneous presence of a large number of players (Tassi, 2013) making additional content such as cosmetics that could distinguish players in-game easier to sell (Rosenberg, 2009).

The fifth and last factor was the revenue instability for publishers (Sandqvist, 2012). As the market became more saturated with video games, the demand curve became unpredictable. This resulted in the shut down of many developers because of unforeseeable cash flows (Sandqvist, 2012; Tomic, 2018). Paired with the increase in data speed, the overproduction of games, large numbers of development teams, sharp drop in equipment prices, and the exponential growth of educated ICT experts - competition intensified, and game developers

had to find new ways to generate revenues (Tomic, 2018). Publishers started to incorporate the freemium model motivated by the possibility of subsequent purchases (Nickinson, 2012). Revenues from microtransactions could theoretically generate higher earnings than the sales of premium games and the same content could be sold to the same customers several times (Nickinson, 2012). The improved stability almost completely eliminated the revenue instability problem (Nickinson, 2012; Tomic, 2018).

To summarize, both videogames, and the industry as a whole has seen substantial changes to their product and how it is being made available for consumers. Growth and innovation ushered in an era where the application of microtransactions rose as a dominant form of revenue generation for many publishers. In order to conceptualize the research questions it is of relevance to understand the microtransaction model as a strategic long-term model that emerged in harmony with technological development and rapid changes in the market, while also eliminating the prominent revenue instability. A holistic understanding of the model is important due to its close relation with the evolution of the modern video game industry, emerging payment methods in real life, and the application of virtual currencies.

2.2 Virtual currency and the microtransaction model as a holistic approach

This subsection summarizes core theoretical aspects of virtual currency and its interrelation with the microtransaction model in online gaming.

According to gaming terminology, all games that let players utilize basic features of a software go under the collective term *"freemium games",* and all purchases made within the games are known as microtransactions. (Tomic, 2017). Initially, microtransactions in games take form in exchanging local currency for virtual currency that is to be used in the game that the consumer is playing. The term virtual currency is defined as "unregulated, digital money, which is issued and controlled for by the competent developers" and thus the payment method in the given virtual community (European Central Bank, 2018; Tomic, 2018). In the online video game League of Legends the currency is called "Riot Points", and it is only obtainable through a transaction in exchange for real currency. This virtual currency is redeemable towards objects in the game such as skins, champions etc. that will help enhance

the experience. One example would be to pay a set amount of NOK to acquire enough Riot Points to unlock the newest champion, so that it is available to use for the next match in the given game. Continuous additions of these small changes behind low-threshold paywalls has proven to be extremely lucrative, and has resulted in the predominance of microtransactions as a business model in online video gaming (Tomic, 2018).

An important distinction exists between the terms micropayments and microtransactions. A micropayment defines all low amount payments (Rivest & Shamir, 1996), while a microtransaction denotes payments for purchasing applications, and additional content in video games (Carter, Priest & Statt, 2013). Although a vital part of microtransactions is equivalent to micropayments, microtransactions are defined by purpose, not by amount (Tassi, 2013). Implementing microtransactions into games has two main aspirations. On the one hand, making purchases should be simple, and not interrupt the gaming process, while on the other hand, the act of purchasing additional content should psychologically be removed from the act of actually spending money (Tomic, 2019).

Figure 1 shows the shop window in League of Legends (https://eune.leagueoflegends.com/en-pl/), which primarily functions as a tool for transactions where real currency can be exchanged for virtual currency in the form of Riot Points. On the left is a visual representation of every accepted tender, the common denominator is that they all work as debit or credit in a transaction that cannot be reversed. On the middle/right side of the shop window, one can choose how much Riot Points one wants to obtain. These values range from a set low to a set high, making it impossible to obtain less than a certain minimum of Riot Points, even if one were to need less than the set low. These all share the concept of inflated numbers compared to local currency, and all except the cheapest option offer bonus Riot Points in exponential quantities, to entice greater perceived value in bigger transactions. The values rarely correspond with common thresholds of redeemable content, in order to ensure that consumers are always close enough to purchase something new. This all serves to obtuse the actual value of the digital currency, and it reinforces habits of a desire for doled out rewards.

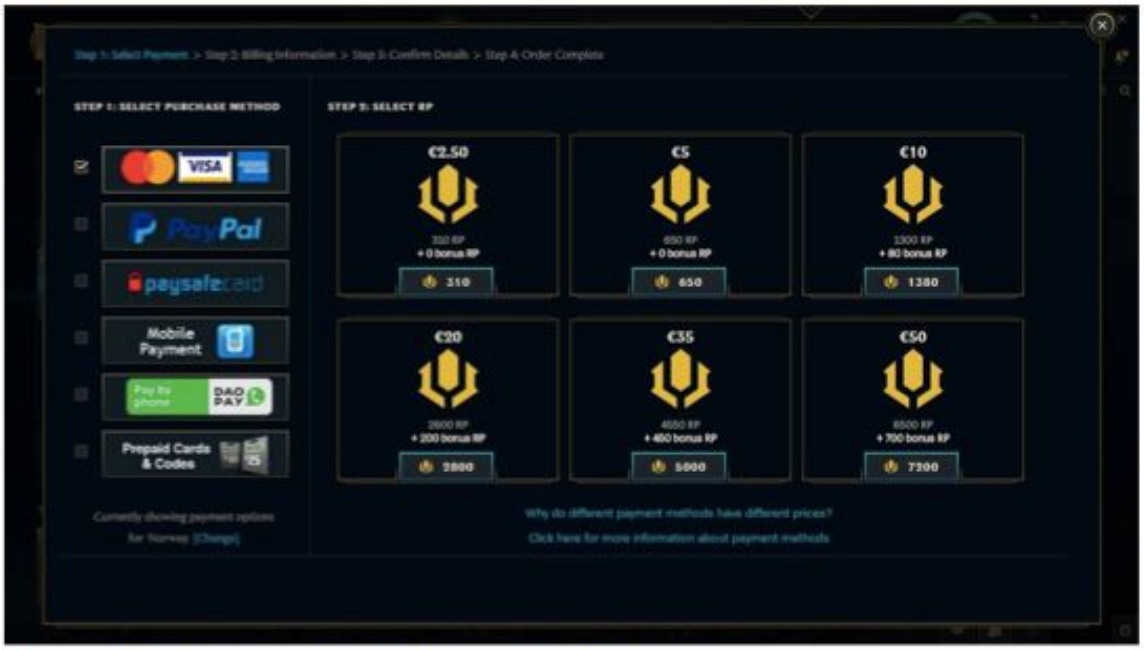

Figure 1: Screenshot from the shop in League of Legends (retrieved 13.07.2020).

Close to all virtual currencies are non-reversible in exchange, and cannot be converted back to real currency. Since virtual currencies are not registered tenders, the publishers who issue them need neither make business reports nor disclose their currency systems (Sutter, 2009; Tomic, 2018). Virtual currency is often to be confused with electronic money (e.g.: electronic bank deposits) and cryptocurrencies (e.g.: Bitcoin) but there are substantial differences in the structural characteristics as shown below in Table 1:

	Electronic Money	Cryptocurrency	Virtual Currency
Legal Status	Regulated	Partially regulated	Not regulated
Issuer	Regulated Issuer	Issuing algorithms	Unregistered issuer
Usage	Transactions with third parties	Transactions with third parties	Closed communities
Supply	Depending on demand	Determined in advance	Depending on issuers choices
Conversion	Guaranteed	Guaranteed	Not guaranteed
Supervision	Yes	Partially	No

Table 1: Source ECB (2020); Tomic, (2018)

An important differentiation between virtual currency and electronic money is their purpose in trades (IMF, 2016). The latter is conventionally utilized in purchases of physical goods and

services, while virtual currency is close to exclusively reserved for purchases of virtual goods (IMF, 2016). Many publishers take advantage of virtual currency as a medium for microtransactions, to move customers' attention from their usage of real tender in the exchange.

In sum, microtransactions in video games usually consist of a transaction where local currency is exchanged for virtual currency, with the ultimate goal of purchasing additional content. These virtual currencies are largely unregulated, and issued by the game publisher solely for use with their product. There is no backwards conversion, thus making virtual currencies different from electronic money, and cryptocurrencies. In this thesis we focused on how spending behaviour changes when a payment is made with a virtual currency, relative to a local currency. In order to conceptualize the research questions we wanted to visually present the reader with the concept of inflated numbers in games, that entice greater perceived value in larger transactions. As this serves as a tool to shroud the actual value of the virtual currencies, we argue that it will affect propensity to spend money on virtual currencies through the microtransaction model.

2.3 How virtual currencies drive propensity to spend money on microtransactions

This key section summarizes core theoretical aspects behind the psychology of money in order to explain underlying rationales of how a virtual currency can drive propensity to spend money on microtransactions.

The sciences of psychology and economy were for a long time rarely mixed, as economists often had cynical attitudes against the applicability of psychological research in the field of economics (Antonides, 1996; Webley et al., 2001). The fundamental cause of it was that the characterization of the human being as a homo economicus that dominated economics. The individual was in other words considered an economic entity who only made rational choices (Nar, 2015). The approaches became heavily criticized as it was argued that while explaining economic behaviours, psychological attributes should also be considered. Then, with a less reductionist approach, the dependence of economy on human psychology was emphasized by

bringing economic and psychological concepts together (Agarwal & Vercelli, 2005; Nar, 2015). The following section will include literature and studies from the field of economic psychology in order to conceptualize the underlying mechanisms of how and, why virtual currencies, relative to local currencies, may affect spending on microtransactions.

2.3.1 Money illusion

In economics, researchers refer to money illusion as the tendency to consider the nominal rather than real value when assigning monetary value to goods and services (Diamond, Shafir & Tversky, 1997; Tyran, 2007). The term covers individuals' cognitive bias of money mistaken for its purchasing power at a previous point in time (Diamond, Shafir & Tversky, 1997). An intriguing example comes from the housing market which reached unprecedented heights in many countries. Brunnermeier and Julliard (2008) attempted to explain the "*housing frenzies*" by proposing a certain type of money illusion. They found that declining nominal interest rates and inflation increased housing prices and vice versa, when controlling for factors such as construction costs, housing quality, property taxes, demographics, and economic conditions. Illusion-prone investors commonly buy when houses seem low-priced, rather than rent, which in turn causes upward pressure on housing prices when inflation declines. However, the decreasing inflation only reduces current entrants payments on mortgage and real costs of future mortgage payments. Investors who base their decisions on this logic are prone to an illusion, much like if an individual were to think a car was cheaper if the down payments were spread over four years rather than two, due to lower monthly rates (Brunnermeier & Julliard, 2008; Tyran, 2007).

We argue that the same illusion may occur when consumers' spend money on virtual currencies relative to local currencies. Shops in online video games utilize the concept of inflated numbers in virtual currencies compared to local currencies to indicate that purchases of increasingly substantial quantities appear like better deals (Agarwal, 2017). Consumers who base their decisions on this logic are prone to an illusion. For instance, in the online video game League of Legends, for $35 consumers get 4550 Riot Points and 450 bonus Riot that can be used in the virtual shops for acquisition of virtual items. We argue that this serves as a tool to obscure the actual value of the virtual currencies, as it highlights a tendency to

make consumers consider the nominal rather than real value when making purchasing decisions in online video games (Diamond, Shafir & Tversky, 1997; Tyran, 2007).

2.3.2 Currency confusion

The concept of virtual currencies has been criticized to be deceptive as companies require consumers to pay hidden prices in the form of virtual currencies, which makes it difficult to assign real monetary values to virtual goods and services, as well as keeping track of the actual costs of purchases (Donnelly, 2018; Gilardoni, Ha & Ringland, 2014). Virtual currencies may create confusion as prices in online video games are not expressed in convertible currencies but rather in virtual currencies, which are usually in-game specific (Gilardoni, Ha & Ringland, 2014).

Raghubir and Srivastava (2002) examined money illusion in the context of evaluating different currencies. They revealed that people's valuations of unfamiliar foreign currencies were biased towards its nominal values with inadequate adjustments for exchange rates - which in turn led to underspending when the nominal value of a foreign currency was a multiple of an equivalent unit of the home currency. On the contrary, when the nominal value of the foreign currency was a fraction of the home currency, consumers spent more. They further argued that consumers anchored on the nominal value of the foreign currencies and adjusted them to determine real values. Because the exchange rate conversion was cognitively taxing, the adjustments were inadequate and caused a face value effect, that was, a biased evaluation in favour of the nominal rather than the real value of the price given in the foreign currency. Other research also showed that students prefered to pay in currencies with lower nominal values when paying for products (Gamble et al., 2002).

However, a positive effect between money illusion and conversion rate could not be fully accepted as Desmet (2002) and Gamble et al. (2002) found that euro conversion effects on price-evaluations did not occur systematically in all affected countries (increase in intention to buy when prices were set in euros was observed in Germany, but not in Spain). Their research generated varied findings suggesting that the effects on price evaluations of different currencies was more complex than previously shown by Raghubir, and Srivastava (2002).

Other studies also showed that consumers anchored on familiar prices in their home/base currencies rather than on the face value of the foreign currencies, when making price judgements (Jonas et al., 2002; Marques and Dehaene 2004). Thus, we argue that when developers and companies attempt to front alternative virtual currencies, they should use consumers' nominal value as an anchor for the evaluation of setting prices in unfamiliar currencies (Kahneman, Tversky, 1974; Raghubir, Srivastava, 2002).

2.3.3 Transaction utility

Virtual currencies perpetuate the main features of traditional currencies, and serve as a symbol of value (Badea & Rogojanu, 2015). The aim of a virtual currency is to give consumers the impression that they are making an advantageous resource trade. According to Thaler (1985), individuals often think of value in relative rather than absolute terms. They derive pleasure not just from an object's value, but also the quality of the deal – its transaction utility.

Consumers often purchase due to the perceived quality of the deal, rather than the goods themselves. "Goods and services that are cheaper than expected may seem so tempting that the bargain itself eclipses their actual utility" (Kirchler, Kunz & Muehlbacher, 2011, p.,1). For instance, in Fortnite, players can acquire cosmetics and battle passes in exchange for V-bucks (the virtual currency in Fortnite), in exchange for real life money. Fortnite V-bucks (https://www.epicgames.com/fortnite/en-US/home) are sold in bundles, where one gets more value based on the size of purchase. Fortnite also provides players with the possibility to acquire Battle Passes, but players must at least spend 950 V-bucks ($10 USD) to unlock the feature. The battle pass grants access to weekly challenges, and opportunities to unlock even more features. Fortnite is one of the most popular games to adopt the revenue model, and the online game has more than 250 million registered users as of March 2020 (Statistica, 2020), and has generated more than a 1$ billion USD in microtransactions since being released in July 2017 (Henry, 2018).

2.3.4 Medium Maximization

An frequent strategy that game developers utilize to make the microtransaction model more appealing, is the use of virtual currencies in arbitrary values, in their game's own economy. Developers commonly utilize mediums such as "crystals", "points", "gold" "coins" and other tokens for value which are regarded suitable in the given genres (Gilardoni, Ha & Ringland, 2014; Tomic, 2018). Hsee, Yu, Zhang and Zhang (2003) provided a perspective for how arbitrary mediums can influence consumers' spending behaviour, and how decisions regarding a medium's currency can influence consumers' perceived value (Kim, Palmatier & Steinhoff, 2020). A medium - in the form of points, bucks or coins is a symbol that consumers receive as the immediate reward for their effort (Branger, Cordes & Langer, 2019; Hsee, et al., 2003). Mediums exist in many contexts and across different industries, from frequent flyer member points and loyalty programs to points, bucks, and diamonds in online video games. The points are merely mediums that consumers' can redeem for desired outcomes in the future (Alba, Manchanda & Van Osselaer, 2001; Kivetz & Simonson, 2002).

It has been demonstrated through experiments that the appearance of a medium can alter spending decisions (Hsee et al., 2003; Kim, Palmatier & Steinhoff, 2020). A medium is often referred to as a conditioned reinforcer, suggesting that a neutral stimulus can acquire reinforcement value through association with a primary reinforcer that can change even after the primary reinforcer is removed (i.e., Armus, 1982; Boysen et al., 1996; Bugelski, 1938; Dunn & Williams, 1991; Hermstein, 1964; Kim, Palmatier & Steinhoff, 2020; Mazur, 1995). Mediums such as points, stars, and diamonds might stem from traditional learning history extending back to childhood, where they represented positive reinforcement and praise. For example, more points on a test may be followed by praise from parents and teachers, and the medium "points" might thereby acquire positive value and remain alluring even when the primary reinforcers (praise) are no longer present (Hsee et al., 2003).

In accordance with Hsee et al (2003), and Kim, Palmatier and Steinhoff (2020) we further argue that the presence of a medium can alter purchasing decisions. The presence of arbitrary mediums can make consumers overestimate the value of rewards due to the illusion of a scale (e.g., more bonus points such as Riot Points in exponential quantities as shown in figure 1) and certainty in the form of linear point distribution (Kwong et al., 2011). The point distribution is often considered on a basis of distance between points as often seen in loyalty

programs (Bagachi & Li, 2010; Kim, Palmatier & Steinhoff, 2020). As illustrated in figure 1, the values in online video games are often set from high to low and all values except the cheapest option offer bonus Riot Points in exponential quantities, to entice greater perceived value in bigger transactions.

2.3.5 Psychological myopia

The idea of medium maximization was also inspired by prior research suggesting psychological myopia (Hsee et al., 2003; Hsee & Wei, 2018). The tendency in decision makers to centre their attention on information instantly related to their judgement and in the process ignore other, less important pieces of information is called psychological myopia, indicating short sighted thinking (Hsee et al., 2003; Hsee & Wei, 2018). An example of it is money illusion (Diamond, Shafir & Tversky, 1997; Fehr & Tyran, 2001; Kahneman, Knetsch, & Thaler, 1986). This myopia is the backbone of medium maximization, where decisions regarding a medium follows two relationships of information:

(a) effort → medium (b) medium → outcome

(a) involves the immediate reward in the form of a medium as a result of effort, while (b) governs the relationship and exchange rate between medium and outcome. This corresponds to the exchange rate between nominal value and real value in money illusion. Since the medium in itself is inherently without value, the logical decision making process would infer to skip considering (a) and base a decision solely on (b). However, (b) is rarely easily discerned, and has to be surmised from the relationships in (a) and (b). If decision makers were to effectively skip the effect of the medium, they should also give similar considerations to the two relationships. Contrary to this, psychological myopia implies that decision makers will be sensitive to relationship (a), but relatively insensitive to relationship (b), and as a result fail to fully skip the effect of the medium in order to make the most logical decision (Hsee et al., 2003). Hsee et al (2003, 2018) explained the (a) effort → medium relationship, by individuals desire for immediate outcomes and the (b) medium → outcome relationship by the perception of fairness (Hossain, Lyons & Siow, 2019; Kagel, Kim & Moser, 1996).

In accordance with the theory of psychological myopia we argue that consumers are sensitive to effort and immediate rewards, with less focus on the relationship and exchange rate between the medium and the desired outcome. Consumers more often than not fail to cancel the medium's effect, and as a result sacrifice logical decision-making in favor of short-sighted thinking.

2.3.6 Summary

Implementing virtual currencies into the microtransaction model can increase propensity to spend money in various ways. First, we introduced the concept of money illusion (Diamond, Shafir & Tversky, 1997; Tyran, 2007) in order to explain how consumers dependence on face value over real value allowed publishers to obscure the actual value of virtual currencies, and make purchases of increasingly substantial quantities appear like better deals (Agarwal, 2017). Second, we presented Raghubir and Srivastava (2002) examination of money illusion in the context of evaluating different currencies, where they argued that consumers anchored on the nominal values of foreign currencies and adjusted them for the exchange rates to determine real values. We further argued that this anchoring also exists when consumers pay in virtual currencies, as publishers utilize the concept of exaggerated numbers in virtual currencies compared to numbers in local currencies. Third, we explored how consumers derive pleasure not just from an object's value, but also the quality of the deal – its transaction utility. We argued that shops in online video games regularly offer bonus points in exponential quantities, to entice greater perceived value in bigger transactions as shown in table 1.

The fourth concept we introduced was arbitrary mediums such as "crystals", "points", "gold" "coins" and other denominators regarded suitable in the given genres (Gilardoni, Ha & Ringland, 2014; Hsee et al., 2003; Tomic, 2018). We argued that the presence of those mediums could make consumers overestimate the value of rewards due to the illusion of a scale (e.g., more bonus points such as Riot Points in exponential quantities as shown in table 1).

Finally, we presented the idea of psychological myopia, where we studied how decision makers are sensitive to the (a) effort → medium relationship, but relatively insensitive to the

(b) medium → outcome relationship. The sensitivity towards the (a) effort → medium relationship could be explained by consumers desire for immediate outcomes (Hsee et al., 2003; Hsee & Wei, 2018) and the (b) medium → outcome relationship could be explained by consumers' perception of fairness (Kagel, Kim & Moser, 1996; Hossain, Lyons & Siow, 2019).

To summarize the key section, we argue that virtual currencies are utilized by the video game industry to influence consumers' spending habits. The purpose of these virtual currencies are to imply advantageous resource trades, due to most consumers inability to gauge face value versus real value correctly. In light of this we assume that the intent to increase consumers' spending by implementing virtual currencies in the microtransaction model will lead to higher purchase intentions.

2.4 The mediating effect of the "pain of paying" notion

This key section explores how the pain of paying principle can impact propensity to spend money on microtransactions.

In the previous section we presented the importance of evaluating individuals spending behaviours through a psychological lens and introduced applicable studies on money illusion (Diamond, Shafir & Tversky, 1997; Tyran, 2007), medium maximization (Hsee, Yu, Zhang & Zhang, 2003), and psychological myopia (Hsee et al., 2003; Keeney & Raiffa, 1977) in order to better explain the underlying rationales of how virtual currencies can drive propensity to spend money on microtransactions. In the following section we will further explore the concept of "pain of paying" to understand if there is a systematic difference in consumers' spending behavior when using virtual currencies compared to local currencies, and particularly if virtual currencies as a part of the microtransaction model can cushion the pain of paying.

2.4.1 The pain of paying

The transaction of goods and services in exchange for monetary payment is commonplace in modern society. Despite its frequency and rational occurrence in many facets of life, the act

of payment is an emotional event. (Bettman, Chartrand, Eisenkraft & Shah, 2016; Zellermayer, 1996). Zellermayer (1996) studied the determination of emotions consumers experience when making payments, and how those emotions affected their behaviour. He found that the pain of paying is more than a combination of the pleasure derived from consuming a good and the displeasure of not being able to consume a different good due to monetary constraints. It is also a non-rational sensation that is influenced by the circumstances surrounding the transaction (Albertson & Fox, 2011; Zellermayer, 1996).

2.4.2 Loss aversion and the sunk cost fallacy

Consumers usually don't like to spend money and experience pain of paying (Bettman, Chartrand, Eisenkraft & Shah, 2016; Zellermayer, 1996) due to loss aversion (Kahneman & Tversky, 1979). Loss aversion is a vital concept associated with prospect theory. The main principle of the theory is that the pain of losing is psychologically stronger than the pleasure of gaining, and that individuals are more willing to take risks to avoid losses - due to a biased weighting of probabilities (Kahneman & Tversky, 1979; Pfattheicher & Schindler, 2016). Video game publishers utilize both non-refundable mediums and loss averse methods in order to motivate consumers to purchase virtual currencies (Delfabbro, King, Poliensa & Russell, 2020). Game publishers provide players with virtual currencies in small amounts as rewards for certain activities, but these amounts rarely come in volumes that are sufficient for purchases of further virtual items. Publishers therefore offer additional purchases of virtual goods that allow for the use of pre-existing stocks. As people are loss averse, and believe that existing currencies are earned, and that they may be lost if not used, many players are willing to pay extra in order to not lose previously earned virtual currencies. Although a fully rational purchase decision should not depend on whether a certain amount of virtual currency has already been earned, many players act in accordance with the sunk cost fallacy and will rather pay extra in order to not lose previously earned currency (Tomic, 2019). The sunk cost fallacy explains behaviour or endeavour as a result of previously invested resources such as time, money or effort (Arkes & Blumer, 1985; Tomic, 2019). Furthermore, Kahneman, Larsen, McGraw and Schkade (2010) found that consumers experienced increased distress while thinking about having lost an amount of money compared to the excitement of winning the same amount (McGraw, Kahneman, Larsen & Schkade, 2010; Pfattheicher & Schindler, 2016).

2.4.3 Consumer hedonism

The microtransaction model has received critique on the basis that consumers are disconnected with the real costs of virtual items (Gilardoni, Ha & Ringland, 2014). Yet gamers who spend money on microtransactions score considerably higher than gamers who do not spend money on microtransactions, when measured on motivation to acquire virtual objects, and whether their perceived value of the game-items represented good value for their money (Delfabbro, King, Poliensa & Russell, 2020). Standard economic consumer behaviour theories have anticipated that the cost of a purchase reduces future utility when expenditures that otherwise could have been made are foregone. The reality of consumer hedonics is, however, different, as individuals often experience an immediate level of pain of paying, which can undermine the pleasure derived from consumption. Observing the ticking of a taxi meter, for example, can reduce the pleasure from the ride (Prelec et al., 1998). Loewenstein and Prelec (1998) further argue that the pain of paying is central in consumer self- regulation, but it is hedonistically costly. A hedonic perspective aims to maximize pleasure and minimize pain, and the ideal situation would therefore be one in which payments are tightly coupled with consumption (paying summons benefits financed), but consumption is decoupled from payments (consumption does not evoke thoughts of payment). Therefore, the mission of virtual currencies in the form of microtransactions is to shift the focus from merely a utilitarian feature (payment method) to a combination of utilitarian and hedonic features (payment method that does not evoke thoughts of payments).

2.4.4 Transaction utility

Richard Thalers' formulation of transaction utility is another relevant concept to the pain of paying notion. Transaction utility theory suggests that consumers motivations surpass the acquisition utility linked with obtaining, and utilizing a product or service. Consumers are also motivated by the transaction utility derived from the difference in reference price and actual price for the product or service, and the actual price they have to pay compared to their subjective reference price (Biswas & Burton, 1994; Kahneman, 1992; Nagle & Holden, 1995). Video game publishers often try to fabricate fictitious utilities by giving away minor amounts of the virtual currencies as rewards, which might yield additional value to the

subjective reference price by offering consumers a lower price compared to the market price (Tomic, 2019). Thaler ultimately recognized the cost to the seller, and the market price as factors influencing consumers' subjective reference price.

The perception of unfairness in relation to cost to seller has been extensively studied since Richard Thalers' formulation of transaction utility. Studies proved that consumers perceived a car dealer who used shortage in a popular car model to boost profits as unfair, connecting judgements of fairness to memory (Bordalo, Gennaioli & Schleifer, 2020; Kahneman, Knetsch & Thaler, 1986). Consumers also perceived an increased degree of unfairness when paying price premiums for necessities, compared to luxuries (Holden & Nagle, 1995). In gaming terminology, it could be said that the game itself is the necessity, while the additional content is the luxury, which might contribute to explain the success of the freemium model. Market price is another determiner of consumers' reference price, as consumers are more likely to make purchases of products when they believe the market price of the good is lower compared to their reference price (Chiang & Zhang, 2020). The transaction utility simply refers to the fact that customers do not want to experience displeasure when having to pay a price that is perceived as unjust. Lee and Park (2011) investigated online video game players' perceived monetary value of virtual items in games, and they found that gamers perceived virtual items to be costeffectice and reasonably priced. Hsiao and Lu (2010) also found that gamers perceived virtual items to be worth more than what they cost and Turel et al. (2010) proved that gamers found game items to be good products given the price, indicating monetary value from using and purchasing virtual items (Delfabbro, King, Poliensa & Russell, 2020; Lee & Park, 2011)

2.4.5 Payment modes

Research on the pain of paying notion states that the benefits and costs of a payment transaction are not solely economic (Bettman, Chartrand, Eisenkraft & Shah, 2016). The pain of paying is rather psychological, and it is determined by other factors than the size of the payment (Mazar et al., 2015). The payment mode used in transactions is one of those factors influencing the pain associated with paying (Bettman, Chartrand, Eisenkraft & Shah, 2016; Desai, Seenivasan & Thomas, 2011; Raghubir & Srivastava, 2008; Soman 2001, 2003).

With the saturation of various payment methods, consumers now have several payment options to choose from when making a transaction (Raghubir & Srivastava, 2008). Typically consumers have the option to purchase with checks, cash, credit, and debit cards but with the advent of internet commerce, the growth of new payment modes has spurred (Raghubir & Srivastava, 2008). The microtransaction model is one of the newest payment methods that emerged in relation to the expansion of e-commerce (Tomic, 2018).

Many academic researchers have studied consumer spending as a function of payment modes. These studies indicate that credit card use, when compared to cash, increases the overall amount spent per transaction (Belmont & McCall, 1996; Feinberg, 1986; Gipe, McCall & Trombetta, 2004; Hirschman, 1979; Loewenstein & Prelec, 1998; Prelec & Simester, 2001; Soman, 2001; 2003; Raghubir & Srivastava, 2008). Loewenstein, Prelec, Simester and Soman (2001), suggested that the increased spending behaviour is due to a decoupling effect, indicating that an electronic payment mode lacks transparency so that the real costs of the transactions are concealed. Other researchers propose that consumers experience psychological pain when parting with cash, as the tangibility of cash creates an immediate awareness of value being transferred (Desai, Seenivasan & Thomas, 2011; Loewenstein & Prelec, 1998; Raghubir & Srivastava, 2008; Soman, 2003; Zellermayer, 1996). Raghubir and Srivastava (2008) demonstrated through experiments that consumers spend more when spending in the form of value certificates than with cash of the same value. They further state that cash was the tender where consumers felt the most pain of paying, as the act of physically parting with money felt the most severe (Shah, Eisenkraft, Bettman & Chartrand, 2016; Soman, 2001). Cards in the form of debit, credit, gift etc. were less transparent than cash, where the swiping of a card obscured the monetary value of the transaction.

"Plastic money" is more likely to detach consumers from the economic reality they're engaging in (Feinberg 1986; Raghubir & Srivastava 2008; Soman 2003; Thomas et al. 2011). Less transparent payments in the form of mobile and online transactions such as automatic payroll, deductions and direct debit have in many instances almost eliminated the consumer's knowledge of the fact that an actual payment occurred (Bettman, Chartrand, Eisenkraft & Shah, 2016).

2.4.6 Summary

To summarize this subsection, it appears as if the pain of paying, as a mediating variable, can influence propensity to spend money on microtransactions. Virtual currencies aim to combine hedonic features with the utilitarian features of modern payment methods, by enabling consumers to utilize a payment method that does not evoke thoughts of payment. In the light of this, we assume that the pain of paying notion will cushion the pain of paying when spending in a virtual currency compared to a local currency. The present study will further explore the relationship between application of virtual currencies and spending on microtransactions, mediated by the pain of paying notion.

2.5 The moderating role of personal characteristics

This subsection draws on psychological theories of consumer behaviour to review findings in economic psychology to explore if there are subjective differences in consumers' pain of paying and propensity to spend money on microtransactions. In the following subsection we have assessed whether individual differences such as impulsivity, reward sensitivity, competitiveness and gambling severity can help to better predict how individuals may vary in spending patterns, and examine the relevance of personality traits to spending on microtransactions.

The literature review has so far explored the history of the microtransaction model as an income stream in video game publishing, and reviewed the interrelation between our main independent variable (virtual currencies) on our dependent variable (spending in the microtransaction model). We further discussed underlying rationales of how virtual currencies can drive propensity to spend money on microtransactions, and studied how our mediator (pain of paying) can affect spending on virtual currencies through the microtransaction model. In the following section we will introduce and discuss our moderator - personality characteristics, to further explore the interface between psychology and economics.

2.5.1 Personality psychology and relevance

Studies show that consumers subjectively value identical prices and money differently depending on their personal characteristics (Manoj, Morwitz & Santana, 2020; Raghubir 2006). Personality psychology tells us that personal characteristics are important factors that should be given more emphasis in economic theory of preferences and constraints (Borghans, Duckworth, Heckman & Weel, 2008). Economics have recently started to explore the effects of elements such as personality traits, motivation, and health on socioeconomic outcomes (Borghans, Duckworth, Heckman & Weel, 2008; Hamermesh, Meng & Zhang, 2002). For the following section we will focus on personality traits, defined as patterns of thought, feelings and behavior (Borghans, Duckworth, Heckman & Weel, 2008).

Motivations and preferences are often driven by a stable set of psychological characteristics, such as personality traits (Benet-Martínez & Ozer, 2006; Gladstone, Matz & Stillwell, 2016). Individuals are motivated to play games that provide cues that are relevant to their own personality traits (Jeng & Teng, 2008) and these traits have been recognized as motivational factors for online gaming (Jeng & Teng, 2008; Park, Song & Teng, 2011). Recognizing personality characteristics can better predict cognitive motivational patterns, such as spending (Benet-Martínez & Ozer, 2006). Gladstone, Matz and, Stillwell (2016) studied the concept of psychological fit in order to determine the most advantageous spending behaviours, in order to increase satisfaction. They found that, when spending matched personality, consumers enjoyably spent more money. As previously mentioned, online video game users reported that they perceived virtual items to be worth more than the cost, and they found game items to be good products given the prices (Hsiao & Lu, 2010; Lee & Park, 2001; Turel et al, 2010), indicating satisfaction and value for money. We therefore argue that personality characteristics should be controlled for when studying individuals spending behaviours.

We argue that the personality traits of impulsivity, reward sensitivity, competitiveness and, gambling severity are not binary, but rather continuum, as the fundamental assumption is that personality traits are multifactorial by nature (Greven et al., 2016). There are obviously personality characteristics that groups of individuals' can possess and agree on, but personality is not necessarily an either/or aspect. We acknowledge the degrees of

differentiation and understand that personality is complex, and we therefore expect that the different levels of the given personality traits will influence spending.

2.5.2 Who spends money to play for free?

We have chosen to further explore the personal characteristics of impulsivity, reward sensitivity, competitiveness, and gambling severity based on Hollingshead, Kim, and Wohl (2016) study on *"who spends money to play for free - identifying who makes microtransactions on social casino games and why"*. They found that personality characteristics are important to understand, when trying to recognize who will spend money on microtransactions in social casino games. The association was tested by recruiting participants who engaged in microtransactions, and participants who had never engaged in microtransactions. Participants who responded to the MTurk recruitment notices were redirected to a survey where the measured variables were gambling involvement, competitiveness, impulsivity, reward sensitivity, and motivations. They did, however, test the concept of microtransactions on social casino games - even though it is a different field we can still find similarities as social casino games are also free to play and similar to the gaming industry operators, they generate handsome profits with significant portions of revenue coming from players desire to purchase virtual credits (Kim et al., 2016).

We argue that the personality traits of gambling severity, reward sensitivity, competitiveness and, impulsivity are powerful predictors of outcomes in regards to spending behaviour and we therefore wanted to examine the relevance of personality traits to spending. Moreover, we wanted to control for personality traits as information that comes from understanding these can help regulate the industry in an ethical manner.

2.5.3 Gambling severity

Gambling severity refers to an individuals' gravity of problem gambling (Ferris & Wynne, 2001). We included gambling severity as a personality trait because microtransactions in games enable players to make purchases that are structurally approximate to gambling (King et al., 2016). Delfabbro, Gainsbury, King, and Russell (2016) found that those who spent the most money in-game reported higher symptoms of problem gambling and psychological

distress when compared to non-paying players. Hollingshead, Kim, and Wohl (2015) found that social casino gamers who engage in microtransactions proved to have greater gambling involvement than those who did not spend money on microtransactions. Drummond, Hall, Loudon, Sauer, and Zendle (2020) further showed that purchasable randomized reward mechanisms in online video games had real world monetary values, and could therefore be regulated under existing gambling legislations. Gambling experts have particularly reacted to the concept of loot boxes (purchasable randomized rewards), which share many key formal features with traditional forms of gambling in that consumers are jeopardizing real loss of money for the chance of obtaining virtual rewards of varying value (Cairns & Zendle, 2019; Griffith, 2018).

Individuals who suffer from problem gambling tend to continue to gamble despite experiencing a series of losses (Becoña, Crespo, Echeburúa, Labrador & Labrador, 2020; Gilovich, 1983). Gilovich (1983) argued that a possible reason for this persistence could be that individuals evaluate outcomes in a biased manner by overestimating wins at face value while discounting losses. Dixon, Fugelsang, Harrigan, MacLaren, and Vance (2011) found that gamblers often have an abnormal understanding of the games they play, and the reason why they play them. These variables are often situational and individual gamblers frequently hold beliefs that are not logically coherent (Vance et al., 2011). A gambler might continue to spend money on a game after a series of losing due to the belief that a winning outcome must occur after a series of losses, even though the outcomes are independent (Kahneman & Tversky, 1974). Alternatively, a gambler might continue spending money after continuous wins due to the belief of a “lucky streak” (Gilovich, Tversky & Vallone, 1985). The same players who believe the first fallacy often believe in the other one (Croson & Sundali, 2006).

We argue that it is necessary to control for gambling severity, as those who suffer from problem gambling are more likely to spend in a different manner compared to individuals who do not suffer from problem gambling. The degrees of spending might also differ based on levels of gambling severity. Furthermore, we expected that the inclusion of gambling-like elements in online video games would create a naturally attractive environment for problem gamblers, thus increasing the necessity of controlling for it.

2.5.4 Competitiveness

Competitiveness can be defined as the desire to win against others in interpersonal situations (Carter, Houston & Smither, 1997; Helmreich & Spence, 1978; Houston, Houston, Luchner & Walker, 2011). We have included competitiveness as a personality trait because online video games often promote direct competition between gamers, and studies have identified competition as a principal motivation for participation in online video games (Harris, Hollett & Remedios, 2020). However, Kim, Hollingshead and Wohl (2016) did not find differences in competitiveness amongst social casino gamers between those who did and did not engage in microtransactions. They did however present a reason for the contrary results as the focus group consisted of emerging adults (mean age of 35). Thus age differences may exist in psychological characteristics of gamers who engage in microtransactions, and we will therefore not exclude the elements of competitiveness from our research.

Most online video games build on competition between gamers both in skill and status (Harris, Hollett & Remedios, 2020). In free-to-play games this status typically comes from elements such as skins and cosmetics (Li, Mills & Nower, 2019). Individuals evaluate their own abilities, build their self-image and gain confidence through a process of competing and comparing themselves to others (Assaf, 2015). For instance, individuals collecting profitable and coveted skins in the online video game Counter-Strike (https://blog.counter-strike.net/) may create a trend where other players either feel the need to do the same, or experience the threshold to engage in the same activity to be lower. In Counter-Strike, skins are tradeable via a marketplace, but due to a cut of sales price being taken by the publisher, the record for most expensive skin was sold for $130,000 in real cash (Swiatek, 2020). Almost all players of this game engage with skins in some fashion, being it a choice of desired aesthetics, boasting or just simple collecting. When not following this trend in a social structure where many others do, this may lead to a diminished social status. We therefore argue that feelings of rivalry and competition can motivate purchasing behaviour in online video games.

2.5.5 Impulsivity

Impulsivity can broadly be defined as "a predisposition toward rapid, unplanned reactions to internal or external stimuli without regard to the negative consequences of these reactions to the impulsive individuals or to others" (Barratt, Dougherty, Moeller, Schmitz & Swann, 2001, p. 1784; Sharp & Stanford, 2013). We included impulsivity as a personality trait because it has has been associated with gambling, (Delfabbro, King, Polisena & Russell, 2020; Nguyen & Toneatto, 2007; Slutske et al., 2005), excessive spending behaviours, sensation seeking, and inhibitory control (Billieux, Rebetez, Rochat & Van der Linden, 2008; Delfabbro, King, Polisena & Russell, 2020). Recent studies have shown that impulsive buying behaviour has rapidly increased in developed economies, and the reasoning behind has been attributed to the proliferation of new payment modes and marketing developments (Billieux, Rebetez, Rochat & Van der Linden, 2008; Delfabbro, King, Polisena & Russell, 2020; Neuner, Raab & Reisch, 2005). Billieux, Rebetez, Rochat and Van der Linden (2008) emphasized that a holistic view of impulsivity can help better predict how spending patterns change with the degree of impulsivity for certain consumers.

The microtransaction model has received critique on the basis of fostering compulsive spending behaviours (Delfabbro, King, Polisena & Russell, 2020). Studies have also shown that gamers with remarkably higher virtual expenditures are more prone to endorse symptoms of addictive behaviour (Delfabbro, King, Polisena & Russell, 2020). We argue that the microtransaction model as a new payment mode might encourage impulsive spending, and that a multifaceted understanding of impulsivity can help predict spending patterns.

2.5.6 Reward sensitivity

Reward sensitivity refers to the degree in which behaviour is motivated by reward-relevant stimuli through factors such as money, social reputation, and feelings of achievement (Gray, 1987; Gray & McNaughton, 2000; Hamann, Kim, Kim & Yoon, 2015; Linke et al., 2010). We included reward sensitivity as a personality trait because Hollingshead, Kim and Wohl (2016) found that gamers who engage in microtransactions provide greater levels of reward sensitivity.

Gamblers and gamers tend to persist on spending money because they crave the reward associated with winning and excelling, or the temporary intermission from the punishment of losing (Corr & McNaughton, 2009). We argue that it is important to control for reward sensitivity as in-game purchasing systems might involve features that manipulate reward outcomes to reinforce purchasing behaviours (Delfabbro, 2018) The structure of rewards and incentives in online video games often encourage individuals reward sensitivity. We further argue that an understanding of reward sensitivity as behaviour motivated by reward relevant stimuli (social reputation - skins, characters) can help predict spending patterns.

2.5.7 Summary

Studies have shown that consumers subjectively value identical prices and money differently depending on their personal characteristics (Manoj, Morwitz & Santana, 2020; Raghubir 2006). Personal characteristics have been recognized as motivational factors in online gaming (Jeng & Teng, 2008), and a component that can help better predict cognitive motivational patterns, such as spending (Benet-Martínez & Ozer, 2006). We argue that personal characteristics such as gambling severity, impulsivity, competitiveness, and reward sensitivity can act as a mediator in the relationship when trying to recognize how individuals may vary in spending patterns. In light of this we expected that participants who spend more money on microtransactions with incorporated virtual currencies would score higher on the personality traits of gambling severity, impulsivity, competitiveness, and reward sensitivity compared to consumers who scored lower on the given personality traits. The present study will further explore the relationship between the application of virtual currencies and spending on microtransactions moderated by personal characteristics.

2.6 Conceptual framework and hypotheses

Our conceptual model depicts the relationships we expected to observe among the study's dependant variable (purchasing through microtransactions), independent variable (virtual currency as payment), mediating variable (pain of paying) and the moderating variables (impulsivity, reward sensitivity, competitiveness, and gambling severity).

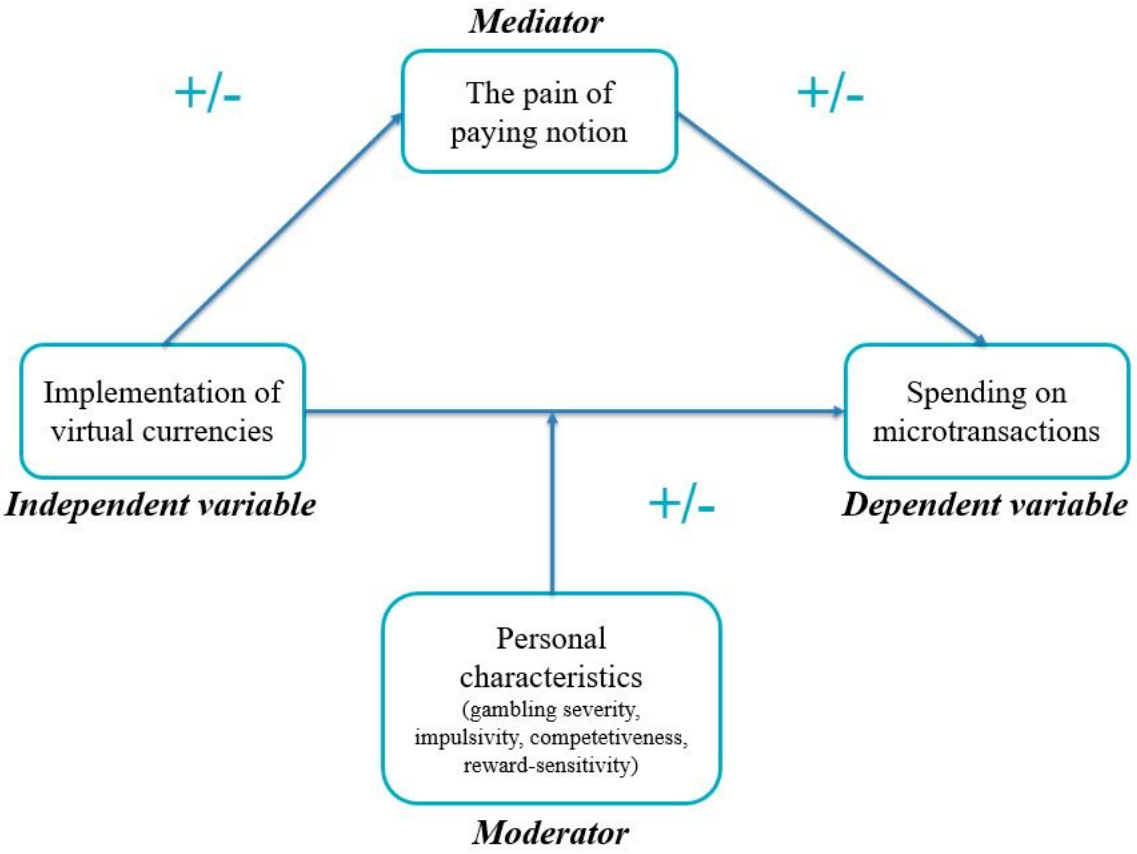

Figure 2: Framework of study

We further describe the dynamics among the study variables and hypothesize the anticipated observations. The processes of these dynamics are extensively explained and analyzed in the data analysis section.

In our study we expected participants who were exposed to virtual currencies to spend more freely compared to the participants who were exposed to local currencies. We also expected that respondents who were using local currencies would have a better recollection of their balance, compared to respondents who were using virtual currencies. In conclusion, we presumed that the intent to increase consumers' spending by implementing virtual currencies in the microtransaction model would lead to higher purchase intentions, as the purpose of these virtual currencies are to imply advantageous resource trades due to most consumers inability to gauge face value versus real value correctly. With regard to the objectives discussed above, the following hypotheses were created:

H1: Respondents purchase more when paying in virtual currency compared to local currency.

H2: Respondents have better recollection of their current balance in a local currency compared to a virtual currency.

We further explored whether virtual currencies implemented into the microtransaction model would yield different outcomes on consumers' pain of paying, compared to local currencies in the same model. Precisely, we expected that the pain of paying as a mediating effect could influence propensity to spend money on virtual currencies. We further believed that participants who spent money in virtual currencies would experience lesser pain of paying, compared to participants who spent in local currencies. Along the same lines, we assumed that the lower the pain of paying, the more influential the application of virtual currencies would be in leading spending on microtransactions.

Virtual currencies aim to combine hedonic features with the utilitarian features of modern payment methods by enabling consumers to utilize a payment method that does not evoke thoughts of payment. In light of this, we assume that the pain of paying notion will cushion the pain of paying, when spending in a virtual currency compared to a local currency. With regard to the objectives discussed above, the following hypotheses were created:

H3: Respondents reported a higher pain of paying when spending in a local currency compared to a virtual currency.

H4: Respondents who reported a greater pain of paying when spending in a local currency compared to a virtual currency spent less money in the game.

We further explored how the moderating effect of personality characteristics could regulate the relationship of virtual currencies on microtransactions. We believed that consumers who spend more money on the microtransaction model with incorporated virtual currencies would score higher on the personality traits of gambling severity, impulsivity, competitiveness, and reward sensitivity compared to consumers who scored lower on the given personality traits. We assumed these mechanisms to be viable when exploring the relationship between the

application of virtual currencies and spending on microtransactions. With regard to the objectives discussed above, the following hypothesis was created:

> **H5:** Respondents who reported higher spending on microtransaction score higher on the personality characteristics of impulsivity, reward sensitivity, competitiveness, and gambling severity compared to respondents who reported moderate spending behaviours on microtransactions.

3.0 Research methodology

In this study, we aimed to research and understand how spending habits change when a payment is made in a virtual currency, relative to a local currency, and how the microtransaction model helps cushion the pain of paying, thus reflecting on consumers' purchase intentions. We also intended to analyze whether personality characteristics such as impulsivity, reward sensitivity, competitiveness, and gambling severity can help to better predict how individuals may vary in spending patterns and how those characteristics can influence the relationship between utilizing virtual currencies through microtransactions.

3.1 Participants

The responses of the survey were recruited by sharing the experiment on social media platforms such as Facebook, Instagram, LinkedIn, Reddit, and asking friends, family, and colleagues to complete the survey and redistribute it to their social networks. Hence, we used convenience sampling.

To decide upon sample size, we had to make sure that the sample would provide enough statistical power. Thus, the amount of data that we would derive from our sample should be strong enough when trying to detect possible relationships between the study's variables. As we did not want to commit a type-II error (non-rejection of a false null hypothesis), we estimated our sample size based on sample sizes of similar studies. Kim, Hollingshead, and Wohl (2017) had a total sum of 302 participants, Raghubir and Srivastava (2008) had a total of 114 participants, and Bettman, Chartrand, Eisenkraft, and Shah, (2016) recruited 513

participants. We managed to gather 921 responses, which we considered more than sufficient in order to detect relationships between study variables, and provide reasonable insight.

Our study was GDPR-compliant, and it was conducted following the legal and ethical guidelines of the Norwegian Centre of Research Data. As we asked questions regarding spending, and personality characteristics, we also presented respondents with information regarding this, and let them know that they were allowed to not complete the study if they wished to do so. We did however not collect any personal information that would allow us to identify respondents through elements such as IP-addresses, names, passwords, contact details, health data, or any other sensitive data.

3.2 Materials

3.2.1 Dependant variable (DV)

As we intended to study the effects of having customers utilize virtual currencies when spending, we treated spending on microtransactions as our fundamental dependent variable throughout all the analyses. Spending was a numerical continuous variable, the value of which was obtained by asking respondents to type in their money balance after playing, through the game simulation (see appendix 1). This was also used as an attention check. We further calculated their spending by subtracting the starting balance, and the final balance. Lastly, we calculated how much money they bought while playing the game.

3.2.2 Independent Variable (IV)

Our aim was to test whether the application of virtual currencies would result in different levels of purchasing among study participants compared to the application of local currencies. These variables were tested as the main independent variables of our study. All the independent variables had nominal values - virtual currency and local currency (see appendix 1).

3.2.3 Mediating variable (M1)

The mediating variable in our study is the pain of paying notion. In order to assess how respondents perceived the variables, we designed questions based on designs following Bettman, Chartrand, Eisenkraft, and Shah (2016), and Bearden, Gershoff, and Soster (2014). After respondents completed the game simulation, we asked 5 questions that inquired about their pain of paying (see appendix 1). Participants rated the first two statements on a Likert scale, ranging from "much better" to "much worse", while the last three statements were answered on nominal scales (see appendix 1). After gathering the data, we proceeded to aggregate the statements pertaining to our mediating variable.

To ensure internal consistency reliability, we took several measures. First we asked respondents synonymous questions to eliminate errors that could occur. If respondents were to give different answers this would have been an indication of poorly phrased questions and possibly non-reliable measures. Second, we checked for the test reliability with Cronbach's Alpha in SPSS. The Cronbach's Alpha test ranged from 0.700 to over 0.900 for almost every hypothesis test. These values confirmed solid and acceptable results, therefore the survey, is internally consistent and reliable.

3.2.4 Moderating Variable (M2)

In the last part of our analysis we studied the moderator of our study - the participants personality characteristics (gambling severity, impulsivity, reward sensitivity, and competitiveness).

Gambling severity was measured with the Problem Gambling Severity Index - PGSI (Casey, Currie & Hodgins, 2013; Kim et al., 2015), in order to estimate risk behaviour in problem gambling. The tool is based on common signs and consequences of problematic gambling (Victorian Responsible Gambling Foundation, 2020).

Impulsivity was measured on the Impulsiveness Scale–Brief (BIS-Brief) (Sharp & Stanford, 2013) as it includes 8 of the original 30 BIS-11 items, and it is proven to reduce the burden of

respondents without loss of information (Sharp & Stanford, 2013). The BIS-11 is a 30-item self-report measure designed to assess general impulsiveness (Patton et al., 1995; Stanford et al., 2009).

Reward sensitivity was measured using the partial Sensitivity to Punishment/ Sensitivity to Reward index (SPSRQ) (Ávila, Caseras, Moltó & Torrubia, 2001), but we only included the questions regarding reward sensitivity.

Finally, competitiveness was measured using the Competitiveness Index (Houston & Smither, 1992). They clarified a conceptual definition of competitiveness and introduced a 20 item scale to measure individual competitiveness called the Competitiveness Index (Gino, Larrick & Tost, 2012; Elliot & Murayama, 2012).

Competitiveness was measured on a Likert scale ranging from strongly agree to strongly disagree, Reward Sensitivity was measured on a nominal scale (yes/no), while Impulsivity was measured on a Likert scale from never to always. Finally, Gambling severity was measured on a Likert scale ranging from never to always.

3.3 Design and procedure

3.3.1 Study design

Our study addresses the perceptions of virtual currencies, and tests if consumers' understand how much they are paying when making purchases of virtual items through the microtransaction model. We therefore created a game simulation in order to better understand the mechanisms behind the study's variables. We based our game simulation on two well-known online video games - League of Legends (https://eune.leagueoflegends.com/en-pl/) and Valorant (https://playvalorant.com/en-gb/). League of Legends, and Valorant are both developed by Riot Games, but they differ by the fact that League of Legends is a strategic multiplayer arena game, and Valorant is a tactical multiplayer shooter game. We decided to create two simulations of games as a manipulation, in order to establish if the game genre or category could influence participants' answers, and spending, and to be able to generalize our results beyond one game.

Each participant went through wins and losses in random order while playing with virtual currency, and through wins and losses while playing with real currency (see Table 2). The assignment of the currencies was randomized as well.

WITHIN PARTICIPANTS

GAME	CURRENCY	STAGE 1	STAGE 2
	REAL	WIN	LOSS
GAME 1	IN-GAME	WIN	LOSS
	REAL	WIN	LOSS
GAME 2	IN-GAME	WIN	LOSS

Table 2: Framework of study

The game simulation questionnaire was designed as an online video game where respondents were asked to play a game where they had to make their own decisions. Participants were also given the opportunity to "win" virtual currencies and gain complimentary virtual currencies as they played and spend them in the simulated shops if they wished to do so. We kept the shop elements, descriptions, and items identical to the real shops from League of Legends (strategy), and Valorant (tactics) in order to make it as similar as possible to the real gaming experience.

Due to the fact that we used NOK currency as the local currency of our study we had to limit the research to Norway, as we did not want other conversions going through the minds of participants. Moreover, in order to avoid currency order effects, we divided the participants into two, half the participants started the simulation with virtual currencies (Rumbo Points, RP, and Vicro Points, VP), while the other half started with the local currency of Norwegian Kroner (NOK). After the first game simulation, participants would play the same game in another currency (if they had virtual currencies before, they would get local currencies for the second round and vice versa). The last randomization that we used in our study consisted of

whether the participants would first lose or win the game in both currency conditions. We assumed that if the participants win first and lose afterwards, they will still be more eager to spend money in the game shop, while the ones who lose first, might not have any incentive to visit the game shop at all, thus we randomized this. All assignments of participants to the games and conditions were completely random. In sum, randomization was employed in order to counteract possible order effects and minimize transfer and learning across conditions.

We conducted a 2 x 2 x 2 experimental design, which means that we had three independent variables, with each having two levels, providing us with sixteen conditions (see figure 3). In our case this meant 2 x game (League of Legends - game 1 vs. Valorant - game 2) x 2 currency manipulation (virtual currency in either RP or VB vs. local currency in NOK) x 2 outcome (win vs. loss). So, a participant in one condition could for example start with the Valorant simulation with virtual currencies, and win, while another could start with the Valorant simulation with virtual currency, and lose. Thus, the outcome is different for each participant.

The survey was designed as both within- and between-subjects, therefore our study design was mixed. The within-subjects design was used for the win-lose, in-game currency-real currency conditions, and for the personality traits questions. As for the between-subjects design, it was used for the LoL-Valorant condition. In the within-subjects design, each participant was exposed to more than one of the conditions being tested, whether it be playing a game with two different parameter values or answering multiple questions (Charness, Gneezy & Kuhn, 2012). A within-subject design can, as long as there is independence of the multiple exposures, generate causal estimates by exploring how individual behaviour changes when the circumstances of the experiment changes (Charness, Gneezy & Kuhn, 2012). The between subjects design was employed in order to control for the game genre.

Each condition and game experience differed a lot from each other. Thus, the outcome was different for each participant as some would want to make purchases in the shop, while others wanted to proceed directly to the game and not buy anything. Whilst this introduced some

level of variation, it also guaranteed that the experiment looked closer to reality. The experiment was conducted via an online survey in Qualtrics (appendix 1).

3.3.2 Survey procedure

At the beginning of the questionnaire we asked participants to follow specific instructions (see appendix 1). First, they were asked to read a description of the game, as it was necessary to provide a framework and guidelines. Secondly, we gave them a starting balance and asked them to keep track of their balance throughout the game, as it was essential for us to establish a potential currency bias. In the first part of the questionnaire we also asked respondents to answer general questions regarding age, and gender to establish demographic factors. We then let the participants play the game simulation, before they proceeded to answer questions regarding their pain of paying. We explored the valence of respondents' attitudes towards making payments in virtual currencies, compared to local currencies, and assessed their pain of paying and overall perception of the presented payment modes. Finally, the last stage of the survey inquired about participants' personality characteristics.

3.3.4 Gameflow

The survey was organized in a way that could divide participants into sixteen different conditions without biasing the results of the study. The randomization function in Qualtrics enabled us to assign participants to the different conditions equally, and without participants knowing about any of the other groups. In Figure 3, as presented below, there is a visualization of all the biases we controlled for, as well as the original flow of the questionnaire. First, participants were randomly assigned to either “play” the League of Legends or Valorant simulations - the between conditions design. After being allocated to a game, the participants were assigned to either start with an in-game currency or a real currency, as well as either a win or a loss. Lastly, participants were once again randomly assigned to the Win-Loss and Loss-Win conditions, while “playing” the same game, but with different currencies.

Figure 3: Survey flow

3.4 Analyses

We used the statistical software package SPSS to analyze our data. For the analyzes, we used a wide range of tests, such as mixed ANOVAs and linear regression models to track the relationships between, and within the groups in various conditions. In addition to that, we utilized independent samples T-tests to explain, and see relationships between-subjects groups. To ensure the reliability of the personality tests the Cronbach's Alpha tests were performed. Finally, for tracking the reported balance accuracy, we closely monitored each participant's spending with a calculator, and created more presentable, and cleaner visualizations with the Microsoft Excel software.

4.0 Data Analysis and results

This section describes the procedure and reasoning behind the data analysis, and reports findings from the study.

4.1 Data Preparation

Due to the complexity of our research we had to test every hypothesis in several steps by constantly dividing the dataset in different groups, this was on account of the 2 x 2 x 2 research design. In total we got 921 responses to our survey, and our participants were equally divided into 16 different groups during the survey because we wanted to control the outcome for several biases such as:

- Whether losing or winning as a first result would influence purchasing in any of the currencies.
- Whether playing first with in-game currency or real currency influences purchasing decision.
- Whether the genre of the game influences purchasing/spending.

In the first stages of analyzing we ran various descriptive analyzes to get an overview of the data we obtained. We noticed that some responses could not be utilized for further analysis due to facetious and missing answers. Thus, we removed data from 24 participants and proceeded to conduct the rest of the analysis with a sample of 897 participants.

4.2 Sample Demographics

Our sample consisted of 81.9% male and 18.1% female participants from Norway (see table 4). Due to the currency manipulation we had to limit our research to Norway. The respondents were between 18 and 52 years of age with a mean age = 27.9, SD = 5.51 (see table 3). The minority of respondents, (34.58%) stated that they had previously played the video games we had based our experiment on. 46.55% said that they had played League of Legends, and only 20.41% stated that they had played Valorant. Thus, we concluded that not many of our participants were familiar with the stream of events in online video games and in-game purchasing systems (see figure 4).

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Please, indicate your age.	897	18,00	52,00	27,9877	5,51893	30,459
Valid N (listwise)	897					

Table 3: Age distribution of participants

Please, indicate your gender.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	735	81,9	81,9	81,9
	Female	162	18,1	18,1	100,0
	Total	897	100,0	100,0	

Table 4: Gender distribution

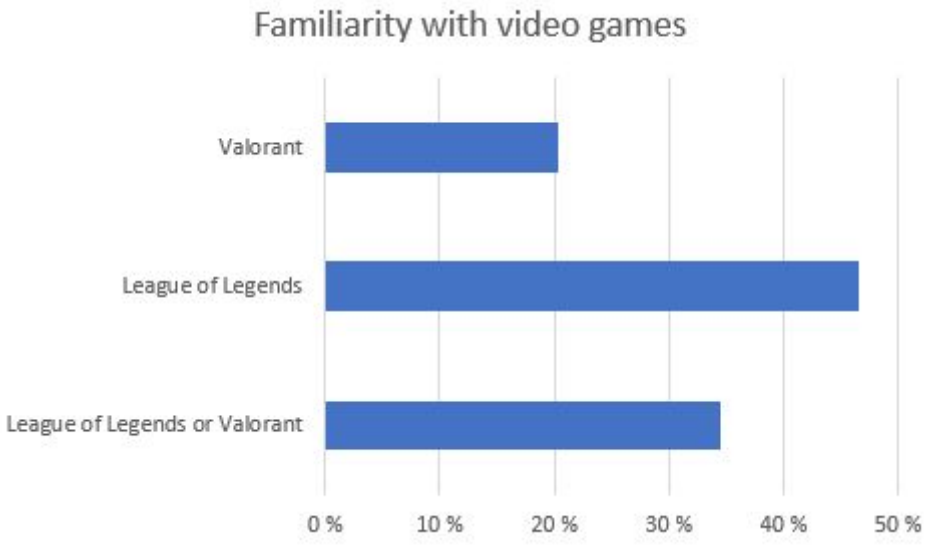

Figure 4: Familiarity with videogames

4.3 The Effect of the Independent Variable on the Dependant Variable

Independent sample t-tests were conducted to determine whether there was a statistically significant difference between spending in virtual currency and spending in local currency. The independent samples T-test showed that mean spending in virtual currency was higher

than in real currency. Moreover, the test showed that it was more significant whether the participants won or lost in a game with real currency, however, losing a game when playing with virtual currency is not as significant for spending levels.

**The results presented in both virtual and real currency. For reference: 436.72 points = 31.76 NOK; 297.65 points = 21,65 NOK; 528.03 points = 38.40 NOK; 463.92 points = 33.74 NOK.*

Group Statistics

	Game	N	Mean	Std. Deviation	Std. Error Mean
Spent balance in-game currency win	LoL	488	436,7213	1381,04353	62,51690
	Valorant	408	297,6471	736,68515	36,47135
Spent balance in-game currency lose	LoL	488	528,0328	1732,97226	78,44797
	Valorant	408	463,9216	1744,24947	86,35322
Spent balance real currency win	LoL	488	24,7541	106,67045	4,82874
	Valorant	408	10,1961	19,52660	,96671
Spent balance real currency lose	LoL	488	8,3607	30,98282	1,40253
	Valorant	408	21,8627	68,86201	3,40918

Table 5: Group statistics

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Spent balance in-game currency win	Equal variances assumed	8,237	,004	1,828	894	,068	139,07425	76,07511	-10,23236	288,38087
	Equal variances not assumed			1,922	768,399	,055	139,07425	72,37764	-3,00711	281,15561
Spent balance in-game currency lose	Equal variances assumed	2,971	,085	,550	894	,583	64,11122	116,59841	-164,72727	292,94970
	Equal variances not assumed			,550	864,122	,583	64,11122	116,66603	-164,87072	293,09315
Spent balance real currency win	Equal variances assumed	24,836	,000	2,719	894	,007	14,55802	5,35490	4,04838	25,06766
	Equal variances not assumed			2,956	525,809	,003	14,55802	4,92456	4,88379	24,23225
Spent balance real currency lose	Equal variances assumed	39,684	,000	-3,887	894	,000	-13,50209	3,47394	-20,32011	-6,68406
	Equal variances not assumed			-3,663	543,417	,000	-13,50209	3,68640	-20,74344	-6,26074

Table 6: Independent Samples T-tests

We then conducted a linear model analysis to see whether the relationships between different personality characteristics, wins and losses had any significance for in-game spending. The table below shows all the relationships between the variables (see table 7).

Impulsivity, measured on a BIS-Brief scale, had a significant relationship with spending after winning a game ($F = 4.930$, $p = 0.027$ and $F = 15.094$, $p < 0.05$). Reward sensitivity, measured with SPSRQ, had a strong relationship with spending both after winning and losing ($F = 38.029$, $p < 0.05$; $F = 57.334$, $p < 0.05$; $F = 41.148$, $p < 0.05$; $F = 52.208$, $p < 0.05$), indicating that reward sensitivity plays a significant role in in-game spending. It is interesting that the competitiveness level of participants, measured with CI, mattered in all cases except from spending virtual currency after losing a game ($F = 1.012$, $p = 0.315$). As for gambling severity, measured with PGSI, it had the complete opposite significance levels compared with impulsivity levels. The relationship between the variables was significant only when participants were spending money in both currencies, after losing a game ($F = 74.439$, $p < 0.05$; $F = 10.747$, $p = 0.001$).

Based on the following results, we were able to prove H1 correct, as participants spent more money on virtual currencies, compared to local currencies.

BIS_Brief	Spent balance in-game currency win	5624546,254	1	5624546,254	4,930	,027
	Spent balance in-game currency lose	2836210,206	1	2836210,206	1,215	,271
	Spent balance real currency win	91444,019	1	91444,019	15,094	,000
	Spent balance real currency lose	2752,002	1	2752,002	1,106	,293
SPSRQ	Spent balance in-game currency win	43389266,92	1	43389266,92	38,029	,000
	Spent balance in-game currency lose	133831476,4	1	133831476,4	57,334	,000
	Spent balance real currency win	249278,109	1	249278,109	41,148	,000
	Spent balance real currency lose	129862,176	1	129862,176	52,208	,000
CI	Spent balance in-game currency win	24507463,17	1	24507463,17	21,480	,000
	Spent balance in-game currency lose	2361649,278	1	2361649,278	1,012	,315
	Spent balance real currency win	38315,672	1	38315,672	6,325	,012
	Spent balance real currency lose	15510,442	1	15510,442	6,236	,013
PGSI	Spent balance in-game currency win	24043,644	1	24043,644	,021	,885
	Spent balance in-game currency lose	173759558,5	1	173759558,5	74,439	,000
	Spent balance real currency win	5041,548	1	5041,548	,832	,362
	Spent balance real currency lose	26733,290	1	26733,290	10,747	,001
Game	Spent balance in-game currency win	5384460,636	1	5384460,636	4,719	,030
	Spent balance in-game currency lose	7971084,456	1	7971084,456	3,415	,065
	Spent balance real currency win	47407,082	1	47407,082	7,825	,005
	Spent balance real currency lose	43060,852	1	43060,852	17,312	,000

Table 7: Linear model analysis

4.4 How the implementation of virtual currencies can affect spending on microtransactions

In order to study the effect of the independent variable on purchasing, the dataset was manually examined, which allowed us to count the number of errors each participant did, while calculating their balance. We hypothesized that respondents would have a better recollection of their current balance in a local currency compared to a virtual currency.

The results proved that 11.92% of participants made mistakes while calculating their balance in virtual in-game currencies. In turn, only 3.74% of participants made a mistake when calculating their local currency. By these calculations, when participants utilized a virtual currency as a payment method, there was more than an 8% chance that they would make a mistake while tracking their balance.

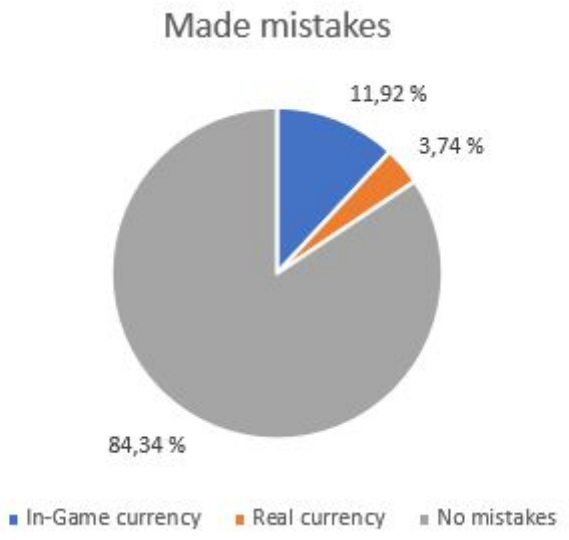

Figure 5: Results of respondents errors when reporting "current balance".

Based on the following results, we were able to prove H2 correct, as participants made more mistakes when reporting their current balance in virtual currencies, compared to local currencies.

4.5 The mediating effect of the pain of paying notion on spending

In order to examine if respondents had a higher pain of paying when spending in a local currency compared to a virtual currency, we conducted a linear model analysis (see table 8).

A larger number of participants preferred playing with virtual currency, as compared to real currency. However the majority indicated that they felt that the game experience was about the same with both currencies (see table 8).

		Value Label	N
Sum results of pain of paying (ig_vs_r)	1,00	Much better	40
	1,50	1,50	72
	2,00	Somewhat better	184
	2,50	2,50	40
	3,00	About the same	432
	3,50	3,50	16
	4,00	Somewhat worse	72
	4,50	4,50	16
	5,00	Much worse	24

Table 8: linear model analysis

The results generated from our mediators effect on spending proved to be very interesting. 37.4% of participants stated that they preferred the experience with virtual currency, while 12.1% of participants preferred the game experience with real currency and 50.5% experienced the game simulation to be about the same in both currencies. Yet, 64.5% wanted to see virtual in-game specific currencies in video games as compared to real world currencies (see table 9). Hence, we were able to prove H3 correct.

Which currency was more painful to pay with?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	in-game currency	69	7,7	7,7	7,7
	real currency	828	92,3	92,3	100,0
	Total	897	100,0	100,0	

Table 9: Frequencies analysis

In regards to our fourth hypothesis, we wanted to know if respondents who reported a greater pain of paying when spending in a local currency, compared to a virtual currency, spent less money in the game. We therefore conducted an independent samples T-test, where the grouping variable was pain of paying. As seen in table 10, participants who reported that it was more painful to pay with real currency, spent more money in game. It is also worth noting that the same participants spent more money when playing with virtual currency as compared to real currency.

Group Statistics

	Which currency was more painful to pay with?	N	Mean	Std. Deviation	Std. Error Mean
Spent balance in-game currency win	in-game currency	69	266,3768	1140,02963	137,24344
	real currency	827	382,3216	1135,38259	39,48112
Spent balance in-game currency lose	in-game currency	69	342,8986	1528,58941	184,02054
	real currency	827	511,8501	1753,93776	60,99039
Spent balance real currency win	in-game currency	69	16,0870	88,68678	10,67663
	real currency	827	18,2950	79,40834	2,76130
Spent balance real currency lose	in-game currency	69	14,9275	61,28221	7,37751
	real currency	827	14,4740	51,40397	1,78749

Table 10: Group statistics

Despite these results, the test seemed to show that there is very little significance in the relationship between spending in different currencies, and the reported pain of paying.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Spent balance in-game currency win	Equal variances assumed	,807	,369	-,815	894	,415	-115,94483	142,31621	-395,25763	163,36796
	Equal variances not assumed			-,812	79,675	,419	-115,94483	142,80939	-400,16234	168,27267
Spent balance in-game currency lose	Equal variances assumed	1,889	,170	-,776	894	,438	-168,95151	217,76223	-596,33626	258,43324
	Equal variances not assumed			-,871	83,677	,386	-168,95151	193,86435	-554,49380	216,59078
Spent balance real currency win	Equal variances assumed	,005	,943	-,220	894	,826	-2,20809	10,04362	-21,91990	17,50373
	Equal variances not assumed			-,200	77,373	,842	-2,20809	11,02793	-24,16582	19,74964
Spent balance real currency lose	Equal variances assumed	,195	,659	,069	894	,945	,45353	6,54368	-12,38923	13,29630
	Equal variances not assumed			,060	76,196	,953	,45353	7,59097	-14,66456	15,57163

Table 11: Independent Samples T-test

Another interesting find is that the within-subjects test that was controlled for, different pain of paying variables showed that even if the results above show very little significance in the relationship between spending in different currencies and the reported pain of paying, the relationship between spending in different currencies and the game currency preference had a remarkably high linear significance (see table 12). The higher the spending, the more respondents stated that they preferred playing with virtual currencies.

Tests of Within-Subjects Contrasts

Measure: MEASURE_1

Source	spending	Type III Sum of Squares	df	Mean Square	F	Sig.
spending	Linear	94979580,28	1	94979580,28	96,312	,000
	Quadratic	112025,741	1	112025,741	,248	,618
	Cubic	29150379,87	1	29150379,87	30,221	,000
spending * Pain_of_paying	Linear	72184344,71	1	72184344,71	73,197	,000
	Quadratic	11981,503	1	11981,503	,027	,871
	Cubic	18737218,69	1	18737218,69	19,426	,000
spending * Pain_of_Paying_1	Linear	1008557,309	1	1008557,309	1,023	,312
	Quadratic	48858,066	1	48858,066	,108	,742
	Cubic	529277,769	1	529277,769	,549	,459
Error(spending)	Linear	880642692,4	893	986162,030		
	Quadratic	402647631,2	893	450893,204		
	Cubic	861353679,5	893	964561,791		

Table 12: Tests of Within - Subjects contrasts

Tests of Between-Subjects Effects

Measure: MEASURE_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	137879484,1	1	137879484,1	80,643	,000
Pain_of_paying	98873049,91	1	98873049,91	57,829	,000
Pain_of_Paying_1	1541627,885	1	1541627,885	,902	,343
Error	1526809139	893	1709752,675		

Table 13: Tests of Between - Subjects Effects

Based on the given results, we were not able to prove H4 correct.

4.6 The moderating effect of personality characteristics

We hypothesized that respondents who reported higher spending on microtransactions would score higher on the personality traits of impulsivity, reward sensitivity, competitiveness, and gambling severity, when compared to respondents who reported moderate spending behaviours on microtransactions. In order to get the results on the given hypothesis, a total score of all the characteristics was created based on standardized measures. The higher the total score of the participant, the more he/she was regarded as impulsive, reward sensitive, competitive, and prone to gambling. In order to control for these personality characteristics, and test the hypothesis, a linear model analysis was conducted.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Sum results of BIS Brief	896	12,00	41,00	24,1964	5,42758
Sum results of SPSRQ	896	9,00	18,00	13,4911	2,33887
Sum results of CI	896	22,00	95,00	68,3750	13,38664
Sum results of PGSI	896	9,00	31,00	10,9018	3,92320
Valid N (listwise)	896				

Table 14: Descriptives for each of the personality tests

The tests showed that there is a significant relationship between spending, and all the characteristics, except for impulsivity, that was measured with the help of BIS-Brief (see table 14).

Tests of Between-Subjects Effects

Measure: MEASURE_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	6713148,979	1	6713148,979	4,560	,033
BIS_Brief	3424093,215	1	3424093,215	2,326	,128
SPSRQ	90394933,30	1	90394933,30	61,405	,000
CI	10291469,91	1	10291469,91	6,991	,008
PGSI	40910234,15	1	40910234,15	27,790	,000
Game	6640865,986	1	6640865,986	4,511	,034
Error	1310180840	890	1472113,304		

Table 15: Test Of Between Subjects Effects

The regression analysis showed that impulsivity and reward sensitivity scores are negatively correlated with spending. This indicates that the more impulsive and reward sensitive the participant was, the less money he or she spent on microtransactions. The complete opposite was shown for competitiveness, and gambling severity. The higher participants scored on those tests, the more money they spent on microtransactions (see table 15).

However, the regression showed that neither impulsivity (BIS-Brief), nor competitiveness (CI) indexes were sufficiently significant (see table 16).

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	453,477	103,559		4,379	,000
	Sum results of BIS Brief	-,439	1,627	-,009	-,270	,787
	Sum results of SPSRQ	-36,568	4,275	-,311	-8,554	,000
	Sum results of CI	1,114	,687	,054	1,622	,105
	Sum results of PGSI	6,459	2,424	,092	2,664	,008

a. Dependent Variable: Spending_total_Real

Table 16: Coefficients

Based on the following results, we were able to prove H5 as partially correct, as we could only prove gambling severity and reward sensitivity as indicators for spending on microtransactions.

5.0 General discussion

This section explores our findings, and presents additional insight as to why the expected phenomena occurred or not.

The purpose of our research was to demonstrate that the application of virtual currencies implemented in the microtransaction model cushioned individuals' pain of paying, compared to the application of local currencies in corresponding denominations.

Within this purpose, we argued that the implementation of virtual currencies would lead to increased spending behavior compared to the implementation of local currencies. We were able to prove that participants spent more money in virtual currencies, hence H1 was proven to be correct. Based on the theories of money illusion (Diamond, Shafir & Tversky, 1997; Tyran, 2007), currency confusion (Raghubir & Srivastava, 2002), and transaction utility (Badea & Rogojanu, 2015; Thaler, 1985) we argue that respondents purchase more in virtual currencies, compared to local currencies because virtual currencies imply advantageous resource trades, due to most consumers inability to gauge face values versus real values

correctly. We further argue that in accordance with the theory of psychological myopia (Hsee et al., 2003; Hsee & Wei, 2018), participants might lose focus regarding the relationship and exchange rate between the virtual currency, and the desired outcome, leading them to cancel the medium's effect, and thereby sacrificing logical decision-making in favor of overestimating the value of the virtual currencies. Our research proves that in accordance with Hsee et al. (2003) and Kim, Palmatier, and Steinhoff (2020) the presence of a medium can alter purchasing decisions. The linear point distribution that we provided participants with (see figure 1 and, appendix 1), might have enticed greater perceived value in bigger transactions, leading participants to spend more in virtual currencies, compared to local currencies.

Consequently, we hypothesized that participants would better recollect their balance when spending in a local currency, compared to a virtual currency. By manually exploring the dataset, we were also able to prove H2. We found that 11.92% of participants made mistakes when calculating their balance in virtual in-game currencies, while only 3.74% of participants made a mistake when calculating in their local currency. Studies have shown that consumers tend to anchor on familiar prices in their home currencies rather than on the face value of the foreign currencies when making price judgements (Dehaene & Marques, 2004; Jonas et al., 2002). We therefore argue that the same logic might apply when it comes to recollection of balance, as respondents are familiar with calculations in local currencies, but rather unfamiliar with in-game currencies (Kahneman & Tversky, 1974; Raghubir & Srivastava, 2002).

Relatedly, we observed that many of our respondents left comments after they completed the gaming-simulation stating that it was a fun experience. As microtransactions are defined by purpose, they have two aspirations. On the one hand, making purchases should be simple and not interrupting of the gaming process, while on the other hand, the act of purchasing additional content itself should psychologically be as far away from spending money as possible (Tomic, 2019). Our results could thereby be explained by the fact that participants, as expected, enjoyed the gaming experience as they were psychologically removed from the act of paying. The payment did not interrupt the game and removed the mental cost for the

consumer (Fransson, 2015). In light of this we believe that consumers' spending behaviours can be increased by implementing virtual currencies in the microtransaction model.

Building on how microtransactions aim to keep the act of payments psychologically separated from actually spending money, we hypothesized that respondents would report a higher pain of paying when spending money in local currencies compared to virtual currencies. We were able to prove H3 right, as 37.4% of participants stated that they preferred the experience with in-game currency, while 12.1% of participants preferred the game experience with real currency. However, 50.5% experienced the game simulation to be about the same in both currencies. As virtual currencies aim to combine hedonic features with utilitarian features, we argue that they enable consumers to utilize a payment mode that does not evoke thoughts of payments, and in the process it makes the game experience more "fun", which can be proved by the fact that 64.5% of our participants wanted to see virtual in-game specific currencies in video games as compared to real world currencies. This result is consistent with research by Gamble et al. (2002), who proved that consumers preferred to pay in currencies with lower nominal values when paying for products.

One of the more noteworthy findings of our study was that 92.3% of respondents stated that it was more painful to pay in a real currency compared to virtual currency. There are many possible reasons for why the given phenomenon occurred. We believe, as many academic researchers have studied, that consumer spending as a function of payment modes plays an important part (Belmont & McCall, 1996; Feinberg, 1986; Gipe, McCall & Trombetta, 2004; Hirschman, 1979; Loewenstein & Prelec, 1998; Prelec & Simester, 2001; Raghubir & Srivastava, 2008; Soman, 2001, 2003). These studies have suggested that increased spending behaviour is due to a decoupling effect, indicating that an electronic payment mode lacks transparency so that the real cost of the transaction is concealed.

Relatedly, we argued that respondents who reported a greater pain of paying when spending in a local currency compared to a virtual currency would spend less money in the game. Surprisingly, we could not prove H4 to be correct. The interesting part is that respondents spent more money when playing with virtual currencies as compared to real currencies, but our analysis showed that there was very little significance in the relationship between

spending in different currencies, and the reported pain of paying. However, the relationship between spending in different currencies, the reported pain of paying, and the game currency preference had high linear significance. This indicates that the higher the spending, the more participants stated that they preferred to play with virtual currencies. We interpret this as a process where the participants who were inclined to spend higher values also preferred to detach the act of paying, thus relying on virtual currencies to soften the perceived pain of paying.

Another interesting find, as illustrated in figure 4, the majority of our respondents had never played the games of League of Legends or Valorant, prior to our game simulation. We found that to be particularly interesting as we believe that it makes our results more generalizable, moving the phenomenon of microtransactions, and virtual currencies from a purely gaming-related business model towards a model that might be applicable across industries.

Finally, we hypothesized that respondents who reported higher spending on microtransactions would score higher on the personality traits of gambling severity, impulsivity, reward sensitivity, and competitiveness, compared to respondents who reported moderate spending behaviour on microtransactions. Our analysis proved that the characteristic of gambling severity was particularly relevant when recognizing who spends money on microtransactions, as participants who scored higher on that test spent more money on microtransactions. Hence, H5 was only partially true. Our findings of gambling severity are consistent with those of Delfabbro, Gainsbury, King, and Russell (2016) and Hollingshead, Kim, and Wohl (2015).

Although the personality traits of reward sensitivity and impulsivity were negatively correlated and competitiveness had a non-significant effect on purchasing, we believe that the results to H5 would have been different if we were to check the effects of the given personality characteristics on loot boxes (randomized rewards), rather than on purchases of cosmetics. This is due to the body of literature that has been able to prove the relationship between spending on microtransactions, and loot boxes with impulsivity, reward sensitivity and competitiveness (Cairns & Zendle, 2019; Drummond, Hall, Loudon, Sauer & Zendle, 2020; Griffith, 2018).

6.0 Implications for business and practice

This section discusses the managerial implications of our findings that can be of particular interest for managers in both video gaming and other industries.

The video game industry has been one of the leading innovators in leisure activities in the last half of the 20th century (González-Piñero & Manel, 2017). The continuing advance of the internet, new communication forms, and distribution channels have contributed to change customers' purchasing patterns, and encouraged companies to develop new strategies both in terms of service offerings and payment modes (Hoyer, Kraume, Kroschke, Schmitt, & Shankar, 2020; Libai et al., 2020).

We find the concept of virtual currencies implemented into the microtransaction model interesting right now, because legislators and consumers all over the world are calling for regulation of these monetization schemes, on the grounds that they are predatory mechanisms that are closely linked to gambling. There is however no conclusive support to these criticisms (McCaffrey, 2019). Yet, many countries are starting to ban microtransactions while we see an influx of the model in other industries (McCaffrey, 2019). We observed an example of this with Joe & The Juice, a chain of juice bars. They recently introduced their own mobile app, that follows a similar point system, as seen in online gaming. Consumers receive an immediate reward for signing up (free juice), followed by receiving an arbitrary amount of points that only corresponds to the given app (1000p). Following the sign-up period, consumers receive points on the basis of the scope of purchases, and these again might lead to rewards and achievements that eventually will grant customers something from their menu for free. The payment mode is also similar to the payment modes found in online videogames, as the developer registers customers payment info with the first purchase and free juice - making payments easy and psychologically removed from actual payments. Furthermore, the juice chain gives rewards and achievements on the basis of visits (per month), and scope of orders (monetary value), much like online videogames give rewards,

and achievements on the basis of time spent in game (performance) and money spent (monetary value). In both scenarios, the investment of time, and money might be seen as an investment, and consumers might act in accordance with the sunk cost fallacy (Arkes & Blumer, 1985; Tomic, 2019). To substantiate our point, Elliot et al. (2012) also found that the two items that make games most addictive were found in reward features, and in-game achievements.

The technological innovation, and industry evolution of payment modes has experienced explosive growth (Xu, Yaoi & Zheng, 2018). It became particularly prominent under the COVID-19 pandemic, as electronic payments experienced massive growth. Society as a whole accelerated towards a cashless society (Arner, Buckley, Didenko & Zetzsche, 2020). Online videogames have been operating with electronic payments for a long time, and we now believe that the payment space in other industries will have to change as well. With the current shift towards an increasingly cashless society, we believe that consumer behaviour will change as individuals' will become more used to making seamless and quick payments. An example of this is the ordering process in cafes and restaurants, which now requires close to no human interaction, as orders can be made via smartphones. This extends to other industries, where COVID-19 forced most retailer-oriented businesses to review and change their approach to customer interaction. One of the more common changes were seen in the ordering and transaction-part, where retailers started catering towards "non-contact delivery", which in part involves deferring from physical handover of cash. Even interacting with bank terminals is advised against, so society as a whole quickly had to shift towards utilizing payment methods like "Apple pay" and "Vipps". Thus as a result of the pandemic, the sudden rise of new needs ushered in the next era of payment methods (Arner, Buckley, Didenko & Zetzsche, 2020).

From a managerial perspective, we believe it is of value to understand a payment model that gives the main product away for free, but still manages to generate substantial revenues. The model can be applied in various fields, such as apps, e-commerce, web apps and subscription-based services. The ever-increasing amount of transactions happening online for virtual goods infer a significant opportunity for new monetization schemes across other industries. Companies offering virtual goods should, in our opinion, be especially attentive to

how the factor of pain of paying plays into their transaction model, and utilize the low threshold consumers exhibit when dealing with this payment method.

We argue that the synergetic possibilities when offering digital goods on a platform that is online by nature, results in a dynamic where companies can tailor offerings alongside other monetization methods, by enabling their customer to choose which parts of the product they want to purchase. This method may result in less “full sales” or “subscriptions”, but attract a myriad of consumers that abstain from purchasing due to the threshold of either price or undesired content. This follows the evolution seen in online video gaming monetization, where the original iterations of the models lacked the flexibility where customers could modify the product to their needs and wants, instead of simply offering standardized “full” editions. This could be applied to many services, easy examples are online magazines and newspapers hiding articles behind paywalls, where unlocking them usually comes at the cost of engaging in a subscription. Regardless of how easy it is to terminate said contract, this becomes a significant threshold many consumers might find too arduous to accept. A concept based on the freemium-model where some articles are behind a paywall that is set as low as i.e. 5 NOK for unlimited access to a single article might remove some of the pain of paying. The use of microtransactions could also be utilized in various streaming services. An example could be found in sports streaming, where fans might not care about all sports or all teams, but by adding flexibility through the microtransaction model they could individually purchase single games according to their preferences. It is however important to keep in mind that the prices need to be below a certain threshold, and the transactions need to function smoothly.

Much like Uber revolutionized the taxi industry (Pepic, 2018) and the entry of cryptocurrencies transformed online payments (Hughes, 2017), we suspect that the microtransaction model will challenge and possibly take over for traditional monetization methods, particularly in online businesses. The use of microtransactions heavily appeals to human tendencies to drive purchases, as it combines hedonic features with the utilitarian features of modern payment methods, by enabling consumers to utilize a payment method that doesn’t evoke thoughts of payment.

Virtual currencies are interesting because they change individuals' spending habits. A fully rational approach would be to treat virtual currencies the same way one treats local currencies

(Albertson & Fox, 2011; Zellermayer, 1996) Yet, individuals comprehend the two identical currencies in a different manner. Even though virtual currencies are presented in arbitrary values, their validity should not interfere with their realness (Yamaguchi, 2004). The mere fact that the arbitrary value allows for a different mental process in spending is very fascinating. Moreover, implementing the virtual currency aspect into the microtransaction model seems to confuse consumers even further. Much like Raghubir and Srivastava (2008) article on monopoly money, we can see that consumers spend virtual currencies more freely, compared to local currencies. Despite the virtual currencies' real value, they are more often treated as "monopoly money" compared to established local currencies, such as Norwegian Kroners or US Dollars.

7.0 Limitations and further research

This section addresses the limitations of the study and debates approaches for further research.

Several limitations from the present research should be noted. First, our game simulation was based on participants spending hypothetical money, not their personal funds. Studies have shown that individuals experience lower thresholds to spending when purchasing with gift cards, received funds and credit cards as compared to more tangible payment modes (Desai, Thomas, & Seenivasan, 2011; Loewenstein & Prelec, 1998; Raghubir and Srivastava, 2008; Soman, 2003; Zellermayer, 1996). Therefore, it would be purposeful to replicate our study in the future by observing the gaming experience in a natural setting, where participants who spend money, actually spend their own money.

Our game simulation was developed as a solo scenario for single players. However, an important factor that contributed to the rise of microtransactions was the evolution from offline first person shooters (FPS) to multiplayer online battle arenas (MOBA) and massive multiplayer online games (MMO). Additional content such as characters and skins became easier to sell with the introduction of MOBA and MMO (Rosenberg, 2009; Tassi, 2013). As skins and other cosmetics are purely aesthetic items, it would be interesting to assess whether social variables such as social support, social image, broader social influences (E-Sports and

celebrities in the given genres), and peers' purchasing behaviours would generate different results. Thus, we believe it would be worthwhile to replicate our study in a realistic MOBA or MMO gaming simulation.

Loot boxes (purchasable randomized rewards) have been criticized to share key formal features with traditional forms of gambling (Cairns & Zendle, 2019; Griffith, 2018). Studies have linked spending on loot boxes with problem gambling characteristics such as gambling severity, reward sensitivity, competitiveness, and impulsivity (Delfabbro, Griffiths & King, 2010; Kim et al., 2015). In our study we could prove that virtual currencies implemented in the microtransaction model had significant effects on spending. We did however exclude the concept of loot boxes from our simulation, as we mainly focused on purchases of skins. Previous research has confirmed that individuals with increased spending behaviours on microtransactions report significantly higher levels of problem video gaming (Anthony & Nower, 2019; Delfabbro, Griffiths & King, 2010; Kristiansen & Severin, 2020). In our case we tested the characteristics in the context of purchasing of cosmetics, which are less associated with gambling mechanisms in nature, and thus, expected to not generate high scores on all the traits of gambling severity, reward sensitivity, competitiveness, and impulsivity. Hence, it is plausible that impulsivity, competitiveness, and reward sensitivity would have a different influence on spending when studied in a simulation including loot boxes.

Another possibility for further research pertains to replicating this study in physical gaming events. We firstly intended to conduct the study in a lab-setting approximating real life. We wanted to test the microtransaction model by asking contestants to physically exchange local currencies into virtual currencies - much like people do at arcades, where consumers pay real-life money to get coupons/coins of a certain value that is only of value at the given arcade. However, due to COVID-19, such an experiment was impossible to conduct at the time. In our opinion, a field experiment would be beneficial in this setting as it would allow researchers to control for other variables such as actual calculator use and time spent on conversion. Additionally, performing this study in a real setting would ensure ecological validity of results.

Finally, we suggest a further approach to our study could be to explore whether or not the player's experience is of significance when making payments. As we controlled for the win and loss scenario, a worthy extension of our study could be to control for actual skills. Yamaguchi (2004) argued that remuneration schemes in virtual worlds are more similar to seniority systems rather than performance-pay systems. He further argued that individuals with higher in-game skills would probably spend less money on microtransactions in the form of skins and cosmetics. As possession of skins and other cosmetics indicate a form of status, it can never rival the acknowledgement actual skill and mastery can provide. This follows the fairly cemented fundamental basis of why publishers are dissuaded from “pay to win”-models. Optimally newer players spend more money in the beginning when their skill level is low, but as skill comes with practice and time, the retention rate is high which in turn probably yields microtransactions on a longer timeline, instead of the usual “one and done”-approach from the age of physical distribution of video games. Thus, we believe that it could be interesting to explore whether in-game skills could mediate purchasing habits.

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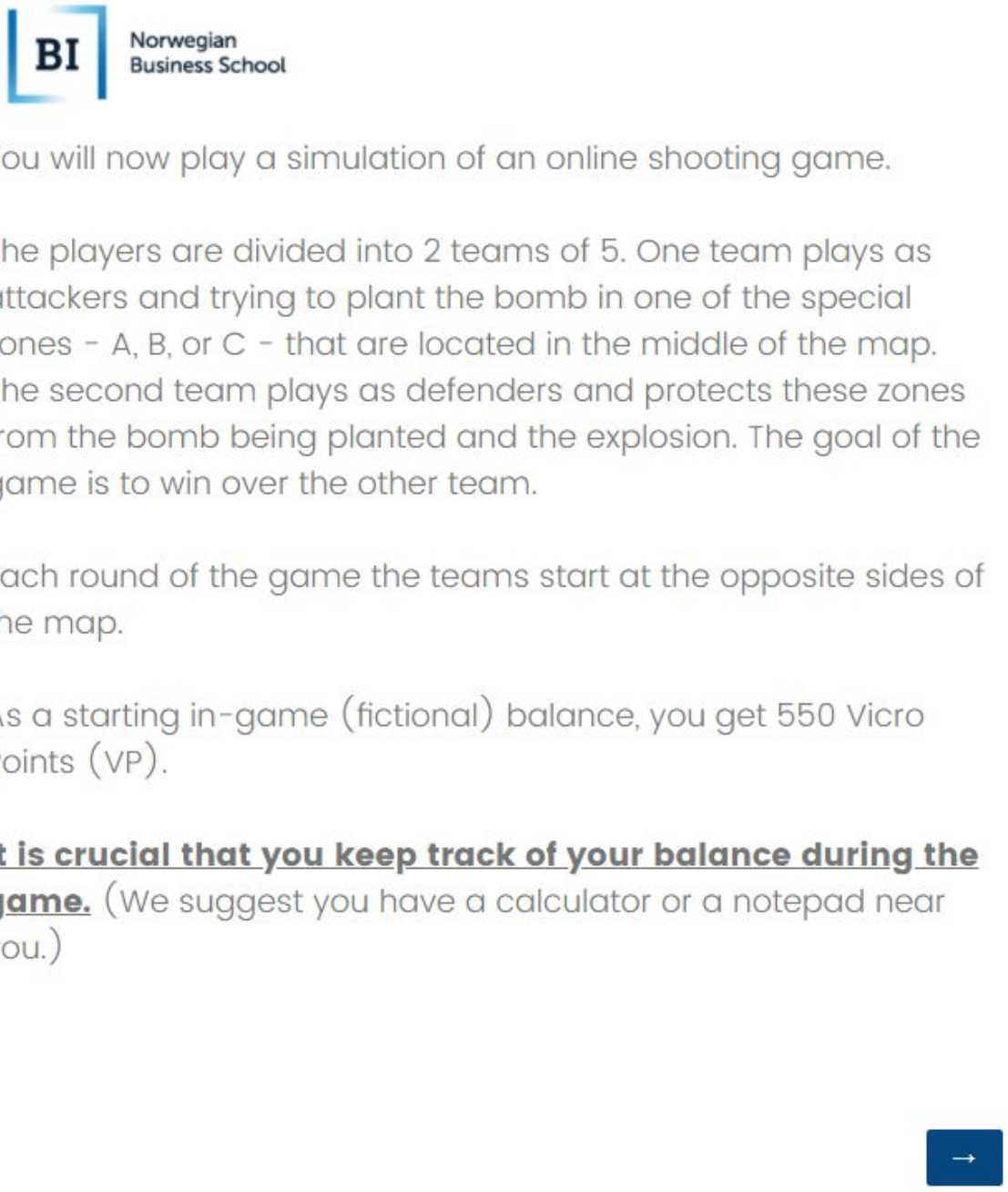
9.0 Appendix

Appendix 1 - Survey screenshots



Your first round has started.

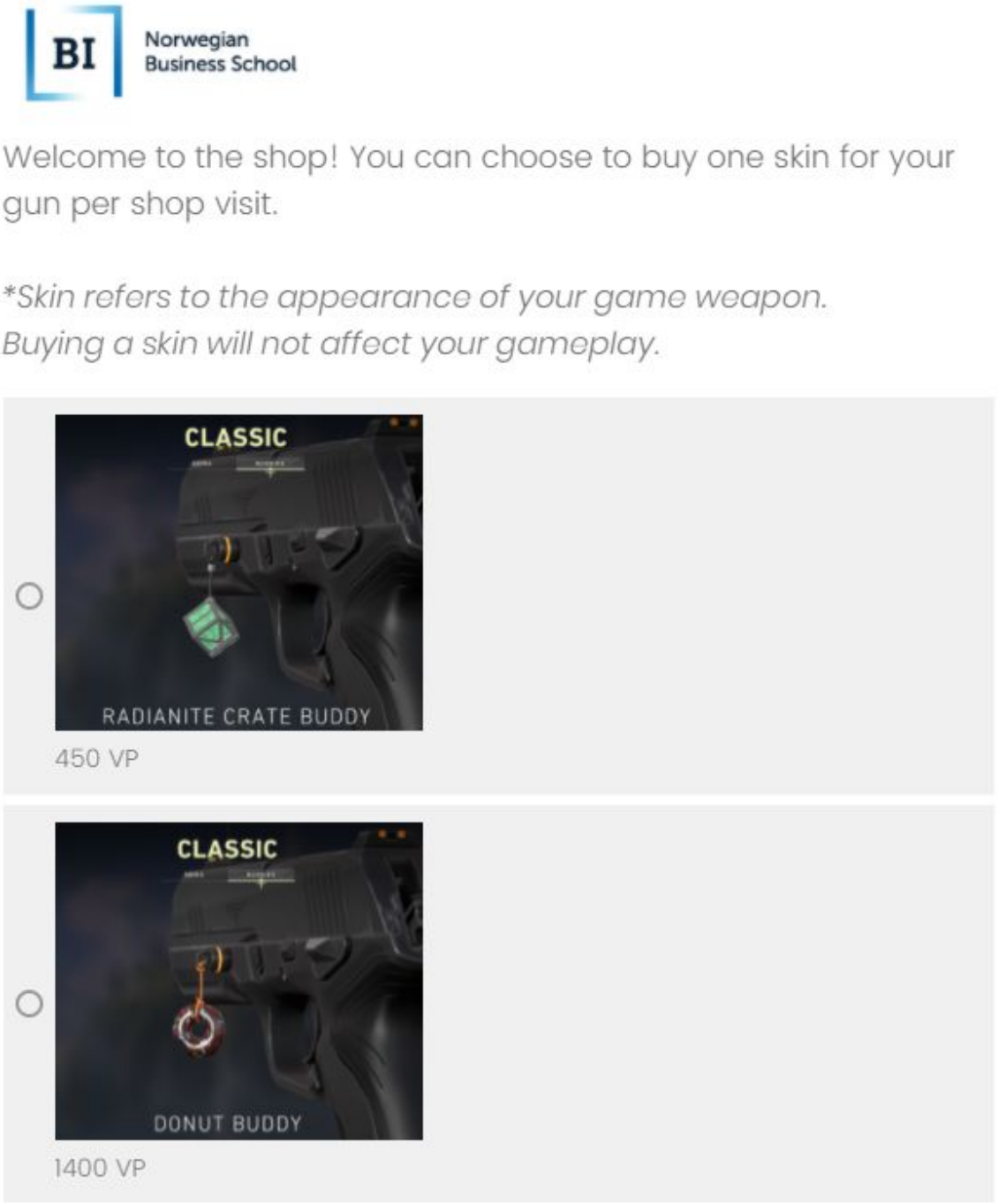
You play as a defender. Your character has an opportunity to either reveal where your enemies are or to hide the position of your team from the attackers team.

What would you do?

- ○ Reveal the enemies
- ○ Hide your team

→

Game shop:


BI
Norwegian
Business School
Welcome to the shop! You can choose to buy one skin for your gun per shop visit.
*Skin refers to the appearance of your game weapon.
Buying a skin will not affect your gameplay.
CLASSIC
RADIANITE CRATE BUDDY
450 VP
CLASSIC
DONUT BUDDY
1400 VP

2900 VP

Buy more VP

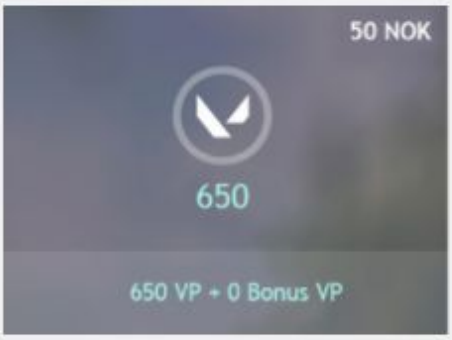
Proceed to the game

→

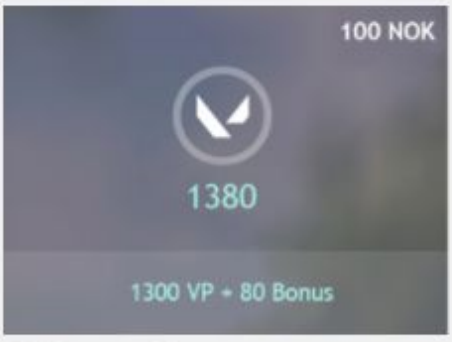
Norwegian Business School

Choose the amount of VP you want to purchase:

310 VP + 0 Bonus VP



650 VP + 0 Bonus VP



1300 VP + 80 Bonus VP

2600 VP + 200 Bonus VP

4550 VP + 450 Bonus VP

6500 VP + 700 Bonus VP

Go back to the store

Proceed to the game

→

Questions regarding the pain of paying:

How was the experience of playing with in-game currency compared to the real-world currency?

- ○ Much better
- ○ Somewhat better
- ○ About the same
- ○ Somewhat worse
- ○ Much worse

How was the experience of playing with real-world currency compared to the in-game currency?

- ○ Much better
- ○ Somewhat better
- ○ About the same
- ○ Somewhat worse
- ○ Much worse

Which type of currency would you prefer to see in games?

- ◯ In-game currency
- ◯ Real-world currency

Have you spent money in the stores from our game simulations?

- ◯ Yes
- ◯ No

→

Which type of currency was more "painful" to pay with?

- ◯ In-game currency
- ◯ Real-world currency

→