ISCTE Business School
Instituto Universitário de Lisboa

Department of Marketing, Operations and Management

MAIN DRIVERS FOR MICROTRANSACTIONS AS IMPULSE PURCHASES IN E-COMMERCE

Dissertation submitted as a partial requirement for the conferral of
Master in Marketing

Ricardo Gil Fonseca Caetano

Supervisor:
Paulo Rita, Full Professor, Department of Marketing, Operations and Management
Instituto Universitário de Lisboa (ISCTE-IUL)

Co-supervisor:
João Guerreiro, Assistant Professor, Department of Marketing, Operations and Management
Instituto Universitário de Lisboa (ISCTE-IUL)

September 2017

ISCTE Business School
Instituto Universitário de Lisboa

MAIN DRIVERS FOR MICROTRANSACTIONS AS IMPULSE PURCHASES IN E-COMMERCE

Ricardo Gil Fonseca Caetano

Abstract

With mobile technology evolving at a very fast-paced level, consumers now have many choices of entertainment on their mobile devices. Thousands of games are available to download free of charge on virtually every smartphone and with them a new revenue model has emerged: microtransactions.

Characterized by low price points, microtransaction have seldom been studied extensively. With great potential in the future, this type of revenue model is currently outgrowing traditional pay-to-play model types.

By focusing on several types of mobile game item drivers (Lehdonvirta, 2009) and adapting some previous research and models (Wu, Chen & Chiu, 2016; Yoo, 2015), this study intends to identify and create a model with the main drivers of microtransactions that lead to impulse purchases in mobile game applications and understand if a price increase will lead to a lower purchase intention.

A PLS-SEM analysis was conducted on a sample of 301 individuals. The measurement model showed a good fit of parameters, with AVE above 0.50 for all components, composite reliability superior to 0.70 for all components as well as an HTMT value inferior to 0.90 present in each component relationship. The six components considered explained 53.3% of the variance in impulse buying tendency. Significant component drivers from strongest to least robust were flow experience, social, hedonic/emotional and performance drivers. Functionality and low perceived risk were not drivers of impulse buying tendency.

Impulse buying tendency is also moderately associated with normal price purchase intention whereas a price increase of 5€/5$ decreases purchase intention significantly.

Keywords: Microtransactions; Mobile Commerce; Mobile Games; Impulse Purchases; Impulse Buying Tendency; Content Drivers; Mobile Commerce.

JEL Classification: M30; M31.

Resumo

Com a tecnologia móvel a evoluir a um passo cada vez mais acelerado, os consumidores têm agora várias escolhas de entretenimento nos seus dispositivos móveis. Milhares de jogos estão disponíveis para descarregar de forma gratuita em virtualmente qualquer smartphone e com isso, um novo modelo de negócio tem emergido: microtransações.

Caracterizado pelos seus preços baixos, as microtransações têm raramente sido estudadas extensivamente. Com um grande potencial no futuro, este tipo de modelo de negócio está a ultrapassar no presente os modelos tradicionais de comprar-para-jogar.

Ao focar-se em vários tipos de drivers de itens de jogos móveis (Lehdonvirta, 2009) e adaptando pesquisas e modelos anteriores (Wu, Chen & Chiu, 2016; Yoo, 2015), este estudo pretende identificar e criar um modelo com os principais drivers das microtransações que originam compras por impulse em aplicações de jogos móveis e compreender se um aumento de preço leva a uma intenção de compra reduzida.

Uma análise de PLS-SEM foi efetuada numa amostra de 301 indivíduos. O modelo medido demonstrou um bom índice dos seus parâmetros, com um AVE superior a 0.50 para todos os componentes, confiabilidade composta também superior a 0.70 para todos os componentes e um valor de HTMT inferior a 0.90 para cada relação entre os componentes. Os seis componentes originais considerados explicam 53.2% da variância da tendência de compra por impulso. Os drivers de conteúdo significantes do mais forte para o menos forte foram: fluidez de experiência, social, hedónico/emocional e performance. Funcionalidade e baixa perceção de risco não foram drivers de tendência de compra por impulso.

A tendência de compra por impulso também está moderadamente associada a uma intenção de compra com preço normal enquanto que um aumento de preço no valor de 5€/5$ reduz de forma significativa a intenção de compra.

Palavras-chave: Microtransações; Comércio Móvel; Jogos Móveis; Compras por Impulso; Tendência de Compra por Impulso; Drivers de Conteúdo; Comércio Mobile.

Classificação JEL: M30; M31.

Acknowledgments

I would like to thank my parents and brother in the first place, not only for their support since the beginning of this dissertation but also for helping me thrive and aim always higher every step of the way.

A big thanks to Emmi Sveholm for the support and emotional backing whenever I needed it.

I would also like to thank my friends for their encouragement and motivation along this long path.

Last but not least, I express my gratitude to all my teachers at ISCTE – University Institute of Lisbon, for their inspiration and enthusiasm and, obviously, a special thanks to my supervisors prof. Paulo Rita and prof. João Guerreiro for their much-needed orientation, assistance and vision throughout the evolution of this dissertation.

Thank you all for your care and support.

I – Table of contents

II – List of figures

III – List of tables

1 – Introduction

Our society is living in an age that heavily relies upon electronic devices. It is safe to say consumers have entered a digital age where information sharing and transactions are performed online to a large extent. Consumers are now even offered the option to buy digital products or upgrade digital services just like they can with physical goods or club memberships.

The world of virtual commerce is commonly named e-commerce or online commerce and it is largely widespread at this point in time, being present in nearly every market segment. E-commerce is comprised of all online interactions and connections based on computer services with the goal of trading products, services and information (Buettner, 2017).

E-commerce has many advantages to consumers and businesses – it grants easier and faster access to information, more transparency in product comparisons, a wide array of data available and quicker communications, faster and more fluid transactions, among other benefits (Niranjanamurthy *et al*, 2013) – and although it represented only 7.4% of total retail sales worldwide in 2015 with a value of 1.548 trillion dollars, it is expected to grow tremendously by 2020 (eMarketer, 2016), with e-commerce representing nearly 15% of total retail sales with a value of 4.058 trillion dollars.

Among the possible types of transactions in e-commerce, microtransactions have been growing considerably in recent years (Business Insider, 2017). A microtransaction can be defined as a payment of a very small amount of money – a micropayment – that is performed online (Cambridge Dictionary, 2016), usually within a game-like environment. Microtransactions go hand in hand with the concept of micropayments. Microtransactions are just a common term employed mostly in game-driven applications, associated with a business model of revenue based on micropayments.

What this means is that microtransactions, and therefore micropayments, are all included in the electronic commerce (e-commerce) universe. One of the most common applications of microtransactions are mobile games, specifically free-to-play games.

According to Valadares (2011a), free-to-play based games were already outpacing premium based games in terms of total revenue in June of 2011. What this means is that more money was being spent on free game-driven applications than non-free game-driven applications. In the latter,

it is required to pay beforehand in order to play the game. The same research by Valadares (2011a) showed that 65% of game revenues in the entire Apple iOS app store were originated from free-to-play games. This means consumers had to be engaged with microtransactions inside those games as they are probably the only transaction method available in them.

This can represent a considerable shift in the digital marketing approach to consumers and how they handle their expenditures. If microtransactions are indeed becoming a successful revenue model for game-driven applications it becomes important for marketers and managers to understand why and how that happens.

Mobile games also have a different nature than console or personal computer games. Users can bring them along, they boot up quickly and are played in shorter session times and spontaneously throughout the day (PwC, 2012). Frequently, most mobile games have a sort of real-time online integration with other users or with game servers in order to create a richer experience. Users spend less time and do not plan how or when they will play their mobile games (PwC, 2012). These factors can potentially predispose mobile game-driven applications to impulse purchases and this is a matter that can be studied further. At the time of this study, there is a very limited number of articles that focus on microtransactions or the link between them and impulse buying. The main drivers of mobile-game microtransactions that can lead to impulse buying have not been analyzed to this date and it is this important identified gap that will be addressed.

Do consumers purchase mobile game content quickly and out of impulse or is it a more rational purchase? What are the main drivers of microtransactions that result in higher impulse purchases regarding mobile games? Is the perceived risk of microtransactions low and does it influence impulse buying tendency? Do the low microtransaction prices influence purchase intention? Or maybe even a combination of multiple factors?

All of these questions can be crucial for businesses who rely heavily on microtransactions as their main source of revenue in mobile games.

As such, focusing specifically on microtransactions and game-driven applications, the main objectives of this study are to explore the main motivations and factors that influence users towards these transactions in a manner linked with impulse buying. There have been studies conducted on online impulse buying (Chan, Cheung & Lee, 2017; Wu, Chen & Chiu, 2016; Ozen & Engizek,

2013; Park *et al*, 2012) but none of them address online impulse buying in microtransaction mobile games or their driving factors. A few microtransaction specific studies have been performed (Guo & Barnes, 2007; Yoo, 2015) and also on virtual game items (Lehdonvirta, 2009) but not on the link that exists between microtransaction characteristics and which ones are more responsible towards generating impulsive behavior. Lehdonvirta (2009) identified drivers for virtual items in game worlds, but not which ones are more prone to impulse buying while Yoo (2015) studied which of those factors were considered more valuable to consumers. Nonetheless, neither of them make specific reference to impulsive buying. Certain items might be considered valuable but not lead to impulse buying. This gap in literature is the main study area of this dissertation: what factors leads to impulse buying – and consequently microtransaction purchases – in mobile games.

A study of this sort will enable a clearer understanding of a microtransaction buying process and what are the most important key factors leading up to impulse buying within this universe. Specifically, the practical highlights that stem from this work are knowing which types of microtransactions are more associated with an impulse buying tendency and to understand if impulse buying tendency leads to purchase intention and, at the same time, comprehend if a price increase will influence purchase intention significantly or not. It was found that 4 components in specific (performance, hedonic/emotional, social, flow experience) are correlated with impulse buying tendency and impulse buying tendency itself is also associated with purchase intention. A price increase also seems to significantly reduce the intention to purchase.

In a managerial point of view, this will allow businesses to adapt their microtransaction content to more adequately lead to impulse buying behaviors and thus create a higher profit level. This will also enable the creation of a work base in a field where there is not yet much information available, which can then be expanded and further studied in the future based on these findings.

The following work will be divided in several sections. Initially, a literature review will be conducted where vital topics such as microtransactions, mobile games and impulse buying will be examined. From this, the formulation of hypotheses and a structural model will be devised, taking into consideration the literature gap identified. Subsequently, a methodology will be presented that will enable the answer and a positive or negative validation of the presented hypotheses and model. Afterwards, the results will be examined and then followed by a discussion of the contributions and implications that have originated from this work.

2 – Literature review

2.1 – E-commerce, game market and mobile market

With consumers having an increased level of action regarding online shopping and activities (Cho, 2003), businesses have resorted to using several types of mechanisms to encourage online shopping, drive sales and intensify interaction and communication with the market. These include data mining tools (R, RapidMiner), customer relationship management (CRM) systems (salesforce, SAP AG) and consumer behavior analysis programs (Google Analytics, SDL) (Buettner, 2017).

This is greatly reflected in market values. Regarding e-commerce, in 2000, a mere 27.62 billion dollars in sales were generated in the United States alone. Fourteen years later in 2014, this same value stands at 298.6 billion, an increase of more than a decuple (Statista, 2016a). Comparing with total retail sales in the US, they stand at 4.636.35 billion in 2014, meaning the e-commerce sales for that same year accounted for nearly 6.5% of the sales. Data by the U.S. Census Bureau News – U.S. Department of Commerce (2016) also states that during the first quarter of 2016, e-commerce sales represented 7.9% of total retail sales in the US. Focusing on mobile e-commerce spending only, a similar pattern can be seen. Statista (2016b) data shows a spending of 13.4 billion dollars in the US in 2011. In 2015, also in the US, mobile e-commerce spending totaled 49.2 billion dollars, an increase of over three times as much.

The basic conclusion observed is that there is both an increase in retail sales, e-commerce sales and mobile e-commerce sales. However, e-commerce sales have been increasing their share inside retail sales, and the same happens for mobile e-commerce in regard to total e-commerce sales.

Narrowing down even more the mobile spending by focusing solely on game-driven application revenues, a report by Newzoo (2016a) described that worldwide, in 2015, mobile game-driven applications (in smartphones and tablets) accounted for 33% of all gaming revenue worldwide, with a value of 30.4 billion US dollars. Additionally, supplementary information by Newzoo (2016b) predicted that mobile games will be responsible for generating 37% of the global games market value in 2016 – which will stand at 99.6 billion US dollars – meaning it generates 36.9 billion US dollars. This forecast was correct (mobile games accounted for 38% of the global games market in 2016) and the prediction for the year 2017 states that mobile games will account

for 42% of the global games market (Newzoo, 2017). This represents an outstanding growth in the mobile games market, with a volume increase in 2016 of 21.3% over the year of 2015. This is visible in figure 1 below where it shows the forecast for the games market volume and share per segment.

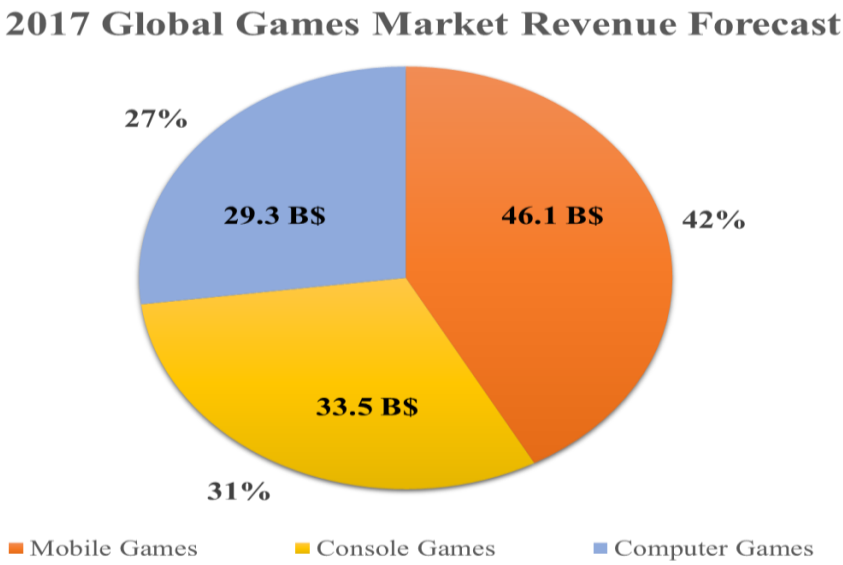


Figure 1 - 2017 global games market forecast adapted from Newzoo's (2017) global games market report.

Moreover, by 2020, the mobile game market will soar and achieve a total revenue worth of 64.25 billion US dollars, representing 50% of the global videogame market (Newzoo, 2017.).

A big part of this revenue is created in the Chinese market – 10 billion US dollars in 2016 and an estimate of 13.9 billion US dollars in 2020. The Chinese market is a good benchmark for the video game business model of microtransactions due to much of their revenues originating from mobile platforms – 41% in 2016 and an estimated 48% in 2019 (Newzoo, 2016b). Furthermore, extra information by Newzoo (2016c) indicates that mobile gaming will be responsible for 40% of the total revenues made by the top 10 video game companies, which include Google, Apple, Microsoft, Sony, Activision Blizzard and Tencent, the latter being the number one game company worldwide with a revenue of 5.3 billion US dollars in the first half of 2016.

On top of all this, the video game industry has gradually gained momentum in the current decade and has now managed to rival and even surpass in some respects the film industry. Data and forecasts by Statista (2016f) show a value of the global games market of 71.27 billion in 2015 and predicts a value of 90.07 billion US dollars in 2020 while the global movie industry stands at

38.3 billion US dollars in 2015 concerning box office revenue (Statista, 2016g) and is forecasted at 49.3 billion US dollars in 2020 (Statista, 2016h). It should be noted nonetheless that box office revenues do not include DVD or Blu-ray sales. All this signals that the video game industry is growing immensely but, more importantly, that mobile game-driven applications are one of the major forces contributing to this growth.

By focusing solely on game spending, mobile game-driven applications have a very promising future and are expected to be the top performer in terms of revenue values, outperforming even console and personal computer revenues. Since most of these mobile game revenues come in the form of microtransaction models, they are a valuable component to understand and to study. It is the fastest growing segment in the gaming industry, with the largest number of users – 1.9 billion – and possibly the highest revenue presently or in the very near future (Newzoo, 2016d).

Now that a general overview has been established regarding e-commerce, game and mobile markets, it becomes important to focus on key aspects concerning the topic at hand, namely microtransactions and impulse purchases.

2.2 – Microtransactions

There are several methods or business models to create revenue on apps, games and programs. The most common are try-and-buy downloadables, sponsored advertising, subscriptions and more recently, microtransactions (Kapralos, Katchabaw & Rajnovich, 2007: 108).

According to Hauser, Steiner and Waidner (1996: 1), "micro-payments have a broad application area in the marketing of information distributed in an electronic form". This type of revenue model struggled initially to succeed (Mills, 2016). Recently however, it has developed and expanded not just from information distribution but to actual purchases of goods and services, whether they are real or virtual (Wauters, 2007).

Micro-payments are characterized by low monetary values and have been implemented to enable products or services to be purchased with real currency (Newman *et al*, 2016) or through virtual currency bought beforehand (Pou *et al*, 2007). Microtransactions is the term commonly employed to identify a revenue model of a game based on micro-payments. This has become a constant form of revenue in most free-to-play or free-to-download game-driven applications.

Commonly, with a typical microtransaction-based monetization model, consumers can use an application free of charge but then have to pay for incremental in-app content by using the application's branded points or virtual currency (Redman, 2016). It allows consumers to access the free basic content, maintaining high visitor traffic, while generating revenue from the interested users towards their preferred content (Waltner, 1996).

On top of that, consumers are becoming less resistant to paying for online content due to small charges made by companies such as Apple and Skype, who charge for music and calls respectively on their online websites or stores (Gelles, 2009). Moreover, recent technology has allowed payment systems to become swift and strong enough to handle multiple requests (Hauser *et al* 1996; Gelles, 2006; Pou *et al*, 2007; Huang *et al*, 2016). A good microtransaction platform is one that supports a high-volume of operations comprised of generally low-cost per-item transactions. There has been an increasing number of electronic micro-payment protocols proposed recently suited for exactly this type of operations (Huang *et al*, 2016). All of this signals a paradigm shift in the e-commerce and mobile world with the entrance of microtransactions to the gist of possible revenue models and transactions with consumers, especially in the gaming environment.

There is evidence that supports this. Valadares (2011a) shows a study demonstrating that free-to-play games with microtransactions in the iOS app store started earning more revenue than their pay-to-play counterparts in mid-2011. Furthermore, more in-depth analysis by Valadares (2011b) revealed that users were spending an average of 14 US dollars per transactions on iOS and Android free-to-play games. This is a significantly higher amount then the usual price points of most pay-to-play mobile games and apps (in June 2016), which are in the range of 0.55$ and 1.13$ respectively (Statista, 2016c). Microtransaction revenues in the UK regarding game applications only have also increased vastly from 384.3 million £ in 2010 to 908.7 million £ in 2014 (Statista. 2016d). League of Legends, one of the most popular free-to-play PC games with embedded microtransactions, reported a revenue of 1.6 billion dollars in 2014 (Colagrossi, 2016). Other games with microtransaction models, such as CrossFire and Hearthstone among many others, are also making millions of dollars in revenues (PC Gamer, 2014). All this is also a sign that microtransactions are starting to be widely accepted and used in the video-game universe.

According to Freese (2012) and Moran (2013), microtransactions have several advantages both to users and producers. To producers, it grants them two major advantages. Firstly, it allows

them to fight piracy with a higher efficiency level. A microtransaction embedded software requires an online connection which in turns allows producers to verify the quality of the software installed and have a more assertive control regarding illegal actions performed. Secondly, it facilitates updates to the software. Developers can expand their software with new content and attributes, make changes to mechanics and offer content that users might be looking for, helping to create an experience that meets the user's expectations. New paid content can be added regularly, creating an ecosystem for users where they will be logging in frequently to see what new changes have taken place, give feedback about it and purchase it (or not). Developers can then analyze performance and make new changes, starting the cycle again.

2.2.1 – Microtransactions as a business model

Companies need to have a business model in place if they want to create revenue. Regarding mobile applications, the same premise stands. With the exception of very specific utility applications available (such as calendar, compass or time zone applications), all applications have a form of generating revenue and it is important to understand what forms of business models there are in order to perceive how and why the microtransaction business model is successful in the mobile market of applications, specifically game-driven applications. Special attention must be given to the types of microtransactions available, especially in game-driven apps. A certain balance must be achieved between the content available and the game itself (Tassi, 2013). Paid content should not deter from the game experience, more so if the game is playable in a multiplayer format. Each form of business model, however, does not exclude the use of other business models at the same time, meaning applications might have more than one business model in place and operating at the same time.

One of the simplest and oldest forms of business model that exists is the pay-to-play model (Newlands, 2015; Munir, 2014). It is a very straightforward method and it simply means that the user must pay prior to using the application. Users can buy the content on retail stores or game shops and more recently also online through digital distribution platforms (Osathanunkul, 2015).

Another business model that has endured for a long time has been the in-app advertising model (Rhodes, 2015; Newlands, 2015; Osathanunkul, 2015; Munir, 2014). With this model, advertisement adds can be inserted in the applications and displayed to users. It is a popular widespread strategy according to data from Developer Economics (2016).

A different model which has proven successful is the subscription based model (Osathanunkul, 2015; Munir, 2014). This revenue model is capable of generating a good profit value while at the same time enabling an easier prediction of future revenues according to Serafimov (2015). This happens because subscription based models work on the basis that users will pay on a regular schedule for content (a good successful example can be Netflix). This can happen weekly, monthly and even annually and it allows a prediction of revenues with a good level of accuracy. Most of the times, the user is allowed access to some content for a limited time before deciding to subscribe. When a user subscribes to a service, he has access to all the content available for the duration of the subscription and in some cases, when the subscription is close to terminating, it is renewed automatically.

Finally, there is the microtransaction business model (Rhodes, 2015; Serafimov, 2015; Osathanunkul, 2015), which encompasses a variety of sub-models, some of them more prone to be used in game-driven applications. Among some of the microtransaction business models used in games, the most significant can be highlighted:

- Gated content: the user has access to the game for free up until a certain point, where the user will then need to pay to unlock more gameplay content. Usually all features remain the same and the user can still access all previous content, he merely pays for more story progression or extra levels (Newlands, 2015; Munir, 2014);
- In-game purchases: users can buy virtual goods within the game. They can range from visual or cosmetic accessories that allow for character or game customization to extra abilities or boosters that enhance gameplay and give actual advantages inside the application to the user (Newlands, 2015; Scholz, 2015a; Munir, 2014);
- Episodic games: the game is split into several different episodes or chapters which users must buy in order to complete the story. Usually the game is not completed upon the first chapter release but is rather worked on by developers using user feedback and experience gathered during previous development stages (Scholz, 2015b).

Focusing more on mobile games, gated content and in-game purchases are the most popular models employed (Newlands, 2015). They easily adapt to the quick and casual style of play of most mobile games – the average play time in mobile game-driven applications is nearly 8 minutes

(Statista, 2015e). In fact, the success of these types of microtransaction models is so evident that even other big successful game companies are considering implementing them on a daily basis in platforms other than mobile (Karmali, 2013; Ho, 2013). A summary of the business models is viewable below in table 1.

Business Model		Description	Source
Pay-to-Play		User must pay prior to using the software or application.	Newlands (2015) Munir (2014)
In-App Advertising		Advertisements are displayed to users who use the software or application.	Rhodes (2015) Newlands (2015) Osathanunkul (2015) Munir (2014)
Subscriptions		Users pay a fixed fee, usually monthly or annually, to have full access to the software or application.	Osathanunkul (2015) Munir (2014)
Microtransactions (Mobile Games)	Gated Content	Users have access up to a specific section in the game. They must pay to access the remaining content.	Newlands (2015) Munir (2014)
	In-Game Purchases	Users can buy virtual goods within the game.	Newlands (2015) Scholz (2015a) Munir (2014)
	Episodic Content	The game is split into several chapters or sections which must be bought to be played. The episodes are usually released sequentially.	Scholz (2015b)

Table 1 - Business models for e-commerce applications.

2.2.2 – Literature gap concerning microtransactions

There are several different articles published regarding microtransactions. The social effects of microtransactions in video games have been studied already. It appears that users tend to dislike players in the same game who use microtransactions (Evers, Van de Ven & Weeda, 2015). This disapproving force is especially high when it comes to microtransactions that grant in-game advantages but it is not so strong concerning cosmetic or visual benefits in the game. These findings remark to the planning and thoughtfulness that must be given regarding the various types of benefits that microtransactions offer in order to create a balanced and enjoyable experience for everyone throughout the lifespan of games.

Factors that influence purchase behavior in virtual game worlds are also important. The purchase behavior of virtual items has a wide range of variability and involves a range of factors

at different stages. Some of the identified factors are performance expectancy, effort expectancy, social influence and the quality of the virtual world system (Guo & Barnes, 2009). “Trust was not perceived as an important factor influencing personal purchase decisions” (Guo & Barnes, 2009: 91). Seemingly, trust still matters but not as much as expected, with some reasons being that virtual items are always reliable and function as expected. This study was focused on game virtual worlds such as World of Warcraft and Second Life and did not have mobile microtransactions as a direct emphasis, however some elements are shared between the two – in both games, users must access in-game shops and use a microtransaction system to purchase the virtual items or goods being studied.

Trust was also investigated further in commercial transactions, from which microtransactions are a part of. To be highlighted here is the importance of recurring transactions which establish trust between both parties – the more transactions performed between the parties involved, the higher the level of trust will be (Orzil & Andalécio, 2013). On the other hand, a sense of opportunism in a transaction can negatively impact trust.

The types of consumers who make microtransactions and their motivations have also been assessed. These can give potential insights and indications regarding microtransaction motivations by players. Conclusions drawn showed that the players who were involved in microtransactions had reported higher levels of impulsivity, reward sensitivity and problems with gambling severity. Their motivations for performing the transactions were mainly linked with a desire to extend the play time and access additional features as well as chasing previously lost credits and also to speed up play (Kim, Hollingshead & Wohl, 2017). Although the research study was fixated on microtransactions in social casino games, some key elements are also common in mobile games and, due to that, valuable information can be extracted to help guide and formulate possible research questions. Some of the findings also seem to correlate microtransactions in social casino games with acts of impulse buying, a significant point in this research.

Several other subjects regarding microtransactions have been studied. Focusing more specifically in the architecture systems of microtransactions and how they can be made more efficient, the first point of difference is that microtransactions are different when it comes to the processing of electronic payments, primarily due to their peculiar low monetary values. Essentially, processing a microtransaction is not as efficient as processing a regular payment due to the

transaction handling costs being very high in proportion with the microtransaction value (Huang *et al*, 2016; Chiejina, 2013; Hauser *et al*, 1996). New technologies and systems have found ways to minimize these costs (Paypal, 2017) and a good solution for this is to pool together several microtransaction payments and only process them after they reach a certain value (Newman *et al*, 2016). This has allowed a higher safety and efficiency in the transactions which can potentially create less concerns on the consumer side.

The likelihood to abort online shopping transactions by measuring influences of cognitive evaluations, attitudes and behaviors is also important. Factors such as better product and value offering, control in information search and effort saving lead to a better attitude towards e-shopping and consequently less chance to abort an online transaction (Cho, 2004). These factors were assessed through e-shopping in general and do not specifically focus on microtransactions, which differ in some aspects when compared to traditional e-commerce. Still concerning online shopping, the biggest barriers are the lack of direct contact between the customer and enterprise and the inability of seeing, touching or testing/trying a product (Kułyk & Michałowska, 2016). Regarding microtransactions however, these do not seem to apply in its full extent.

Consumers engaging in a microtransaction do so because they are users of an application or game belonging to a certain company. They are using their products and have contact with it. Although they are not dealing with enterprises directly, they do so indirectly through their products and will probably have conceived a mental image about the company, such as its quality and positioning. If costumers are satisfied with the product and its perceived quality, they will develop higher loyalty towards the brand and consequently a positive brand image (Halim et al, 2014). This makes the first barrier ineffective to a large extend. Additionally, when consumers are purchasing virtual goods or services – a common microtransaction purpose in game-driven applications – they likely know exactly what they will purchase with the transaction and thus are well informed. On top of that, microtransactions tend to happen mostly inside applications or software, meaning consumers are already familiarized with the product and need to have used it before already. As such, the second barrier does not necessarily apply, more so because the goods are not physical and cannot be touched and every user can easily see what they look like and what they will offer or grant before buying. Because microtransactions are peculiar and not similar to a traditional online

purchase, these barriers might not apply correctly to them and only through a microtransaction specific study can new barriers or drivers be investigated.

Another crucial component are the purchase drivers for microtransaction game content. Purchase drivers for virtual items have been studied already and they correlate highly with microtransactions. Lehdonvirta (2009) conducted a study about virtual item sales as a revenue model, which directly correlates with microtransactions. In the article, a list of virtual item attributes is presented which act as purchase drivers.

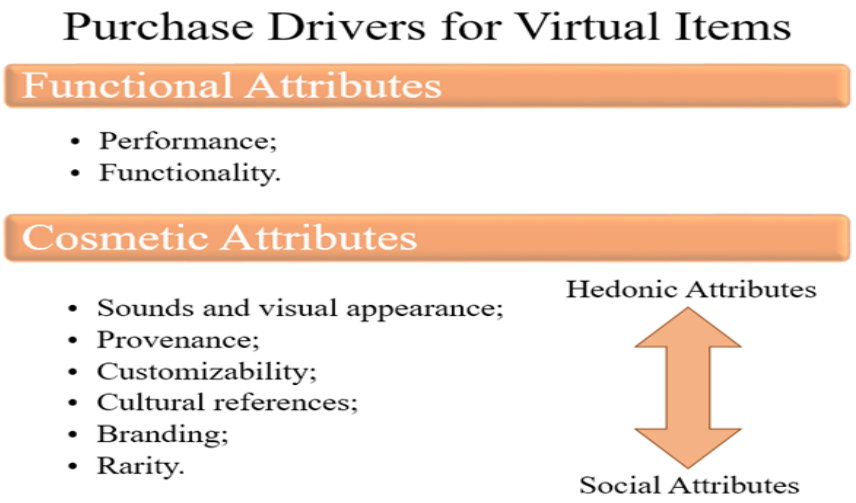


Figure 2 - Purchase drivers for virtual items, adapted from Lehdonvirta (2009).

The list divides attributes in two categories, as seen above in figure 2, which are functional attributes and decorative attributes. These two attribute categories can then be split further, with decorative attributes having two opposite sides – hedonic and social attributes. They cannot be spliced entirely and must share some common ground due to some of their traits being blurred and subjective according to personal preference – some decorative items can have a more social or hedonic attribute than others according to the user and/or the situation. This attribute division can be useful further ahead in this study due to the fact that some attributes might predispose users to buy more out of impulse than others, a situation that is worth investigating further.

Another important concept that can be applied to microtransactions is the Technology Acceptance Model (TAM). Davis (1989) states that perceived usefulness (PU) and perceived ease of use (PEU) are the main factors contributing for an individual's behavior intentions to embrace new technologies. Perceived usefulness refers to "the extent to which a person believes that using

the system will enhance his or her job performance" while the perceived ease of use refers to "the extent to which a person believes that using the system will be free of effort" (Davis, 1989: 320). The results indicated that perceived usefulness as well as perceived ease of use were significantly correlated with the use of systems. Out of the two factors, perceived usefulness had a better correlation strength with system usage than perceived ease of use. The same source states this makes sense seeing as that even though a difficult to use service can discourage adoption of a useful system, a super easy to use system will not be used at all if it does not provide a useful function. While the TAM model is applied generally to new systems such as computer software and programs, it can also be used in the scope of microtransactions in the sense that people will make use of them if they prove to be easy to use or provide a useful benefit.

One of very few articles directly regarding microtransactions and its perceived value of items was performed by Yoo (2015). In it, the Consumer Perceived Value model is used to establish which dimensions play a bigger role in the purchase intentions of free-to-play game items and if those purchased items increase the intention of playing games. The results garnered that the higher the perceived value of items by gamers, the higher the probability of them purchasing items. Emotional, social and functional monetary values were found to correlate positively with purchase intentions of items. Functional value of performance, on the other hand, did not and it even had the opposite effect of detracting from purchasing intention. Functional performance value should have a positive effect on people who have not yet purchased a microtransaction item (Artz & Kitcheos, 2016) and the author concluded that due to the broad concept of functional value, questions about perceived value must be modified specifically to adjust to a game context. However, there could be other reasons for this result, specifically two reasons:

- The questioned users were mostly playing games that had no microtransactions that granted functional benefits in-game and as such they could not be influencing their purchase intention, or;

- Individuals who were surveyed believe that the functional benefits granted by the microtransactions gave an unfair advantage to players or made the game less enjoyable. This goes in line with previous findings by Evers *et al* (2015) that state microtransactions should be fair for everyone, carefully balanced or used more towards cosmetic items. A gamer might find an item to

be beneficial before purchasing but consider it to be unfair to others after purchasing, resulting in a lower purchase intention in the future.

As stated before, this study by Yoo (2015) used as a base the Consumer Perceived Value Model (PERVAL). This model was created by Sweeney and Soutar (2001) based on the popular Theory of Consumption Values model of Shet, Newman and Gross (1991). The PERVAL model has four dimensions: emotional value; social value; functional value (price/value for money); and functional value (performance/quality). In table 2, a synthesis of the PERVAL model can be seen along with a description. According to Sweeney and Soutar (2001), some values are more relevant than others depending on the situation. For example, the emotional value dimension was more significant when predicting willingness to buy an item while the functional value of quality dimension was more relevant in user's expectations of problems, or lack thereof.

Consumer Perceived Value Model (PERVAL)

Values	Description
Emotional Value	The utility derived from feelings or affective states that a product generates.
Social Value (social self-concept enhancement)	The utility derived from the product's ability to increase social self-concept.
Functional Value (price | value for money)	The utility derived from the product due to the reduction of its perceived short and long term costs.
Functional Value (performance | quality)	The utility derived from the perceived quality and expected performance of the product.

Table 2 - Consumer perceived value model adapted from Sweeney and Soutar (2001).

This model can prove useful for creating a potential microtransaction model in this study. It has several values that can be applied to microtransaction content offered on games and additionally it is in line with Lehdonvirta's (2009) purchase drivers for virtual items, which also include functional and cosmetic values.

Generally speaking, mobile microtransactions do not usually have high price points (Onebip, 2014; Swrve, 2015) and that can be a positive influence on consumers. When it comes to price, there is still no literature available to this day regarding price influences on mobile microtransactions. Despite this fact, there is other literature available that can give cues to the effects of the price points used in microtransactions.

For once, microtransactions are always price transparent. In traditional online shopping, there might be hidden fees such as minimum shopping price values or shipping fees. These hidden costs and fees are perceived as negative and can reduce the trust of the consumer (Nguyen & Klaus, 2013). But these types of charges can never take place in microtransactions – there are no actual physical goods involved, everything takes place online and the user has access to the virtual goods or extra content after purchasing them in a manner of seconds.

Price also seems to have an impact on consumers' online purchase intentions, at least as a moderator. According to Ekpe, Adubasim and Adim (2016), reduced prices positively influenced online purchase intentions. Guo (2011) also supports this, stating that competitive prices online are one of the primary factors influencing consumers' purchase decisions and that by making their prices more competitive, online retailers can make their advantages more prominent and increase the number of consumers. Furthermore, the influencing factor of product price on the customer motivation to scrutinize more closely the content of trust-assuring arguments has also been investigated and it was concluded that customers are more influenced by the content of trust-assuring arguments when the price of a product is relatively high than when it is relatively low (Kim & Benbasat, 2009), meaning they care less about actual facts when prices are lower and do less research before buying. Price discounts also seem to result in a better impulse buying intention when the considered products are hedonic-based (Xu & Huang, 2014). Additionally, price discounts also cause a higher impulse buying intention when the products are inexpensive.

With all this information considered regarding price, it becomes an interesting component to measure regarding potential microtransaction impulse buying intention since microtransactions are notoriously low value transactions and possibly have an inherently lower risk for the consumer.

Hansen (2005) identifies four main reasons for the emerging popularity of online shopping: convenience; more choice; lower prices; and ability to compare prices/products. These four advantages might possibly occur generally in microtransaction game menus but they are still not focused directly on a microtransaction driven environment, making a microtransaction focused study more relevant and meaningful.

All of these articles and studies cover a good ground for user buying motivations, intentions and perceived value, although most of them do not deal with microtransactions directly. There are indicators of the main motives for buying, but not those that create higher impulse buying

tendencies. This means there is no indicator of whether a microtransaction purchase is made on-the-fly out of an impulse or urge or if it is a thought-out process that involves a more planned and rational approach. Moreover, there is no information about the time users take to purchase microtransaction content.

Basically, there are no studies referring to the impulsiveness of microtransactions, specifically in mobile games, and the main drivers that result in impulse buying for microtransactions. Below, in table 3, a summary of the contributions towards mobile microtransactions or other related topics can be seen.

Study	Conclusion	Incidence	Author
Social effects of microtransaction usage in games.	Users tend to dislike other individuals who perform microtransaction, especially when they grant competitive advantages.	General Game Microtransactions	Evers, Van de Ven & Weeda (2015)
Factors that influence purchase behavior in virtual game worlds.	Performance expectancy, effort expectancy, social influence and the quality of the virtual world system influence purchase behavior. Trust was not seen as an important influencer.	General Game Microtransactions	Guo & Barnes (2009)
Types of consumers who perform microtransactions and their motivations.	Microtransaction players appear to have higher levels of impulsivity, reward sensitivity and problems with gambling severity. Motivations for performing microtransactions range from a desire to extend play time, speed up play functions, chase lost credits and access additional features.	Microtransactions in Social Casino Games	Kim, Hollingshead & Wohl (2017)
Likelihood to abort online transactions by measuring influences of cognitive evaluations, attitudes and behaviors.	Better product and value offering, control in information search and effort saving lead to a better attitude towards e-shopping and lessen the chances to abort online transactions.	General Online Shopping	Cho (2004)
Purchase drivers for virtual items.	Purchase drivers are divided into 2 major groups: functional attributes and cosmetic attributes: Functional attributes are split between performance and functionality factors while cosmetic attributes can either be hedonic or social in nature, with the line being blurred between them.	General Virtual Game Items	Lehdonvirta (2009)
Perceived value of game items and purchase intention.	A higher perceived value of game items (functional monetary value , emotional value, social value) will result in a higher probability of purchase.	Free-to-Play Game Items	Yoo (2015)

Table 3 - Summary of contributions towards microtransactions or related topics.

It is easily visible that no work exists to study the link between mobile microtransactions and the realm of impulse purchases, hence the choice of the present study is more clearly justified and rational to perform since it will address this specific gap.

2.3 – Impulse purchases

Switching attention now to impulse purchases, these can be defined as purchases performed suddenly, being hedonically complex and without a strong factor of consideration, thoughtfulness and planning (Sharma *et al*, 2010). Floh and Madlberger (2013) also assert that impulse purchases are unplanned and abrupt, accompanied by strong sensations of pleasure and exhilaration but that they are also driven by environmental stimuli and cues during the shopping period. Additionally, impulse purchases can also be influenced by other elements such as social visibility, cultural factors and personality (Yu & Bastin, 2010). There is a high degree of shoppers, around 40% according to Verhagen and van Doulen (2011) and Liu, Li and Hu (2013), that can be rated as impulse buyers. It does not necessarily imply that all those 40% of shoppers only buy out of impulse but instead that they have, at one point in time, partaken in a purchase that could be graded as an impulse purchase.

These types of purchases stem from high hedonic urges to achieve satisfaction, well-being and a positive disposition (Taute & McQuitty, 2004; Punj, 2011). Additionally, impulse purchases are seen in the eyes of buyers as purchases which are very hard to resist acquiring, preceded by high urges and needs. Buyers feel powerless to struggle with those urges and find a lack of arguments and behaviors to not purchase in the moment (Park *et al*, 2011; Roberts & Manolis, 2012). Wu *et al* (2016) devised a research model conveyed from other previous research and investigation that attempts to identify the main factors contributing to an online impulse purchase.

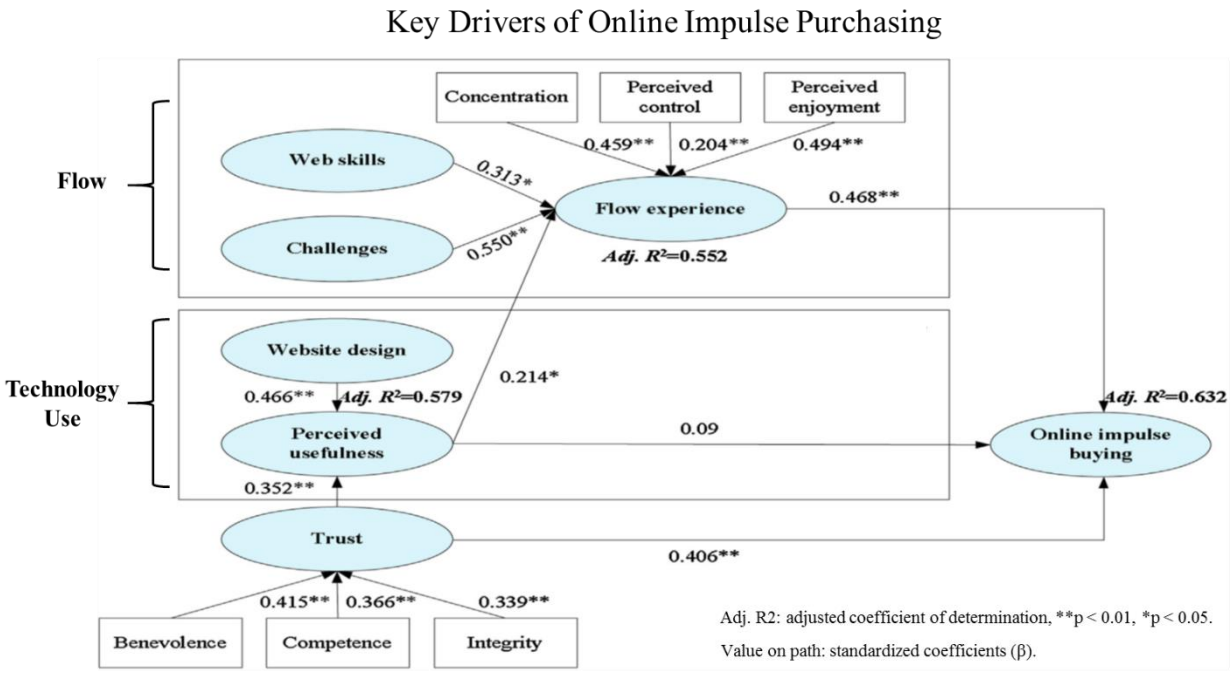


Figure 3 - Structural model of key drivers of online impulse purchasing. (Wu et al, 2016).

In the model shown in figure 3, trust and flow experience directly contribute to online impulse purchasing. Trust refers to the e-vendor's ability to be reliable. The more consumers trust and believe in a vendor, the more they are willing to purchase from them. As such, they will only share private and sensitive information when they trust the company and consequently that their online systems are safe (Palvia, 2009).

Regarding flow experience, it can be characterized by the state of immersion of a user within an activity. The more they are immersed, focused and enjoying what they do, the higher the flow experience. It can be an important metric of online consumer experience and according to Chang and Wang (2008), flow experience leads to a higher attitude towards use and a stronger behavioral intention to act, especially in entertainment-oriented software – where most of microtransactions take place. Some elements that comprise the core of flow experience are: feeling in control, focusing attention on the activity, feeling curiosity, and being intrinsically interested in the activity (Webster & Trevino, 1995). Although perceived usefulness – a component present in the Technology Acceptance Model (TAM) – did not directly lead to online impulse buying, it did have an effect on the flow experience (Wu *et al*, 2016).

The study by Wu *et al* (2016) was applied on a traditional online shopping setting. As such, some of its components might not correlate with microtransactions. For example, while this study implies that trust plays a good role on online impulse buying, Guo and Barnes (2009) found this might not apply in virtual world purchases. Still, some elements can prove useful for future studying, such as flow experience, which is likely represented in games by their overall quality, gameplay and entertainment level – the higher these elements, the higher the flow experience and the possibility of users purchasing extra content for the games, thus using microtransactions in mobile games. Su *et al* (2016) also studied the effects of flow experience on player loyalty in mobile game applications and results showed that the more players enjoy and concentrate on playing a game, the more loyal they might become to that game, demonstrating again that flow experience is an important component in games.

Verplanken and Herabadi (2001) devised a scale with the purpose of measuring an individual's Impulse Buying Tendency (IBT). This scale is composed of 20 items, with 10 of them having a cognitive facet (lack of planning, a tendency not to deliberate or think) and the other 10 an affective aspect (feelings of pleasure, urge to buy and difficulty to control impulses). This scale was reportedly efficient in measuring impulse buying tendency: after the items were subjected to a principal component analysis and using a two-factor solution with an Oblimin rotation, the cognitive factor accounted for 29.24% of variance and the affective factor for 20.94%. As such, this scale has the potential to be used when testing impulse purchases in the medium of microtransactions, adapting beforehand the language and context of the scale. Thus, by identifying certain factors or values surrounding microtransactions, these can then be used to try to explain how they influence or affect a person's impulse buying tendency, using the IBT scale as the basis for impulse buying.

Items	IBT-Total	IBT-Cognitive	IBT-Affective
Cognitive Items			
1. I usually think carefully before I buy something.	0.63	0.83	-0.18
2. I usually only buy things that I intended to buy.	0.84	0.79	0.19
3. If I buy something, I usually do that spontaneously.	0.75	0.78	0.07
4. Most of my purchases are planned in advance.	0.69	0.78	-0.02
5. I only buy things that I really need.	0.77	0.74	0.16
6. It is not my style to just buy things.	0.81	0.74	0.21
7. I like to compare different brands before I buy one.	0.45	0.67	-0.23
8. Before I buy something I always carefully consider whether I need it.	0.56	0.66	-0.04
9. I am used to buying things 'on the spot'.	0.65	0.65	0.09
10. I often buy things without thinking.	0.67	0.65	0.12
Affective Items			
11. It is a struggle to leave nice things I see in a shop.	0.56	0-02	0.81
12. I sometimes cannot suppress the feeling of wanting to buy something.	0.61	0.02	0.79
13. I sometimes feel guilty after having bought something.	0.32	-0.15	0.66
14. I'm not the kind of person who 'falls in love at first sight' with things I see in shops.	0.25	-0.20	0.65
15. I can become very excited if I see something I would like to buy.	0.42	-0.09	0.63
16. I always see something nice whenever I pass by shops.	0.44	0.08	0.54
17. I find it difficult to pass up a bargain.	0.61	0.32	0.48
18. If I see something new, I want to buy it.	0.42	0.12	0.47
19. I am a bit reckless in buying things.	0.71	0.44	0.47
20. I sometimes buy things because I like buying things, rather than because I need them.	0.44	0.15	0.45

(Items 1, 2, 4-8 and 14 must be reverse coded.)

Table 4 - The impulse buying tendency (IBT) scale and factor loadings for a single-factor and a two-factor solution adapted from Verplanken and Herabadi (2001).

The IBT scale has since been studied deeper and applied in other article studies. For example, Dincer (2010) studied the IBT cognitive and affective factors regarding impulse buying behavior against people who considered themselves impulse buyers and those who did not. Results showed that impulse buying is purely affective. This same IBT scale was also used as a basis for impulse buying behavior when studying the effects of price discounts and promotions on consumer's impulse buying levels (Xu & Huang, 2014). Additionally, Arnold and Reynolds (2003) investigated hedonic shopping motivations, although focused on a retail environment. They classified shoppers based on their hedonic motivations (adventure shopping, gratification shopping, role shopping, value shopping, social shopping and idea shopping) and identified five groups of shoppers: minimalists; gatherers; providers; enthusiasts; and traditionalists.

Another study was conducted to determine whether hedonic motivations of Turkish consumers would have an impact on their impulse buying tendencies (IBT) (Ozen & Engizek, 2013). However, only items of the IBT scale regarding the affective facet were used on the research, as it was claimed that impulse purchases are mainly hedonic and emotional despite a higher or lower cognitive value of individuals. Their findings stated that adventure shopping, value shopping and relaxation shopping are correlated with a higher IBT while social shopping and idea shopping are not. A similar research was performed but with an emphasis on online shopping and what factors would lead to research intention and purchase intention (To, Liao & Lin, 2007). The study was based on not just hedonic factors alone but also utilitarian factors. The conclusion was that utilitarian factors are an important determinant of consumer intention to search and to purchase. Hedonic factors also have a direct impact on intention to search but only an indirect impact on intention to purchase.

Finally, another important aspect regarding impulse purchases is the self-regulatory resources (Muraven *et al*, 1998). These non-physical, invisible resources available in a person's mind allows them to struggle and repel actions that are deemed negative or considered erroneous (Baumeister & Vohs, 2004). However, after resisting and countering those foul or negative actions, the individual will have less and less of the self-regulatory resources. The less resources available, the more inclined the person is to conduct personal urges or give in to other sorts of temptations, such as impulse purchases.

A study by Vohs and Faber (2007) on this matter showed that individuals with supposedly lower or depleted self-regulatory resources "felt stronger urges to buy, were willing to spend more and actually did spend more money in unanticipated buying situations". This can also be an important aspect to consider since mobile and tablet devices have a higher usage rate at the end of the day according to data retrieved by Chaffey (2016). This can potentially be the time when most people have lower self-regulatory resources available due to the daily stress of work and other activities and thus are more inclined to buy out of impulse. It then becomes interesting to inquire microtransaction purchasers when is their preferred time of day to purchase game content and see if a pattern can be detected. If purchases are mostly done at the end of a work day, for example, a self-regulatory resource study might be interesting to formulate in the future due to the fact they might play a role in impulse purchasing in mobile games.

2.3.1 – Perceived risk in impulse purchases

When a user is purchasing a certain product or service, there is an associated risk with that act in the sense that any action of a consumer will produce consequences that will be viewed with some degree of uncertainty (Bauer, 1960). Additionally, perceived risk can vary by product category or class (Jacoby & Kaplan, 1972; Dowling & Stealin, 1994; Ueltschy, Krampf & Yannopoulos, 2004) and by a person's ability to absorb a monetary loss (Dowling & Staelin, 1994).

There are several types of perceived risk as stated by Jacoby and Kaplan (1972): financial risk; performance risk; physical risk; psychological risk; social risk; and an overall perceived risk of all factors combined. Financial risk is concerned with the loss of money in the case of a bad product choice. Performance risk regards the loss incurred when the product does not perform as expected. Physical and psychological risk regard the safety/health of the individual and their self-disappointment, respectively, in the case of a poor product choice.

Type of Perceived Risk	Definition
1. Financial Risk	What are the chances that you stand to lose money if you try an unfamiliar brand of ___ (either because it won't work at all, or because it costs more than it should to keep it in good shape)?
2. Performance Risk	What is the likelihood that there will be something wrong with an unfamiliar brand of ___ or that it will not work properly?
3. Physical Risk	What are the chances that an unfamiliar brand of ___ may not be safe; i.e., may be (or become) harmful or injurious to your health?
4. Psychological Risk	What are the chances that an unfamiliar brand of ___ will not fit in well with your self-image or self-concept (i.e., the way you think about yourself)?
5. Social Risk	What are the chances that an unfamiliar brand of ___ will affect the way others think of you?
6. Overall Perceived Risk	On the whole, considering all sorts of factors combined, about how risky would you say it was to buy an unfamiliar brand of ___?

Table 5 - Types of perceived risks and their meanings, adapted from Jacoby and Kaplan (1972).

On a cross-national study performed using the aforementioned perceived risk factors towards online purchasing, it was found that financial risk and performance risk were the more pronounced risk factors across all types of different products (clothing, computers, airline tickets) (Ueltschy *et al*, 2004). However, Jacoby and Kaplan's (1972) study saw that the cheaper the product, the lower the perceived financial risk. This makes logic from a commonsense point of view: the cheaper something is, the less someone worries about the money lost on the purchase if it ends up being a bad product. It can be interesting to investigate if the same applies to microtransactions and if a low perceived risk overall leads to higher purchases by impulse.

Further studies have been developed regarding perceived risk, namely in the e-commerce universe. Glover and Benbasat (2010) have studied and developed a model of perceived risk of e-commerce transactions and state that e-commerce risk is an aggregate factor comprised of three dimensions: risk of information misuse (personal and financial information revealed in the transaction), risk of functionality inefficiency (difficulties of finding, ordering, receiving, returning and maintaining the products purchased), and risk of failure to gain product benefit (the purchased goods will not meet expectations or will not arrive at all). Suki and Suki (2007: 88) also assessed that the consumers perceived risk associated with online shopping has a critical effect on their decision making.

Focusing specifically on the perceived risk of impulse buying, there have been contradictory results on the few studies performed. Chen and Zhang (2015) have studied the influential factors for online impulse buying in the Chinese population, in which they included perceived risk as a factor. Results have showed that perceived risk was not an influential factor in online impulse buying. On the other hand, Lee and Yi (2008) analyzed specifically the effects of shopping emotions and perceived risk on impulse buying. One of their main conclusions was that perceived risk was indeed negatively associated with impulse buying behavior but no link was established between perceived risk and impulse buying intention. They argue that when perceived risk is high, consumers become more risk averse. Therefore, users with high perceived risk would show risk aversion and display a lesser impulse buying level while users with a low perceived risk show increased impulse buying behavior.

Perceived risk within the realm of mobile payments has also been studied by Yang, Liu, Li and Yu (2015). Again, perceived financial risk and perceived performance risk where the most notorious negative influencers of acceptance intention to perform payment. This can be important considering microtransactions are performed often through mobile devices. Also worth noting is that a virtual good does not have the same risk factors as a normal purchase. There is for example no physical risk present for a virtual purchase on a mobile game world.

Additionally, Forsythe, Liu, Shannon and Gardner (2006) developed a scale to measure perceived benefits and risks of online shopping. Their risks of online shopping included, yet again, financial risk and product performance risk, as well as time/convenience risk. As such, it can be seen that performance and financial risk are some of the most highlighted. This is in line with other

studies by Bhatnagar and Ghose (2004a, 2004b) that identified performance risk and financial risk as being associated frequently with online shopping.

3 – Preliminary conceptual model and research hypotheses

Despite the existence of numerous research conducted on impulse purchases, both in retail and online, there has not been a thorough investigation regarding impulse buying towards microtransactions, which happen almost entirely online through game-driven applications. Moreover, regarding mobile microtransactions directly, there is not a great research on the matter regarding buying motivations and which ones are more prone to lead to acts of impulse.

It is this gap in the literature that this dissertation study intends to start filling – what factors lead to a higher impulse buying in a microtransaction mobile environment. This will be particularly important considering that microtransactions might very well be an important component in e-commerce and the digital market and are already a key component in mobile game-driven applications (Grubb, 2014).

Seeing as this is a study to identify impulse buying behavior towards mobile game-driven applications, it becomes vital to be able to ascertain a person's impulse buying behaviors. Verplanken and Herabadi's (2001) Impulse Buying Tendency (IBT) scale has 2 facets: cognitive and affective. These 2 factors are a good predictor of the level of impulse buying of a user (Hausman, 2000; Verplanken & Herabadi, 2001; Kim & Eastin, 2011). As such, it makes sense to use that scale to identify the respondent's IBT level concerning mobile game microtransactions and subsequently see what are the main components of microtransactions that fuel their impulse buying behavior.

Lehdonvirta's (2009) Purchase Drivers for Virtual Items are a good starting point to link with microtransaction impulse buying behavior – identifying which types of content are more likely to create a bigger impulse feeling and lead to a faster and more sudden purchase – especially seeing as these attributes are in some ways linked with the Consumer Perceived Value model by Sweeney and Soutar (2001). In that model, four dimensions are identified (emotional, social, value for money and performance) that can potentially lead to a higher perceived value of products and consequently enhance the purchase intention of game items as seen in Yoo (2015). The values and drivers from the previous sources can then be coupled with the Impulse Buying Tendency (IBT) scale of Verplanken and Herabadi (2001) to discover the impact that each of them have on an individual's IBT level. Having this into account, several hypotheses can be formulated based on those sources.

Lehdonvirta (2009) divides the drivers of virtual items in two main categories: functional and cosmetic. Functional drivers have two sub branches: performance and functionality. These sub branches are in line with Sweeney and Soutar's (2001) CPV model, which has a functional value for performance/quality (perceived value and expected impact of the product) as well. However, in Yoo's (2015) study, this specific value was found to have a negative effect on purchase intention, with one claim being that there is a broad concept of functional value and that it should be modified specifically to adapt to a game context. As such, it makes sense to divide this functional value and use Lehdonvirta's (2009) functional drivers instead, which already have a gaming environment in mind.

The basic premise behind performance traits and functionality traits is that, respectively: powerful characters or actions are more competent against other players or perform better in-game and allow better performances overall; and that extra game content and functionalities will lead to a more entertaining and enjoyable experience (Lehdonvirta, 2009; Evers *et al*, 2015; Yoo, 2015). With this, the first 2 hypotheses can be formulated:

H1: Microtransaction performance based content has a positive influence on microtransaction impulse buying tendency (IBT) of consumers.

H2: Microtransaction functionality based content has a positive influence on microtransaction IBT of consumers.

Going back to Lehdonvirta's (2009) item drivers, the cosmetic drivers also have two sub branches: hedonic and social attributes. In the CPV model, there are also two similar values: an emotional value (feelings or affective states a product generates) and a social value (the products ability to enhance social self-concept).

In these cases, social items – those who are rare or confer a sort of social status – can increase the enjoyment of the game (Lehdonvirta, 2009; Guo & Barnes, 2012; Chen, Lu & Wang, 2016) while hedonic items – customizability and aesthetic objects – if sufficiently compelling, can give users self-indulging pleasure from experiencing them (Lehdonvirta, 2009; Guo & Barnes, 2012). Mobile microtransaction based content offers quite a lot of these two types of content and, as such, two more hypotheses can be generated:

H3: Microtransaction hedonic/emotional personalization content has a positive influence on microtransaction IBT of consumers.

H4: Microtransaction social personalization content has a positive influence on microtransaction IBT of consumers.

Perceived risk can also be a hindrance towards impulse buying behavior (Lee and Yi, 2008). There are several factors that compose perceived risk (Jacoby & Kaplan, 1972) although some of them might not apply to the same extent to microtransactions such as physical risk – game items are virtual goods that cannot harm a human being, for example. Of the several types of perceived risks, financial risk and performance risk appear to be the most influential ones across several types of products (Yang *et al*, 2015; Forsythe *et al*, 2006; Ueltschy *et al*, 2004; Bhatnagar & Ghose, 2004a, 2004b). It makes sense to include these two risks within the realm of mobile game microtransactions since users can experience a risk of a microtransaction purchase not performing as expected in-game and/or losing money if the purchase was not considered useful after buying or was considered unsafe to perform.

As such, these two types of risk will be combined to form the perceived risk of mobile microtransactions. Bearing this in consideration, the following hypothesis is devised:

H5: A perceived low microtransaction risk has a positive influence on microtransaction IBT of consumers.

An additional factor affecting online impulse buying tendency is the flow experience (Wu *et al*, 2016). Moreover, flow experience seems to matter more in entertainment services where mobile games are inserted (Chang & Wang, 2008). Flow experience is assessed through factors such as curiosity, interest and focused attention on the activity at hand (Webster & Trevino, 1995). These can be roughly translated to a user's interest in the mobile game, the game's quality and its ability to absorb and addict the player, creating a pleasurable experience. A sixth hypothesis can be created:

H6: A mobile game that provides a high flow experience leads to a positive influence on microtransaction IBT of consumers.

Furthermore, because price is what in great part defines a microtransaction, it should also be taken into account in the proposed model. Microtransactions are low cost purchases and

according to Ekpe *et al* (2016) and Nguyen and Klaus (2013), low price points can lead to higher purchase levels. It becomes interesting to measure if the low price points of mobile game microtransactions contribute for users to more easily act on their impulse tendencies and make a purchase. Would they still purchase content if the prices were higher, even if they have high impulse tendencies? With all this in mind, it makes sense to include two hypotheses that test if impulse tendency is correlated with purchase intention and subsequently see what is the effect that a high price has on that purchase intention:

H7: Impulse buying tendency is positively associated with normal price purchase intention.

H8: High microtransaction price points have a negative influence on purchase intention.

A summary of the hypotheses as well as a draft of the proposed model can be seen below in table 6 and figure 4 respectively, along with the main concepts, their definitions and origins demonstrated in table 7 further down the section.

H1: Microtransaction performance based content has a positive influence on microtransaction impulse buying tendency (IBT) of consumers.
H2: Microtransaction functionality based content has a positive influence on microtransaction IBT of consumers.
H3: Microtransaction hedonic/emotional personalization content has a positive influence on microtransaction IBT of consumers.
H4: Microtransaction social personalization content has a positive influence on microtransaction IBT of consumers.
H5: A perceived low microtransaction risk has a positive influence on microtransaction IBT of consumers.
H6: A mobile game that provides a high flow experience leads to a positive influence on microtransaction IBT of consumers.
H7: Impulse buying tendency is positively associated with normal price purchase intention.
H8: High microtransaction price points have a negative influence on purchase intention.

Table 6 - Summary of proposed hypotheses.

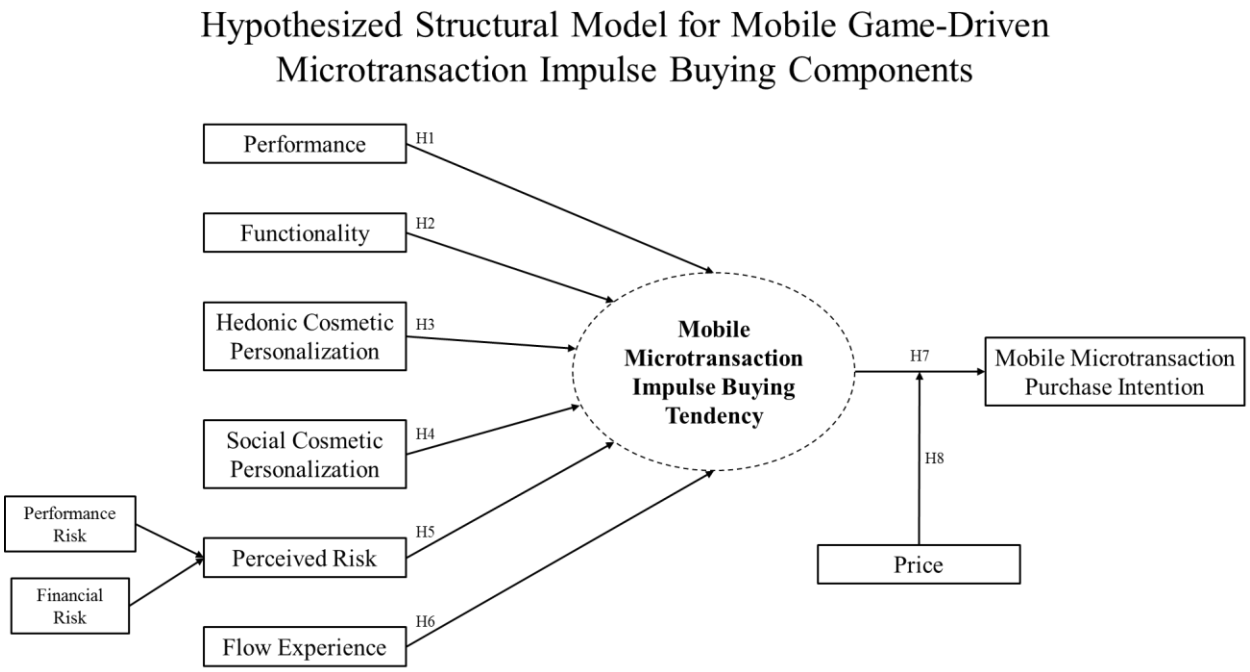


Figure 4 - Proposed structured model for mobile game-driven microtransaction impulse buying components.

These components will be tested to see how they influence and explain the Impulse Buying Tendency of consumers regarding mobile game microtransactions while also examining the moderator role of price on purchase intention. Additional questions regarding age, education, gender, buying time and game usage will also be queried to see if any of those variables display a pattern regarding any of the components and also to assess future potential research areas such as with buying times and history of mobile game usage.

By comparing the proposed model to that of Wu *et al* (2016), some differences can be highlighted. A major difference is the inclusion of purchase intention in the proposed model as well as the presence of price as an influencer of purchase intention. Moreover, in the Wu *et al* (2016) model, there are three proposed components influencing online impulse buying as opposed to six components in the projected model. Additionally, those three components are referring to all sorts of possible online characteristics that lead to impulse buying while this model in specific is focused heavily on an environment of mobile content purchases, specifically game microtransactions – the six components are all characteristics present in mobile purchases but not on general online purchases. The proposed model in this study is very specific and meant to be applied to content based on a microtransaction model while the Wu *et al* (2016) model is apt for general online purchases.

In the following table 7, the main components of this study and their definitions are identified and explained.

Construct	Definition	Source
Microtransaction	A term associated with video-games, characterized by an online micropayment transaction in order to obtain extra game content.	Cambridge Dictionary, 2016 Visa, n.d. Newman *et al*, 2016 Pou *et al*, 2007
Micropayment	An e-commerce transaction of a low financial amount (usually below 20$, typically around 5$).	Techopedia, n.d. Paypal, n.d.
Impulse Buying	"The buying of goods without planning to do so in advance, as a result of a sudden whim or impulse."	Oxford Dictionaries, n.d.
Impulse Buying Tendency (IBT)	A scale composed of 20 items with 2 facets (cognitive and affective). It refers to the degree to which an individual is likely to make an impulse purchase of products/services in general. The higher the IBT, the greater the susceptibility to purchase on impulse.	Verplanken and Verabadi, 2001 Jones, Reynolds, Weun, & Beatty, 2003.
Impulse Buying Intention	"A sudden, often powerful and persistent urge to buy something immediately". Accompanied by emotional conflict and reduced ability to reflect. People may chose to act upon this urge or not.	Rook, 1987: 191 Adelaar *et al*, 2003: 250
Impulse Buying Behavior	A set of values and norms that refer to the acts of impulse purchase an individual performs.	Adelaar *et al*, 2003: 250
Purchase Drivers for Virtual Content/Items	Attributes and characteristics of the virtual items that create motivations to purchase. They can be performance-based, functionality-based, hedonic-based, and social-based.	Lehdonvirta, 2009
(Content Type) Performance	Performance content can be characterized by any type of content that allows a user to perform better, thus allowing him/her to obtain higher scores, achieve better results or gain a leverage against other players online.	Lehdonvirta, 2009
(Content Type) Functionality	Functionality content can be described as content that provides new functions, convenience or gameplay options to the players. They do not allow better performance but instead increase and expand the game.	Lehdonvirta, 2009
(Content Type) Hedonic	Hedonic content refers to any game content that gives the player hedonistic pleasure from experiencing it, such as visual or audio customization.	Lehdonvirta, 2009
(Content Type) Social	Social content regards all goods that are meant to cause social impression or notoriety within the game. They can be visually stylish goods or rare items, for example.	Lehdonvirta, 2009
Perceived Risk	The associated risk of performing a purchase. Larger perceived risks lead to a negative predisposition to act or buy goods.	Jacoby and Kaplan, 1972 Bauer, 1960
Financial Risk	The likelihood of wasting money due to the purchased good not working at all or performing lower than expected for its price point.	Jacoby and Kaplan, 1972
Performance Risk	The likelihood of there being something wrong with the purchased good or that it will not perform as expected.	Jacoby and Kaplan, 1972
Flow Experience	The degree of immersion, focus and enjoyment that a product or service is capable of creating. Higher flow experience generates a more positive attitude to act and buy out of impulse.	Wu *et al*, 2016 Chang and Wang, 2008 Webster and Trevino, 1995

Table 7 - Model concepts with their respective definitions and sources.

4 – Methodology

In order to test the aforementioned model, a quantitative approach seems the ideal method to gather the largest amount of answers. By using closed questions and by means of Likert-type items, it allows the measurement of both the IBT level and the strength each driver has concerning microtransactions. Afterwards, an analysis of the strength each of the components have on the respondent's mobile microtransaction IBT can be conducted. The IBT variable should then be tested in terms of its correlation and effect with the purchase intention. To assess the relationships between microtransaction drivers and IBT, as well as between IBT and purchase intention, a non-parametric Spearman's rank correlation coefficient test can be employed as well as a basic structured equation model path analysis using partial least squares (PLS) regression.

PLS offers several advantages when compared with Structural Equation Modelling (SEM). First and foremost, it can handle all types of data from metric to non-metric (IBM, 2017; Hair *et al*, 2014: 755), including Likert type data. Also, it is better suited for circumstances where the emphasis of the research is more on prediction rather than explanation (Hair *et al*, 2014: 757). The main goal of PLS is the explanation of variance. The significance testing of parameter estimates must be performed by using bootstrapping methods. This happens because PLS structural modeling is a non-parametric method that does not require the data to meet certain distributional assumptions such as a normal distribution – which is likely to happen with Likert-type data (Clason & Dormody, 1994; Bertenthal, 2007). This means that parametric significance tests are not the most suited to assess the reliability and significance of various results such as path coefficients, loadings and variances. For this reason, bootstrapping – a non-parametric technique that allows the testing of statistical significance of various PLS results such as path coefficients, Cronbach's alpha, and R^2 values (explained variance) – is used (Hair *et al*, 2017).

There are several indicators in the SmartPLS program that are used to check the validity and quality of the model and its measures, which can be divided in two phases (Hair *et al*, 2011). In a first stage, the measurement model must be assessed to see if it is valid and only then can conclusions be assessed in a second stage, using structural model parameter estimates.

In the first stage of the measurement model, several metrics must be analyzed, namely: the item reliability, where loadings of items on parent factors must be examined, with loadings having a minimum acceptable value of 0.50 (Hair *et al*, 2010) or 0.70 (Hair, Ringle & Sarstedt, 2011); the

convergent validity, where composite reliability should be above 0.70 (Hair *et al*, 2010; Nunnally & Bernstein, 1994) and the average variance extracted (AVE) above 0.50 (Hair *et al*, 2010; Urbach & Ahlemann, 2010); the discriminant validity, where the heterotrait-monotrait ratio of correlations (HTMT) should be inferior to 0.9 (Hair *et al*, 2017; Henseler *et al*, 2015); and the reliability, in which the Cronbach's alpha should be higher than 0.70 (Hair *et al*, 2010) and the inner and outer variance inflation factor (VIF) inferior to 5 (Kock & Lynn, 2012) or 10 (Hair *et al*, 2010).

After the measurement model is validated, conclusions about the structural model can be taken. The criteria that can be used to extract conclusions are: the coefficient of determination (R^2), with values close to 0.75 deemed substantial, near 0.50 being moderate and around 0.25 considered weak (Sarstedt *et al*, 2014: 110; Hair *et al*, 2011: 145); path coefficients, where the paths must be gauged according to their significance level (Hair *et al*, 2010); and the effect size (f^2), with values around 0.02 considered weak or small, values close to 0.15 categorized as moderate or medium and values near 0.35 labelled high or large (Cohen, 2013). The R^2 represents the percentage of the variance that is explained by the variables, the path coefficients account for a relationship between variables and the f^2 denotes the magnitude of the path coefficients. The measurement and structural model reference guidelines can be consulted below on tables 8 and 9.

Measurement Model Metrics			
Assessment	Criteria	Guideline	Reference
Item Reliability	Item Loadings	> 0.70	Hair, Ringle & Sarstedt (2011)
		> 0.50	Hair *et al* (2010)
Convergent Validity	Composite Reliability	> 0.70	Hair *et al* (2010)
			Nunnally & Bernstein (1994)
	Average Variance Extracted (AVE)	> 0.50	Hair *et al* (2010)
			Urbach & Ahlemann (2010)
Discriminant Validity	Heterotrait-Monotrait (HTMT)	< 0.90	Hair *et al* (2017)
			Henseler *et al* (2015)
Reliability	Cronbach's Alpha	> 0.70	Hair *et al* (2010)
	Inner and Outer Variance Inflation Factor (VIF)	< 5	Kock & Lynn (2012)
		< 10	Hair *et al* (2010)

Table 8 - Measurement model metrics for PLS-SEM (SmartPLS 3).

Structural Model Metrics		
Criteria	Guideline	Reference
Coefficient of Determination (R2)	0.75 - Substantial	Sarstedt *et al* (2014) Hair *et al* (2011)
	0.50 - Moderate	
	0.25 - Weak	
Path Coefficient	sig. $p < \alpha$ (usually $\alpha = 0.05$)	Hair *et al* (2010)
Effect Size (f2)	0.35 - Large	Cohen (2013)
	0.15 - Medium	
	0.02 - Small	

Table 9 - Structural model metrics for PLS-SEM (SmartPLS 3).

Furthermore, the constructs (latent variables) in this PLS model study are to be weighted equally by all of their respective item variables (indicated by an 'S' letter inside the circles, meaning summed scores). This is decided because there is no previous research on these topics and it is assumed each item has equal importance when contributing to its component, or in other words, that there is no variance in the strength of the relationship of the items with their respective constructs (Garson, 2017: 16). This implies no covariance is examined in the items or that there is not a difference in coefficients for each item.

Additionally, the constructs can be built using a reflective process or a formative process. In this particular case, the constructs are built as being reflective, where each item is a representation of the latent variable. In reflective models, "indicators are a representative set of items which all reflect the latent variable they are measuring. Reflective models assume the factor is the "reality" and measured variables are a sample of all possible indicators of that reality." This means that by removing one indicator, results should not change significantly because the other indicators are still present and are generally representing the latent variable (Garson, 2016: 18).

Formative constructs on the other hand, are just the opposite: each indicator measures a variable and said variable must be compulsory made up of a particular set of items. If one item is removed from a formative construct, the variable is no longer being represented correctly (Garson, 2016).

Afterwards, a Wilcoxon test can be performed to measure any differences in the respondents between the normal price purchase intention and the higher price purchase intention. This is a non-parametric test employed on two dependent samples. The test compares the changes in scores from

one scenario to the other (Kerby, 2014). If results are significant, then it is possible that a higher price detracts from microtransaction purchase intention.

The Wilcoxon (signed-rank) test is employed instead of the Mann-Whitney U test due to the fact that the two samples being tested in this study are related to each other - they are the same individuals on both samples and as such they are dependent samples. The output and interpretation of results are similar between both tests and allow the extraction of the same assumptions (Randles & Wolfe, 1991). The Wilcoxon signed-rank test will compare answers between both price level scenarios and determine if there is a negative, neutral or positive change of scores from a normal price purchase intention to a higher price purchase intention.

Other tests and analysis should also be performed, such as descriptive statistics and tests for normality of distribution to confirm the likely non-normal distribution of the Likert-variables (Clason & Dormody, 1994). The items of each component should also be tested for reliability using Cronbach's alpha, followed by a common factor analysis to understand if the responses indeed follow the hypothetical considered factors.

The proposed methodology to gather answers for this dissertation is in the form of a quantitative questionnaire based approach, using Google Forms as the means for data collection. These questionnaires can be issued online, using as a medium the message boards and forums of the most popular general gaming websites and specific mobile gaming websites. Social network communities can also be targeted as well as performing a direct contact with members that are eligible to answer the survey by sending direct messages to them. This is where and how the chance of obtaining more responses is higher. The goal is to target young adults who also play mobile games frequently and these locations and methods provide a good number of these kinds of individuals. This means the study will be based on a convenience sample.

These assumptions are extracted from a PricewaterhouseCoopers (2012) study on the evolution of video gaming and content consumption. The same study found that regarding average amount willing to spend on subscriptions, mobile and console gamers had an average of 14.96 dollars, while the considered "heavy gamers" in particular had an average of 20.92 dollars. This is a good indicator of where to conduct research – younger people (16 – 35 years old) who consider themselves to be gamers. Gaming communities as such become an obvious key location to scout for answers.

Specifically, information must be acquired regarding the main drivers for microtransaction purchases in game-driven apps and see which of those components are more linked with an impulse buying tendency. These will be obtained by asking specific questions regarding each of the components/drivers considered in the model: performance component; functionality component; hedonic component; social component; perceived risk component; and flow experience component. Each of the components is made up of three separate questions that ask for an opinion of agreement directly related to that component. The only exception is the perceived risk component, which is composed of 3 questions, 2 of which are related to perceived performance risk and the other with perceived financial risk – these 3 questions grouped form the global perceived risk. The IBT scale is made up of 10 questions.

The survey will be initiated with a set of 3 different questions that assess the individual's history of mobile game usage, the amount of weekly time dedicated to playing mobile games and if they have ever purchased in-game content. A negative response in the latter question results in the survey being terminated since the user has never purchased a microtransaction before starting the survey.

After the first trio of answers, the respondents will move to a new section where they will grade affirmations regarding impulse buying tendency to determine their impulsiveness level as well as grading affirmations related to the content/components of microtransactions. The affirmations are presented in a randomized way to avoid biased results. The possible choices range from 1 to 5 – a Likert-type scale of five points – where 1 represents "Strongly Disagree", 2 "Disagree", 3 "Undecided", 4 "Agree" and 5 "Strongly Agree". This allows the grading of the user regarding their IBT and each component and consequently see which components affect users the most or the least and its association with the level of IBT. Components more highly correlated with impulse buying tendency will be considered the drivers of microtransaction purchases.

Finally, in the last phase, purchase intention and the moderator effect of price on purchase intention is measured. A set of 6 questions will attest to this. For the first 3 questions, the user is asked to think about their favorite mobile game(s) and the prices of its content. With those prices in mind, the user is asked to grade 3 affirmations related to purchase intention, with the possible choices ranging from 1 to 5 – a Likert-type scale of five points – where 1 represents "Almost never true" and 5 "Almost always true". Afterwards, a new set of 3 questions is presented but in a new

context: now the user is asked to once again think of its favorite mobile game(s) but with the change being that the price points of the game(s) content having increased by an average of 5€/5$. The 3 affirmations and their possible answers remain the same as in the previous situation. These different scenarios will allow the extraction of data regarding purchase intention of mobile game content with normal price points and higher price points and compare them to understand if there is a significant moderator effect of price on microtransaction purchases on mobile games.

To conclude, questions about gender, age, country, education level, time taken to purchase and preferred time of day to purchase are also asked in order to understand and characterize the extracted sample of the population and to open future study avenues. The main focus of the survey will nonetheless be to define what are the main factors that come into play that lead to impulse buying in a microtransaction mobile game environment and understand if microtransaction price points influence the purchase intention.

A good number of answers – three hundred being the goal – was gathered to ascertain reliable and useful information that contributes to the theme at hand: what are the motivations and attitudes that lead consumers to engage in impulse buying within microtransactions and the weight of those attitudes relative to their global impulse buying behavior.

5 – Results

5.1 – Descriptives and frequencies

Three hundred and one (301) valid answers were collected for the purposes of this study.

Descriptive analysis was performed on every variable. Some results can be highlighted. Note that some described results may not add up due to rounding. The respondent's ages ranged between 17 years old and 40 years old. The average age was 25 years while the mode age was 27 years. Ninety-four percent of the respondents were male (283) while the remaining six percent were female (18). This indicates a huge bias towards the male gender. Although males are the predominant gender (Cowley, 2017), such a difference is perhaps explained by how the data was collected on online forums and game communities where males happened to be more present.

Fifty-one percent were students and forty-three percent were employed. Five percent were unemployed. Forty-two percent of the respondent's play mobile games between two to seven hours a week – they are probably more casual or low intensity players. Forty-one percent play more than seven hours weekly – these can be considered high intensity players. All respondents have some sort of education level. Sixty-five percent have a university degree or higher. Thirty-three percent have either finished secondary school or a professional degree of some kind.

Interestingly, eighty-six percent (260) performed their mobile purchases at the end of the day. This is in line with tablet and mobile system usages according to Chaffey (2016). Additionally, it can be interesting to investigate further if this purchase schedule behavior is influenced by low or depleted self-regulatory resources (Muraven *et al*, 1998; Vohs & Faber, 2007).

Another interesting variable was the 'time between interest and purchase' of microtransaction content. This variable offered mixed results. Twenty-nine percent of the sample users took over an hour to purchase mobile content while sixty-five percent took between fifteen to sixty minutes. Thirty-two percent of respondents take less than 15 minutes to buy content. There is no exact definition that states which duration of a purchase constitutes an impulse buying but it is interesting to see that a lot of users still take some time before buying content and that not all of them purchase immediately on sight. This can be interesting to study further in the future and clarify if there really is an impulse buying pattern with short buying times or if it is related to something else. Definitions of purchase times should also be made more precise to avoid

confusions by players or while interpreting data – some users might buy content within 5 minutes without it being an impulse purchase while others might take more time and buy out of impulse. It should be remembered that an impulse purchase is a purchase that is made without being planned (Sharma *et al*, 2010; Floh & Madlberger, 2013).

Regarding the other Likert-type variables – IBT scale and performance, functionality, social, hedonic, flow experience and perceived risk – responses varied wildly from item to item. Overall, the '2 – Disagree' and '4 – Agree' categories were the most prominent in many questions as it can be seen in figures 5 and 6. The figures show the number of answers per category of each Likert item. Items whose grouping form a component have the same color on the left side and each white line in the figures represents one quarter of the sample.

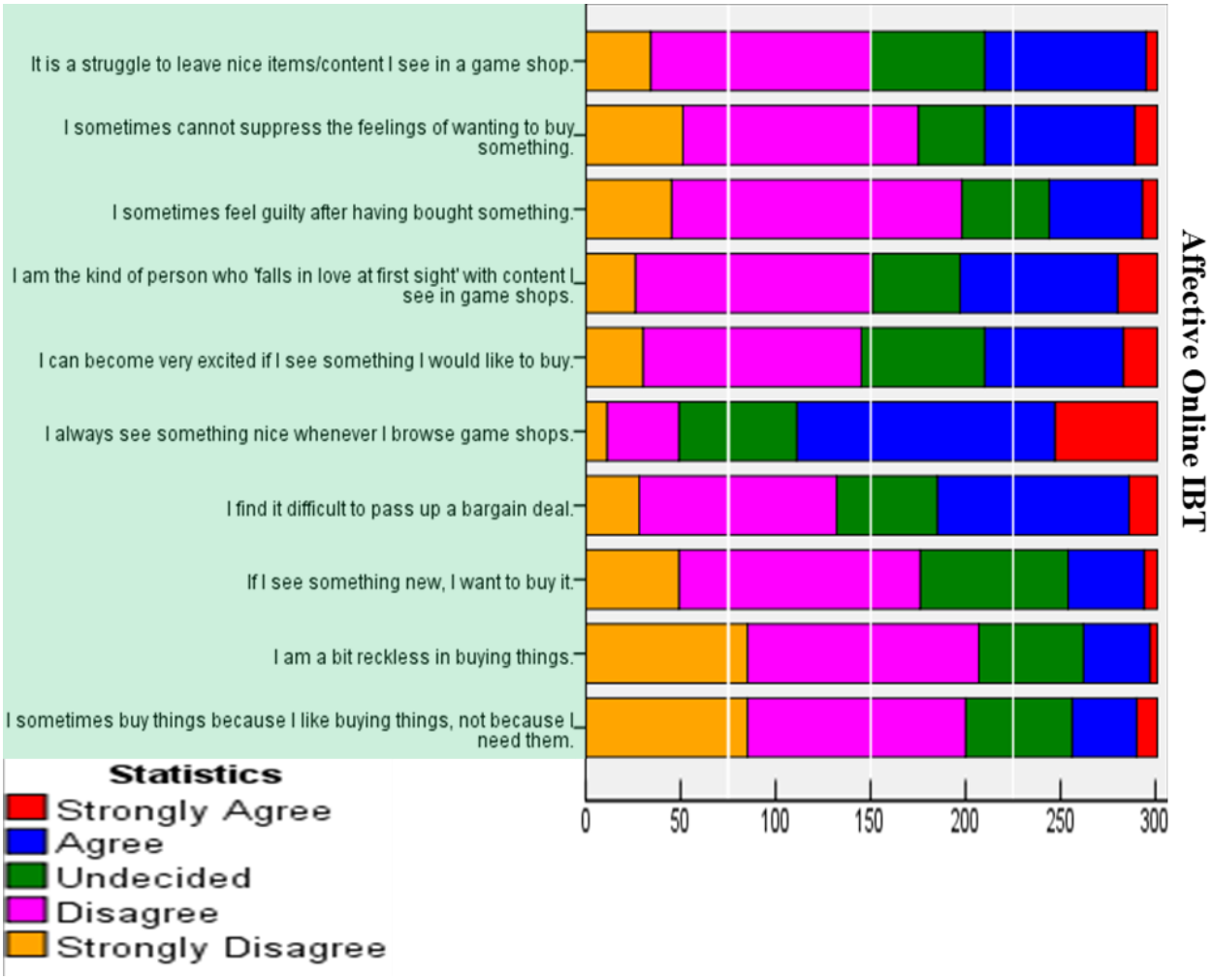


Figure 5 - Stacked bar chart for the IBT Likert items.

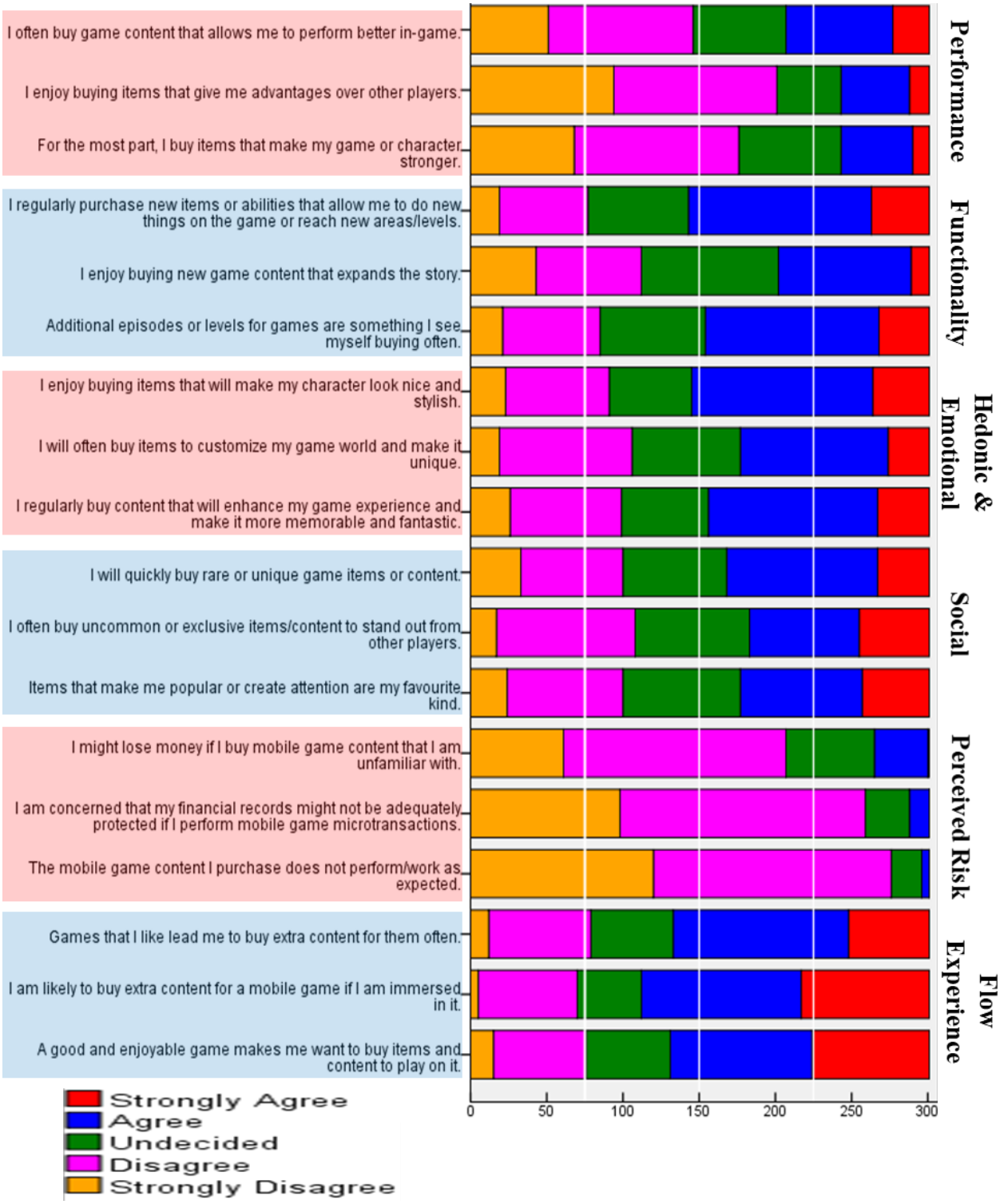


Figure 6 - Stacked bar chart for the Likert items of each component/driver.

Concerning the purchase intention with a normal price and purchase intention with a higher price, some differences are noticeable between the two variables at a first glance. By having a look

at the frequency of responses, it is possible to see that purchase intention with a normalized microtransaction price is mostly medium to high. However, after introducing a price increase, this purchase intention is heavily reduced to the lower ranges of one and two of the five point Likert-type scale.

This can possibly indicate that there might be a potential significant difference between the two purchase intentions. The stacked bar chart in figure 7 gives a clear idea of the difference between the two scenarios.

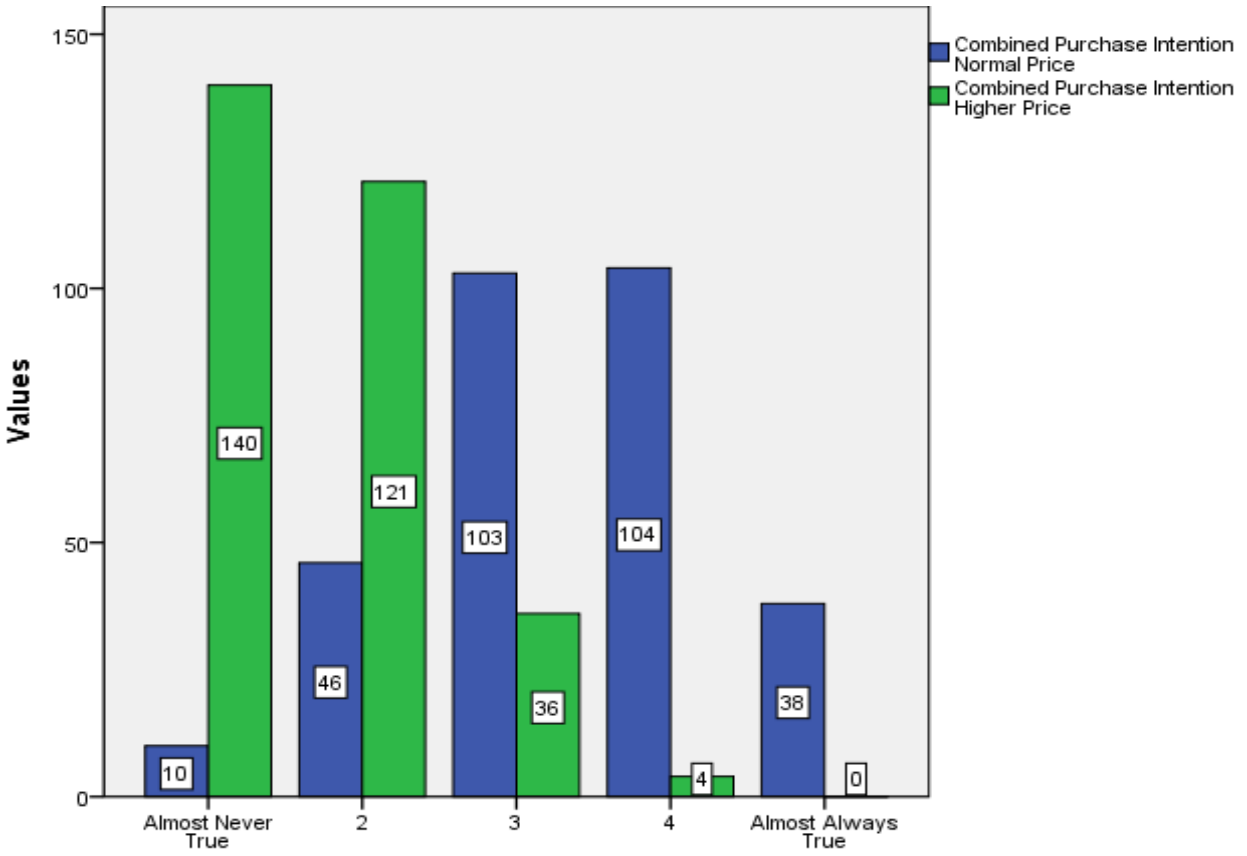


Figure 7 - Stacked bar chart: normal vs higher price purchase intention.

5.2 – Statistical tests and structural model

Moving on from descriptive and frequency statistics, distribution tests were performed on all Likert variables to understand if they followed a normal distribution or not. Usually, Likert variables do not follow a normal distribution (Clason & Dormody, 1994). A single analysis per Likert item proved this to be true, with no normal distributions present in any variable (p=0.000 for Kolmogorov-Smirnov and Shapiro-Wilk tests). The same non-normal distribution was also

present when the Likert-items were added and combined to form their respective components or when the median per category of the respondents was used (again, p=0.000 for Kolmogorov-Smirnov and Shapiro-Wilk tests). Despite the non-normality of the variables, the Q-Q plots showed that the data did not deviate vastly from a normal distribution.

Afterwards, the Likert items were also evaluated in their reliability before being combined into their respective components for analysis. The ten Likert items that formulated the affective online impulse buying tendency showed a good reliability, with a Cronbach's alpha of 0.882. The other trios of Likert items that formulated the potential microtransaction drivers had Cronbach alphas between 0.646 and 0.884, as seen below on table 10. According to Hair *et al* (2014: 124), an alpha of 0.70 is generally seen as the acceptable lower limit for the Cronbach alpha measure, although it can also decrease to 0.60 if an exploratory research or study is being conducted. This means that globally, in this study, all Likert-items have fairly good degrees of consistency in measuring their respective constructs. Moreover, a Spearman's rank correlation coefficient among the various Likert items making up each component also showed significant correlations.

Reliability	Cronbach's Alpha	Standardized Items Cronbach's Alpha	Nº of Items
IBT Scale	0,882	0,880	10
Performance	0,841	0,841	3
Functionality	0,823	0,823	3
Hedonic/Emotional	0,880	0,881	3
Social	0,843	0,844	3
Perceived Risk	0,646	0,655	3
Flow Experience	0,884	0,884	3
Normal Price Purchase Intention	0,880	0,881	3
Higher Price Purchase Intention	0,808	0,818	3

Table 10 – Cronbach's alpha reliability analysis of each component.

Treating these Likert-items exceptionally as scale variables rather than ordinal variables, a common factor analysis can also be performed to corroborate the results on the IBT component and the microtransaction driver components. The extraction method used was principal axis factoring. For component analysis, normality is not a mandatory requirement unless further statistical tests are applied to the significance of the factors (Hair *et* al, 2014: 102). Moreover, the

rotation method used in this common factor analysis was the Oblimin technique (with Kaiser normalization). This rotation method was used because the factors present are likely to be correlated and as such, an oblique rotation method is preferred like the Oblimin technique (Hair *et al*: 2014: 115).

With an initial analysis in SPSS extracting only factors with eigenvalues of one and above, six factors are extracted. Kaiser-Meyer-Olkin measure of sampling adequacy suggests a good intercorrelation among variables (0.913) and the Bartlett test of sphericity also indicates presence of correlations (sig=0.00) (Hair *et al*, 2014: 103). The extractions based on the eigenvalue results suggest that social and hedonic/emotional items are part of the same factor. This makes some sense, especially considering that the line between social and hedonic items can be blurred (Lehdonvirta, 2009). What is considered hedonic content for some users might be considered social for others. It is also possible that certain content can have both a social and hedonic value, thus making these two attributes highly intertwined and maybe even possible to be coupled together into one single component of social/hedonic attributes. If certain content really is social and hedonic in nature, users might have rated those respective items in the survey equally, thus creating this possible factor.

By ordering the common factor analysis to extract seven factors, then all items are grouped neatly into their respective components as hypothesized in the proposed model. Although it appears feasible to combine social and hedonic/emotional drivers into one single component, the seven proposed components will be maintained for the rest of this study. Table 11 shows the pattern matrix obtained from the common factor analysis by extracting 7 factors. Coefficients lower than 0.25 were removed from the table.

Pattern Matrix[a]

	Factor						
	1	2	3	4	5	6	7
It is a struggle to leave nice items/content I see in a game shop.	,620						
I sometimes cannot suppress the feelings of wanting to buy something.	,733						
I sometimes feel guilty after having bought something.	,509						
I am the kind of person who 'falls in love at first sight' with content I see in game shops.	,600						
I can become very excited if I see something I would like to buy.	,614						
I always see something nice whenever I browse game shops.	,282						,258
I find it difficult to pass up a bargain deal.	,483						
If I see something new, I want to buy it.	,546						
I am a bit reckless in buying things.	,529						
I sometimes buy things because I like buying things, not because I need them.	,274		,295				
I often buy game content that allows me to perform better in-game.					,771		
I enjoy buying items that give me advantages over other players.					,814		
For the most part, I buy items that make my game or character stronger.					,746		
I regularly purchase new items or abilities that allow me to do new things on the game or reach new areas/levels.		,749					
I enjoy buying new game content that expands the story.		,749					
Additional episodes or levels for games are something I see myself buying often.		,807					
I enjoy buying items that will make my character look nice and stylish.			,421				,272
I will often buy items to customize my game world and make it unique.			,742				
I regularly buy content that will enhance my game experience and make it more memorable and fantastic.			,620				
I will quickly buy rare or unique game items or content.							,423
I often buy uncommon or exclusive items/content to stand out from other players.							,850
Items that make me popular or create attention are my favourite kind.							,687
I might lose money if I buy mobile game content that I am unfamiliar with.				,623			
I am concerned that my financial records might not be adequately protected if I perform mobile game microtransactions.				,711			
The mobile game content I purchase does not perform/work as expected.				,545			
Games that I like lead me to buy extra content for them often.						,716	
I am likely to buy extra content for a mobile game if I am immersed in it.						,729	
A good and enjoyable game makes me want to buy items and content to play on it.						,759	

Table 11 - Common factor analysis for Likert items. Extraction of 7 factors.

To perform the next examination, the Likert-items were combined into their respective components using the median as a reference for each respondent. This means there are now nine main variables being considered and examined: affective online impulse buying tendency (made up of 10 items) and performance, functionality, social, hedonic/emotional, perceived risk, flow experience, normal price purchase intention and higher price purchase intention (all made up of 3 items). Due to the lack of normality in the distribution and having ordinal variables present, a non-parametric test was employed to assess and investigate some of the hypotheses (Ghasemi & Zahediasl, 2012).

The Spearman's rank correlation coefficient is employed to see which of the components correlate with each other, and it is a nonparametric measure of rank correlation and thus adequate for ordinal variables (Lehman, 2005). Per the formulated hypotheses, all microtransaction driver components of performance, functionality, social, hedonic/emotional and flow experience should be associated with impulse buying tendency while the component of perceived risk should be negatively associated with impulse buying tendency. At the same time, impulse buying tendency should also be associated with normal price purchase intention. The nonparametric measure showed that this holds true for all components except two: functionality was not significantly correlated with impulse buying tendency and there was also no significant negative correlation between impulse buying tendency and perceived risk. Table 12 demonstrates the results of the Spearman's rank correlation coefficients. Correlations are significant at the 0.05 level or lower.

		Combined Affective Online IBT Scale Median	Combined Performance Median	Combined Functionality Median	Combined Hedonic/Emotional Median	Combined Social Median	Combined Perceived Risk Median	Combined Flow Experience Median	Combined Purchase Intention N Median	Combined Purchase Intention H Median
IBT Scale Median	Correlation Coefficient	1,000	,442**	-,010	,557**	,600**	-,057	,590**	,557**	,387**
	Sig. (2-tailed)	.	,000	,869	,000	,000	,323	,000	,000	,000
	N	301	301	301	301	301	301	301	301	301

Table 12 - Spearman's rank correlation coefficient.

There is evidence in the Spearman's rank correlation test that not all components are correlated with impulse buying tendency. For a more in depth look at the proposed model and their respective hypothesis, a Partial Least Squares (PLS) analysis can be conducted to sketch a structural model. It is possible to view the standardized regression weights of the different

components (the effects of each component), factor loadings and the percentage of variance explained by the independent variables by using a PLS analysis (Henseler *et al*, 2009).

An initial assessment of the measurement model with all the original items and variables showed that there were some metrics that were not being fulfilled. The Affective IBT component presented with an AVE value of 0.493, a value slightly lower than the 0.50 guideline. Because the AVE value is calculated as the mean of the squared loadings of all indicators associated with a component (Sarstedt *et al*, 2014), the correctional step to take is to analyze each item of the component and understand if their loadings are low.

This was indeed the case, as five items had loadings below 0.70. One item in specific had a low loading of 0.472 (item number 10 of the IBT scale). The deletion of this specific item will likely allow the AVE to surpass 0.50. As for the other remaining four items with loadings below 0.70, three of them have loadings not very far from the guideline, with values of 0.656 for item number 3, 0.638 for item number 6 and 0.648 for item number 8. Item number 9 has a loading of 0.581. According to Henseler *et al* (2009) and *Hair et al* (2011: 145), items with loadings between 0.40 and 0.70 should only be considered for removal if their deletion results in an increase in composite reliability above the suggested threshold value of 0.70, which in this measurement model is already located at 0.905. As such, because the IBT scale was based on previous studies, the composite reliability and other measurement model metrics are fulfilled and the item loadings themselves are not below the 0.40 value suggested for elimination (Sarstedt *et al*, 2014), they will be kept for the remainder of the study if the AVE surpasses the necessary level of 0.50 by eliminating only item number 10 of the IBT component.

Results of the PLS analysis after elimination of item number 10 from the IBT factor seem to display a positive measurement model overall. All metrics comply with the recommended guidelines with the sole exception of the Cronbach's alpha for the Perceived Risk component – it has a value of 0.655. While its value is lower than 0.70, it is not far from it. It is also based on previously established metrics (Ueltschy *et al*, 2004; Jacoby & Kaplan, 1972) and the component is made up of only 3 items – the fewer the items, the less inflated the Cronbach alpha will be (Cortina, 1993). For these reasons, the component and its items are left unchanged.

Most items display healthy loadings close to or higher than 0.70. Composite reliability is well over the 0.70 threshold for all components, with all values higher than 0.80. AVE for every

factor is also above the 0.50 level. Discriminant validity is also established between constructs, with HTMT values all below 0.90. Outer and inner VIF parameters are also below the guideline of 5. The specific values of these parameters and metrics can be found at their respective tables in the appendix section, starting at page 78. With the measurement model being a good fit, conclusions can now be drawn based on the model seen below in figure 8.

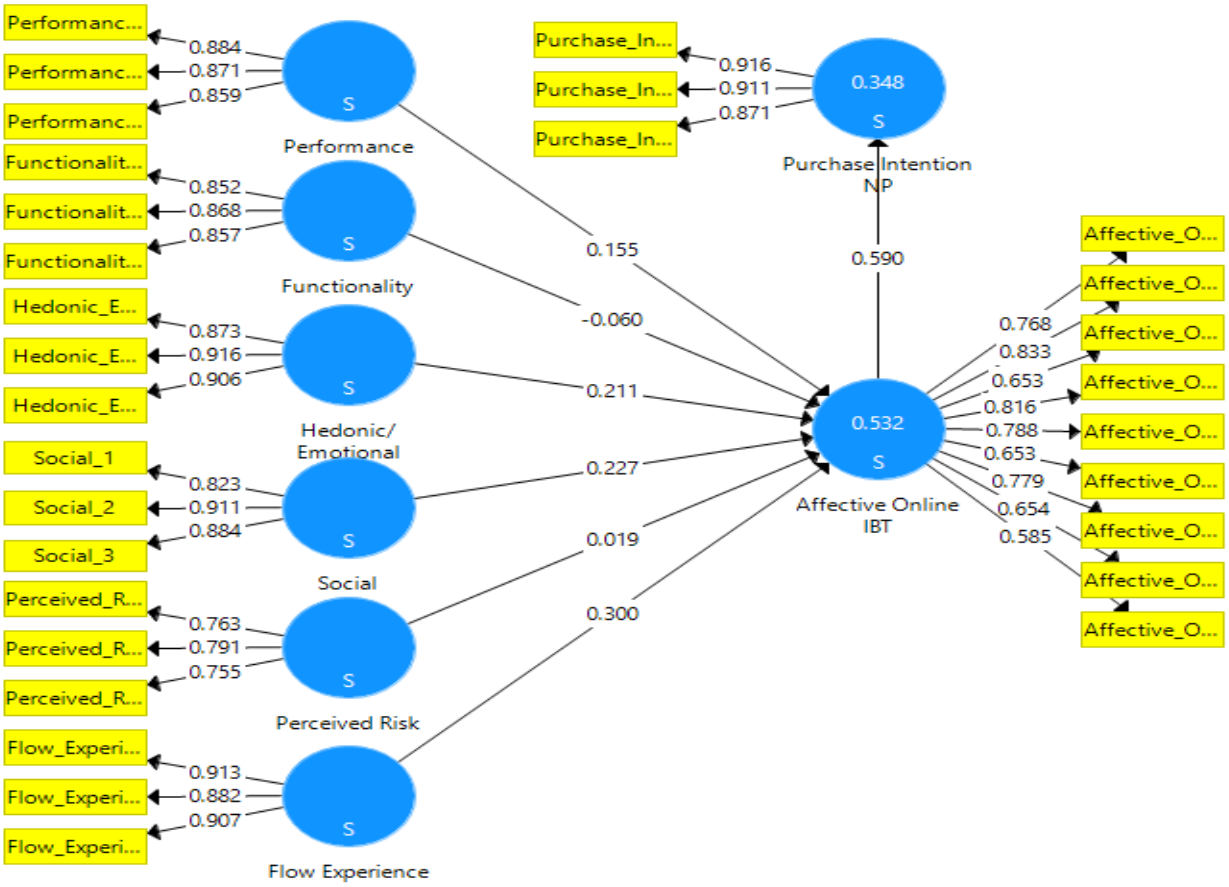


Figure 8 - SmartPLS structural model.

By viewing the model, it can be seen that the six microtransaction component drivers explain 53.2% of the variance of affective online IBT (R^2 = 0.532, as seen inside the circle). This is suggestive of an average to substantial explanation effect (Hair *et al*, 2011: 145). It now becomes important to understand what are the components that actually influence the affective online IBT in a significant way, and of those components, which ones are the strongest.

The most significant path appears to originate from the flow experience component (beta path coefficient = 0.300). The second most significant path comes from the social component (beta path coefficient = 0.227), followed by the hedonic/emotional component (beta path coefficient =

0.211) and afterwards by the performance component (beta path coefficient = 0.155). These four component path coefficients are significant, with p values below 0.05 (performance p=0.003; hedonic/emotional p=0.001; social p=0.000; and flow experience p=0.000).

The remaining component drivers of functionality and perceived risk have the least significant paths (beta path coefficients = -0.060 and 0.019 respectively) and they do not show adequate significance levels below 0.05, with p=0.186 for functionality and p=0.649 for perceived risk.

An examination of the effect size (f^2) is also appropriate, to understand the magnitude of influence of each component. Functionality and perceived risk have f^2 values of 0.006 and 0.001 respectively. Falling well below the minimum 0.02 guideline, the components have a tiny or almost non-existent effect on the affective online IBT. Performance, hedonic/emotional, social and flow experience components have f^2 values between 0.02 and 0.15, indicating small to moderate effect sizes on affective online IBT.

Regarding purchase intention with normal prices, the affective online IBT component explains 34.8% of the variance of normal price purchase intention (R^2 = 0.348, as seen inside the circle). This expresses an average explanation of the variable (Hair *et al*, 2011: 145). Path coefficient is significant from affective online IBT to normal price purchase intention (beta path coefficient = 0.590 and p=0.000) and f^2 = 0.534, indicating a large effect size.

Based on all the previous information, very valuable suppositions can be extracted. Functionality and perceived risk components are not drivers of online impulse buying tendency regarding mobile game microtransactions. Performance, hedonic/emotional, social and flow experience components are drivers of online impulse buying tendency regarding mobile game microtransactions, with small to moderate effects on impulse buying tendency. Flow experience and social components are the most significant drivers out of the four validated. Affective online IBT is also positively associated with a normal price purchase intention. These correlations are on par with the previously performed Spearman's rank correlation test seen on table 12.

This data would lead us to reject hypotheses 2 and 5 while accepting hypotheses 1, 3, 4, 6 and 7. Hypotheses 8 requires additional testing, to understand if there are significant changes in the scores between the normal and higher priced questions in the survey.

To measure the difference between purchase intention with normal and higher price, a Wilcoxon signed-rank test is employed. This is a non-parametric test used to compare related or equal samples and understand if their population mean ranks are different (Kerby, 2014). The variables used are the combined medians of the respondents of the three items for normal price purchase intention (called Combined Purchase Intention N Median) and the higher price purchase intention (called Combined Purchase Intention H Median). Tables 13 and 14 show the results for the Wilcoxon signed-rank test while figure 9 illustrates the differences in the results of both price types.

Ranks

		N	Mean Rank	Sum of Ranks
Combined Purchase Intention H Median - Combined Purchase Intention N Median	Negative Ranks	283[a]	142,41	40301,00
	Positive Ranks	1[b]	169,00	169,00
	Ties	17[c]		
	Total	301		

a. Combined Purchase Intention H Median < Combined Purchase Intention N Median

b. Combined Purchase Intention H Median > Combined Purchase Intention N Median

c. Combined Purchase Intention H Median = Combined Purchase Intention N Median

Table 13 - Wilcoxon rank test.

Test Statistics[a]

	Combined Purchase Intention H Median - Combined Purchase Intention N Median
Z	-14,898[b]
Asymp. Sig. (2-tailed)	,000

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

Table 14 - Wilcoxon significance test.

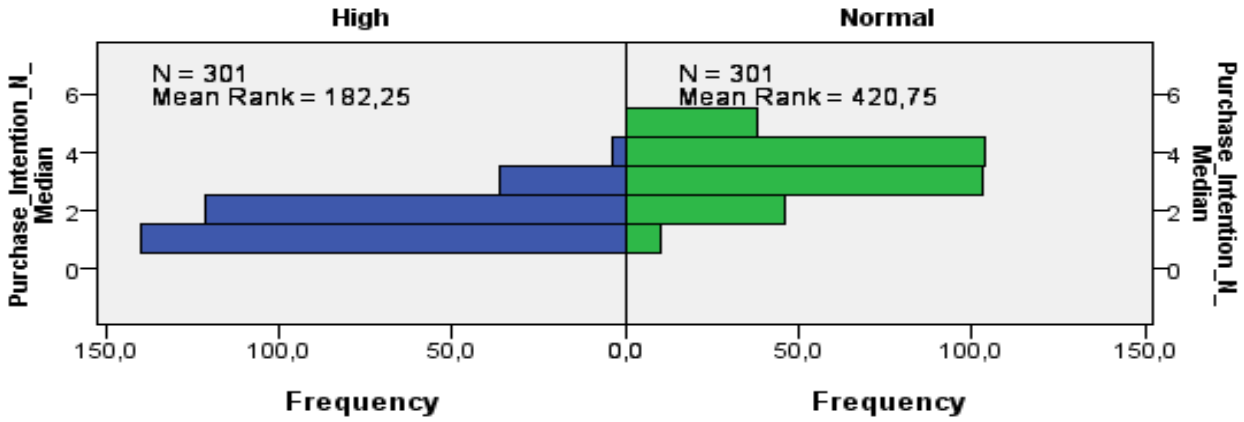


Figure 9 - Frequency comparison between normal and high price scenarios.

By interpreting the results, it is visible that negative ranks increased considerably from normal price purchase intention to higher price purchase intention (i.e. 283 respondents lowered their scores from a normal price purchase intention to a higher price purchase intention). The test is also significant (sig=0.000). This indicates a significant change from a normal price purchase intention to a higher price purchase intention, which in this case is negative. This hints that price does indeed have a moderating effect on purchase intention, since purchase intention decreases as price goes up (in this specific case, price increased by 5€/5$).

All analysis combined suggests that hypotheses 2 and 5 are to be rejected – Functionality and a low perceived risk are not positively associated with microtransaction impulse buying tendency of consumers. Hypotheses 1, 3, 4, 6, 7 and 8 on the other hand are feasible to be accepted – performance, social, hedonic/emotional and flow experience are positively associated with microtransaction impulse buying tendency of consumers; impulse buying tendency is positively associated with normal price purchase intention; and high microtransaction price points have a negative influence on purchase intention. A summary and the acceptance or rejection of the hypotheses can be viewed below on table 15.

H1: Microtransaction performance based content has a positive influence on microtransaction impulse buying tendency (IBT) of consumers.	Accepted
H2: Microtransaction functionality based content has a positive influence on microtransaction IBT of consumers.	Rejected
H3: Microtransaction hedonic/emotional personalization content has a positive influence on microtransaction IBT of consumers.	Accepted
H4: Microtransaction social personalization content has a positive influence on microtransaction IBT of consumers.	Accepted
H5: A perceived low microtransaction risk has a positive influence on microtransaction IBT of consumers.	Rejected
H6: A mobile game that provides a high flow experience leads to a positive influence on microtransaction IBT of consumers.	Accepted
H7: Impulse buying tendency is positively associated with normal price purchase intention.	Accepted
H8: High microtransaction price points have a negative influence on purchase intention.	Accepted

Table 15 - Hypotheses summary and respective outcomes.

6 – Conclusions

6.1 – Main research contributions

First and foremost, the lack of articles (to this date) to directly compare results with is a good indicator of the pertinence and relevance of the study conducted. In-game microtransaction studies have been scarce and their link with impulse buying had not been established before. Hence, this is the first contribution of the research conducted.

The results that surfaced seem to be on par with some conclusions of other previous studies of similar topics. On a more general level, flow experience – as seen on Wu et al (2016) – is also positively associated with an impulse buying tendency. The more immersive and enjoyable a mobile game is, the higher the tendency for impulse buying.

Regarding performance, functional, social and hedonic/emotional attributes, the findings seem to be in line with those of Yoo (2015). Social and emotional values are positively linked with purchase intention. Functional value however was not. In Yoo (2015), functional value considered both functional and performance attributes but in this case, these attributes have been divided. This could explain with more depth that functional attributes – those that don't give competitive advantages – are less prone to be purchased, more so regarding impulse buying. Performance attributes on the other hand, seem to be more appealing to gamers and associated with impulse buying. It is interesting to note that although the users of content that grant in-game advantages are seen negatively by other players (Evers, Van de Ven & Weeda, 2015), performance attributes are still a driver of impulse buying. It could be that the advantages gained in-game outweigh the risk of being negatively perceived by other individuals. If items with perceived value are more prone to be purchased (Yoo, 2015), then perhaps social, hedonic, and performance items have more value in the eyes of consumers, or at least contribute more to impulse buying.

The purchase drivers present in Lehdonvirta (2009) also seem to be in line with these findings. Apart from functional drivers, all other characteristics seem to be linked to impulse buying. The cosmetic drivers which have two different facets – hedonic and social – seem to be somewhat blurred in mobile gaming. Although they were examined apart in this study, an initial common factor analysis did couple the two components together in one factor. This is also another

possible point to be studied further – what is considered social and hedonic/emotional content and what distinguishes both. This could enable businesses to better offer content to suit player's needs.

Regarding perceived risk, it was not found to be negatively correlated with impulse buying. Another way to put it is that perceived risk does not seem to have an impact on mobile impulse buying, whether perceived risk is high or low. This could suggest that players might overlook possible risks when presented with content they like. This is in line with Chen and Zhang (2015), although other articles have showed different results (Yang, Liu, Li & Yu, 2015; Lee & Yi, 2008). Perceived risk of microtransactions can be studied further with a wider range of risks, perhaps more related to the actual games themselves and the buying process of microtransactions.

Looking at the price as a moderator of purchase intention, results showed that there was a clear drop in purchase intention with an increase of price. This follows Ekpe, Adubasim and Adim (2016) and Guo (2011) interpretations that reduced prices do seem to increase online purchase intention. Price however was not considered as a factor for impulse buying tendency, nor were promotions or discounts taken into account – a possible path to study eventually to discover the extend of these actions on purchase intentions and impulse buying behavior.

Overall, the results obtained appear to be auspicious. In a field where there is not yet much information available, promising ground was already covered in this study, which can hopefully lead to more in-depth and narrowed investigations into different microtransactions drivers, characteristics and to outline clearer definitions of certain aspects of mobile game content that are quite different compared to general online shopping.

There is now a link created between the main components of game microtransactions and impulse buying tendency. There is now information that is available to understand which components are more likely to induce impulse buying. Performance items, social content, hedonic/emotional objects and the flow experience of the game are important aspects to consider regarding impulse buying tendency. Functionality content was not found to be significantly correlated with impulse buying tendency. Moreover, a low perceived risk was also not associated with impulse buying tendency. Impulse buying tendency is correlated with purchase intention.

Also of interest is the fact that microtransaction prices appear to be somewhat important to consumers. As prices stand at present, intention to purchase is generally medium. By increasing

price in the order of the average purchase volume (≈ 5€/5$), intention to purchase is significantly reduced.

Other worthy contribution that have emerged from this research are the fact that most of the purchases seem to happen at the end of the day. Additionally, time between viewing of content and its purchase varies greatly from individual to individual.

6.2 – Managerial implications

There is now an established base for future mobile microtransaction studies with this investigation. Some very important suppositions can be drawn from this study that might allow businesses or managers to increase their efficiency on the point of sale for mobile microtransactions.

If the content intends to elicit more impulse buying, it is important to first assure that the software offers a good experience to the consumers. Since flow experience is correlated with impulse buying tendency and had the strongest link, the quality of the software games and the experiences it offers to consumers are important. With a stable software, a focus on performance content, social content and hedonic/emotional content should be applied to tempt consumers to perform impulse purchases.

Additionally, price points should remain consistently low for most of the previously mentioned content so as not to decrease purchase intention. Higher price points can perhaps be more sustainably achieved on functionality content, such as new levels or maps, since this type of content is not correlated with impulse buying tendency.

Finally, since perceived risk does not necessarily have to be low to lead to impulse buying tendency, a wide variety of content can be offered in-game and at different price ranges, keeping in mind that a sufficiently large enough price increase is detrimental to purchase intention.

6.3 – Limitations of the study

There are some limitations present in this forerunner investigation.

Firstly, the sample obtained for this study came from a set based on several criteria. This causes the sample to be deemed non-random and as such, it is hard to predict how efficiently it represents the real population – margin of error and confidence levels are hard to ascertain (Ochoa,

2017). Additionally, the survey was performed online which limits to some degree the control that can be have over the answers and the individuals answering them. It is also important to state is the circumstance of the survey being applied to all games that have microtransactions available. This indicates that results have a chance of fluctuating based on different games – some games might offer specific types of content while relinquishing others which would obviously reflect on survey answers. Two individuals who play totally different games, where one game offers mostly social content and the other mainly performance content, would be influenced in their answers about microtransaction purchase type.

A last limitation to be noted is that microtransaction prices also vary from game to game and depending on the type of content – this can make purchase intention differ from game to game or based on content type (a price increase of 5€ on a 0.50€ item is different than a 5€ price increase on a 10€ item). This again means that results can be influenced depending on the game. Another peculiar facet interesting to study can be price sensitivity – trying to understand just how sensitive consumers are to game content prices and what is the limit of a price increase that significantly reduces purchase intention.

6.4 – Future research suggestions

Looking at potential study avenues in the future, some routes can be highlighted.

Studying impulse purchases from the perspective of different types of games would be interesting. Different games have different emphasis on their playing style: some games are more competitive-oriented whilst others can be more social-oriented. The content each game offers will vary greatly but so will the potential impact the content can have on the game or the players. The scope of the game can therefore have an influence on the drivers that lead to impulse purchase and specific differences in microtransaction drivers could be highlighted for each type of game.

Additionally, perceived risk for mobile games in specific can also be investigated more intensely. The metric used in this study had into account the more important and significant risks with a mobile purchase but there is a possibility that performance risk and financial risk are not the only forms of risk or the most significant.

Also of interest to investigate would be the analysis of the duration of purchase time between the viewing of content and its actual purchase in order to identify and quantify what are actual impulse purchases being made.

Finally, the several drivers proposed in this study can also be studied independently or extended to include other types of potential drivers. As seen in the initial common factor analysis that was performed to extract factors with eigenvalues higher than 1, for example, social content and hedonic/emotional content were being grouped in the same factor. These details could be an interesting facet to study, as well as what other types of factors present in microtransaction could influence impulse buying tendency, such as item promotions, content exclusivity based on phone operators or other interesting designs.

The world of mobile games will undoubtedly continue to expand and offer new ways of entertainment. Individuals are now constantly connected online, through a big assortment of devices, and perform diverse tasks at a very fast pace. The ease of use and agility of online operations means that purchases can be made very quickly and, more importantly, without being planned for. It thus becomes important to understand how consumers react to different content types and adjust them so as to lead to more impulse purchasing.

This study has set out to create a starting point for microtransactions and their impulse buying drivers, specifically focusing on mobile software games. There are many new paths to take to expand this research and they can help clarify some of the unknow matters that are still in sight. The main microtransaction drivers have been identified and outlined, along with the role of price on purchase intention. Now it becomes important to either corroborate these results, study new microtransaction avenues or disprove the findings herein and identify what was erroneous, why and what is the optimal vision regarding microtransaction components and their main drivers regarding impulse buying.

References

Adelaar, T., Chang, S., Lancendorfer, K. M., Lee, B., & Morimoto, M. 2003. Effects of media formats on emotions and impulse buying intent. ***Journal of Information Technology***, 18(4): 247-266.

Arnold, M., & Reynolds, K. 2003. Hedonic shopping motivations. ***Journal of Retailing***, 79(2): 77-95.

Artz, B., & Kitcheos, A. 2016. Microtransactions – ***A study of consumer behavior and virtual goods/services among students at Linköping university in Sweden***. Unpublished bachelor dissertation, Linköping University – Department of Management and Engineering, Sweden.

Bauer, A. 1960. Consumer behavior as risk taking. In R.S. Hancock (Ed.), ***Dynamic Marketing for a Changing World***, Proceedings of the 43rd. conference of the american marketing association: 389-398.

Bertenthal, B. I. 2007. Dynamical systems: It's about time! In S. Boker & M. Wenger (Eds.), ***Data Analytic Techniques for Dynamical Systems***. Hillsdale, New Jersey: Erlbaum.

Bhatnagar, A., & Ghose, S. 2004a. A latent class segmentation analysis of e-shoppers. ***Journal of Business Research***, 57(7): 758-767.

Bhatnagar, A., & Ghose, S. 2004b. Segmenting consumers based on the benefits and risks of internet shopping. ***Journal of Business Research***, 57(12): 1352-1360.

Buettner, R. 2017. Predicting user behavior in electronic markets based on personality-mining in large online social networks: A personality-based product recommender framework. ***Electronic Markets: The International Journal on Networked Business***, 27(3): 247-265.

Business Insider. 2017. Global app revenue grows 40%. http://www.businessinsider.com/global-app-revenue-grows-40-2017-1. 14.09.2017.

Cambridge University Press. 2014. Micropayment noun - definition in the business english dictionary - Cambridge Dictionaries Online. http://dictionary.cambridge.org/dictionary/business-english/micropayment. 02.06.2014.

Chaffey, D. 2016. Mobile marketing statistics compilation. http://www.smartinsights.com/mobile-marketing/mobile-marketing-analytics/mobile-marketing-statistics/. 16.10.2016.

Chalk, A. 2014. League of legends has made almost $1 billion in microtransactions. http://www.pcgamer.com/league-of-legends-has-made-almost-1-billion-in-microtransactions/. 04.10.2016.

Chan, T. K. H., Cheung, C. M. K., & Lee, Z. W. Y. 2017. The state of online impulse-buying research: A literature analysis. ***Information & Management***, 54(2): 204-217.

Chang, H., & Wang, C. 2008. An investigation of user communication behavior in computer mediated environments. ***Computers in Human Behavior***, 24(5): 2336-2356.

Chen, A., Lu, Y., & Wang, B. 2016. Enhancing perceived enjoyment in social games through social and gaming factors. ***Information Technology & People***, 29(1): 99-119.

Chen, Y., & Zhang, L. 2015. Influential factors for online impulse buying in china: A model and its empirical analysis. ***International Management Review***, 11(2): 57-69.

Chiejing, C. 2013. Investigating new mutually beneficial business models for stake holders involved with electronic micropayments. ***International Journal of Global Business***, 6(1): 1-43.

Cho, J. 2004. Likelihood to abort an online transaction: Influences from cognitive evaluations, attitudes, and behavioral variables. ***Information & Management***, 41(7): 827-838.

Clason, Dennis L., & Dormody, Thomas J. 1994. Analyzing data measured by individual likert-type items. ***Journal of Agricultural Education***, 35(4): 31-35.

Cohen, J. 2013. ***Statistical power analysis for the behavioral sciences*** (2 ed.). Hoboken: Taylor and Francis.

Colagrossi, M. 2016. How microtransactions are evolving the economics of gaming. http://www.investopedia.com/articles/investing/022216/how-microtransactions-are-evolving-economics-gaming.asp. 03.10.2016.

Cortina, J.M. 1993. What is coefficient alpha? An examination of theory and applications. ***Journal of Applied Psychology***, 78: 98-104.

Cowley, R. 2017. 60% of all mobile gamers are men but number of women gamers is on the rise. http://www.pocketgamer.biz/news/65051/superdata-research-player-profiles/. 26.06.2017.

Davis, F. 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. ***Management Information Systems Quarterly***, 13(3): 319-340.

Developer Economics. 2016. Survey results h1 2016 – Mobile business models. https://www.developereconomics.com/graphs/de11#mobile-business-model. 26.10.2015.

Dincer, C. 2010. The influence of affect and cognition on impulse buying behavior, ***Öneri***, 9(33): 153-158.

Dowling, R., & Staelin, R. 1994. A model of perceived risk and intended risk-handling activity. ***Journal of Consumer Research***, 21(1): 119-134.

Drossos, D. A., Kokkinaki, F., Giaglis, G. M., & Fouskas, K. G. 2014. The effects of product involvement and impulse buying on purchase intentions in mobile text advertising. ***Electronic Commerce Research and Applications***, 13(6): 423-430.

Ekpe, I., Adubasim, E., & Adim, V. 2016. Effect of price, advertising and motivation on online purchase behaviors among youth academic entrepreneurs in Nigeria: social influence as moderator. ***International Journal of Entrepreneurship***, 20(1): 42-56.

eMarketer. 2016. Worldwide retail ecommerce sales will reach $1.915 trillion this year. https://www.emarketer.com/article/worldwide-retail-ecommerce-sales-will-reach-1915-trillion-this-year/1014369. 29.09.2016.

Evers, K., Van de Ven, N., & Weeda, D. 2015. The hidden cost of microtransactions: Buying in-game advantages in online games decreases a player's status. ***International Journal of Internet Science***, 10(1): 20-36.

Floh, A., & Madlberger, M. 2013. The role of atmospheric cues in online impulse-buying behavior. ***Electronic Commerce Research and Applications***, 12(6): 425-439.

Forsythe, S., Liu, C., Shannon, D., & Gardner, L. 2006. Development of a scale to measure the perceived benefits and risks of online shopping. ***Journal of Interactive Marketing***, 20(2): 55-75.

Freese, T. 2012. Microtransactions can benefit the player. http://www.leviathyn.com/2012/09/16/microtransactions-can-benefit-the-player/. 04.10.2016.

Garson, G. D. 2016. ***Partial least squares: Regression and structural equation models***. Asheboro, NC: Statistical Associates Publishers.

Gelles, D. 2009, May 02. Internet groups do battle for pennies. Financial Times. https://www.ft.com/content/a29b81f0-3675-11de-af40-00144feabdc0. 05.10.2016.

Ghasemi, A., & Zahediasl, S. 2012. Normality tests for statistical analysis: A guide for non-statisticians. ***International Journal of Endocrinology and Metabolism***, 10(2): 486-489.

Glover, S., & Benbasat, I. 2010. A comprehensive model of perceived risk of e-commerce transactions. ***International Journal of Electronic Commerce***, 15(2): 47-78.

Grewal, D., Monroe, K. B., & Krishnan, R. 1998. The effects of price-comparison advertising on buyers' perceptions of acquisition value, transaction value, and behavioral intentions. ***Journal of Marketing***, 62(2): 46-59.

Grubb, J. 2014. Report finds free-to-play microtransactions make up 79% of U.S. app store revenues. https://venturebeat.com/2014/02/21/report-finds-free-to-play-microtransactions-make-up-79-of-u-s-app-store-revenues/. 20.09.2017.

Guo, L. 2011. A research on influencing factors of consumer purchasing behaviors in cyberspace. ***International Journal of Marketing Studies***, 3(3): 182-188.

Guo, Y. & Barnes, S. 2012. Explaining purchasing behavior within world of warcraft. ***The Journal of Computer Information Systems***, 52(3): 18-30.

Guo, Y., & Barnes, S. 2009. Virtual item purchase behavior in virtual worlds: An exploratory investigation. ***Electronic Commerce Research***, 9(1-2): 77-96.

Guo, Y., & Barnes, S. 2007. Why people buy virtual items in virtual worlds with real money. ***ACM SIGMIS Database***, 38(4): 69-76.

Hair, J. F., Hult, Thomas M., Ringle, Christian M., & Sarstedt, Marko. 2017. ***A primer on partial least squares structural equations modeling (PLS-SEM)*** (2nd ed.). Thousand Oaks, CA: Sage Publications Ltd.

Hair, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. 2014. Partial least squares structural equation modeling (PLS-SEM). ***European Business Review***, 26(2): 106-121.

Hair, J. F., Ringle, C. M. & Sarstedt, M. 2011. PLS-sem: Indeed a silver bullet. ***The Journal of Marketing Theory and Practice***, 19(2): 139-151.

Hair, J. F., Black, William C., Babin, Barry J., & Anderson, R. E. 2010**.** ***Multivariate Data Analysis*** (7th ed.). Upper Saddle River, NJ: Prentice Hall.

Halim, P., Swasto, B., Hamid, D., & Firdaus, M. 2014. The influence of product quality, brand image, and quality of service to customer trust and implication on customer loyalty. ***European Journal of Business and Management***, 6(29): 159-166.

Hansen, T. 2005. Consumer adoption of online grocery buying: A discriminant analysis. ***International Journal of Retail & Distribution Management***, 33(2): 101-121.

Hassan, A., Kunz, M., Pearson, A., & Mohamed, F. 2006. Conceptualization and measurement of perceived risk in online shopping. ***The Marketing Management Journal***, 16(1): 138-147.

Hauser, R., Steiner, M., & Waidner, M. 1996. Micro-payments based on iKP. https://www.researchgate.net/publication/2669783_Micro-Payments_based_on_iKP. 04.10.2016.

Hausman, A. 2000. A multi-method investigation of consumer motivations in impulse buying behavior. ***Journal of Consumer Marketing***, 17(5): 403-426.

Henseler, J., Ringle, C. M., & Sarstedt, M. 2015. A new criterion for assessing discriminant validity in variance-based structural equation modeling. ***Journal of the Academy of Marketing Science***, 43(1): 115-135.

Henseler, J., Ringle, C. M., and Sinkovics, R. R. 2009. The use of partial least squares path modeling in international marketing. In R. R. Sinkovics & P. N. Ghauri (Eds.), ***Advances in International Marketing Bingley***: Emerald. 277-319.

Ho, V. 2013. Freemium is irresistible, even for successful game companies. https://techcrunch.com/2013/07/19/freemium-is-irresistable-even-for-successful-game-companies/. 30.10.2016.

Huang, X., Bao, J., Dai, X., Singh, E., Huang, W., & Huang, C. 2016. M&E-Netpay: A micropayment system for mobile and electronic commerce. ***Symmetry***, 8(8): 74.

IBM. 2017. Partial Least Squares Regression. https://www.ibm.com/support/knowledgecenter/en/SSLVMB_22.0.0/com.ibm.spss.statistics.help/spss/base/idh_idd_pls_variables.htm. 08.06.2017.

Jacoby, J., & Kaplan, B. 1972. The Components of Perceived Risk. ***Proceedings of the annual conference of the association for consumer research***, 10: 382-393.

Jones, M. A., Reynolds, K. E., Weun, S., & Beatty, S. E. 2003. The product-specific nature of impulse buying tendency. ***Journal of Business Research***, 56: 505-511.

Kapralos, B., Katchabaw, M., & Rajnovich, R. 2007. ***Proceedings of the 2007 conference on future play: November 14-17, 2007, Toronto, Canada***. New York, NY: ACM Press.

Karmali, L. 2013. Electronic arts building microtransactions into all future games. http://www.ign.com/articles/2013/02/27/electronic-arts-building-microtransactions-into-all-future-games. 30.10.2016.

Kerby, Dave. 2014. The simple difference formula: An approach to teaching nonparametric correlation. ***Comprehensive Psychology***, 3(1): 1-9.

Kim, D., & Benbasat, I. 2009. Trust-assuring arguments in B2C e-commerce: Impact of content, source, and price on trust. ***Journal of Management Information Systems***, 26(3): 175-206.

Kim, H., Hollingshead, S., & Wohl, M. 2017. Who spends money to play for free? Identifying who makes micro-transactions on social casino games (and why). ***Journal of Gambling Studies***, 33(2): 525-538.

Kim, S., & Eastin, M. 2011. Hedonic tendencies and the online consumer: An investigation of the online shopping process. ***Journal of Internet Commerce***, 10(1): 68-90.

Kock, N., & Lynn, G. S. 2012. Lateral collinearity and misleading results in variance-based SEM: An illustration and recommendations. ***Journal of the Association for Information Systems***, 13(7): 546-580.

Kokkonen, T. 2014. ***Microtransactions in an android game***. Unpublished bachelor dissertation, Karelia University of Applied Sciences, Finland.

Kułyk, P., & Michałowska, M. 2016. Consumer behaviour on the e-commerce market in the light of empirical research in Lubuskie Voivodeship. ***Management***, 20(1): 239-255.

Kurnia, A. 2013. ***Microtransaction practice in video games and its impact to consumer satisfaction***. Unpublished bachelor dissertation, University of Amsterdam, Netherlands.

Lee, G., & Yi, Y. 2008. The effect of shopping emotions and perceived risk on impulse buying: The moderating role of buying impulsiveness trait. ***Seoul Journal of Business***, 14(2): 67-92.

Lehdonvirta, V. 2009. Virtual item sales as a revenue model: Identifying attributes that drive purchase decisions. ***Electronic Commerce Research***, 9(1-2): 97-113.

Lehman, A. 2005. ***Jmp for basic univariate and multivariate statistics***: A step-by-step guide. Cary, NC: SAS Press.

Liu, Y., Li, H., & Hu, F. 2013. Website attributes in urging online impulse purchase: An empirical investigation on consumer perceptions. ***Decision Support Systems***, 55(3): 829-837.

Memon, A. H., & Rahman, I. A. 2014. Sem-Pls analysis of inhibiting factors of cost performance for large construction projects in malaysia: Perspective of clients and consultants. ***The Scientific World Journal***, 2014: 1-9.

Mills, M. 2016. Online publishers can't see a future in micropayments. Here's what they're missing. https://www.dprism.com/wp-content/uploads/2016/05/Micropayments_Report_dprism-2.pdf. 15.10.2015.

Moran, M. 2013. Fears over game microtransactions and the birth pangs of a post-stuff age. https://www.theguardian.com/commentisfree/2013/apr/15/moral-panic-in-app-purchases-post-stuff-age. 04.10.2016.

Munir, A. 2015. App monetization: 6 bankable business models that help mobile apps make money. http://info.localytics.com/blog/app-monetization-6-bankable-business-models-that-help-mobile-apps-make-money. 25.10.2016.

Muraven, M., Tice, D., & Baumeister, R. 1998. Self-control as limited resource: Regulatory depletion patterns. ***Journal of Personality and Social Psychology***, 74(3): 774-789.

Newlands, M. 2015. 8 ways to wring revenue from your mobile app. https://www.entrepreneur.com/article/251575. 25.10.2016.

Newman, R., Chang, V., Walters, R., & Wills, G. 2016. Web 2.0 – The past and the future. ***International Journal of Information Management***, 36(4): 591-598.

Newzoo. 2017. 2017 Global games market report. http://resources.newzoo.com/hubfs/Reports/Newzoo_Global_Games_Market_Report_2017_Light.pdf?utm_medium=email&_hsenc=p2ANqtz-_hJmtuE7YxSHDBdQ8yH-6PLuAxRJrSMIdp_nMqupu_k7FL5UBxUQqCxtPkVeZcfYoX5O-iBmh0o8QbJzj9ZY7GxA6jtQ&_hsmi=53391641&utm_content=53391903&utm_source

=hs_email&hsCtaTracking=b1e7ad0f-0367-47fe-af74-d25b087e0247%7C1f97673a-73fc-4014-ac26-8ed0a696bc2a. 21.09.2017

Newzoo. 2016a. 2016 Global games market report. http://resources.newzoo.com/hubfs/Reports/Newzoo_Free_2016_Global_Games_Market_Report.pdf?__hssc=133451409.2.1476785677552&__hstc=133451409.1de406c02cf81681eae10a0d6dbe028c.1476171587338.1476179320577.1476785677552.3&__hsfp=1782643335&hsCtaTracking=df924a51-0302-4d95-b440-56273fbce61b%7C4b95d366-0ad4-4d6d-b0b5-54e34fd454fb. 12.10.2016.

Newzoo. 2016b. The global games market reaches $99.6 billion in 2016, mobile generating 37%. https://newzoo.com/insights/articles/global-games-market-reaches-99-6-billion-2016-mobile-generating-37/. 29.10.2016.

Newzoo. 2016c. Biggest industry growth in five years: Game revenues of top 25 public companies jump 22% to $34.5bn in h1 2016. https://newzoo.com/insights/articles/game-revenues-of-top-25-public-companies-jump-22-to-34-5bn-in-h1-2016/. 39.10.2016.

Newzoo. 2016d. Mobile. https://newzoo.com/insights/segments/mobile/. 13.10.2016.

Nguyen, B., & Klaus, P. 2013. Retail fairness: Exploring consumer perceptions of fairness towards retailers' marketing tactics. ***Journal of Retailing and Consumer Services***, 20(3): 311-324.

Niranjanamurthy, M., Kavyashree, N., Jagannath, S., & Chahar, D. 2013. Analysis of e-commerce and m-commerce: Advantages, limitations and security issues. ***International Journal of Advanced Research in Computer Communication Engineering***, 2(6): 2360-2370.

Nunnally, J. C., & Bernstein, I. H. 1994. ***Psychometric theory***. New York: McGraw Hill.

Ochoa, C. 2017. Random and non-random sampling. https://www.netquest.com/blog/en/random-non-random-sampling. 05.09.2017.

Onebip. 2014. Gamers embrace microtransactions through mobile carrier billing. http://corporate.onebip.com/wp-content/uploads/2014/08/Gamers-Embrace-Microtransactions-press-release-PDF_Final_11Aug2014.pdf. 05.03.2017.

Orzil, F., & Andalécio, A. 2015. Confiança nas transações comerciais no meio digital: Abordagens e fundamentos. ***GESTÃO.Org - Revista Eletrônica de Gestão Organizacional***, 13(1): 1-10.

Osathanunkul, C. 2015. A classification of business models in video game industry. ***International Journal of Management Cases***, 17(1): 35-44.

Oxford Dictionaries. 2017. Impulse buying. https://en.oxforddictionaries.com/definition/impulse_buying. 27.06.2017.

Ozen, H., & Engizek, N. 2014. Shopping online without thinking: Being emotional or rational? ***Asia Pacific Journal of Marketing and Logistics***, 26(1): 78-93.

Palvia, P. 2009. The role of trust in e-commerce relational exchange: A unified model. ***Information & Management***, 46(4): 213-220.

Park, E., Kim, E., Funches, V., & Foxx, W. 2011. Apparel product attributes, web browsing, and e-impulse buying on shopping websites. ***Journal of Business Research***, 65(11): 1583-1589.

Paypal. 2016. You can earn more with micropayments. https://www.paypal.com/uk/webapps/mpp/micropayments. 05.11.2016.

Pou, R., Edmonson, B., Jaworski, D., & Gorman, K. 2007. Microtransactions using points over electronic networks. ***United States Patent Application Publication***, US 2007/0233568A1: 1-6.

PricewaterhouseCoopers. 2012. The evolution of video gaming and content consumption. http://www.pwc.com/us/en/industry/entertainment-media/publications/assets/pwc-video-gaming-and-content-consumption.pdf. 30.10.2016.

Randles, R., & Wolfe, D. 1991. ***Introduction to the theory of nonparametric statistics***. Malabar, Florida: R.E. Krieger.

Redman, J. 2016. Visa to test microtransactions with new developer platform. https://news.bitcoin.com/visa-set-to-test-microtransactions-with-new-developer-platform/. 15.08.2017.

Rhodes, W. 2015. How do free apps make money? http://savvyapps.com/blog/how-do-free-apps-make-money. 25.10.2016.

Roberts, J., & Manolis, C. 2012. Cooking up a recipe for self-control: The three ingredients of self-control and its impact on impulse buying. ***The Journal of Marketing Theory and Practice***, 20(2): 173-188.

Rook, D. W. 1987. The buying impulse. ***Journal of Consumer Research***, 14(2): 189-199.

Sarstedt, M., Ringle, C. M., Smith, D., Reams, R., & Hair, J. F. 2014. Partial least squares structural equation modeling (PLS-SEM): A useful tool for family business researchers. ***Journal of Family Business Research***, 5(1): 105-115.

Scholz, E. 2015a. Business models for digital goods: video games (free-to-play games). http://www.ipdigit.eu/2015/03/business-models-for-digital-goods-video-games-free-to-play-games/. 30.10.2016.

Scholz, E. 2015b. Business models for digital goods: video games (episodic games). http://www.ipdigit.eu/2015/03/business-models-for-digital-goods-video-games-episodic-games/. 30.10.2016.

Serafimov, D. 2015. Subscriptions vs micro-transactions: Comparing the major content monetization models. https://inplayer.com/2015/subscriptions-vs-micro-transactions-comparing-the-major-content-monetization-models/. 26.10.2016.

Sharma, P., Sivakumaran, B., & Marshall, R., 2010. Impulse buying and variety seeking: A trait-correlates perspective. ***Journal of Business Research***, 63(3): 276-283.

Sheth, J., Newman, B., & Gross, B. 1991. Why we buy what we buy: A theory of consumption values. ***Journal of Business Research***, 22(2): 159-170.

Statista. 2016a. Total and e-commerce value of u.s. retail trade sales from 2000 to 2014 (in billion u.s. Dollars). https://www.statista.com/statistics/185283/total-and-e-commerce-us-retail-trade-sales-since-2000/. 28.09.2016.

Statista. 2016b. Mobile e-commerce spending in the united states from 2nd quarter 2010 to 4th quarter 2015 (in billion u.s. dollars). https://www.statista.com/statistics/268439/quarterly-us-mobile-e-commerce-spending/. 29.09.2016.

Statista. 2016c. Apple app store: average app price 2016 | statistic. https://www.statista.com/statistics/267346/average-apple-app-store-price-app/. 04.10.2016.

Statista. 2016d. Microtransaction revenues gaming industry uk 2010-2014 | statistic. https://www.statista.com/statistics/529492/microtransaction-revnues-gaming-industry-statistic/ 04.10.2016.

Statista. 2016e. Average mobile app session length as of 4th quarter 2015, by category (in minutes). https://www.statista.com/statistics/202485/average-ipad-app-session-length-by-app-categories/. 30.10.2016.

Statista. 2016f. Value of the global video games market from 2011 to 2020 (in billion u.s dollars). https://www.statista.com/statistics/246888/value-of-the-global-video-game-market/. 31.10.2016.

Statista. 2016g. Global box office revenue from 2005 to 2015 (in billion u.s. dollars). https://www.statista.com/statistics/271856/global-box-office-revenue/. 31.10.2016.

Statista. 2016h. Global box office revenue from 2016 to 2020 (in billion u.s. dollars). https://www.statista.com/statistics/259987/global-box-office-revenue/. 01.11.2016.

Stephenson, T. 2015. ***Evaluating the brand equity of brands using the micro-transaction strategy in the video gaming industry through consumer perceptions***. Unpublished research thesis, Vega School of Brand Leadership, South Africa.

Su, Y.-S., Chiang, W.-L., Lee, C.-T., & Chang, H.-C. 2016. The effect of flow experience on player loyalty in mobile game application. ***Computers in Human Behavior***, 63: 240-248.

Suki, N., & Suki, N. 2007. Online buying innovativeness: Effects of perceived value, perceived risk and perceived enjoyment. ***International Journal of Business and Society***, 8(2): 81-93.

Sweeney, J., & Soutar, G. 2001. Consumer perceived value: The development of a multiple item scale. ***Journal of Retailing***, 77(2): 203-220.

Swrve. 2015. The swrve new players report. https://www.swrve.com/whitepapers/files/SWRVE-new_players-report-2015.pdf. 05.03.2017

Tassi, P. 2013. The ten commandments of microtransactions. Forbes. http://www.forbes.com/sites/insertcoin/2013/11/25/the-ten-commandments-of-microtransactions/#70aca2ca4eba. 13.12.2016.

Taute, H., & McQuitty, S. 2004. Feeling good! Going good! An exploratory look at the impulsive purchase of the social good. ***The Journal of Marketing Theory and Practice***, 12(2): 16-27.

Techopedia. 2017. Micropayment. https://www.techopedia.com/definition/13654/micropayment. 05.02.2017.

To, P.-L., Liao, C., & Lin, T.-H. 2007. Shopping motivations on internet: A study based on utilitarian and hedonic value. ***Technovation***, 27(12): 774-787.

Ueltschy, C., Krampf, F., & Yannopoulos, P. 2004. A cross-national study of perceived consumer risk towards online (internet) purchasing. ***Multinational Business Review***, 12(2): 59-82.

Urbach, N., & Ahlemann, F. 2010. Structural equation modeling in information systems research using partial least squares. ***Journal of Information Technology Theory and Application***, 11(2): 5-40.

U.S. Census Bureau News – U.S. Department of Commerce. 2016. Quarterly retail e-commerce sales. 2nd quarter 2016. http://www.census.gov/retail/mrts/www/data/pdf/ec_current.pdf. 05.10.2016.

Valadares, J. 2015a. Free-to-play revenue overtakes premium revenue in the app store. http://flurrymobile.tumblr.com/post/113367742230/free-to-play-revenue-overtakes-premium-revenue-in. 04.10.2016.

Valadares, J. 2015b. Consumers spend average of $14 per transaction in ios and android freemium games. http://flurrymobile.tumblr.com/post/113369382610/consumers-spend-average-of-14-per-transaction-in. 04.10.2016.

Valadares, J. 2015c. Freemium mobile gamers spend most money on items they don't keep. http://flurrymobile.tumblr.com/post/113370287600/freemium-mobile-gamers-spend-most-money-on-items. 04.10.2016.

Verhagen, T., & van Dolen, W. 2011. The influence of online store beliefs on consumer online impulse buying: A model and empirical application. ***Information & Management***, 48(8): 320-327.

Verplanken, B., & Herabadi, A. 2001. Individual differences in impulse buying tendency: Feeling and no thinking. ***European Journal of Personality***, 15(S1): 71-83.

Vohs, K., & Baumeister, R. 2010. ***Handbook of self-regulation: Research, theory, and applications*** (2nd ed.). New York: Guilford Publications.

Vohs, K., & Faber, R. 2007. Spent resources: Self-regulatory resource availability affects impulse buying. ***Journal of Consumer Research***, 33(4): 537-547.

Waltner, C. 1996. Turning pocket change to big dough on the net. ***Advertising Age***, 67(17): 22.

Wauters, R. 2007. Virtual goods: The next big business model. https://techcrunch.com/2007/06/20/virtual-goods-the-next-big-business-model/. 29.09.2016.

Webster, J., & Trevino, K. 1995. Rational and social theories as complementary explanations of communication media choices: Two policy-capturing studies. ***Academy of Management Journal***, 38(6): 1544-1572.

Wu, I., Chen, K., & Chiu, M. 2016. Defining key drivers of online impulse purchasing: A perspective of both impulse shoppers and system users. ***International Journal of Information Management***, 36(3): 284-296.

Xu, Y., & Huang, J.-S. 2014. Effects of price discounts and bonus packs on online impulse buying. ***Social Behavior and Personality***, 42(8): 1293-1302.

Yang, Y., Liu, Y., Li, H., & Yu, B. 2015. Understanding perceived risks in mobile payment acceptance. ***Industrial Management & Data Systems***, 115(2): 253-269.

Yoo, J. 2015. Perceived value of game items and purchase intentions. ***Indian Journal of Science and Technology***, 8(19).

Yu, C., & Bastin, M. 2010. Hedonic shopping value and impulse buying behavior in transitional economies: A symbiosis in the mainland china marketplace. ***Journal of Brand Management***, 18(2): 105-114.

Appendix

Survey questionnaire

[Page 1]

Survey – Mobile Game Content Drivers

In this survey, several questions regarding mobile game content will be presented.

Nowadays, the purchase of game content such as items, power-ups, add-ons or expansions - usually paying low fees for those purchases - has become a common trend in games, especially in mobile games.

The survey takes an estimated time between three and five minutes to complete. All data provided will be used for statistical purposes only and will not be shared with any person or entity whatsoever. Also, there will be no private information collected regarding your identity.

Your input is highly valuable! Please answer honestly and when in doubt, pick the answer that first came to your head.

Thank you for your time!

** Required*

For how long have you been playing mobile games? *

Less than a year. | One to three years. | Over three years.

For how long do you play mobile games on a weekly basis? *

Less than two hours. | Two to seven hours. | Seven or more hours.

Have you ever purchased any type of in-game mobile content? (i.e. game items, expansions, add-ons, power-ups, etc.) *

Yes | No

Please answer the following questions about yourself using a scale from 1 to 5, with 1 representing something you 'strongly disagree' with and 5 something you 'strongly agree' with. * [Order of questions is randomized every time for each survey response.]

1 – Strongly Disagree | 2 – Disagree | 3 – Undecided | 4 – Agree | 5 – Strongly Agree

It is a struggle to leave nice items/content I see in a game shop.

I sometimes cannot suppress the feelings of wanting to buy something.

I sometimes feel guilty after having bought something.

I am the kind of person who 'falls in love at first sight' with content I see in game shops.

I can become very excited if I see something I would like to buy.

I always see something nice whenever I browse game shops.

I find it difficult to pass up a bargain deal.

If I see something new, I want to buy it.

I am a bit reckless in buying things.

I sometimes buy things because I like buying things, not because I need them.

I often buy game content that allows me to perform better in-game.

I enjoy buying items that give me advantages over other players.

For the most part, I buy items that make my game or character stronger.

I regularly purchase new items or abilities that allow me to do new things on the game or reach new areas/levels.

I enjoy buying new game content that expands the story.

Additional episodes or levels for games are something I see myself buying often.

I enjoy buying items that will make my character look nice and stylish.

I will often buy items to customize my game world and make it unique.

I regularly buy content that will enhance my game experience and make it more memorable and fantastic.

I will quickly buy rare or unique game items or content.

I often buy uncommon or exclusive items/content to stand out from other players.

Items that make me popular or create attention are my favorite kind.

I might lose money if I buy mobile game content that I am unfamiliar with.

I am concerned that my financial records might not be adequately protected if I purchase mobile game content.

The mobile game content I purchase does not perform/work as expected.

Games that I like lead me to buy extra content for them often.

I am likely to buy extra content for a mobile game if I am immersed in it.

A good and enjoyable game makes me want to buy items and content to play on it.

[Page 2]

Final Part of the Survey (1/2)

To end the survey, you will be asked three questions regarding your favorite mobile game(s), according to two different scenarios. In the first scenario, keeping the prices of your favorite mobile game(s) content (items, add-ons, power-ups, expansions) in mind, please respond to the following three questions:

I will purchase content for the game(s). *

Almost Never True – 1 | 2 | 3 | 4 | 5 – Almost Always True

I will buy content for the game(s) in the near future. *

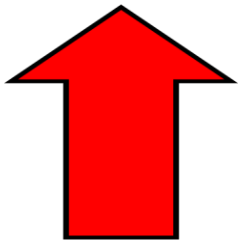
Almost Never True – 1 | 2 | 3 | 4 | 5 – Almost Always True

I will purchase content for the game(s) the next time I need to. *

Almost Never True – 1 | 2 | 3 | 4 | 5 – Almost Always True

[Page 3]

Final Part of the Survey (2/2)



5 € | $

Now for the second scenario, assume that the price of those items, add-ons, power-ups and expansions in your favorite mobile game(s) have increased by an average of 5€/5$. Please respond to the same questions:

I will purchase content for the game(s) if the prices have increased by an average of 5€/5$. *

Almost Never True – 1 | 2 | 3 | 4 | 5 – Almost Always True

I will buy content for the game(s) in the near future if their price has increased by an average of 5€/5$. *

Almost Never True – 1 | 2 | 3 | 4 | 5 – Almost Always True

I will purchase content for the game(s) the next time I need to, despite the prices increasing an average of 5€/5$. *

Almost Never True – 1 | 2 | 3 | 4 | 5 – Almost Always True

[Page 4]

To finish, please enter some general demographic/segmentation information about your person.

How much time passes between your interest in a game shop content and its actual purchase? *

0-5 minutes. | 5-15 minutes. | 15-60 minutes. | Over an hour.

At what time of the day do you usually perform your mobile game purchases? *

Beginning of the day. | Middle of the day. | End of the day.

Age (please use numbers when responding) *

Gender *

Male | Female

Education Level *
Please select the option that most closely resembles your own completed level.

None | Primary School | High School/Secondary School | Professional Degree / Polytechnic Degree | University Degree – Bachelor | Postgraduate – Master or PhD

Country *

Employment Status *

Unemployed | Student | Employed

---------- End of Survey ----------

Thank you for your input and time! Your responses have been saved. If you know other friends, people or communities that also play mobile games and have purchased content for those games in the past, please feel free to share this survey with them.

Data analysis tables (SPSS and SmartPLS 3)

Component correlations (SPSS)

Correlations

			Combined Affective Online IBT Scale Median	Combined Performance Median	Combined Functionality Median	Combined Hedonic/Emotional Median	Combined Social Median	Combined Perceived Risk Median	Combined Flow Experience Median	Combined Purchase Intention N Median	Combined Purchase Intention H Median
Spearman's rho	Combined Affective Online IBT Scale Median	Correlation Coefficient	1,000	,442**	-,010	,557**	,600**	-,057	,590**	,557**	,387**
		Sig. (2-tailed)	.	,000	,869	,000	,000	,323	,000	,000	,000
		N	301	301	301	301	301	301	301	301	301
	Combined Performance Median	Correlation Coefficient	,442**	1,000	,060	,452**	,473**	-,111	,519**	,366**	,245**
		Sig. (2-tailed)	,000	.	,296	,000	,000	,055	,000	,000	,000
		N	301	301	301	301	301	301	301	301	301
	Combined Functionality Median	Correlation Coefficient	-,010	,060	1,000	,114*	-,138*	-,167**	,197**	-,015	,077
		Sig. (2-tailed)	,869	,296	.	,048	,016	,004	,001	,790	,185
		N	301	301	301	301	301	301	301	301	301
	Combined Hedonic/Emotional Median	Correlation Coefficient	,557**	,452**	,114*	1,000	,653**	-,058	,598**	,409**	,245**
		Sig. (2-tailed)	,000	,000	,048	.	,000	,315	,000	,000	,000
		N	301	301	301	301	301	301	301	301	301
	Combined Social Median	Correlation Coefficient	,600**	,473**	-,138*	,653**	1,000	,000	,521**	,496**	,293**
		Sig. (2-tailed)	,000	,000	,016	,000	.	,998	,000	,000	,000
		N	301	301	301	301	301	301	301	301	301
	Combined Perceived Risk Median	Correlation Coefficient	-,057	-,111	-,167**	-,058	,000	1,000	-,195**	-,039	-,039
		Sig. (2-tailed)	,323	,055	,004	,315	,998	.	,001	,503	,502
		N	301	301	301	301	301	301	301	301	301
	Combined Flow Experience Median	Correlation Coefficient	,590**	,519**	,197**	,598**	,521**	-,195**	1,000	,419**	,272**
		Sig. (2-tailed)	,000	,000	,001	,000	,000	,001	.	,000	,000
		N	301	301	301	301	301	301	301	301	301
	Combined Purchase Intention N Median	Correlation Coefficient	,557**	,366**	-,015	,409**	,496**	-,039	,419**	1,000	,694**
		Sig. (2-tailed)	,000	,000	,790	,000	,000	,503	,000	.	,000
		N	301	301	301	301	301	301	301	301	301
	Combined Purchase Intention H Median	Correlation Coefficient	,387**	,245**	,077	,245**	,293**	-,039	,272**	,694**	1,000
		Sig. (2-tailed)	,000	,000	,185	,000	,000	,502	,000	,000	.
		N	301	301	301	301	301	301	301	301	301

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 16 - Component correlations matrix.

Common factor analysis (Eigenvalue of 1) (SPSS)

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,913
Bartlett's Test of Sphericity	Approx. Chi-Square	4589,489
	df	378
	Sig.	,000

Table 17 - KMO and Bartlett's test for common factor analysis (Eigenvalue of 1).

Total Variance Explained

	Initial Eigenvalues			Rotation Sums of Squared Loadings[a]
Factor	Total	% of Variance	Cumulative %	Total
1	9,821	35,074	35,074	6,915
2	2,893	10,332	45,406	2,264
3	1,650	5,894	51,300	5,150
4	1,608	5,743	57,043	1,434
5	1,365	4,875	61,918	6,719
6	1,006	3,592	65,510	4,985
7	,836	2,985	68,495	
8	,756	2,701	71,196	
9	,708	2,528	73,723	
10	,677	2,417	76,140	
11	,627	2,240	78,381	
12	,608	2,170	80,550	
13	,580	2,072	82,623	
14	,537	1,917	84,540	
15	,494	1,763	86,303	
16	,412	1,471	87,774	
17	,402	1,435	89,208	
18	,373	1,334	90,542	
19	,362	1,293	91,835	
20	,343	1,226	93,061	
21	,338	1,207	94,268	
22	,318	1,136	95,404	
23	,268	,956	96,359	
24	,252	,900	97,260	
25	,235	,838	98,097	
26	,196	,699	98,797	
27	,178	,637	99,434	
28	,158	,566	100,000	

Extraction Method: Principal Axis Factoring.

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

Table 18 - Extracted factors and explained variance of common factor analysis (Eigenvalue of 1).

Pattern Matrix[a]

	Factor					
	1	2	3	4	5	6
It is a struggle to leave nice items/content I see in a game shop.	,649					
I sometimes cannot suppress the feelings of wanting to buy something.	,782					
I sometimes feel guilty after having bought something.	,563					
I am the kind of person who 'falls in love at first sight' with content I see in game shops.	,631					
I can become very excited if I see something I would like to buy.	,664					
I always see something nice whenever I browse game shops.	,295					
I find it difficult to pass up a bargain deal.	,515					
If I see something new, I want to buy it.	,573					
I am a bit reckless in buying things.	,556					
I sometimes buy things because I like buying things, not because I need them.	,302				-,267	
I often buy game content that allows me to perform better in-game.			,772			
I enjoy buying items that give me advantages over other players.			,806			
For the most part, I buy items that make my game or character stronger.			,751			
I regularly purchase new items or abilities that allow me to do new things on the game or reach new areas/levels.		,722				
I enjoy buying new game content that expands the story.		,753				
Additional episodes or levels for games are something I see myself buying often.		,799				
I enjoy buying items that will make my character look nice and stylish.					-,626	
I will often buy items to customize my game world and make it unique.					-,779	
I regularly buy content that will enhance my game experience and make it more memorable and fantastic.					-,805	
I will quickly buy rare or unique game items or content.					-,448	
I often buy uncommon or exclusive items/content to stand out from other players.		-,256			-,521	
Items that make me popular or create attention are my favourite kind.		-,300			-,534	
I might lose money if I buy mobile game content that I am unfamiliar with.				,628		
I am concerned that my financial records might not be adequately protected if I perform mobile game microtransactions.				,700		
The mobile game content I purchase does not perform/work as expected.				,554		
Games that I like lead me to buy extra content for them often.						-,626
I am likely to buy extra content for a mobile game if I am immersed in it.						-,681
A good and enjoyable game makes me want to buy items and content to play on it.						-,603

Extraction Method: Principal Axis Factoring.
Rotation Method: Oblimin with Kaiser Normalization.[a]

a. Rotation converged in 13 iterations.

Table 19 - Pattern matrix of common factor analysis (Eigenvalue of 1).

Factor Correlation Matrix

Factor	1	2	3	4	5	6
1	1,000	-,060	,424	,045	-,573	-,379
2	-,060	1,000	,024	-,218	,042	-,158
3	,424	,024	1,000	-,018	-,439	-,422
4	,045	-,218	-,018	1,000	-,071	,136
5	-,573	,042	-,439	-,071	1,000	,447
6	-,379	-,158	-,422	,136	,447	1,000

Extraction Method: Principal Axis Factoring.
Rotation Method: Oblimin with Kaiser Normalization.

Table 20 - Factor correlation matrix for common factor analysis (Eigenvalue of 1).

Common factor analysis (7 factors extraction) (SPSS)

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,913
Bartlett's Test of Sphericity	Approx. Chi-Square	4589,489
	df	378
	Sig.	,000

Table 21 - KMO and Bartlett's test for common factor analysis (7 factors extraction).

Total Variance Explained

	Initial Eigenvalues			Rotation Sums of Squared Loadings[a]
Factor	Total	% of Variance	Cumulative %	Total
1	9,821	35,074	35,074	6,376
2	2,893	10,332	45,406	2,318
3	1,650	5,894	51,300	4,634
4	1,608	5,743	57,043	1,423
5	1,365	4,875	61,918	5,142
6	1,006	3,592	65,510	5,975
7	,836	2,985	68,495	6,057
8	,756	2,701	71,196	
9	,708	2,528	73,723	
10	,677	2,417	76,140	
11	,627	2,240	78,381	
12	,608	2,170	80,550	
13	,580	2,072	82,623	
14	,537	1,917	84,540	
15	,494	1,763	86,303	
16	,412	1,471	87,774	
17	,402	1,435	89,208	
18	,373	1,334	90,542	
19	,362	1,293	91,835	
20	,343	1,226	93,061	
21	,338	1,207	94,268	
22	,318	1,136	95,404	
23	,268	,956	96,359	
24	,252	,900	97,260	
25	,235	,838	98,097	
26	,196	,699	98,797	
27	,178	,637	99,434	
28	,158	,566	100,000	

Extraction Method: Principal Axis Factoring.

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

Table 22 - Extracted factors and explained variance of common factor analysis (7 factors extracted).

Factor Correlation Matrix

Factor	1	2	3	4	5	6	7
1	1,000	-,044	,458	,048	,399	,439	,450
2	-,044	1,000	,029	-,210	,084	,289	-,131
3	,458	,029	1,000	,071	,300	,376	,485
4	,048	-,210	,071	1,000	-,016	-,158	,084
5	,399	,084	,300	-,016	1,000	,452	,485
6	,439	,289	,376	-,158	,452	1,000	,516
7	,450	-,131	,485	,084	,485	,516	1,000

Extraction Method: Principal Axis Factoring.
Rotation Method: Oblimin with Kaiser Normalization.

Table 23 - Factor correlation matrix for common factor analysis (7 factors extracted).

SmartPLS 3 analysis graphs (initial model (10 item IBT component))

	Affective Online IBT	Flow Experience	Functionality	Hedonic/Emotional	Perceived Risk	Performance	Purchase Intention NP	Social
Affective_Online_IBT_Scale_1	0.759							
Affective_Online_IBT_Scale_10	0.472							
Affective_Online_IBT_Scale_2	0.829							
Affective_Online_IBT_Scale_3	0.656							
Affective_Online_IBT_Scale_4	0.812							
Affective_Online_IBT_Scale_5	0.777							
Affective_Online_IBT_Scale_6	0.638							
Affective_Online_IBT_Scale_7	0.767							
Affective_Online_IBT_Scale_8	0.648							
Affective_Online_IBT_Scale_9	0.581							
Flow_Experience_1		0.913						
Flow_Experience_2		0.882						
Flow_Experience_3		0.907						
Functionality_1			0.852					
Functionality_2			0.868					
Functionality_3			0.857					
Hedonic_Emotional_1				0.873				
Hedonic_Emotional_2				0.916				
Hedonic_Emotional_3				0.906				
Perceived_Risk_1					0.763			
Perceived_Risk_2					0.791			
Perceived_Risk_3					0.755			
Performance_1						0.884		
Performance_2						0.871		
Performance_3						0.859		
Purchase_Intention_N1							0.916	
Purchase_Intention_N2							0.911	
Purchase_Intention_N3							0.871	
Social_1								0.823
Social_2								0.911
Social_3								0.884

Table 24 - SmartPLS 3 outer loadings (10 item IBT component).

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Affective Online IBT	0.880	0.905	0.493
Flow Experience	0.884	0.928	0.812
Functionality	0.823	0.894	0.738
Hedonic/Emotional	0.881	0.926	0.808
Perceived Risk	0.655	0.813	0.592
Performance	0.841	0.904	0.759
Purchase Intention NP	0.881	0.927	0.809
Social	0.844	0.906	0.763

Table 25 - Construct reliability and validity (10 item IBT component).

SmartPLS 3 analysis graphs (revised model (9 item IBT component))

	Affective Online IBT	Flow Experience	Functionality	Hedonic/Emotional	Perceived Risk	Performance	Purchase Intention NP	Social
Affective_Online_IBT_Scale_1	0.768							
Affective_Online_IBT_Scale_2	0.833							
Affective_Online_IBT_Scale_3	0.653							
Affective_Online_IBT_Scale_4	0.816							
Affective_Online_IBT_Scale_5	0.788							
Affective_Online_IBT_Scale_6	0.653							
Affective_Online_IBT_Scale_7	0.779							
Affective_Online_IBT_Scale_8	0.654							
Affective_Online_IBT_Scale_9	0.585							
Flow_Experience_1		0.913						
Flow_Experience_2		0.882						
Flow_Experience_3		0.907						
Functionality_1			0.852					
Functionality_2			0.868					
Functionality_3			0.857					
Hedonic_Emotional_1				0.873				
Hedonic_Emotional_2				0.916				
Hedonic_Emotional_3				0.906				
Perceived_Risk_1					0.763			
Perceived_Risk_2					0.791			
Perceived_Risk_3					0.755			
Performance_1						0.884		
Performance_2						0.871		
Performance_3						0.859		
Purchase_Intention_N1							0.916	
Purchase_Intention_N2							0.911	
Purchase_Intention_N3							0.871	
Social_1								0.823
Social_2								0.911
Social_3								0.884

Table 26 - SmartPLS 3 outer loadings (revised model).

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Affective Online IBT	0.887	0.910	0.533
Flow Experience	0.884	0.928	0.812
Functionality	0.823	0.894	0.738
Hedonic/Emotional	0.881	0.926	0.808
Perceived Risk	0.655	0.813	0.592
Performance	0.841	0.904	0.759
Purchase Intention NP	0.881	0.927	0.809
Social	0.844	0.906	0.763

Table 27 - Construct reliability and validity (revised model).

	Affective Online IBT	Flow Experience	Functionality	Hedonic/Emotional	Perceived Risk	Performance	Purchase Intention NP	Social
Affective Online IBT								
Flow Experience	0.690							
Functionality	0.142	0.327						
Hedonic/Emotional	0.704	0.709	0.149					
Perceived Risk	0.091	0.165	0.241	0.077				
Performance	0.589	0.567	0.125	0.580	0.072			
Purchase Intention NP	0.667	0.504	0.050	0.525	0.065	0.467		
Social	0.713	0.626	0.205	0.785	0.126	0.559	0.577	

Table 28 - Discriminant validity - Heterotrait-Monotrait Ratio (HTMT) (revised model).

	Affective Online IBT	Flow Experience	Functionality	Hedonic/Emotional	Perceived Risk	Performance	Purchase Intention NP	Social
Affective Online IBT							0.534	
Flow Experience	0.091							
Functionality	0.006							
Hedonic/Emotional	0.040							
Perceived Risk	0.001							
Performance	0.035							
Purchase Intention NP								
Social	0.045							

Table 29 - Effect size (f^2) (revised model).

	Outer VIF
Affective_Online_IBT_Scale_1	2.124
Affective_Online_IBT_Scale_2	2.729
Affective_Online_IBT_Scale_3	1.558
Affective_Online_IBT_Scale_4	2.536
Affective_Online_IBT_Scale_5	2.220
Affective_Online_IBT_Scale_6	1.618
Affective_Online_IBT_Scale_7	2.137
Affective_Online_IBT_Scale_8	1.501
Affective_Online_IBT_Scale_9	1.351
Flow_Experience_1	2.825
Flow_Experience_2	2.190
Flow_Experience_3	2.718
Functionality_1	1.792
Functionality_2	1.938
Functionality_3	1.834
Hedonic_Emotional_1	2.067
Hedonic_Emotional_2	2.952
Hedonic_Emotional_3	2.753
Perceived_Risk_1	1.269
Perceived_Risk_2	1.341
Perceived_Risk_3	1.245
Performance_1	2.152
Performance_2	2.010
Performance_3	1.874
Purchase_Intention_N1	2.984
Purchase_Intention_N2	2.884
Purchase_Intention_N3	2.035
Social_1	1.634
Social_2	2.863
Social_3	2.531

Table 30 - Outer variance inflation factor (VIF) (revised model).

	Affective Online IBT	Flow Experience	Functionality	Hedonic/Emotional	Perceived Risk	Performance	Purchase Intention NP	Social
Affective Online IBT							1.000	
Flow Experience	2.117							
Functionality	1.337							
Hedonic/Emotional	2.376							
Perceived Risk	1.065							
Performance	1.471							
Purchase Intention NP								
Social	2.429							

Table 31 - Inner variance inflation factor (VIF) (revised model).