

Determinants of access-based hedonic IT consumption in online gaming

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Preface

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Executive Summary

Access-based consumption is gaining traction in many different areas of business. Utilitarian and hedonic products and services are increasingly in the access-based form to complement or disrupt ownership-based business models. Research in this area is scarce, but increasing, as the prevalence of access-based consumption is expected to increase because of technological advances and societal preferences.

Hedonic access-based consumption, in particular, is increasing because of the new technological possibilities and facilitating conditions that make it possible to digitize services and products. This thesis investigates the motivations of importance to consuming access-based gaming, which has gotten increased attention in the last two years. Therefore the research attempts to answer the question of what exactly the main drivers for access-based gaming consumption are amongst gamers in Europe and North-America.

Conceptual frameworks from technology acceptance models, unifying theory of acceptance and use of technology and theory of planned behavior are used combined with findings from previous access-based research to form a conceptual model that predicts that the burden of ownership, perceived enjoyment, perceived ease of use, subjective norm, facilitating conditions and price value are the main drivers of access-based gaming.

Additionally, experience in both access-based gaming and hedonic access-based consumption is tested to investigate whether it moderates the relationship between perceived enjoyment, facilitating conditions, and price value and access-based gaming. Finally, an experiment is conducted to advance the understanding of access-based services that function as platforms and to research the importance of within-user network benefits in access based gaming.

A research design is conducted with a survey that contains robust scales from relevant literature and an experiment where three different treatments are applied. A total of 745 respondents were sampled from Amazon Mechanical Turk of which 394 were valid. Consequently, the relationships were tested with regression models and relevant within-subject and between-subject tests.

The conceptual model is proven to be a good predictor of usage intention by explaining 44.1% with all direct constructs statistically significant predictors of usage intention. Perceived enjoyment is the most important predictor followed by roughly equal explanatory values of facilitating conditions, subjective norm, price value, and ease of use. Finally, the burden of

ownership is a statistically significant effect, albeit lower in explanatory value. The moderating relationships are found to be not significant in any of the regression models.

Finally, network effects are shown to be of importance to access-based gaming with respect to consumers not losing network benefits they are currently enjoying with ownership-based platforms giving guidance to Apple, Google, Sony, Nvidia, and Microsoft all entering and expanding access-based gaming business models.

The results advance the understanding of access-based models both in an academic and managerial context. Increased understanding in this field of business is valuable because of the rapid proliferation of access-based products and services, but, ultimately, more research will need to be conducted.

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1. Introduction

In recent years, access-based consumption has been on the rise (Lawson *et al.*, 2016). However, this alternative way of consuming goods and services is not new but is being applied in many new and different contexts. Access-based consumption distinguishes itself from ownership, through the fact that there is no transfer of property taking place (Bardhi & Eckhardt, 2017). Rifkin (2000) was the first to report it in the context of business to business markets. Though, it has been stigmatized for a long time and seen as an inferior mode of consumption (Ronald, 2008). A common view was that access-based consumption would be wasteful, financially inferior, and limiting an individual's freedom (Rowlands & Gurney, 2000). When used in the past, it was seen as useful for public goods, such as museums and libraries (Chen, 2009).

The stigmatization of access-based consumption has changed reduced in recent years, with a proliferation of new companies and businesses utilizing access-based consumption in their products and services (Belk, 2014). While sharing is not a new concept in any way, as it has been utilized for many centuries, collaborative consumption and access-based goods and services are growing in popularity (Belk, 2014). Ownership is not seen as the ultimate desire of consumers anymore. In many industries, large parts of the consumers prefer access without ownership, through sharing, pooling, short term renting, or subscription-based models (Chen, 2009; Bardhi & Eckhardt 2017). Ultimately, access can potentially provide many of the same values that ownership can provide with immaterial aspects and experiences that enhance an individual's life (Chen, 2009).

The music industry is one of the industries that has been severely disrupted by streaming platforms. At streaming platforms, the individual does not own any songs but has access to almost all of them. Similarly, this is the case within the TV and movie industry, where consumers are shifting from buying products to own them, to paying a fee to have access to platforms offering them. More examples can be found in car-sharing (e.g., Greenwheel, Car2go, SnappCar), housing and renting (e.g., Airbnb, PodHome), computing (e.g., Amazon Webservices, Microsoft), storage (e.g., Dropbox, Google, Amazon) and many other new businesses that launch around these concepts or change their existing strategy to incorporate access-based consumption.

It is hypothesized that not many industries are immune to the changing trend in consumer preferences and changing market environment (Belk, 2014). A study conducted by PwC

estimates an increase in access-based consumption revenues globally, from \$15 billion in 2014 to over \$300 billion as recent as 2025 (Osztoivits *et al.*, 2015). These new trends have given rise to new dimensions of consumption characterized as either solid or liquid consumption (Bardhi & Eckhardt, 2017). In this respect, liquid consumption is characterized as ephemeral, access-based, dematerialized, whereas solid consumption is enduring and ownership-based (Bardhi & Eckhardt, 2017). This distinction can be used to explain some of the changing market environments in which companies and entire industries will operate.

More recently, the gaming industry is in the process of being disrupted by access-based consumption. New services such as Google Stadia and Nvidia Geforce Now have been launched in 2019 and 2020, respectively (Kleinman & Lee, 2019; Baraniuk, 2020). Other potential providers are refocusing their efforts as well. Apple announced in August 2020, a renewed focus on its access-based gaming service by providing it as a complement to the other access-based services it provides (Gurman, 2020). Additionally, more traditional ownership-based providers attempt an ambidextrous model where the games are monetized in access-based as well as ownership-based form. Both PlayStation and Xbox, critical players in the gaming industry, are expanding PlayStation Now and launching projects like xCloud next to their traditional offerings (Xbox.com, 2020; PlayStation.com, 2020). Similarly to other access-based consumption products and services, this new business model is fueled by technological advances and digital technology with the emergence of faster and more stable internet connections and the soft launch of next-generation 5G internet (Kelion, 2019).

While considering these insights, this thesis will attempt to address the following research question based upon a gap in the scientific literature: ***What are the main drivers for access-based consumption in the gaming industry amongst consumers?***

1.1 Relevance and goals

Research on access-based consumption is relatively limited, particularly in the emerging, new hedonic products and services that are being launched, such as gaming services. Since gaming is only recently introduced to this mode of consumption (Kleinman & Lee, 2019; Baraniuk, 2020), there is an even more significant research gap in this particular context. Bardhi & Eckhardt (2012) argue that different consumptionscapes in different contexts vary across several dimensions. Therefore, the research objectives of this thesis aim to contribute both to managerial and scientific contributions to the field of access-based consumption.

Firstly, it aims to provide more insight into hedonic access-based consumption products and services by expanding on previous research into a new context. Research amongst utilitarian access-based consumption and specific hedonistic access-based consumption like music, TV, and movies have been conducted in recent years (Bardhi & Eckhardt, 2012; Sinclair & Tinson, 2017). However, different consumptionscapes can lead to different preferences (Bardhi & Eckhardt 2017). Identifying these factors is expected to help researchers and theoreticians gaining a better understanding of this relatively new mode of consumption in a new context.

Secondly, it attempts to provide further insight into intention-based models for adoption in new information systems in a different context. Constructs from the unifying theory of acceptance and use of technology and technology acceptance are tested to advance the understanding and robustness of these models in a new hedonic context (Davis, 1989; Venkatesh, 2012).

Thirdly, the study aims to provide insight into how network effects affect the relationship between adopting and prolonged usage intention of access-based consumption. Insights into networking effects can potentially contribute towards an increased understanding in a new context of technology adoption as well as provide a strategic context in the gaming business environment. Current models of technology adoption omit network effects entirely, which potentially can be a contribution to information systems and technology innovations where users derive value from other users.

Furthermore, the thesis aims to provide insight for managers, CEOs, and strategic officers of current and prospective businesses operating in the gaming industry. Strategic insights could prove to be very valuable since the gaming industry is a vastly growing sector with growth figures between 9-12% in recent years (Newzoo, 2019b) and 12% forecasted yearly for the period 2020-2025 (Newzoo, 2019b). The annual revenues of the gaming market are projected to exceed 152 billion dollars in 2020, making it a larger market than the movie- and music industry combined with a respective 38 and 57 billion dollars in 2020(bbc.com, 2019; Newzoo, 2019b) The size of this industry means that potential disruption to even just a part of this industry could have major consequences for the strategic decisions of a myriad of companies in this space.

The master thesis will continue as follows. First, a literature review will be conducted on past research in access-based consumption. Following this, the theory and constructs discussed will provide the reasoning for the conceptual model. Consequently, the conceptual model will be developed along with the accompanying hypotheses. Then, the research methodology will be

explained, and the results will be reported and discussed. Finally, a discussion and possibilities for future research, as well as the limitations and boundaries, will conclude the thesis.

2. Literature Review

This section posits the theoretical background in the context of the study about access-based consumption and possible determinants that will influence the prolonged use of access-based consumption. It will start with distinguishing between ownership and access-based consumption, of which a clear definition will be given. Additionally, drivers that potentially increase the demand for access-based consumption will be discussed as well as acceptance and usage models. Finally, the network effects will be discussed.

2.1 Ownership versus access

The concept of ownership and its importance in business environments is changing across many areas. Ownership is defined by a relationship between an object and a person, where the person can own this object as his personal property (Snare, 1972). Ownership has been the leading conceptual framework on which consumers purchase objects that become their property (Snare, 1972). These market mediated transactions between a buyer and a seller, provide both parties a clear definition of legal ownership and the transfer of ownership, which are often of enduring nature (Bardhi & Eckhardt, 2017).

Ownership used to be the normative ideal between different types of consumption. The value of this ownership can be attributed to different aspects. Possessions imply extensions as well as symbols of an individual (Belk, 1988). Ownership extends oneself into the possessions that an individual owns in which the person characterizes itself by (Belk, 1988). Artifacts of life stories can help with forming attachments and communicating ones self. These objects of different parts of an individual's life can help narrate an individual's life story and to provide reflection (Kleine *et al.*, 1995). This narration starts with saving deciduous teeth in childhood up to owning possessions that portray a person's sense, such as having a favorite suit, jewelry, or otherwise.

In contrast, access-based products and services only provide consumers temporary access to these goods and services (Schaefer & Lawson, 2015). A common definition of access-based consumption is the consumption by transactions where there is no transfer of ownership involved in any aspect of the transaction (Bardhi & Eckhardt, 2012). While this is not an entirely novel business model, its importance has dramatically increased through cultural changes that affect individual preferences.

Historically, access-based consumption was mostly used in the public sector (Bardhi & Eckhardt, 2017). The usage was mostly adopted in non-profit settings, as public and temporary access provide opportunities to offer certain experiences to the masses that are otherwise out of reach for many individuals (Chen, 2009). Examples of this are short-term borrowing of books and toys, access to museums and cultural parks, or more traditional rental forms with cars and housing.

Consumption by accessing was, however, seen as an inferior consumption mode (Ronald, 2008). Renters do not acquire the value of the product; thus, it was seen as financially inferior. Allocating large portions of an individual's purchasing power to access-based objects was seen as feckless and foolish (Rowlands & Gurney, 2000). Purchasing objects was universally perceived as cheaper in the long run because of the accumulation of capital through means of ownership (Cheshire *et al.*, 2010).

Spending purchasing power just to gain experiences also undermines a sense of security and pride in ownership. In the housing market, it was considered wasteful for a long time, undermining the aesthetic value of a neighborhood, lacking a sense of community, and ethically defective by missing a sense of pride for the goods that were rented (Cheshire *et al.*, 2010). As a result, homeowners tried to avoid living amongst rental properties and vastly preferred their neighborhood consisting out of homeowners (Cheshire *et al.*, 2010)

Sharing is very similar to access-based consumption, as they both do not involve a transfer of ownership. The difference primarily lies in the fact that a sense of joint ownership is involved in sharing a good or service. In contrast, with merely gaining access to a good or service, this sense of ownership is commonly not present (Bardhi & Eckhardt, 2012). Another important distinction is that access-based consumption is not pro-social or altruistic in most circumstances where sharing often has a social element to it (Belk, 2010). The thesis will focus on accessing an object rather than sharing, because the majority of new business-related concepts in this space, monetize access in one way or another.

2.2 Proliferation of access-based consumption

The scope in which the access-based business model operates has changed dramatically (Belk, 2014). Access-based models used to exist in the public sphere, primarily. However, in recent years, many new business models have spurred in which access rather than ownership has been the central theme. Examples are collaborative consumption (Jiang & Tian, 2018), sharing systems (Lamberton & Rose, 2012), co-production and creating (Payne *et al.* 2009), prosumption and prosumers (Toffler, 1980; Ritzer & Jurgenson, 2010), access-based consumption (Bardhi & Eckhardt, 2012) amongst many other terminologies that are often used interchangeably to indicate some form of sharing or accessing.

The emergence of access-based consumption can be accounted to changing consumer preferences and technological advances (Bardhi & Eckhardt, 2012). Both the cultural shift and technology advances made many of these new business models possible, which will be now be discussed.

Technological advances

Technological advances in information systems and information technology enable the emergence of many new sharing based consumption business models. The internet, more particularly web 2.0, facilitated greatly in this. Web 2.0 is characterized by O'Reilly (2007) by the change from static web pages to content in which interactions take place between different parties in applications, services, or even interactions that are entirely user-generated between users like social networking sites (O'Reilly, 2007).

This shift in content enables many forms of sharing. New ways of sharing like peer-to-peer file sharing are made possible in this context. Free and often illegal data began to flow between unknown users (Bardhi & Eckhardt, 2012) Early examples of were Napster and peer-to-peer torrenting protocols and websites. Eventually, it was adopted by legal platforms as well. On these platforms, consumers can access, watch, stream, download many different types of content that are monetized in different ways. YouTube mostly does it through advertising, while Netflix does it exclusively through subscriptions. Many other peer-to-peer social networks expect users to share and create content for free.

Apart from spurring new types of business models, web 2.0 is also effective in making it possible for older forms of accessing and sharing to be conducted on a much bigger scale with better efficiency (Belk, 2014). Traditional renting industries like the car and housing industry have heavily grown thanks to access-based web 2.0 models such as Zip-Car, Uber or Airbnb

(Belk, 2014). This growth is in part because of the efficient gathering, processing, and storing of data, which in turn is purposefully utilized by its information systems. These information systems can link demand and supply more efficiently, predict demand and changing trends better, price their goods and services to maximize their profit, and have better feedback cycles by integrating more data in their decisions and internal processes (Peppard & Ward, 2004; Powell & Dent-Micallef, 1997).

Technological development will continue to allow for more opportunities in existing and newly emerging business models. The Internet of Things (henceforth IoT) empowers the connectedness of devices and further blurs the lines of the physical and digital market space (Li *et al.*, 2014). It allows for connectedness without human intervention, even in physical markets. For example, electric cars, scooters, and bikes can be rented in cities without any human transaction taking place (He *et al.*, 2014; Claus, 2019). IoT applications are still relatively in their infant stages. However, applications will become more efficient and subsequently will be able to integrate sensors that can help track access-based goods and services.

Finally, many of the changes are thanks to increasing data and internet speeds. This increasing speed allows for more data processing and for data transfers that were previously impossible to do, or financially unattractive for companies. 5G internet is expected to be rolled out during 2020 and 2021, which will significantly increase the speed of data transfers, holding the promise to revolutionize the way we live, work and spend leisure time (Palattella *et al.*, 2016).

Sociocultural preferences

Bardhi & Eckhardt (2012) claim that the market has shifted in the sociocultural and politics of consumption. Where access-based consumption was long viewed as inferior, like discussed in *section 2.1*, these views changed over time (Bardhi & Eckhardt, 2012). Attachments and ownership are becoming less preferred in many different consumptionscapes, and it is seen as inflexible and enduring in a heavily globalized fast-paced changing world (Bardhi & Eckhardt, 2012). An increased and multidirectional flow of objects, people, places along urbanization creates less demand towards ownership and more towards access. Fluidity and flexibility are often preferred over rigidity and different types of burdens of ownership (Moeller & Wittkowski, 2010).

Also, increased mindfulness of spending habits is theorized as a contributing factor since the popularity of access-based goods and services massively increased after the last financial crisis

of 2008 (Hermann, 2009). Lasting changes in consumer behavior became apparent; increasing aspects of risk in hard and tangible assets generally became less preferred, which is theorized to still be the case (Hermann, 2009; Bardhi & Eckhardt 2017).

Furthermore, aspects like urbanization and individualism are theorized to have impacts on the degree of access-based consumption because of both practical and risk aspects (Bauman, 2007; Bardhi & Eckhardt 2017). Urbanization by design creates limitations in space, thus having merely access to objects and services with them being stored elsewhere can be seen as an attractive proposition (Bardhi & Eckhardt, 2017).

The proliferation of sharing and access-based consumption modes leads to conceptualizing new dimensions of consumption. Liquid consumption is characterized by being ephemeral, access-based, and dematerialized (Bardhi & Eckhardt, 2017). This mode of consumption only offers temporary value, as product cycles shorten and possessions are only valued temporarily, both by increased technological innovation in, for example, tech products or changing preferences, in for example luxury brands (Bardhi & Eckhardt, 2017; Janssen *et al.*, 2013). Additionally, liquid consumption is enabled by new digital and technological advances and defines the contrast between ownership and access-based objects (Bardhi & Eckhardt, 2017).

Access is valued over ownership in liquid consumption in both material and immaterial consumption (Bardhi & Eckhardt, 2017). The reasons for this preference differ across different contexts, but an important commonly proposed reason is to forgo any burden of ownership that a certain product or service would have (Lawson *et al.*, 2016). Finally, liquid consumption distinguishes itself with a high degree of dematerialization (Bardhi & Eckhardt, 2017). This manifests itself in the advancements of digital technology that spurs much of the liquid consumption and the demand of a liquifying society, where experiences are valued higher than possessions (Bardhi & Eckhardt, 2017).

2.3 Dimensions of Access-based Consumption

Bardhi and Eckhardt (2012) have attempted to dimensionalize the different contexts in which access-based consumption can differ from one and another. These dimensions form the basis of why consumer preferences in access-based goods differ between different contexts. The differences between access-based goods and services on these dimensions are continuous rather than discrete as well, making many different subtle differences possible. The dimensions that are defined and discussed in the current thesis are the following: *temporality*, *anonymity*, *market*

mediation, consumer involvement, type of accessed object, and political consumerism (Bardhi & Eckhardt, 2012).

The first dimension is *temporality*. Access-based consumption has a temporary nature, which can vary in two different ways (Chen, 2009). Firstly, access to consumption can be short-term or longitudinal (Bardhi & Eckhardt, 2012). This continuum is characterized at both ends with a very short one-time transaction (e.g., renting a particular room or apartment) versus a long-term commitment with a subscription service (Bardhi & Eckhardt, 2012). Additionally, the usage of a good or service can also vary between long-term use and short-term use.

Secondly, access-based consumption spaces differ in the degree of *anonymity* (Bardhi & Eckhardt, 2012). The use of the product or service can have different levels of anonymity, where interactions with other consumers on the most extreme sides of the spectrum are either wanted or unwanted. Examples on the ends of this continuum are renting a room or apartment where a consumer likes anonymity from other customers or sharing in collective enjoyment in a museum when admiring an art piece (Bardhi & Eckhardt, 2012; Chen, 2009). Additionally, anonymity is characterized as well by the spatial anonymity between the consumer and the object, where closer proximity creates more intimacy with the consumption (Bardhi & Eckhardt, 2012).

Third, access-based consumption can have different degrees of *market mediation* (Bardhi & Eckhardt, 2012). While access-based consumption historically was predominantly used in a non-profit context or in peer to peer sharing with one and another, other access-based goods and services have a profit motive (Chen, 2009). The difference in the degree of market mediation can change the relationship with the access-based good or service (Bardhi & Eckhardt, 2012).

The fourth dimension that Bardhi & Eckhardt (2012) describe is *consumer involvement*. This relates to the level of involvement a consumer has in consuming the product or service. This spectrum is characterized by full self-service to full service and everything in between (Bardhi & Eckhardt, 2012).

The fifth dimension in which access-based consumption is characterized is the *type of accessed object* (Bardhi & Eckhardt, 2012). The type of object can differ in two ways. Firstly, a good or service can be utilitarian or hedonic (Hirschman & Holbrook, 1982). The object can provide value to the consumer by increasing functionally related activities in a utilitarian context, or it can provide multisensory, emotional aspects that provide the consumer with experiences

(Hirschman & Holbrook, 1982) Secondly, the type of object can be defined on a spectrum from fully physical to digital as well. (Bardhi & Eckhardt, 2012).

Finally, the sixth dimension of access-based consumption is *political consumerism* (Bardhi & Eckhardt, 2012). The type of object accessed can represent an individual in a political sense to articulate their views and beliefs by the consumption choices that they make (Micheletti *et al.*, 2004). Politically motivated choices could make an impact outside of the marketplace of the product, with more than merely filling an economic need. Examples of this can be environmentally friendly access-based services like bike-sharing and the rental of electric cars.

2.4 Consumption in gaming

While research in access-based consumption is still relatively scarce, many of the newly emerged sectors have been studied in the recent past. However, some contexts have remained unexplored (Bardhi & Eckhardt, 2012; Payne *et al.*, 2009; Schaeffers *et al.*, 2015; Sinclair & Tinson, 2017; Chen, 2009). This gap is in large part because of the rapid proliferation of the access-based consumption model penetrating existing markets and entering new ones (Bardhi & Eckhardt, 2010; Belk, 2014). A recent study conducted by PwC estimates a substantial increase in access-based consumption from \$14 billion in 2014 to more than \$300 billion projected in 2025 (Osztoivits *et al.*, 2015). In this study, I will attempt to advance the understanding of access-based consumption in a new context, namely the gaming industry.

The industry has quite significantly evolved from a very solid consumption in which consumers buy both the hardware and games in solid form to liquifying part of the experience with of sales digital copies vastly outperforming solid copies with approximately 83% of the sales being digital copies (Statista, 2018). The lack of demand for physical copies shows signs that this industry is liquifying as well. The dematerialization of the games to digital downloads is not the only part of the industry that is liquifying; many of the hardware, updates, add-ons are liquified as well (Newzoo, 2019a).

All console platforms provide an access-based subscription to be able to play the games online even though the consumer provides the internet connection. Well over a third of total revenue in the games sector is earned on consoles like the Xbox One, Playstation 4 and Nintendo Switch (Newzoo, 2019b). This means that a significant part of consumers is already facing an access-based component in their gaming environment, in contrast to PC and mobile gaming, where no mandatory subscription fees other than the fee of your internet subscription is present.

In addition to this, many auxiliary products and services are added to these subscriptions to increase the perceived enjoyment and perceived value (PlayStation, 2020; Google Stadia, 2020a; Nvidia, 2020). Examples are old games of older platforms, exclusive add-ons, early access, online skins, and other additional perks to the subscription.

2.5 Google Stadia

As of 2019, the dematerialization of gaming is attempted to take a step further by launching fully access-based gaming by Google Stadia (Kleinman & Lee, 2019). The consumer has no ownership of any specialized hardware or software to play the games (Google Stadia, 2020a). All that is needed is a controller, a displaying device like a tv, tablet, or otherwise and a fast and stable internet connection (Google Stadia, 2020a). In this respect, it is the most liquid form of gaming that is possible; however, both Google Stadia and its competitors Nvidia GeForceNow, and PlayStation still offer some exclusive games for a one-time fee next to the selection of free games (Barianuk, 2020; Google Stadia, 2020b; Sony, 2020).

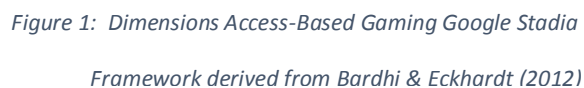
In this thesis, I will focus on Google Stadia, because it was the first of its kind to launch and has the highest brand awareness being from Google, having the second-highest brand awareness in the world, only beaten by Apple (Interbrand, 2019). Additionally, because it is the most liquid form of gaming from console to games, it applies the most towards research about access-based consumption. This is in contrast with other competitors like Playstation Now, which still requires the user to own a computer or the newest generation PlayStation (Playstation, 2020). Additionally, Xbox project xCloud is still in Beta and is therefore not a good option.

Based on the dimensions of Bardhi & Eckhardt (2012), Google Stadia is defined as longitudinal access. There is a subscription service of \$9.99 per month, which gives access to an expanding list of free games (Google Stadia, 2020a). The objects it accesses are somewhat temporary, as one of the selling points in the marketing is that one can play many different games instead of buying all of them (Google Stadia, 2020a).

Furthermore, it is characterized as being relatively anonymous, considering gamers are playing against other persons from all kinds of platforms and devices without noticing what player uses Google Stadia or more traditional ownership-based offerings. The spatial anonymity is quite big, but considering it is a digital service, it should not hinder the convenience.

The service is fully market mediated with a for-profit incentive, and is mostly, if not wholly, hedonic. Gaming can be a useful learning tool, but the main motive of consumption is pleasure

A full overview of Google Stadia's dimensions is shown in *Figure 1*, with consumer involvement shown as the level of self-service and the type of object accessed as the level of hedonic consumption for additional clarity on the scale from low to high.



2.6 Acceptance and usage models

To fully understand the possible determinants of access-based consumption, a look into the intention and usage-based behavior models will be conducted. The theory of planned behavior (henceforth TPB), the theory of technology acceptance, and the unified theory of acceptance and use of technology (UTAUT) will be discussed.

Intention based behavior

Adoption and prolonged usage of new information systems have been researched and improved upon greatly (Venkatesh *et al.*, 2012). Intention based behavior, in general, is mostly known and extensively used in the framework of TPB from the field of social psychology (Ajzen, 1991). This framework offers a model that predicts intentions based on both social and individual factors and has been applied across many different studies in different demographics (Doll & Ajzen, 1992).

TPB is based on three different constructs: the attitude towards a behavior, subjective norms, and perceived behavioral control. The attitude towards a behavior is different and based upon one's expectation and beliefs (Ajzen, 1991). These beliefs, when combined with outcomes, form positive or negative attitudes.

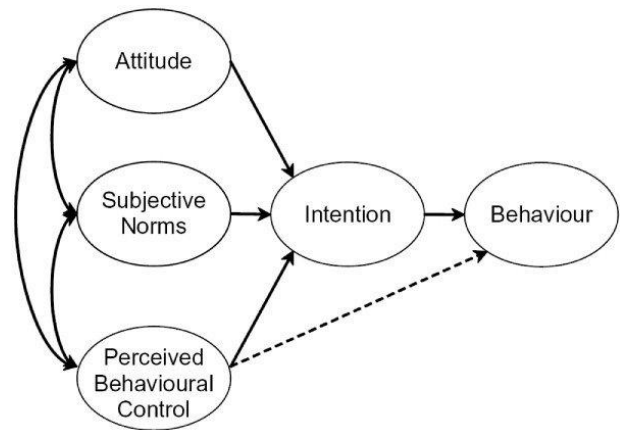


Figure 2 Theory of Planned Behavior (Ajzen, 1991)

Secondly, the subjective norm is the expectation from the individual about the normative beliefs important people have about the behavior. These beliefs could be positive or negative and can influence intention-based behavior in varying degrees. The important people can include friends, family members, mentors, or otherwise important role models (Ajzen, 1991)

Finally, perceived behavioral control refers to how well a respondent thinks it would perform while doing a certain behavior (Ajzen, 1991). This self-efficacy is a necessary construct to predict intentions because if an individual does not believe it can perform a particular action, it most likely will not try it.

Technology acceptance models

Acceptance of technology and any type of information system do have specific framework models as well. Davis (1989) developed the Technology Acceptance Model, henceforth referred to as TAM (Davis, 1989). This conceptual model became well-established for predicting user acceptance across many disciplines in information systems for many years (Venkatesh & Davis, 2000; van der Heijden, 2004).

TAM posits that perceived usefulness and perceived ease of use are critical for user acceptance of any type of information technology (Davis, 1989). Perceived usefulness defined by the degree the individual believes that a specific information system would enhance someone's lives. In contrast, the perceived ease of use contains the degree to which a certain information system would be free of effort (Davis, 1989).

TAM was improved by Venkatesh & Davis (2000) into TAM2. TAM2 explained higher parts of the variance in usage-based behavior than the original TAM from Davis (1989). TAM2 improves the models with interrelated social effects that can cause an individual to adopt or reject an information system. These social effects are the subjective norm, voluntariness, and image of intention to use a new system (Venkatesh & Davis, 2000). In this respect, certain attributes of the TPB are included in the technology acceptance models.

Gaming is a pleasure orientated activity (Wu & Holsapple, 2014). While there are certain benefits of gaming, the main goal is to enjoy oneself and improved leisure.

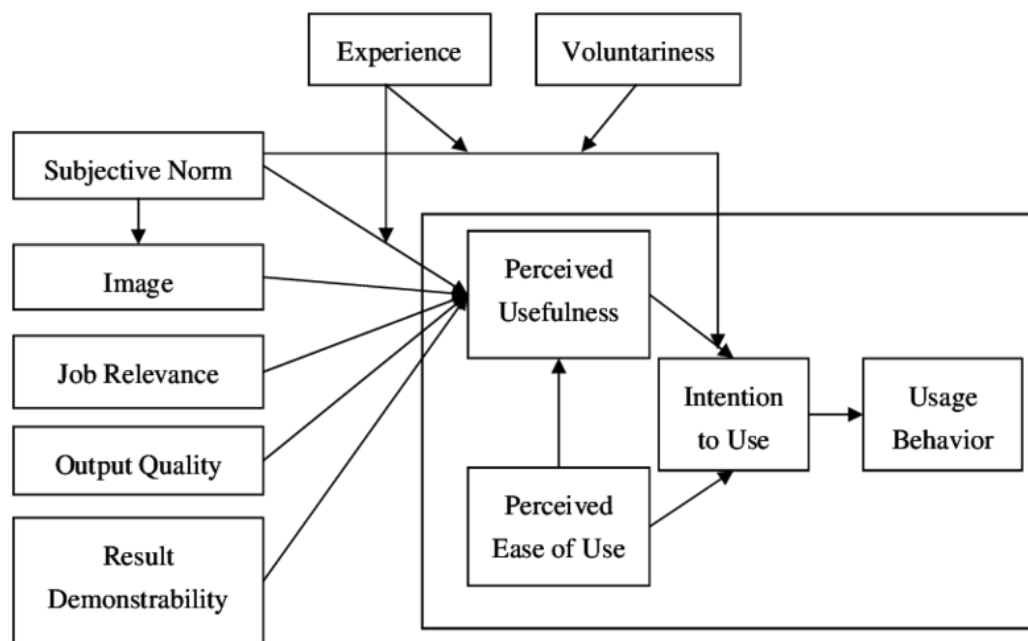


Figure 3 Technology Acceptance Model 2 (Venkatesh & Davis (2000))

However, the focal point of TAM and TAM2 were utilitarian information systems (van der Heijden, 2004). Utility information systems have a focal purpose of increasing productivity and efficiency (van der Heijden, 2004). External goals like a higher output, higher profitability, greater revenues are common goals for utility information systems. These goals are in stark contrast with hedonic information systems. Hedonic information systems are orientated on pleasure rather than productivity, and the system itself is often the reason for usage instead of external goals (Van Der Heijden, 2004).

Van der Heijden (2004) posits that hedonic information systems aim to be self-fulfilling rather than giving instrumental value. Additionally, this focus on fun and leisure reflects itself in the most important determinants for usage intentions in these hedonic information systems (van der Heijden, 2004). The two most important determinants, according to Van der Heijden (2004), are perceived enjoyment and perceived ease of use- rather than perceived usefulness, which is a productivity orientated construct.

Unifying technology models

Venkatesh *et al.* (2003;2012)

attempted to unify the theory of acceptance with the Unified Theory of Acceptance and Use of Technology, henceforth referred to as UTAUT and UTAUT2. UTAUT attempted to compare, review, and use existing intention and usage-based models such as the TAM and TPB amongst others to formulate a unifying theory of acceptance and use of technology.

This framework integrates elements from different models that ultimately outperformed the

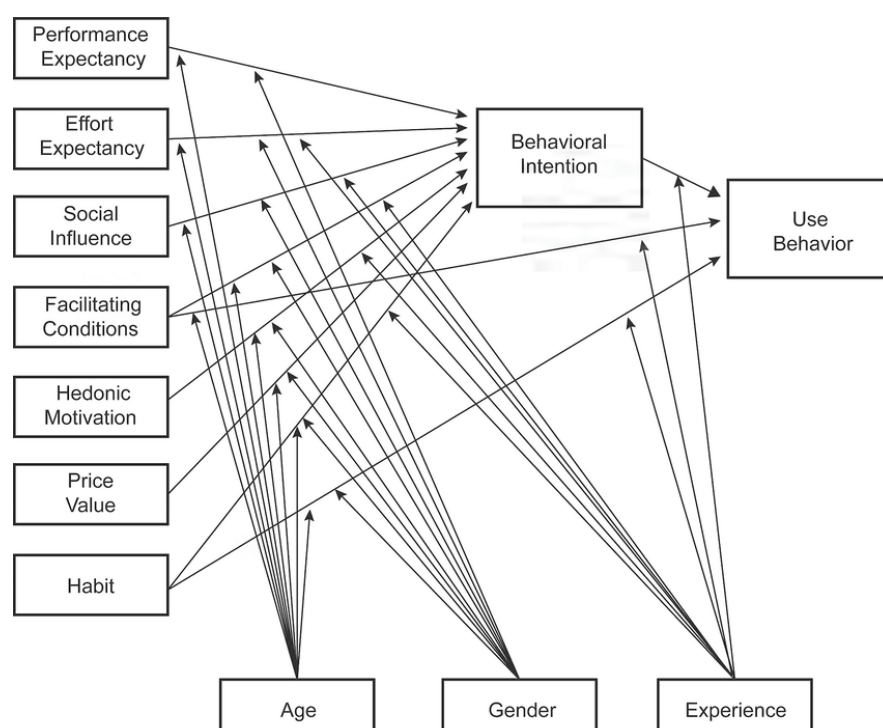


Figure 4 Unifying Theory of Acceptance and Usage of Technology 2 (Venkatesh et al., 2012)

previous models. Four core determinants were identified: performance expectancy, effort expectancy, facilitating conditions, and social influence (Venkatesh, 2003). In respect to this research, performance expectancy should be omitted from UTAUT because it is similar to

perceived usefulness and not relevant in a hedonic context like gaming (Van Der Heijden, 2004).

UTAUT received an extension in which the particular focus and attention were drawn onto consumer use context to develop UTAUT2 (Venkatesh *et al.*, 2012). It provided additional constructs to predict intention-based behavior in the acceptance of technology, which was used to improve on the older UTAUT, tailoring it specifically towards consumers. While UTAUT2 was not tailored towards hedonic consumption, it did integrate more constructs tailored towards consumers. Subsequently, the extension led to the introduction of three new constructs: price value, hedonic motivation, and habit shown in *Figure 4*.

Habit describes to what extent individuals will perform a certain behavior automatically. Considering the nascent stage in which access-based gaming currently is, the vast majority of consumers will not have any experience, let alone habits around access-based gaming. Thus this construct is dropped from this study.

2.7 Network Effects

Sharing based services and access-based services have a shared commonality in that they are often platforms. Platforms are defined as intermediaries that facilitate and manage interactions between different user-groups (Belleflamme & Peitz, 2015). Certainly, sharing-based services all apply to this definition based on the structure of this mode of consumption. Access-based services, however, often also adhere to this definition. Access-based services where the entity both provides all the services and access to a particular service cannot be defined as a platform because it merely connects consumers to the product or service that they offer.

Many examples exist, however, of information systems that do conform to the definition of a platform, particularly in hedonic access-based services. Social media brings together users with other users as well as advertisers with users. Similarly, music and tv access-based services connect consumers of this product with the suppliers, where many access-based services employ a dual strategy where they also offer content themselves.

In general, the overarching value of a platform can be derived from three variables the price to enter, stand-alone value, and network benefit (Belleflamme & Peitz, 2015). The price to enter could be a one-time purchase in the case of ownership business models. Other examples are advertisements, relinquishing personal data, or a subscription service in the case of access-based models. Often a combination is used.

The stand-alone value of a platform is the value the user derives from the platform; this can be both utilitarian or hedonic and thus is also applicable for this study (Belleflamme & Peitz, 2015). Many intention-based models described in *section 2.6* are focused on this aspect in particular. The focus on stand-alone values only lacks possible value that can be derived from possible networking effects that could apply to information systems that use access-based business models.

Gaming has widely documented network effects, both within-group users and between-group users (Kim et. al., 2014; Shankar & Bayus, 2002). Networking benefits in the context of gaming means that more developers will bring in more other developers as well as more users will bring in more users, within-group network benefits. Additionally, more users of any given platform will attract more developers, and more developers will bring more in more games and, as such, attract more users, between-group network benefits. A schematic overview of these benefits is shown in *Figure 5* below.

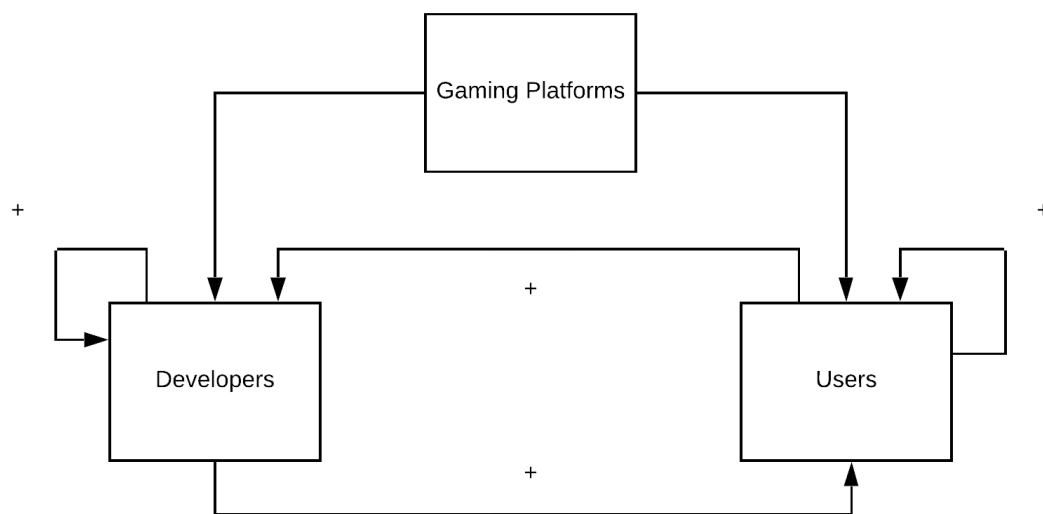


Figure 5 Network Effects Gaming Platforms

Both the prevalence and strength of networking effects can differ per context (Belleflamme & Peitz, 2015). There are examples where networking effects dwarf stand-alone values of platforms because of the high amount of utility other users bring to each other. Many of these information systems, therefore, have high switching costs because of the chicken-and-egg dilemma that can occur. Users might be interested in an access-based information technology innovation but potentially do not want to give up their current network benefit (Katz & Shapiro, 1985).

3. Conceptual Model

Based on TPB, TAM2, and UTAUT2, in combination with the previous research into access-based consumption and possible networking effects at play, several hypotheses are developed in the following section. Finally, the conceptual model is presented.

3.1 Burden of ownership

Many studies have theorized that the "burden of ownership" is an important reason for the increasing liquefaction of services and products (Moeller & Wittkowski, 2010). The assumption here is that consumers are avoiding risk by not assuming any ownership of the product or service in question (Moeller & Wittkowski, 2010). In the context of gaming, an average new game costs \$60 (Yan & Gilbert, 2018); thus, it can be hypothesized that buying new games to play has a reasonably high risk to it if the game is disappointing. Other financial risks with the hardware or software such as performance risks, maintaining risks, repairing risks can also occur (Schaefters & Lawson, 2015). Liquifying the consumption by using access-based models gives the consumer more flexibility and gives more adaptability. This difference should lead to the risks of ownership being lower with access-based gaming since one does not need specialized equipment or expensive games to be able to game. This leads to the following hypothesis:

H1: The burden of ownership involved with gaming positively influences the use of an access-based service in the context of gaming.

3.2 Perceived enjoyment and ease of use

Access-based consumption in gaming is characterized as hedonic in the dimensionalization of Bardhi & Eckhardt (2012). This characterization means that van der Heijden's (2004) changes towards the TAM and TAM2 apply in the context of gaming. The changes in core constructs for hedonic information systems are perceived enjoyment and perceived ease of use, rather than the proposed perceived usefulness from TAM and TAM2 (Venkatesh & Davis, 2000).

Furthermore, Venkatesh *et al.* (2003) describe the degree of difficulty in which a consumer can adopt and use a new information system with effort expectancy. The degree of difficulty is an

identical construct to the perceived ease of use described by TAM and TAM2, as well in the modified model of van der Heijden (2004)

Additionally, Venkatesh *et al.* (2012) showed in UTAUT2 that hedonic motivation is a critical determinant in a consumer context as well. This is an identical construct to the perceived ease of use described by Davis (1989). These insights on the adjusted TAM2 of van der Heijden (2004) as well as the UTAUT and UTAUT2, lead to the following two hypotheses:

H2: The perceived enjoyment of an access-based service positively influences the use of an access-based service in the context of gaming.

H3: The perceived ease of use of an access-based service positively influences the use of an access-based service in the context of gaming

3.3 Social Effects

General intention-based models like the TPB give a central focus towards the subjective norm of a certain behavior (Ajzen, 1991). The subjective norm describes the normative beliefs of important people around the individual and what they think about doing this particular behavior (Ajzen, 1991). Additionally, TAM2 explains higher parts of the variance than TAM in usage-based behavior when incorporating interrelated social effects. These social effects are the subjective norm, voluntariness, and image of intention to use a new system (Venkatesh & Davis, 2000).

Voluntariness and the image described in TAM2 by Venkatesh (2000) do not apply to this research. This is mostly because these constructs are found to be significantly correlated with the perceived usefulness of the technology, which is the construct that is omitted. After all, van der Heijden (2004) proved that it is not an important determinant in hedonic information systems.

Bardhi & Eckhardt (2012) argue that changing cultural shifts have played a large role in the proliferation of access-based consumption modes as well. This implies that these studies also argue that societal viewpoints, and on a smaller scale, the viewpoints of your peers, are important determinants of the acceptance of a mode of consumption.

Finally, UTAUT and UTAUT2 consider social influence to be a factor in behavioral intention as well. All taken together, this leads to the following hypothesis:

H4: The subjective norm of access-based gaming positively influences the use of an access-based service in the context of gaming.

3.4 Facilitating conditions

Facilitation conditions in the framework of Venkatesh *et al.* (2003) describe the degree to which an individual believes that the organizational and technical infrastructure currently exists to support the new information system (Venkatesh *et al.*, 2003). While this construct is described in the context of a utilitarian information system, it can apply to hedonic information systems as well; if an individual does not believe a new information system will work properly, it won't be used, no matter what context. Facilitating conditions can be particularly important in access-based gaming, considering this type of consumption was regarded as not possible up to very recently and wasn't even offered for consumption before summer 2019 (Kleinman & Lee, 2019). Because of that, it could be that the facilitating conditions that UTAUT and UTAUT2 describe potentially hold a very strong relationship with the intended usage of access-based gaming. Consequently, the following is hypothesized:

H5: The facilitating conditions positively influences the use of an access-based service in the context of gaming.

3.5 Price value

The price value is not very important to consumers in contrast to a utilitarian context. Often, the users are not paying for the new technology in a utilitarian context, because they are often employees of organizations and businesses rather than consumers of the new technology. With the proliferation of new access-based services like car-sharing or bike-sharing, this is not always the case anymore, so that that price value can be an important construct in both utilitarian and hedonic goods.

However, certainly in a consumer only context, in which access-based gaming operates, the value for money is hypothesized by UTAUT2 as an important construct for technology acceptance. Additionally, as stated in section 2.3.2, Bardhi & Eckhardt (2012) argue that more mindful spending habits have contributed to the shift towards access-based consumption as a whole as well, indifferent from context. Mindful spending habits distinguishes itself from the burden of ownership because price value does not describe the risks a financial commitment can burden. Instead, it describes if the value for money is perceived to be a good deal on its own. These arguments lead to the following hypothesis:

H6: The price value positively influences the use of an access-based service in the context of gaming.

3.6 Experience

UTAUT2 and TAM2 analyze experience as a moderating variable between the relationship in the constructs and intention based prolonged usage. Experience is a particularly interesting variable because of the novelty of access-based gaming, and as such, one could expect more variability in the possible effects it could have. UTAUT2 claims that experience has moderating effects between its hedonic enjoyment and usage intention. In the case of access-based gaming, perceived enjoyment could potentially be moderated by experience to strengthen the relationship as the user will have higher confidence that in the level of enjoyment one experiences when using such a service. Thus the following hypothesis is derived:

H7a: When the level of experience in access-based gaming increases, the relationship between perceived enjoyment and usage intention increases.

Similarly, price value and facilitating conditions are moderated by experience in UTAUT2 as well. This is expected to be the case for access-based gaming in particular because of its novelty. When a user has experience with access-based gaming, it can be expected that the relationship between the price value and facilitating conditions and usage intention is strengthened. The following two hypotheses are constructed:

H7b: When the level of experience in access-based gaming increases, the relationship between price value and usage intention increases.

H7c: When the level of experience in access-based gaming increases, the relationship between facilitating conditions and usage intention increases.

The constructs explored in the previous section lead to the following conceptual model:

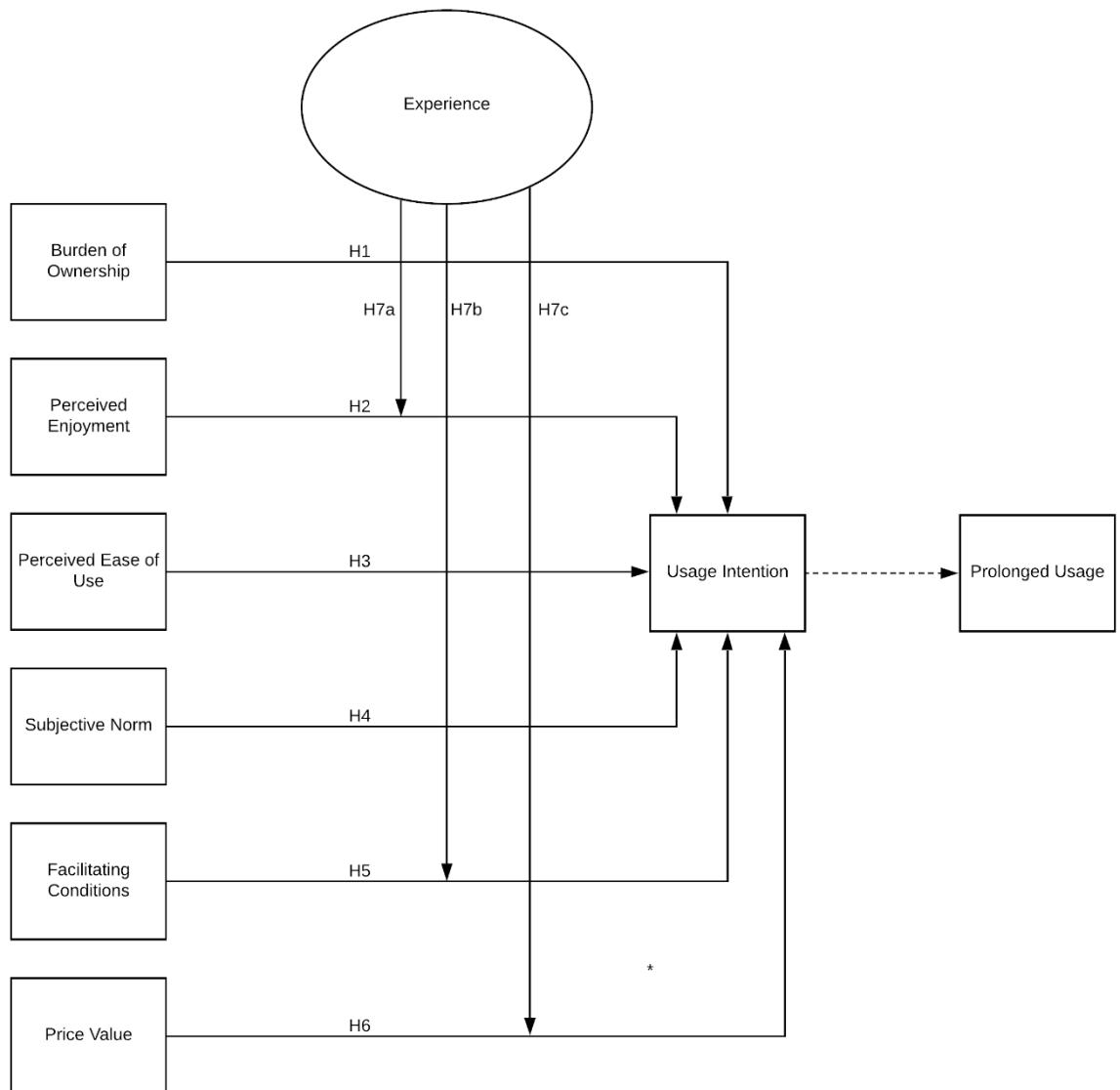


Figure 6 Conceptual Model

3.7 Additional analysis Network effects

It is documented that gaming indeed has networking effects, particularly in multi-player games. The strength of network benefits differs per context and is unclear in access-based gaming. There is likely a minimum amount needed so users can enjoy the games they want to play with who they want to play. While some network effects naturally develop based on stand-alone values, strategies can be employed to influence the effects (Belleflamme & Peitz, 2015).

Most notably, the switching costs of switching from a specific ownership platform to an access-based platform can be influenced by differing strategies. Pooling liquidity across different platforms can severely reduce switching costs and reduction of network effects. In the context of gaming, this should mean that access-based gamers can play versus ownership-based games without any friction involved.

To investigate if and how strong network effects play a role in access-based usage intention the following hypothesis is constructed:

H8: Network effects positively influences the use of an access-based service in the context of gaming.

4. Research Methodology

The following section will discuss the research methodology of the thesis and how the hypothesized relationships are investigated. The procedures, participants, and research design will be discussed accordingly.

4.1 Participants and Procedures

The focus of this study is to determine what the relationship is between the constructs that are defined in the previous section being the independent variables and how they are related to the acceptance and usage of new technology in the context of online access-based gaming. Based on *section 3.1 to 3.6*, the predictors in this model are the following: the subjective norm, perceived enjoyment, burden of ownership, perceived ease of use, facilitation conditions, and price value. Finally, strengthening interactions between perceived enjoyment, facilitating conditions, price value, and usage intention will be researched in the context of experience with the new technology.

The type of research needed to investigate this conceptual model is a cross-sectional study that attempts to represent a targeted sample of the broader population. The targeted sample of this study is gamers because the opinion of the consumer group that is currently consuming gaming products and services is likely the essential group in the population for this study. This does not mean that consumers who do not game at all are excluded from this research. Some of the advantages that access-based gaming could provide over more traditional ways of gaming could be of interest to this consumer group as well.

The population targeted in this study is contained in the developed nations of the world. This is of particular importance in the study because access-based gaming innovation is still at its relative infancy. Targeting countries that are behind in terms of facilitating conditions might skew the results because the respondents can not accurately answer the questions. Moreover, the developed nations from North America and Europe are also the countries where the access-based services are launched and adopted first (Harrison, 2020).

Conducting the survey across different developed nations with different cultures allows for improved generalizability of the results and added robustness. Moreover, it potentially could give additional insight if there are differences between the countries as well, particularly the difference between North-America and Europe as a whole. Access-based services are active in all of these countries, so the validity of this group of respondents is high as well.

The pilot study was conducted with convenience sampling, using the social contacts close at hand. This way of sampling allowed for in-depth qualitative feedback and quick turnover to improve the survey. Amazon Mechanical Turk gives access to a global, on-demand, 24/7 workforce to deploy tasks that can be outsourced virtually (Mturk, 2020). Consequently, participants for the study were drawn from Amazon Mechanical Turk from both Europe and North-America.

4.2 Questionnaire design

The specific method to investigate the conceptual model is a quantitative-based survey method. The survey (see Appendix A) starts with a few questions about access-based behavior and gaming behavior to make the participants accustomed to the subject of the survey. Intensity and variation in access-based service consumption and gaming activity were asked before access-based gaming becomes the focal point.

To test the constructs on access-based gaming usage intention scales were used from several highly cited studies to provide robust and reliable results. The construct of the burden of ownership was sourced from Schaefers *et al.* (2015). This study created an ownership scale based on financial risk, performance risk, and social risk. Based on the construct created, the social risk will be separately tested in the subjective norm and as such these questions will be omitted,

Secondly, perceived ease of use and perceived enjoyment was sourced from Venkatesh et al. (2012) UTAUT2, because these survey items are used many different studies for technology acceptance, attempting to unify TPB, TAM1, TAM2, and UTAUT. UTAUT2 is applicable here because the scales are indifferent between hedonic or utilitarian consumption. Additionally, price value and facilitating conditions were tested using Venkatesh et al. (2012) for the same reasons.

Third, the subjective norm was tested using the construct of the TPB of Ajzen (1991). This construct is extensively used to predict behavior with intentions in many different types of contexts and was be changed to reflect the context of gaming with Google Stadia as the primary example given when the context for the question is required. This scale is very similar to Venkatesh et al. (2012) social effects, however, Venkatesh et al. (2012) were focused on consumers but not necessarily in a hedonic context. Thus, it is expected that the robust subjective norm will fit better in this study.

The dependent variable was constructed out of a scale of three items taken from UTAUT2, which attempted to unify general theories of behavioral intention in TPB and behavioral intention in technology acceptance and prolonged usage, like TAM and TAM2.

Additionally, interaction effects of experience between perceived enjoyment, perceived ease of use, facilitating conditions, and usage intention was tested by using the questions of experience in access-based gaming and experience in digital hedonic access-based consumption from the survey. The construct of access-based gaming experience ranges from 0 to 1, and digital access-based hedonic consumption is an item scale with three items, being access-based music consumption, access-based movie/tv consumption, and access-based gaming consumption that ranges from 0 to 3.

Finally, possible network effects on the usage intention were tested with an experimental method. The experimental method was used to gather data through observation by manipulating the variable of networking effects in question and subsequently compare the values between groups. The manipulation was conducted with three different scenarios in the survey, of which a respondent randomly is assigned to one (Field & Hole, 2003).

The respondent was asked to fill out one of three questionnaires that have different treatments of the networking effect where the experimental design allows for manipulation in networking effects (see appendix B). This manipulation is done, by giving two different treatments, one where the network effects are manipulated upwards with seamless integration in other platforms and games, and another where the effects are diminished to near-zero with being unable to do any type of cross-platform playing.

This means that when considering the usage intention of access-based gaming respondents get a precise scenario that makes it crystal clear that a switch to this type of platform either loses the network effects they are currently experiencing (treatment 2) or that any current gamer will not lose out on any of the current network effects he enjoys by seamless pooling of the liquidity with other userbases (treatment 1).

Table 1. *Schematic overview experiment*

		Manipulation of network effects	Potential effect	Other factors
Control Group	R			constant
Treatment 1	R	X1	O1	constant
Treatment 2	R	X2	O2	constant

Additionally, the control group gets an unchanged scenario that is not changed from the current status quo with slightly more ambiguous, fluidly changing, and uncertain network effects that can vary per context. The price to enter and stand-alone value of the platform is the same across all three groups and unchanged, allowing for only differences in networking effects of the platform.

The survey ended with control questions, like gender, highest completed education, and age. Venkatesh et al. (2003;2012) & Venkatesh & Davis (2000) present in TAM2, UTAUT, and UTAUT2 that many of those control variables have moderating effects on many of the relationships between technology acceptance and usage and its antecedents. The relationships between these constructs were tested as well but are not the focal point of this study because of the lack of scientific contributions that the possible moderating effects of these control variables will offer.

Lastly, a random ID was printed to uniquely identify each Amazon Mechanical Worker and improve the quality of respondents. By doing this, the respondents are risking potential reputational effects by not appropriately taking the time to give high-quality answers, which in turn can affect their future earnings on the platform. Additionally, this allowed non-payment to clear violators of the system by being able to identify those respondents as well. To increase the validity of the respondents even further, one item of the construct Price Value was recoded to function as an attention check.

5. Data and findings

In this section, the data collection methods and cleaning are discussed as well as tests for reliability, validity, and normality are performed. Finally, descriptive statistics are shown as well as preliminary results in the form of a correlation table.

5.1 Data collection and cleaning

The number of respondents sampled for the pilot study was 42. The results showed that the survey was understandable, and the treatment appeared to have its desired effect. The small amount of data is inherently not meaningful for the results, but descriptive statistics showed differences in averages between the groups. Moreover, a question was added for feedback on any problems that respondents had with the survey. Small modifications and clarifications were made and ultimately showed the feasibility of the study.

The total number of respondents sourced from Amazon Mechanical Turk was 745 throughout nine days. Qualtrics was used to collect the data, and since it allows for forced completion, there were zero partial responses. 19 Respondents were removed since they started the survey at the first question and did not complete it.

Invalid respondents were removed based on speeding and failure to respond to the attention check appropriately. Considering the survey had 28 questions, responses that were generated within three minutes were discarded, and respondents that failed the attention check were discarded as well. These two properties had considerable overlap, though, and accounted for the removal of 318 respondents. Furthermore, 14 respondents were removed for not being a gamer in any way. This result was such a low amount that, ultimately, no constructive conclusions could be drawn from these 14 outliers. It does, however, show the ubiquitous nature of gaming when just 1.39% of the respondents do not game in any way.

The remainder of 394 respondents were used for analysis, of which 99 were primarily consoled players, 101 smartphone and tablet gamers, and 194 PC gamers. The frequency of gaming was relatively evenly distributed between daily and multiple daily usage versus less frequent usage being 220 and 174 respondents. Furthermore, 68.5% were male and 31.5% female. The respondents were primarily between the ages of 18 and 40 years old (see Appendix C).

As mentioned in *section 4.2*, Price Value had a question that needed to be reverse coded. Item 2 of this scale was recoded back into a positive statement to ensure validity and reliability in

the scale. The country where the respondents resided was recoded as well into two options being North America and not North America, because of the many different eligible countries. This recoding effectively gives a split between North America and Europe as a control variable instead.

Gender was recoded into a dummy variable (0,1), and experience in access-based gaming was done similarly. Finally, because of the many different groups that respondents could choose from, education was recoded as well between university and not-university as the highest completed education.

5.2 Reliability

The scales used to test the hypotheses are well established by several studies to be robust, valid, and reliable. However, per context, there may be issues with the reliability or validity of the constructs. As such, these factors were tested.

The internal consistency of the scales was tested by using a Cronbach's Alpha test. The findings of this test are shown in *Table 2*. Literature suggests .7 as a measure for internal consistency (Nunnally, 1978). Facilitating Conditions and Ease of Use fail to meet this requirement. Ease of Use can be improved dramatically from 0.611 to towards a value of .727 when one of the three items is deleted. The question "*It is easy for me to become skillful at using access-based gaming*" might have been too ambiguous for the respondents, because in hindsight, it does seem that it could be unclear if the gaming itself or using the new technology is meant in that particular item. When removing this item, a 2-item scale remains and tested to be highly correlated and thus applicable in this study.

Furthermore, facilitating conditions is just shy the requirement of .7, and there is no improvement when removing one of the items either. Lance *et al.* (2006), however, notes that .7 is merely a guideline and not an exact measure. Since the scale only has three items, it is not as problematic and thus suffices internal reliability.

Table 2. *Internal Reliability Scales*

	Cronbach's Alpha	N of items in scale
Usage Intention	.928	4
Perceived Enjoyment	.869	3
Financial Burden	.771	5
Price Value	.855	3
Facilitating Conditions	.679	3
Subjective Norm	.737	3
Ease of Use	.727	2

5.3 Validity

The validity of the scales was tested as well. The results show further confirmation that the scales are accurate in what they are attempting to measure. The validity was tested by using a Principal Component Analysis, which attempts to find the lowest amount of separate constructs that are correlated to each other. Since we measured seven variables, this is the number of components you expect to extract.

Firstly, the suitability of a Principal Component Analysis was assessed with a Kaiser-Meyer-Olkin measure on both the entire dataset as the individual constructs. This test resulted in satisfactory values above 0.500 for all (see Appendix D). These values show adequate sampling for a Principal Component Analysis.

Furthermore, Bartlett's Test of Sphericity was conducted and shown to be highly significant for all variables with a p-value lower than 0.000 (see Appendix D) and thus suitable for a Principal Component Analysis. The measurement units across constructs are the same as they are all 5-point Likert Scales.

The Principal Component Analysis extracted seven variables as expected, and accounted for 70.91% of the variance cumulatively. The accompanying scree-plot (see Appendix D) indeed shows seven components with an eigenvalue higher than 1. Consequently, the constructs were created as intended by the literature with one change in the Ease of Use scale by omitting the second item for reliability.

5.4 Descriptive statistics

The scales were subsequently tested for normality with the Shapiro Wilk test. All scales tested significantly positive and thus are not normally distributed. Indeed when looking at the kurtosis and skewness of the scales, a similar picture is shown as well as the Q-Q plots where extreme values seem to be underrepresented, particularly the lower values (see Appendix E).

The descriptive statistics of the main effects and control variables of this study are shown in *Table 3*. A Spearman's rho correlation was run considering the lack of normality in the scales used. It shows strong support in the correlation between Perceived Enjoyment, Financial Burden, Ease of Use, Subjective Norm, Price Value, and Usage Intention, as hypothesized in *section 3*.

Other notable and expected correlations are found between the respondents' age and its Ease of Use and Facilitating Conditions of access-based gaming. This is expected because early adoption and technology acceptance is negatively correlated with age (Hong *et al.*, 2013). Additionally, experience with access-based gaming is positively correlated directly to usage intention.

Most notably, Perceived Enjoyment and Subjective Norm seem to be very strongly correlated with Usage Intention with correlation coefficients of 0.537 at $p < 0.01$ and 0.446 at $p < 0.01$. The Financial Burden, Facilitating Conditions, and Price Value are statistically significant at $p < 0.01$ in correlation to Usage Intention; however, its coefficients are smaller being 0.178, 0.188, and 0.178, respectively.

Table 3. *Descriptive Statistics and correlations*

Variables		Mean	St. Dev	Min	Max	1.	2	3	4	5.	6	7.	8.	9.	10.	11.
DV	1. Financial Burden	3.38	0.78	1	5											
	2. Perceived Enjoyment	3.90	0.70	1	5	0.151**										
	3. Ease of Use	4.17	0.68	1.5	5	-0.031	0.230**									
	4. Subjective Norm	3.71	0.73	1	5	0.140**	0.455**	0.204**								
	5. Facilitating Conditions	4.00	0.77	1.33	5	-0.021	0.206**	0.593**	0.276**							
	6. Price Value	3.53	0.79	1	5	-0.002	0.211**	0.228**	0.232**	0.188**						
Control	7. Age	3.60	1.34	1	8	0.036	-0.009	-0.143**	0.021	-0.121**	-0.002					
	8. Education	0.23	0.42	0	1	0.097*	-0.020	-0.075	-0.001	-0.050	-0.048	-0.012				
	9.. Man	0.69	0.47	0	1	-0.059	-0.044	0.045	0.022	0.126**	0.092*	-0.112*	0.018			
	10. North- American	0.55	0.49	0	1	-0.004	0.074	-0.056	.121**	0.033	0.074	0.126**	-0.059	0.018		
	11. Experience					0.026	0.123**	0.053	0.152**	0.134**	0.077	-0.070	0.046	0.003	-0.004	
IV	12. Usage Intention	3.05	1.14	1	5	0.178**	0.537**	0.052	0.446**	0.188**	0.178**	-0.013	0.111*	-0.028	-0.022	0.361**

(n = 396) ** $p < 0.01$ * $p < 0.05$ 1-tailed

6. Results

In this section, the results of the hypothesis testing are given and discussed. In order to prove causation and not just correlation of hypothesis 1 through 6, regression analysis was performed. The possible moderating effects of hypotheses 7a, 7b, and 7c were tested as well. Finally, the experiment for hypothesis 8 was analyzed using a non-parametric t-test. Significance levels are reported in-depth; however, to assess all the hypotheses, an α of 0.05 is used as a cut-off point.

6.1 Multiple Regression Assumptions

Correlations between constructs in *Table 3* offer great insight into the variables that have been tested but does not allow testing of the hypothesis as it does not imply causation from the dependent variable to the independent variable (Aldrich, 1995). To accurately test the causal relationships of hypotheses 1 to 6, a regression analysis is necessary.

Nominal variables with more than two categories cannot be used as attributes in the regression and, as such, are recoded into dummy variables. The recoding includes education, which makes the distinction between university, master or bachelor and not university training, high school, trade school, vocational, trade, technical training. Similarly, countries of origin split up between being from North America and Not North America, which in the context of this study encapsulates Europe.

To safely use multiple regression to test hypotheses 1 through 6, several assumptions must hold. Firstly, a linear relationship between the dependent and independent variable must hold. Inspection of scatter plots between Usage Intention and the dependent variables shows no curvature in the relationships.

Secondly, the errors between observed and predicted values should be normally distributed to use linear regression. This is assessed by saving the standard residuals of the regression and using it to create a Q-Q plot (see Appendix G). The Q-Q plot compares the observed quantile with what would be theoretical in a normal distribution and follows the expected trend line sufficiently.

Thirdly, the independent variables must not highly correlate with each other; otherwise, multicollinearity occurs, which affects the validity regression negatively. This is highly likely not the case, as *Table 3* does not show correlations above 0.5 between the independent variables.

To make sure the variance inflation factors values of the linear regression were monitored alongside the regressions. Values above ten are problematic because it will hurt the reliability of the regression (Thompson *et al.*, 2017). However, this was never the case in any of the regressions conducted (see Appendix F).

Fourthly, homoscedasticity needs to be present in the variables. This assumption was assessed by plotting the standardized predicted values against the standardized residuals. No clear pattern was observed in this graph, and thus homoscedasticity can be assumed (see Appendix H).

6.2 Multiple Regression

Before multiple regression was conducted, correlations between the moderators of Price Value x Experience and Perceived Enjoyment x Experience and Facilitating Conditions x Experience and the dependent variables Perceived Enjoyment, Facilitating Conditions and Price Value was conducted. No correlation above 0.2 was observed, so no multicollinearity with the moderators was present.

Autocorrelation was assessed by using the Durbin Watson Statistic and showed a value of 1.871, indicating independence between the residuals as it is possible to range between 0 and 4 with 2 meaning no autocorrelation at all. The value of 1.956 indicates a slight positive autocorrelation; however, the value falls well within commonly accepted values of 1.5 to 2.5.

One additional outlier was detected by performing case-wide diagnostics with three standard deviations as a cut-off point for the residuals. Furthermore, possible leverage points were analyzed by creating a variable to display the distance in leverage and consequently assessed with scatter plots. Values above 0.2 are risky and could be discarded, of which one was found with a value of 0.29 (Huber, 1981). Similarly, Cook's distance was calculated and assessed for possible influential points. No cases with a value greater than 0.035 were found, and thus, no additional actions were necessary (see Appendix I).

Finally, the regression was conducted with the results shown in *Table 4*. In model one, the independent variables were tested on its own, and its robustness was tested by incorporating the control variables of University Education, Age, Gender, and residing in North-America. Finally, model 3 includes possible interaction effects between Price Value, Facilitating Conditions, Perceived Enjoyment, and Usage Intentions by experience with access-based gaming.

Table 4. *Findings of Regression Analyses*
Dependent Variable: Usage Intention

		Model 1	Model 2	Model 3
Main effects	Perceived Enjoyment	0.384***	0.362***	0.374***
	Burden of Ownership	0.095**	0.080**	0.082**
	Facilitating Conditions	0.167***	0.141***	0.139***
	Subjective Norm	0.199***	0.194***	0.195***
	Price Value	0.141***	0.134***	0.144**
	Ease of Use	0.206***	0.197***	0.200***
Controls	University education		0.087**	0.083**
	Age		-0.010	-0.013
	Man		-0.020	-0.021
	North-American residing		-0.096**	-0.093**
	Experience		0.250***	0.250***
Interaction effect	Price Value x Experience			0.045
	Facilitating Conditions x Experience			0.029
	Perceived Enjoyment x Experience			-0.003
R²		0.346	0.422	0.441
F value		35.638***	27.098***	21.384***

(n = 394) *p<0.10 **P<0.05 ***P<0.01

Table 4 shows the standardized coefficients of each of the dependent variables in all three models. As such, hypotheses 1 through 6 can be assessed. Model 3 includes the possible interaction effects that are hypothesized in H7a, H7b, H7c. A total of 44.1% of the variance in usage intention is explained by the dependent variables and moderating effects in the model. This is generally seen as a substantial effect (Cohen et al., 2003). This percentage of variance improves slightly from the models that do not include the interaction effects even though the interaction effects themselves are not statistically significant. All three models are statistically significant in predicting usage intention with a p-value of 0.000.

There is a statistically significant result found between the burden of ownership in gaming and the usage intention with a p-value of <0.05 . Therefore, H1 is not rejected at a p-value <0.05 . The perceived enjoyment, ease of use, subjective norm, and facilitating conditions of H2, H3, H4, and H5 respectively are found to be statistically significant at p-values <0.01 and therefore show strong support for the hypothesized relationship between the constructs and usage intention in access-based gaming. Finally, price value has a statistically significant relationship with usage intention at a p-value of <0.01 as well, and as such, H6 is not rejected.

H7a and H7b that test the possible moderating effects of experience in access-based gaming on perceived enjoyment, facilitating conditions, and the relationship with usage intention are not significant at any level in this study with p-values of 0.587 and 0.791 respectively. Possible moderating effects of experience in access-based gaming and price value and usage intention is not statistically significant, even at a p-value of $p < 0.10$ since the p-value was 0.142. This p-value fails to meet the required significance of an α of 0.05, and as such, H7c is rejected.

Repeating the moderating effects of experience in the context of access-based hedonic consumption does not yield better results, either. This variable contains not only experience in access-based gaming, but also access-based music and television or movie subscriptions. The moderating effects of this particular model are also not statistically significant in this regard either with p-values well above 0.2. An updated conceptual model with tested hypotheses is shown in *Figure 7*.

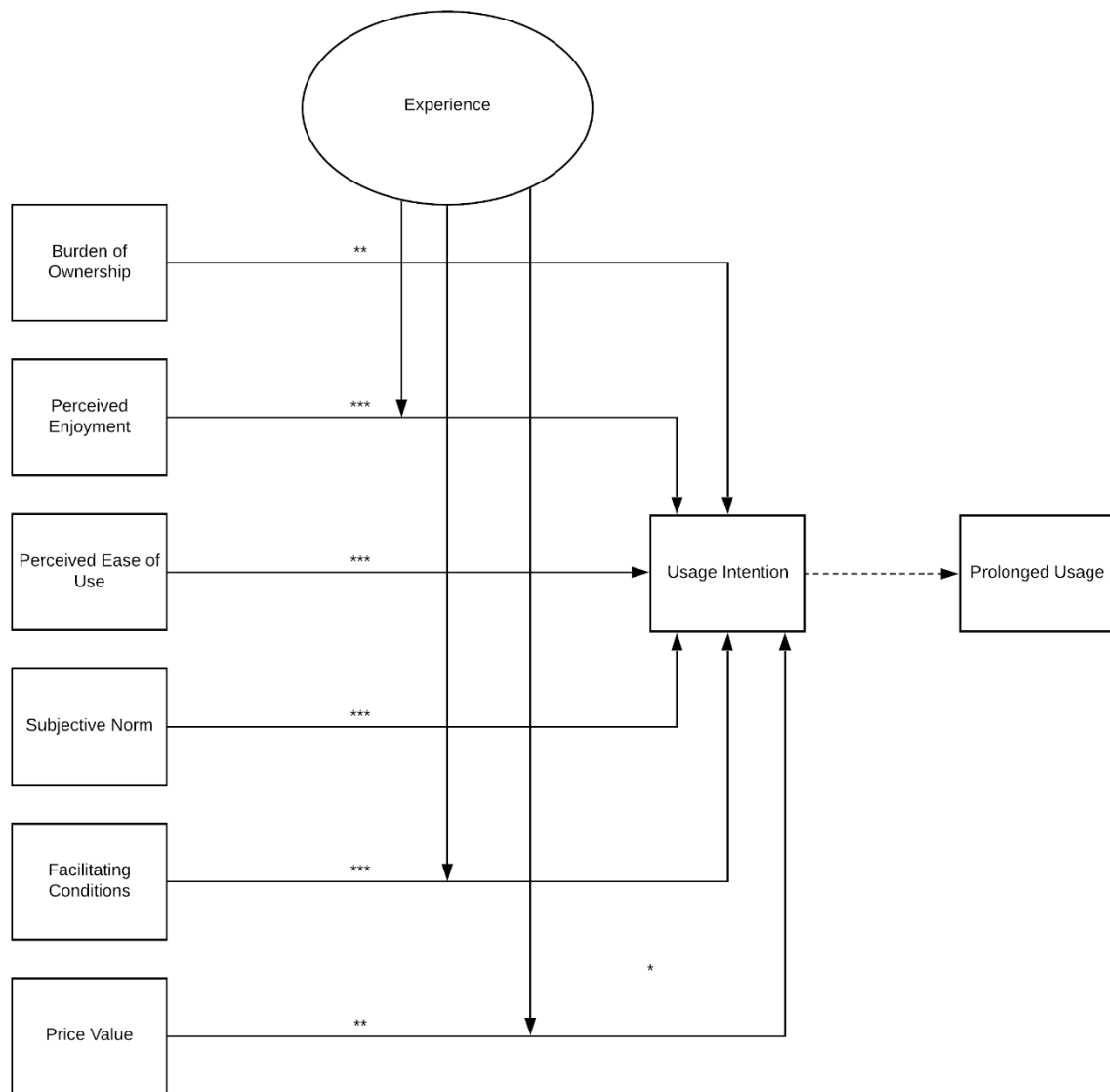


Figure 7 Updated Conceptual Model

6.3 Additional Analysis of networking effects

Possible network effects and its direct relationship between the adoption of new access-based gaming technology was tested to review H8 and possibly expand technology adoption models in which users derive value of other users. This was done by conducting the experiment described in *section 4.2*

Usage Intention, however, does not seem normally distributed with a tri-modal shape (see Appendix J). A Kolmogorov-Smirnov test was conducted on Usage Intention and indeed shows significant results with a p-value of 0.000, and thus parametric one-way ANOVA tests cannot be used. Non-parametric tests can offer a solution to test hypothesis 8; however, a few other assumptions must hold.

Usage Intention must be ordinal or continuous of nature, which indeed holds because it is a Likert-scale variable. Secondly, the independent variable tested, Network Effects, should consist of two or more categorical independent groups, which also holds because it is either "High," "Low," or the status-quo "Medium" in networking effects.

Thirdly, the observations need to be independent of each other. This assumption also holds given the way the experiment was conducted. Finally, the distributions of each group need to have a similar shape and thus, variability, to be able to compare the medians of Usage Intention after the treatment was applied. This final assumption holds as well; the shapes are similar (see Appendix K), and thus the Kruskal-Wallis test was performed to compare the mediums of Usage Intention. $\chi^2(2)$

The Kruskal-Wallis test reported showed that there was a statistically significant difference in usage intention with $\chi^2(2)$ of 9.091 and a p-value of 0.011, which is statistically significant on p-value < 0.05. Thus, a significant relationship has been found between the network effects and the usage intention.

Pair-wise comparison between groups is shown in *Table 5* and reveals statistically significant results in the difference in usage intention between low and medium networking effects. However, when controlling for inflating type I errors with a Bonferroni correction (Field & Hole, 2000), it does not reveal a significant effect as the p-value is 0.148. The difference between medium and high network effects is not statistically significant, with a p-value of 0.691. Finally, clear statistically significant results were found between pair-wise comparison of high and low networking effects with an adjusted p-value of 0.004.

Table 5. *Pair-wise comparisons of groups in the experiment*

	W	p-value	Adjusted p-value
Low Network – Medium Network	-1.964	0.049	0.148
Low Network – High Network	1.764	0.003	0.008
Medium Network – High Network	.228	0.230	0.691

Conducting pair-wise non-parametric Wilcoxon-rank analysis on the respondents with usage intention before and after the treatment was applied to , and gives similar results. This test was applicable as the assumptions hold. The samples of pre- and post-treatment of usage intention are dependent on the cases because each respondent was surveyed twice. Secondly, as mentioned before, the observations are randomly drawn by the way the survey was designed, and the dependent variable can be assumed to be continuous because usage intention is a Likert scale. The results of this test are shown below in *Table 6*.

Table 6. *Pair-wise comparison of groups before and after treatment was applied*

	W	p-value
Medium Network – Medium Network	-1.641	0.101
Medium Network – Low Network	-3.783	0.000
Medium Network – High Network	-0.750	0.453

There was a significant relationship when respondents were faced with a change from medium to low networks with a $W = -3.783$ at a p-value of 0.000. Respondents that got no treatment produced a $W = -1.641$ at a p-value of 0.15, and thus as expected, there was no change in the control group that had medium networking effects before and after the treatment. Finally, manipulating the networking effects from medium to high produced a $W = -.750$ at a p-value of 0.453. The results of the within and between pair-wise comparison tests conducted, show statistically significant results, and H8 cannot be rejected since there does seem to be significant differences between different levels of networking effects and usage intention.

7. Conclusion

The following section will summarize all the main findings of the study. The results are compared with previous research, and academic and managerial implications are subsequently distilled. Following this, limitations are stated, and recommendations for future research are given.

7.1 Main Findings

The thesis attempted to distill the main rivers for access-based consumption in the gaming industry which followed from the research question that was defined:

What are the main drivers for access-based consumption in the gaming industry amongst consumers?

It hypothesized several constructs that might be of relevance both as a direct as a strengthening effect towards usage intention. Particularly, constructs from UTAUT2, TAM, TPB were drawn along with context-specific constructs of the burden of ownership and networking effects. An overview of all the results can be found in *Table 7* below.

Table 7. *Overview of Hypothesizes*

Hypothesis	Result	p-value
H1: The burden of ownership involved with gaming positively influences the use of an access-based service in the context of gaming.	Not rejected	0.040
H2: The perceived enjoyment of an access-based service positively influences the use of an access-based service in the context of gaming.	Not rejected	0.000
H3: The perceived ease of use of an access-based service positively influences the use of an access-based service in the context of gaming	Not rejected	0.000
H4: The subjective norm of access-based gaming positively influences the use of an access-based service in the context of gaming.	Not rejected	0.000
H5: The facilitating conditions positively influences the use of an access-based service in the context of gaming.	Not rejected	0.006
H6: The price value positively influences the use of an access-based service in the context of gaming.	Not rejected	0.001
H7a: When the level of experience in access-based gaming increases, the relationship between perceived enjoyment and usage intention increases.	Rejected	0.313
H7b: When the level of experience in access-based gaming increases, the relationship between price value and usage intention increase	Rejected	0.142
H7c: When the level of experience in access-based gaming increases, the relationship between facilitating conditions and usage intention increases.	Rejected	0.932
H8: Network effects positively influences the use of an access-based service in the context of gaming.	Not rejected	0.004

Every main effect is found to have a statistically significant effect on usage intention and thus confirms past literature into a new context. Hypothesis one, concerning the burden of ownership, shows a weak but significant relationship with usage intention. As such, outcomes of previous studies into this construct by Moeller & Wittkowski (2010), Schaefer *et al.* (2015) are confirmed in the context of access-based gaming. Moeller & Wittkowsi (2010) claim that the demand for non-ownership is influenced by the importance of an individual attachment to full ownership. It does appear that the demand for non-ownership in this context is less severely influenced by the burden of ownership.

This reduced influence can be the case for several reasons; current ownership-based platforms have already liquified parts of their business. Freemium games, the vast majority of mobile games (Statista, 2020), offer a free version where the user is not expected to pay unless he wants to. The freedom of choice, in this regard, can potentially alleviate the burdens of ownership quite severely. On top of this, mobile, tablets, and computers are multi-purpose devices that are not only used for games, as such burdens of ownership of the devices themselves is likely quite low.

Furthermore, pc-games are trending towards freemium versions as well. Half of the top 10 most popular games of 2019 and 2020 are Fortnite, Valorant, League of Legends, Apex Legends, and PlayerUnknown Battlegrounds, which are all freemium games (Newzoo, 2020). Other games often offer additional downloadable content along with the initial release, making the risk to buy the original game smaller since not all the features are paid for upfront.

Perceived enjoyment, which was tested in hypothesis two, confirmed Bardhi & Eckhardt (2012) and van der Heijden (2004) theories of being very important for usage intention in a hedonic context. This is confirmed in the hedonic context of gaming with a large and statistically significant effect.

Furthermore, ease of use, hypothesized in H3, and drawn from UTAUT2 and TAM is shown to be statistically significant with a moderate prediction effect as well. This aligns with previous research from van der Heijden (2004) in a hedonic context and adds robustness to the claim that this construct is important in both utilitarian and hedonic context. This result does make sense, because why would an individual want to use a hedonic object that he deems hard to use when the main goal is to enjoy oneself.

Additionally, subjective norm, arguably the most robust, most tested, and oldest construct of the conceptual model, is found to have a moderate statistically significant effect in hypothesis four as well. It gives further insight into what drives individuals to adopt this new information system in gaming. If peers that one deems essential are dismissive of this mode of consumption, it is less likely that the individual will partake in this mode of consumption.

Further building on Venkatesh (2012) UTAUT2, price value, and facilitating conditions are deemed to be statistically significant as well in hypotheses 5 and 6. This significance further underscores the robustness of these constructs as they appear to be important in hedonic information systems too. This means that individuals both need to be capable of running these new technological information systems as well as find them to be reasonably priced. The early

adopter tax, often present in innovations, does not seem to hold ground in the gaming context, likely because ownership alternatives are quite good substitutes if the price value is deemed poorly.

Hypothesis 7- a,b,c, tested the possible moderating relationship of experience in access-based gaming on the relationship of perceived enjoyment, facilitating conditions, and price value with usage intention. None of the three hypothesized effects were statistically significant which is in contrast with past literature. Since experience is quite a robust construct across most models described, this was a surprising result.

Possible reasons for the lack of significance in these hypotheses might be because of the survey design. Additionally, since access-based gaming is such a new mode of consumption, none of the respondents could have any expertise or long-term experience with this kind of consumption by default. The lack of big differences in this regard might result in needing bigger sampler sizes before statistically significant results can be found. The direct relationship between experience and usage intention is strongly statically significant; however, not within the scope of the proposed hypotheses.

Finally, network effects do seem to play a role in the adoption of access-based gaming platforms. Hypothesis 8 resulted in a statistically significant effect when testing differences between usage intention between groups after the treatment as well as usage intention within groups before and after the treatment was applied. Lower networking effects are deemed to be more hurtful than high network effects are beneficial. As such, a minimum floor seems to be prudent to alleviate any switching cost individuals might experience.

7.2 Academic Implications

The theory of usage intention models has been expanded within a new context of hedonic consumption. UTAUT2, TAM, TPB, and context-specific burden of ownership have been newly confirmed to be good predictors of usage intention and, by extension, actual prolonged usage. While much of the previous research into information system adoption has been focused on utilitarian products and services, this thesis expands the body of research into hedonic information system adoptions.

In particular, this research contributes to understanding the new and underresearched consumption mode of access-based digital consumption. The research contributes to an increased understanding of the liquefaction of consumption and found supporting evidence that

access-based consumption will be the next digital disruption into this liquefaction. Overall, respondents had a positive usage intention towards access-based gaming, and as such, this merits more academic focus.

Additionally, it attempts to bridge different frameworks into technology acceptance and posits that more attention must be given to networking effects when users can derive value and utility of other users in a new information system. This effect seems to be prevalent in sharing based systems, because by design, these platforms bring different users together. However, access-based information systems often also adhere to the definition of a platform, thus network effects with differing strengths across contexts will apply.

7.3 Managerial Implications

The study gives clear insights into which variables are deemed important by consumers in Europe and North-America when deciding to use an access based system. Moreover, it does show that access-based gaming is looked upon in a positive light, which means that managers and CEOs of respective gaming companies should not ignore this trend.

The thesis gives clear guidance on what features the access-based gaming should have. Firstly, the perceived enjoyment of the system is deemed the most important. This is expected in hedonic consumption but is comforting to observe and should be of high priority in the corporate strategy of Google Stadia or any other access-based gaming platform.

Secondly, the subjective norm is essential to users when opting to use access-based gaming platforms. Because of this importance, the image of a platform is critical. If access-based gaming is not seen as cool, trendy or otherwise positive, this can have a detrimental effect on the usage intention. Several different strategies are possible to influence this outlook and can be employed by management and CEOs. For example, the use of influential adopters.

Thirdly, facilitating conditions, price value, and ease of use are critical aspects to keep in mind as well. Therefore, it is not wise to launch these platforms into areas where the facilitating conditions are not present, with fast and reliable internet being the most important condition to take into account.

Additionally, price value and ease of use, show that the platforms need to be of high quality. Early adopters will not pay a premium for this innovation, most likely because close substitutes are available. Possibly with more innovations in access-based gaming, this might change in the future. However, currently, prospective users are reasonably price-elastic.

Finally, network effects play a substantial role in usage intention. That result is a critical fact for managers because it can be strategically manipulated upwards and downwards (Stummer *et al.*, 2018). The implication that network effects play a role in access-based gaming provides guidance for managers and CEOs into incorporating strategic manipulation of network benefits into the corporate strategy.

In particular, effective tipping strategies are of importance to managers and CEOs that launch new platforms that are likely to derive significant value from network benefits. The chicken-and-egg dilemma between users is a highly researched topic and shows guidance into what options managers of gaming companies have to tip the scales in their favor (Belleflamme & Peitz, 2015).

This strategic manipulation can be done in several ways. Firstly, dynamic pricing can be adopted to subsidize the users that are needed for the platform (Belleflamme & Peitz, 2015; Stummer *et al.*, 2018). If there are not enough games for other games to derive value from, one can temporarily increase the amount of games by subsidizing part of the price to enter, with, for example, deep discounts. Subsidizing has been a widely adopted strategy in other sectors (Stummer *et al.*, 2018).

Additionally, vertical integration or exclusivity contracts can play a pivotal part in the success of a platform with strong network effects. By doing this, competing platforms cannot offer the same value, increasing stand-alone values of that platform, which results in more gamers. More games then subsequently results in other gamers that will follow to that platform as the tipping point for that subset is gamers is then reached. Some hedonic platforms employ these vertical integration strategies (e.g., Netflix) with both exclusivity contracts and vertical integration (e.g., Netflix), and others mainly focus on exclusivity contracts (e.g., Spotify).

7.4 Limitations and research boundaries

The thesis has several limitations and research boundaries. Firstly, in contrast with previous literature, the moderating effects of experience have not been found. It is possible this resulted from the wrong interpretation of this variable, the nascent stage of access-based gaming, or self-reporting biases (Bhattacharjee, 2012).

Furthermore, the entire research has been done with a cross-sectional survey. This brings some methodological limitations. Cross-sectional data can potentially be biased based on when the respondents took the survey and does not guarantee to be representative over time.

Additionally, self-reporting biases are possible. Respondents need to estimate their behavior with self-reporting, which negatively affects the validity of the research. Self-reporting can be particularly challenging for the reliability and validity of the experiment since both the manipulated variable is simulated as well as the respondents' prolonged usage of access-based gaming. The gold standard of experimental research was a boundary of this research because of the infeasibility of conducting a randomized field experiment on the subject (Bhattacharjee, 2012).

Also, though no answer can be wrong and, as such, is emphasized at the start of the survey, respondents could produce socially desirable answers. While anonymity between the respondent and researcher is guaranteed on Amazon Mechanical Turk, the random ID can still identify the respondent. Possibly, to minimize the threat of non-payment, the respondents could bias the answers in the survey to what they deem the researcher wants to find.

Another methodological limitation is the construct used to research prolonged usage. While usage intention and intention of prolonged usage are good predictors of actual usage, they are not perfect (Searle, 1980). Several factors could hinder the realization of usage intention because intention is just partly a predictor of action (Searle, 1980).

Finally, the results of the thesis are confined within the boundaries of the population tested. North-America and Europe are interesting populations to research, in particular in the context of access-based gaming since the services are launched there before other areas. However, different cultural dimensions could potentially yield different results, and thus the validity of the thesis towards vastly different cultures is questionable. (Hofstede, 1983).

7.5 Future research

The results of this study are exciting but cannot be directly applied to larger populations with extreme confidence. Replication studies are necessary to solidify the findings of this study and will increase the validity and generalizability of the findings. Researching similar research questions on different populations with different cultures, then the developed countries from Europe and North-America could give compelling results and possible differences from this study.

Furthermore, because of the nascent stage of access-based consumption research, many different areas are still underresearched. In the context of access-based gaming, antecedents of

enjoyment, perceived or otherwise, are essential to research. It is the most important antecedent in this study, but relatively little is known about what its potential drivers are. Interesting research could be to both investigate those aspects and the potential difference with ownership gaming consumption.

Additionally, as Bardhi & Eckhardt (2012) and Belk (2014), different forms of access-based consumption, pro-sumption, co-creation, and sharing are only increasing in prevalence. More in-depth research in the distinctions between these modes of consumptions in the context of digital consumption of information systems is an exciting approach to take and underresearched. Possibly Bardhi & Eckhardt (2012) dimensionalization of access-based consumption could provide a framework into important constructs for prolonged usage across different contexts.

Finally, more research into consumer types in digital access-based consumption could lead to valuable insights. Lawson *et al.* (2016) claim four distinct user groups where consumers may fall in. Additionally, Bardhi & Eckhardt (2012) claim that the new access-based consumption modes are, in part, developing because of changes in societal and cultural preference. These insights could mean that there could be user groups that are interesting to target and possibly also user groups that are incredibly uninteresting to target. While access-based consumption is significantly increasing, a counter-reaction is a possibility as well with a consumer group heavily favoring ownership.

Concluding, plenty of research is possible to understand better these new modes of consumption, its antecedents, and how they differ per context.

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Appendix A Questionnaire

The first question will gauge how much access-based products and services you are consuming or have consumed in the past.

Access-based means that you do not own the content or service in any way but are paying to access it, often with a weekly, monthly, or yearly subscription that allows you access to a product or service that is otherwise unavailable for free.

I am currently subscribed or have been in the last 12 months to one or more of the following **PAID** services: (more than one allowed)

☐ Movie and TV streaming services (e.g., Netflix, Videoland, Amazon Prime, HBO max, ..)

☐ Music streaming services (e.g., Spotify, Apple Music, Youtube Music, Tidal, ..)

☐ Standard TV cable

☐ Paid cloud storage (Google Drive, iCloud, Azure, Strato, Dropbox, ..)

☐ Musea and attraction park (Rollercoaster, Zoo, ..)

☐ Gaming streaming services (e.g., Google Stadia, GeForce Now, PlayStation Now, ..)

Now I would like to know a little bit about your gaming consumption in the recent past. This can be free to play games or apps, subscription based, any type of paid game or otherwise

In the last 12 months i have played some form of digital game on either a console (e.g. Xbox, Nintendo, Playstation), computer, laptop, smartphone or tablet

☐ Yes

☐ No

What devices do you use to play games? (More than one answer allowed)

☐ Console (e.g. Nintendo, Playstation, Xbox)

☐ Computer or laptop

☐ Smartphone or tablet

My most used device is:

☐ Console (e.g. Nintendo, Playstation, Xbox)

☐ Computer or laptop

☐ Smartphone or tablet

How often do you estimate you play games on these devices in general?

- ☐ Multiple times a day
- ☐ Every day
- ☐ Multiple times a week
- ☐ Every week
- ☐ Multiple times a month
- ☐ Every month
- ☐ Every year

How many hours do you estimate to spend on games on either console, pc, smartphone or tablet a week?

- ☐ Between 0 and 4 hours
- ☐ Between 4 and 8 hours
- ☐ Between 8 and 12 hours
- ☐ Between 12 and 16 hours
- ☐ Between 16 and 20 hours
- ☐ More than 20 hours

You have the option to subscribe to Google Stadia or a similar access-based service.

In this service, you do not need to have the computing power nor the games in your possession to play. This severely decreases the one-time price but you do pay \$9.99 a month.

This type of gaming is not widespread yet and many of your peers are not using these services (yet). The multiplayer games can be played cross-platform however the player usually is at a slight disadvantage in latency, speed, resolution, and refresh rates prefers to play against others using a cloud-based platform. The number of games is plentiful, however not every game is always made available by the game developers. Additionally, for triple-A new games often a user will incur additional costs, sometimes up to the purchasing price on traditional platforms.

Please indicate your likely usage of such systems according to the following questions:

	Strongly Disagree	Disagree	Neither Agree nor disagree	Agree	Strongly Agree
I intend to use an access-based gaming service in the next 12-18 months.	☐	☐	☐	☐	☐
I predict I will use an access-based gaming service in the next 12-18 months.	☐	☐	☐	☐	☐
As soon as I am able, I will use an access-based gaming service.	☐	☐	☐	☐	☐
I plan to use access-based gaming as my main form of gaming consumption in the future	☐	☐	☐	☐	☐

Indicate your level of agreement with the following statements regarding access-based gaming:
(if you cannot answer accurately because of lack of experience please indicate your perception)

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Access-based gaming is a fun activity	☐	☐	☐	☐	☐
Access-based gaming is enjoyable	☐	☐	☐	☐	☐
Access-based gaming is entertaining	☐	☐	☐	☐	☐

Indicate your level of agreement with the following statements regarding access-based gaming:

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
Access-based gaming is reasonably priced.	☐	☐	☐	☐	☐
Access-based gaming is bad value for money.	☐	☐	☐	☐	☐
At the current price, access-based gaming can provide good value for money.	☐	☐	☐	☐	☐

Indicate your level of agreement with the following statements regarding gaming:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Given the financial expenses associated with buying new hardware and software to play new games, there is substantial financial risk.	☐	☐	☐	☐	☐
I would worry about the cost of purchasing hardware and games to play new games.	☐	☐	☐	☐	☐
Given the financial commitment, I may regret purchasing new games.	☐	☐	☐	☐	☐
If a game or system malfunctions, the consequences can be fairly severe.	☐	☐	☐	☐	☐
Buying the wrong game can lead to very negative outcomes.	☐	☐	☐	☐	☐

Indicate your level of agreement with the following statements regarding access-based gaming:

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
I have the resources necessary to use access-based gaming.	☐	☐	☐	☐	☐
I have the knowledge necessary to use access-based gaming.	☐	☐	☐	☐	☐
I can get help from others when I have difficulties using access-based gaming.	☐	☐	☐	☐	☐

If you decided to mainly use access-based gaming, would people in your close environment approve of that decision?

	Total Disapproval	Disapproval	Neither Approval or Disapproval	Approval	Total Approval
Your close family	☐	☐	☐	☐	☐
Your fellow gamers	☐	☐	☐	☐	☐
Your friends	☐	☐	☐	☐	☐

Indicate your level of agreement with the following statements regarding access-based gaming:

	Strongly Disagree	Disagree	Somewhat disagree	Agree	Strongly Agree
Learning how to use access- based gaming is easy for me.	☐	☐	☐	☐	☐
How to interact with access- based gaming is clear and understandable to me.	☐	☐	☐	☐	☐
It is easy for me to become skillful at using access-based gaming.	☐	☐	☐	☐	☐

Based on the scenario described, please indicate your likely usage of such systems according the following questions:

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I intend to use an access-based gaming service in the next 12-18 months.	☐	☐	☐	☐	☐
I predict I will use an access-based gaming service in the next 12-18 months.	☐	☐	☐	☐	☐
As soon as I am able, I will use an access-based gaming service.	☐	☐	☐	☐	☐
I plan to use access-based gaming as my main form of gaming consumption in the future	☐	☐	☐	☐	☐

What is your gender?

- ☐ Male
- ☐ Female

What is your age ?

- ☐ Under 18 years old
 - ☐ 18-25 years old
 - ☐ 26-33 years old
 - ☐ 33-40 years old
 - ☐ 41-48 years old
 - ☐ 49-56 years old
 - ☐ 56-63 years old
 - ☐ 64 years and over
-

What is your highest completed education?

- ☐ Secondary Education (high school)
- ☐ Undergraduate education (College or university)
- ☐ Postgraduate education (masters or doctorate)
- ☐ Less than high school
- ☐ Trade/technical/vocational training

In which country do you currently reside?

▼ Afghanistan ... Other

Thank you for completing the survey, here is your unique ID: [\\${e://Field/Random%20ID}](#)

Please copy/paste this into MTurk and click next to complete your survey

Appendix B Treatments questionnaire experiment

Control Group

Now we are going to look at a specific scenario for you to consider, please imagine the following scenario and read it very carefully to understand:

You have the option to subscribe to Google Stadia. In this service, you do not need to have the computing power nor the games in your possession to play. This severely decreases the one-time price, but you do pay \$9.99 a month.

This type of gaming is not widespread yet, and many of your peers are not using these services (yet). The multiplayer games can be played cross-platform however the player usually is at a disadvantage in latency, speed, resolution, and refresh rates prefers to play against others using a cloud-based platform. The number of games is plentiful, however not every game is always made available by the game developers. Additionally, for triple-A new games, often a user will incur additional costs, sometimes up to the purchasing price on traditional platforms.

Treatment 1

Now we are going to look at a specific scenario for you to consider, please imagine the following scenario and read it very carefully to understand:

You have the option to subscribe to Google Stadia. In this service, you do not need to have the computing power nor the games in your possession to play. This severely decreases the one-time price, but you do pay \$9.99 a month.

This type of gaming is getting more widespread and is gaining users. Also, the multiplayer games can be played cross-platform, and the player is not at a disadvantage versus traditional non-cloud offerings making you able to seamlessly integrate into multiplayer games from traditional offerings like console and pc games without being at a disadvantage. You are able to play with your current group of friends and acquaintances.

The number of games are plentiful, however not every game is always made available by the game developers. Additionally, for triple-A new games often a user will incur additional costs, sometimes up to the purchasing price on traditional platforms

Treatment 2

Now we are going to look at a specific scenario for you to consider, please imagine the

following scenario and read it very carefully to understand:

You have the option to subscribe to Google Stadia. In this service, you do not need to have the computing power nor the games in your possession to play. This severely decreases the one-time price, but you do pay \$9.99 a month.

This type of gaming is not widespread yet, and many of your peers are not using these services. The multiplayer games cannot be played cross-platform, and you can only play against other users using a cloud-based service like Stadia.

The number of games are plentiful, however not every game is always made available by the game developers. Additionally, for triple-A new games, often a user will incur additional costs, sometimes up to the purchasing price on traditional platforms.

Appendix C Descriptive Statistics respondents



Figure 8 Location Respondents

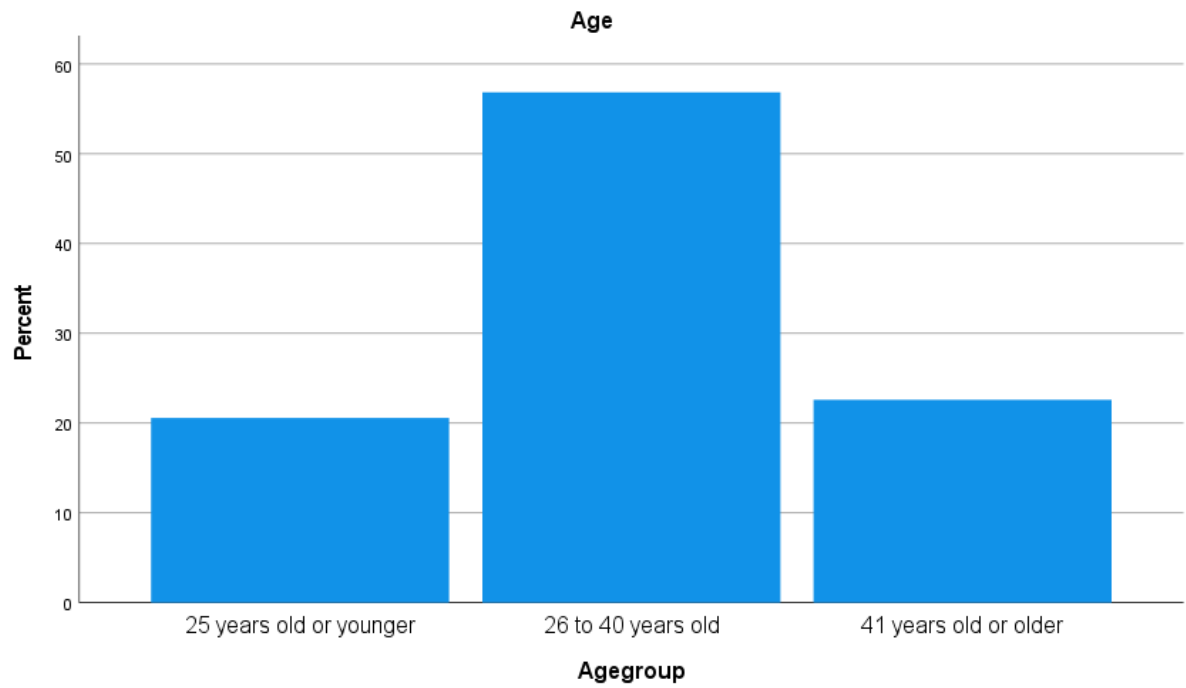


Figure 9 Age Respondents

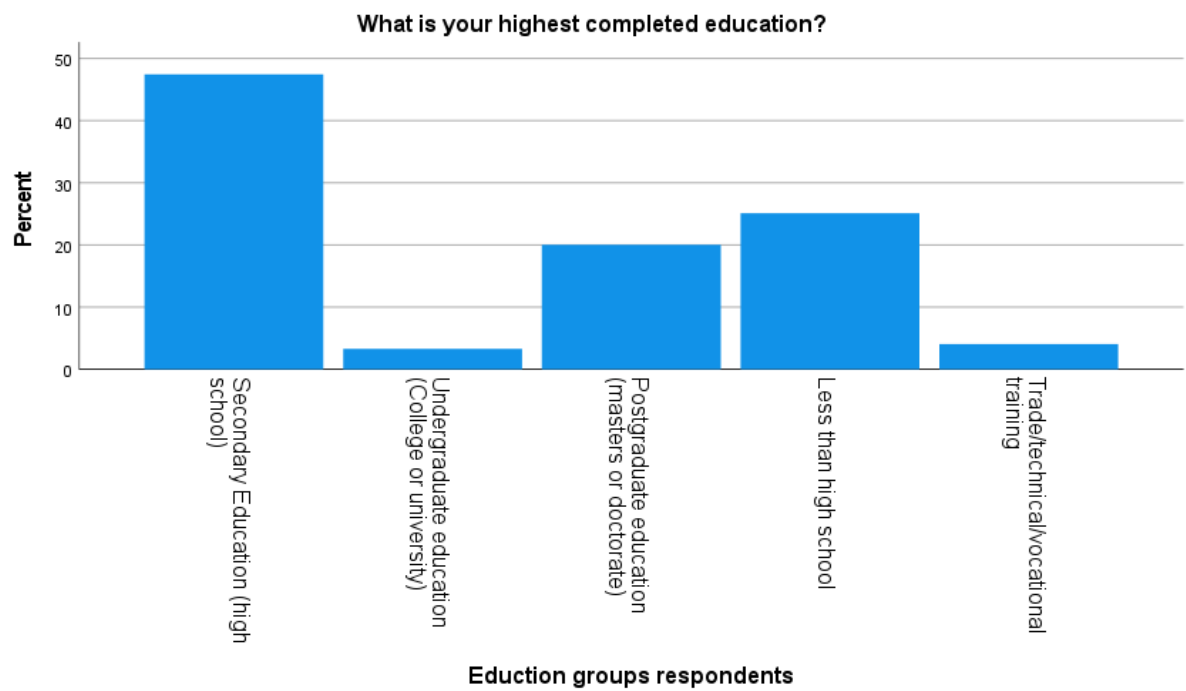


Figure 10 Education Respondents

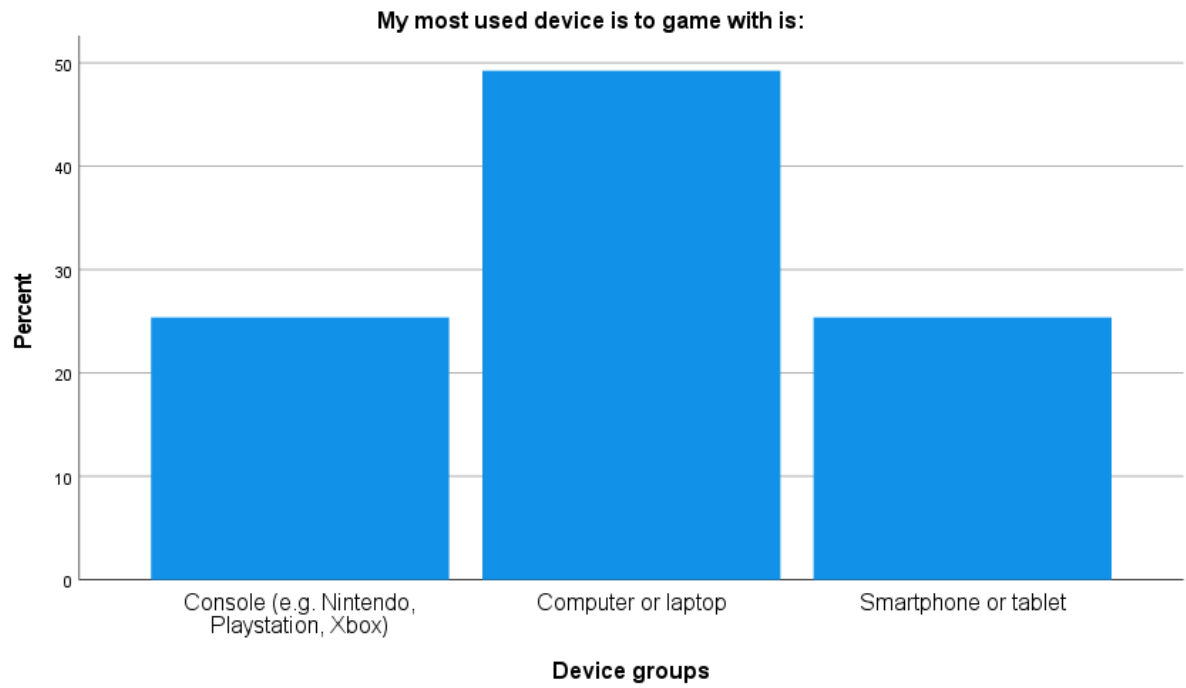


Figure 11 Most Used Gaming Device



Figure 12 Experience Access-based Gaming

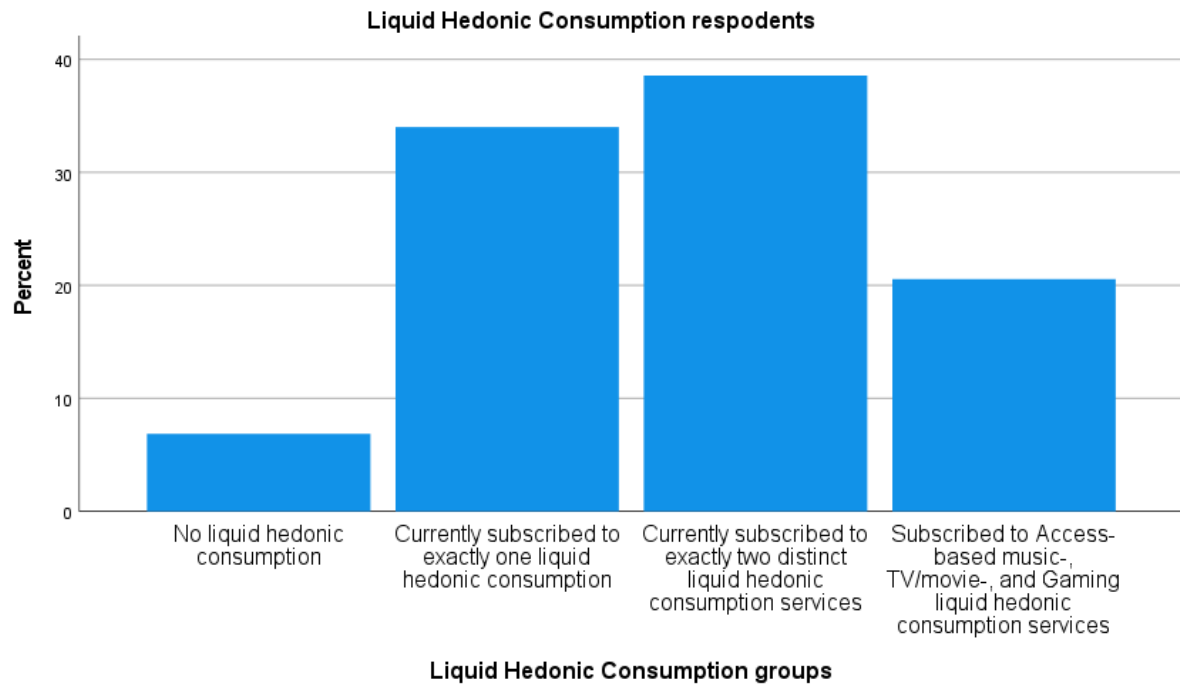


Figure 13 Current Liquid Hedonic Consumption Respondents

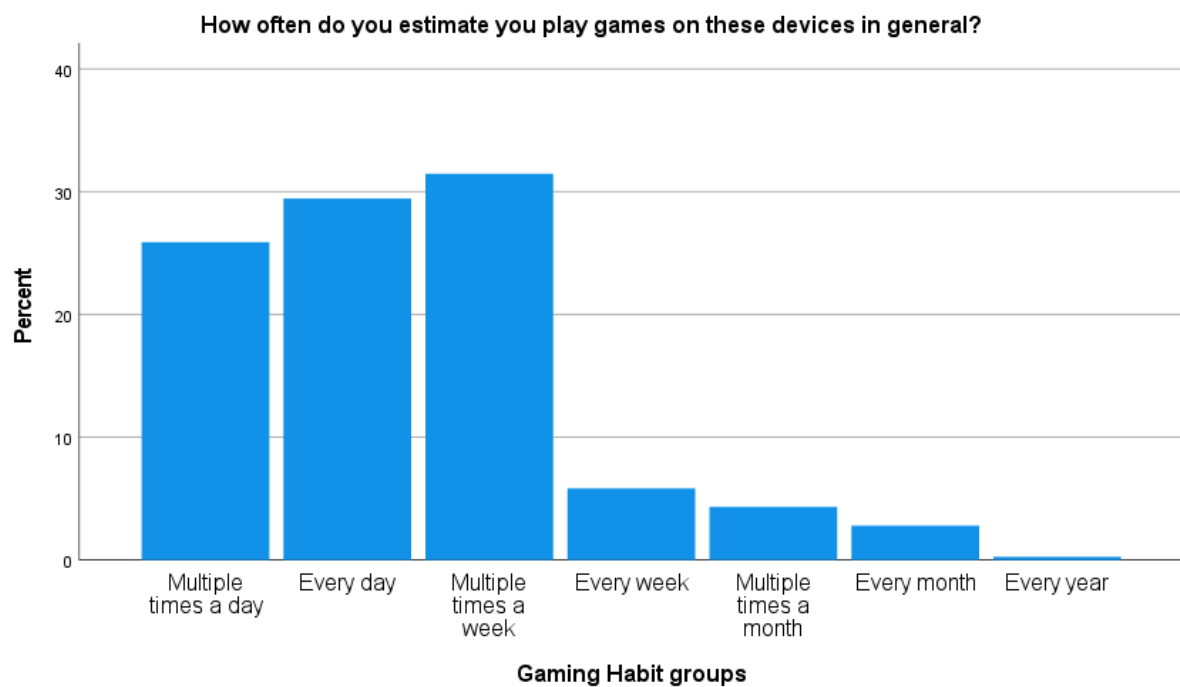


Figure 14 Gaming Habit Respondents

How many hours do you estimate to spend on games on either console, pc, smartphone or tablet a week?

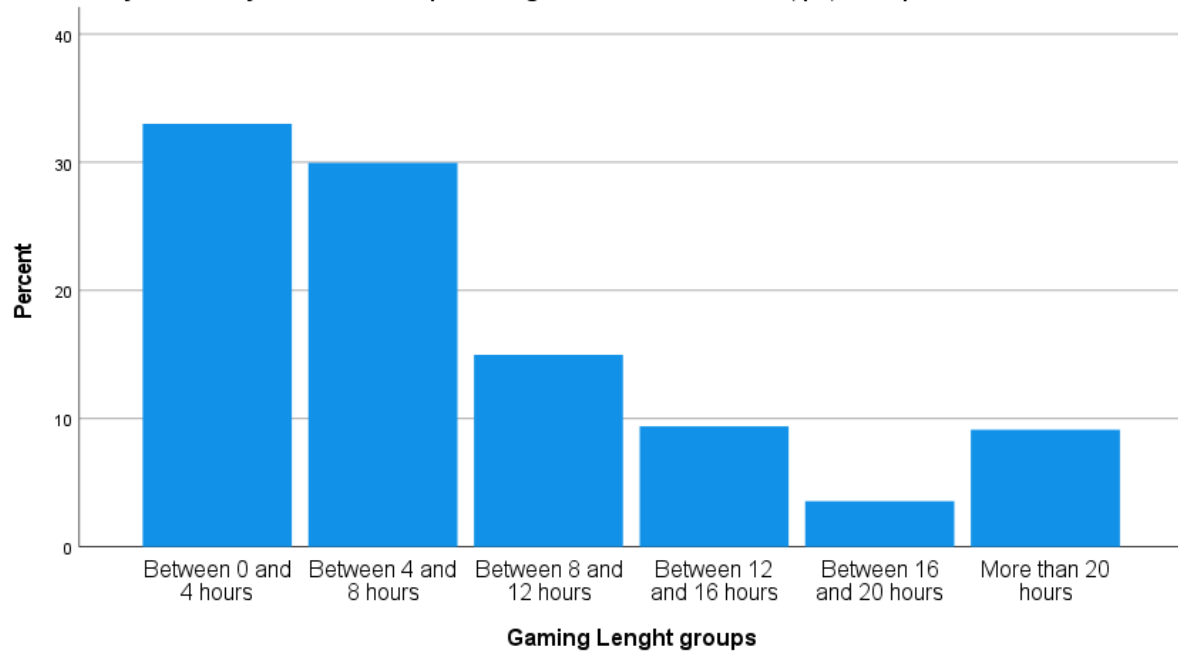
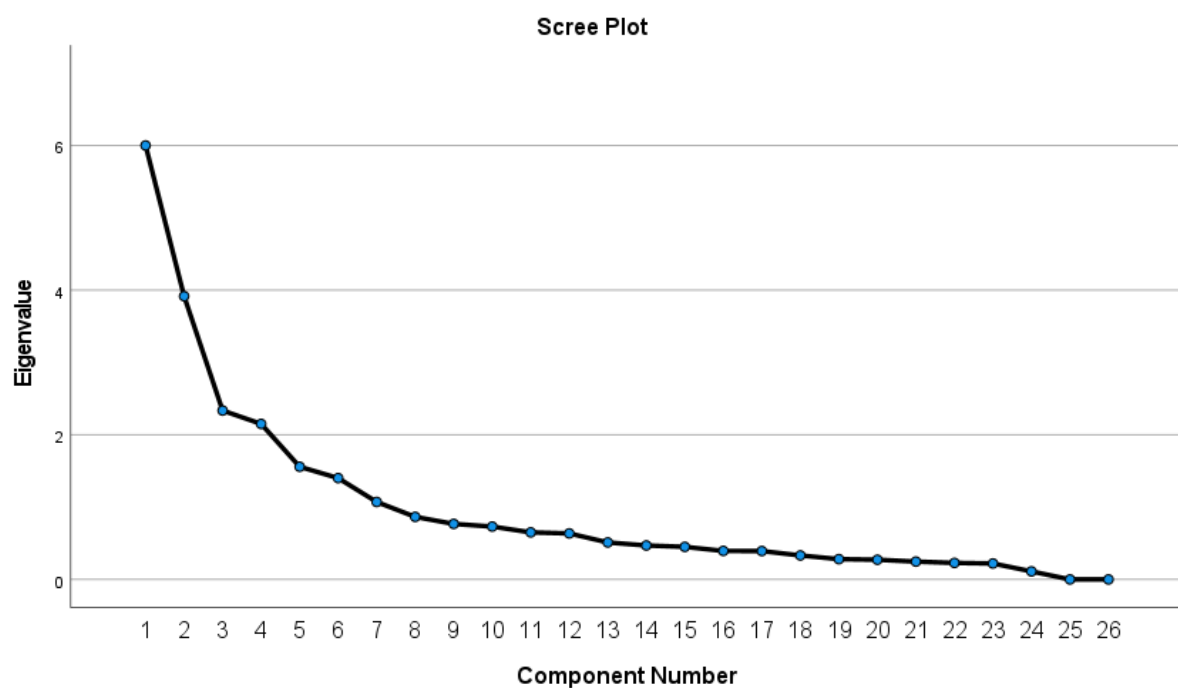


Figure 15 Average Gaming Length Respondents

Appendix D Preparation Factor Analysis

Table 8. *KMO & Barlett Test*

	KMO Value	Barlett's Significance
Usage Intention Pre Treatment	.835	.000
Perceived Enjoyment	.737	.000
Financial Burden	.757	.000
Price Value	.632	.000
Facilitating Conditions	.639	.000
Subjective Norm	.606	.000
Ease of Use	.500	.000



Appendix E Tests for Normality

Table 9. *Shapiro-Wilk test*

	Statistic	Shapiro-Wilk Significance
Usage Intention	.931	.000
Perceived Enjoyment	.898	.000
Facilitating Conditions	.919	.000
Price Value	.913	.000
Financial Burden	.980	.000
Ease of Use	.881	.000
Subjective Norm	.961	.000

Table 10. *Skewness main constructs*

	Skewness	Std. Error
Usage Intention	-.400	.122
Perceived Enjoyment	-1.007	.122
Facilitating Conditions	-.668	.122
Price Value	-.788	.122
Financial Burden	-.403	.116
Ease of Use	-.750	.116
Subjective Norm	-.297	.116

Table 11. *Kurtosis main constructs*

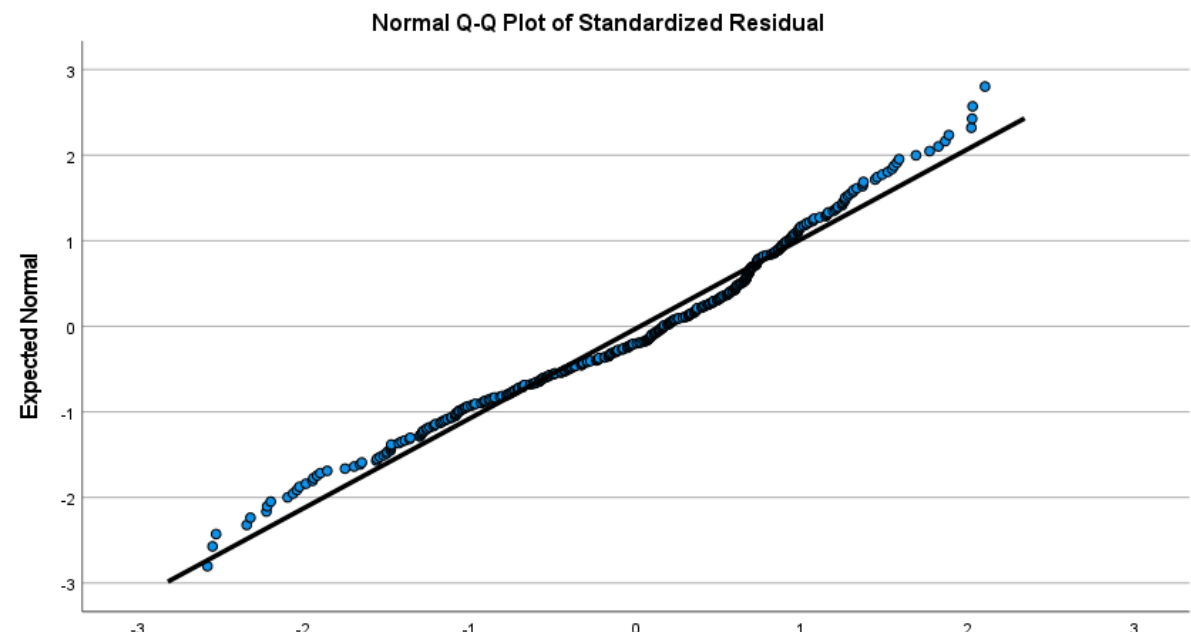
	Kurtosis	Std. Error
Usage Intention	-.808	.244
Perceived Enjoyment	1.764	.244
Facilitating Conditions	.228	.244
Price Value	.321	.244
Financial Burden	.108	.244
Ease of Use	-.750	.244
Subjective Norm	.356	.244

Appendix F Variance Inflation Factors

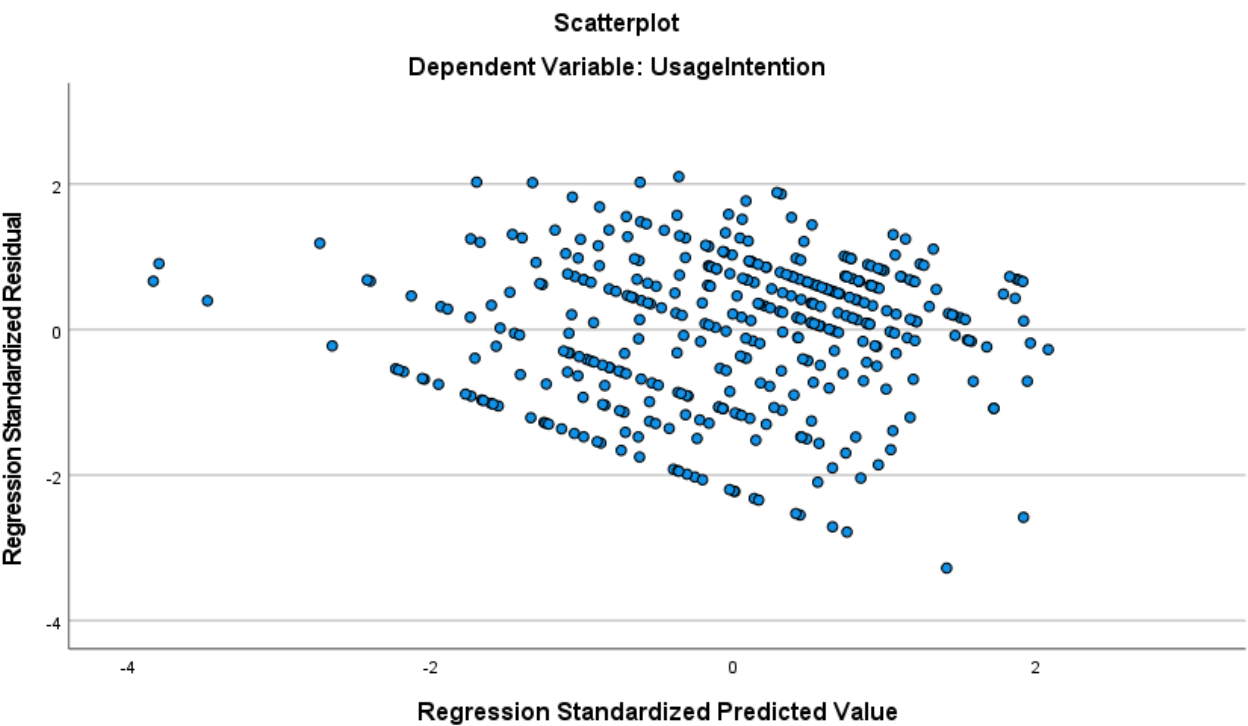
Table 12. *Variance Inflation Factors Regression 1,2 and 3*

	VIF regression 1	VIF regression 2	VIF regression 3
Perceived Enjoyment	1.313	1.317	1.573
Facilitating Conditions	1.651	1.694	2.238
Price Value	1.100	1.114	1.558
Financial Burden	1.039	1.056	1.080
Ease of Use	1.630	1.672	1.720
Subjective Norm	1.346	1.369	1.377

Appendix G Q-Q Plot Residuals Regression



Appendix H Homoscedasticity Regression Scatterplot



Appendix I Additional Outlier Analysis Regression

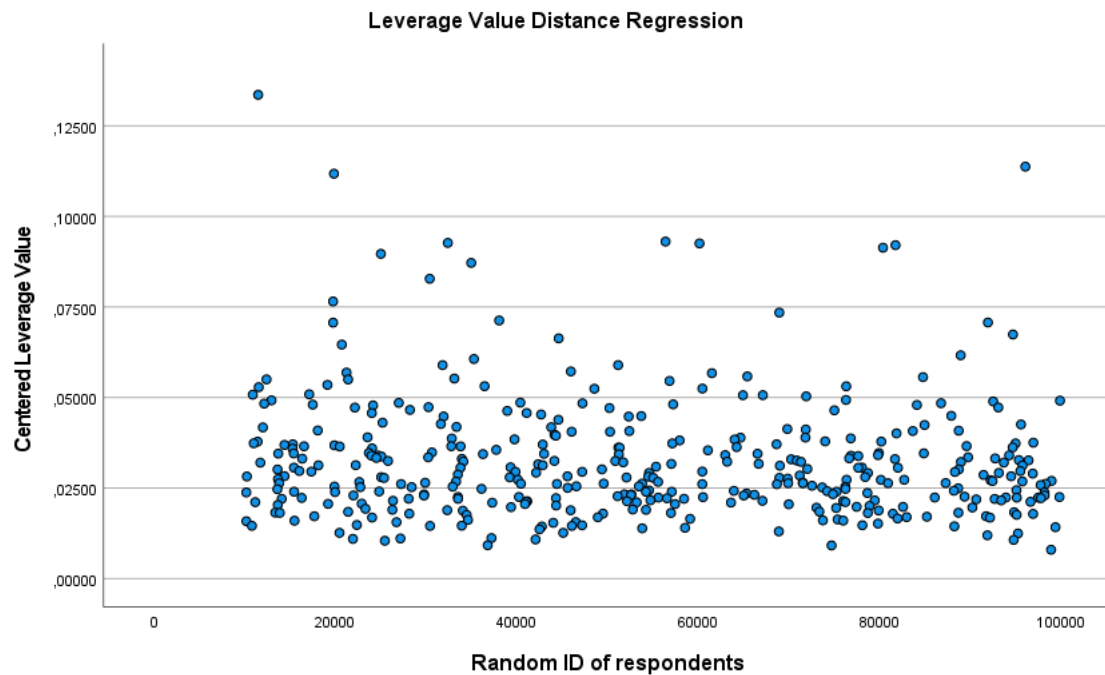


Figure 19 Scatterplot Leverage Regression

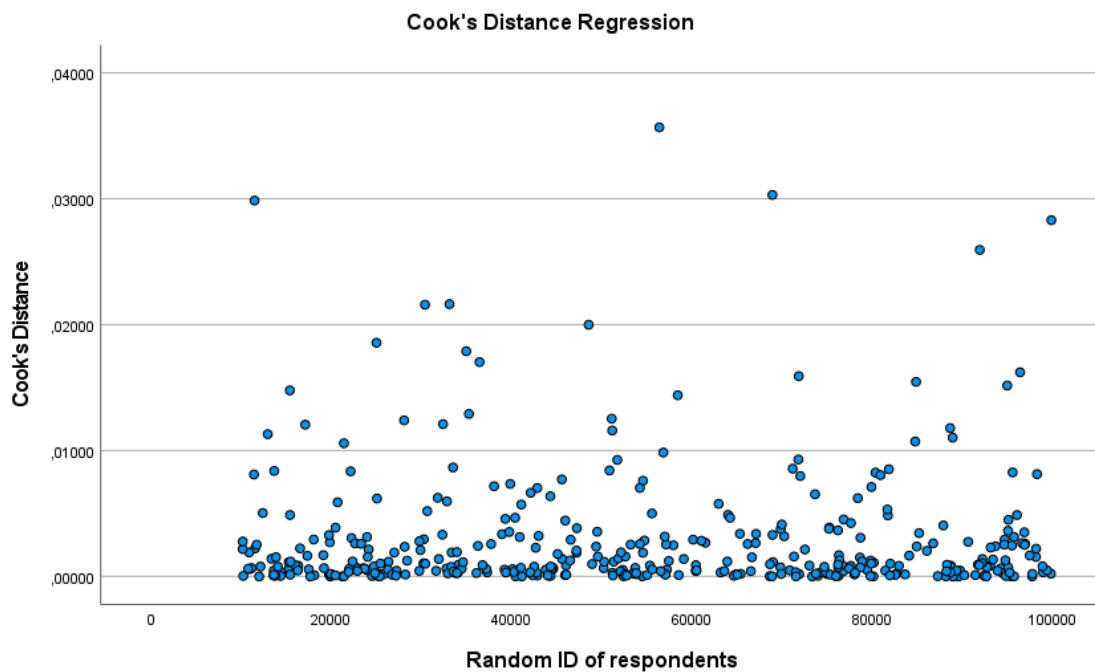


Figure 20 Scatterplot Cook's Distance Regression

Appendix J Usage Intention Histogram

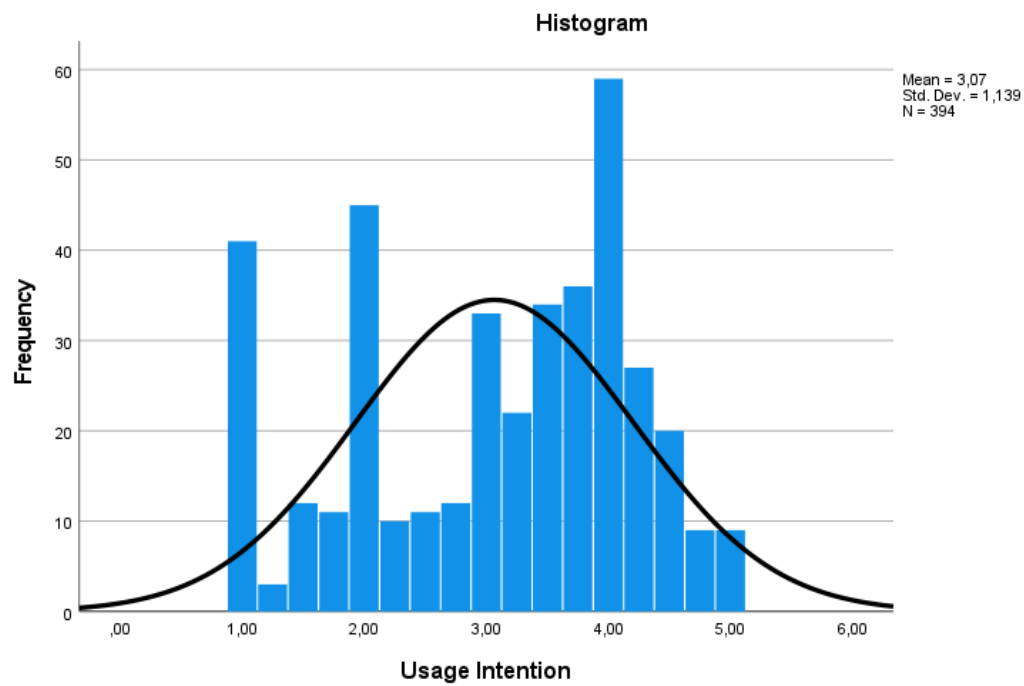


Figure 21 Distribution Usage Intention

Appendix K Histogram Variability of Groups

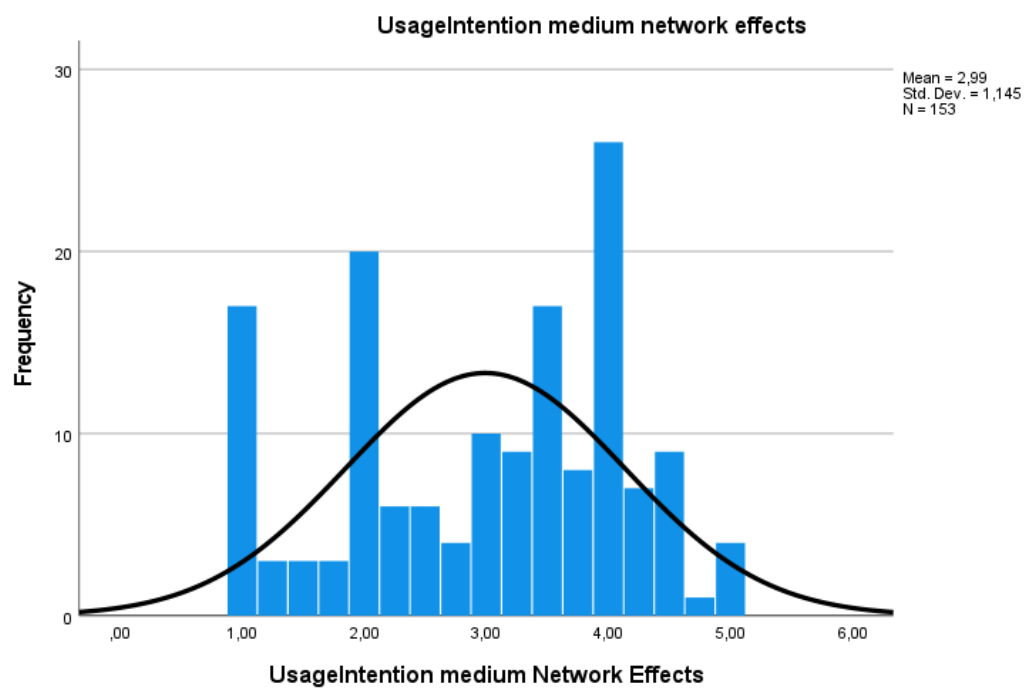


Figure 20 Distribution Usage Intention medium network effects

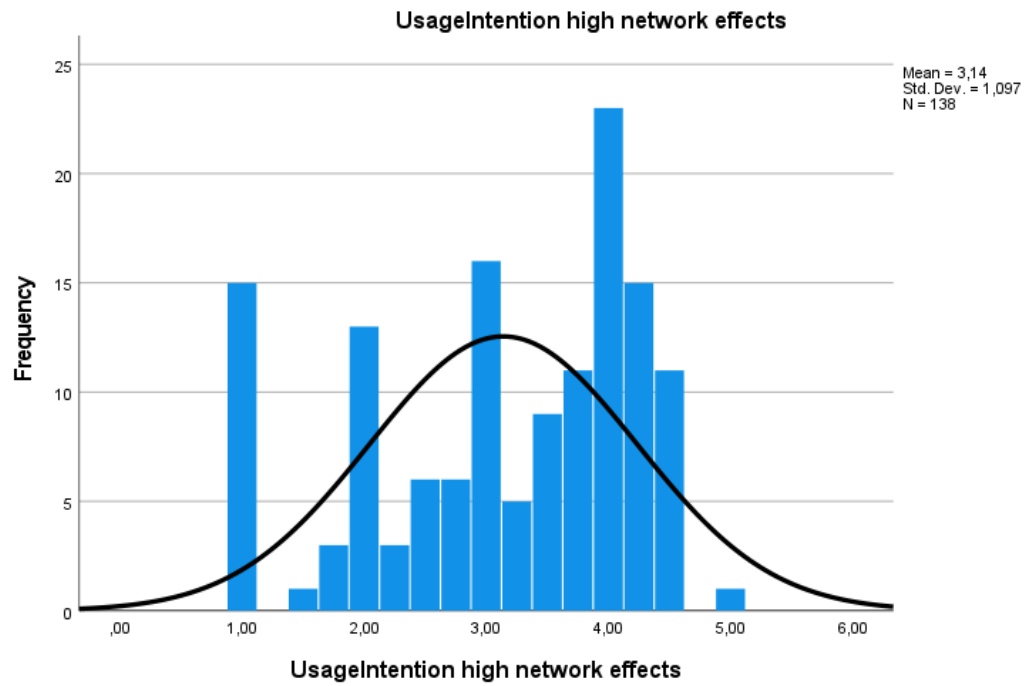


Figure 23 Distribution Usage Intention high network effects

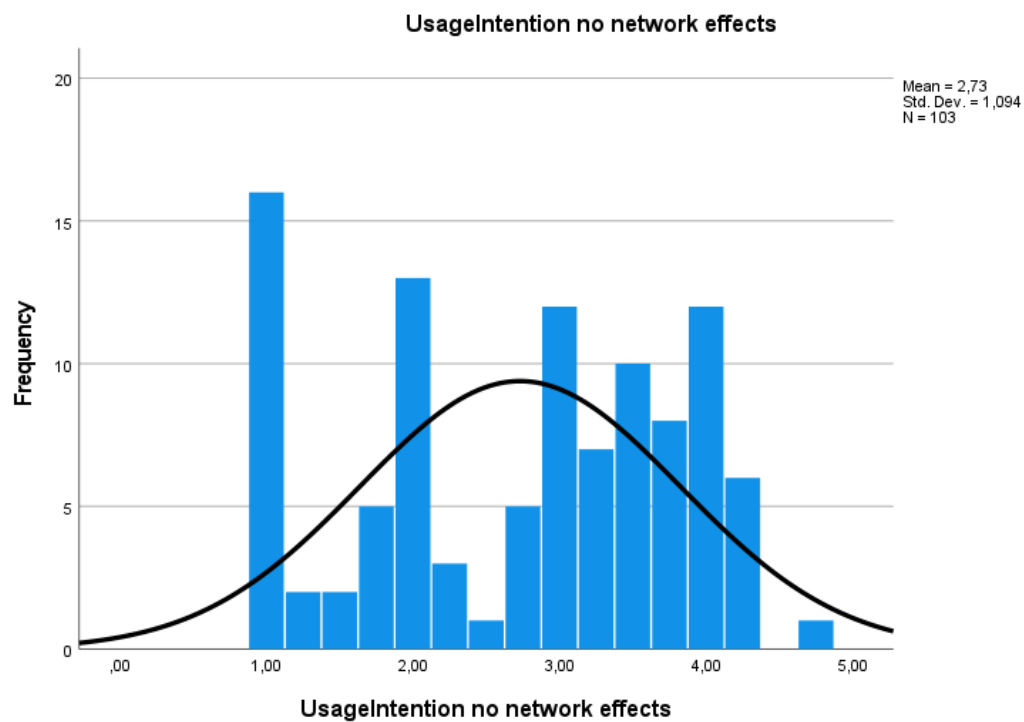


Figure 24 Distribution Usage Intention no network effects

Appendix M Box plot Distribution of Groups

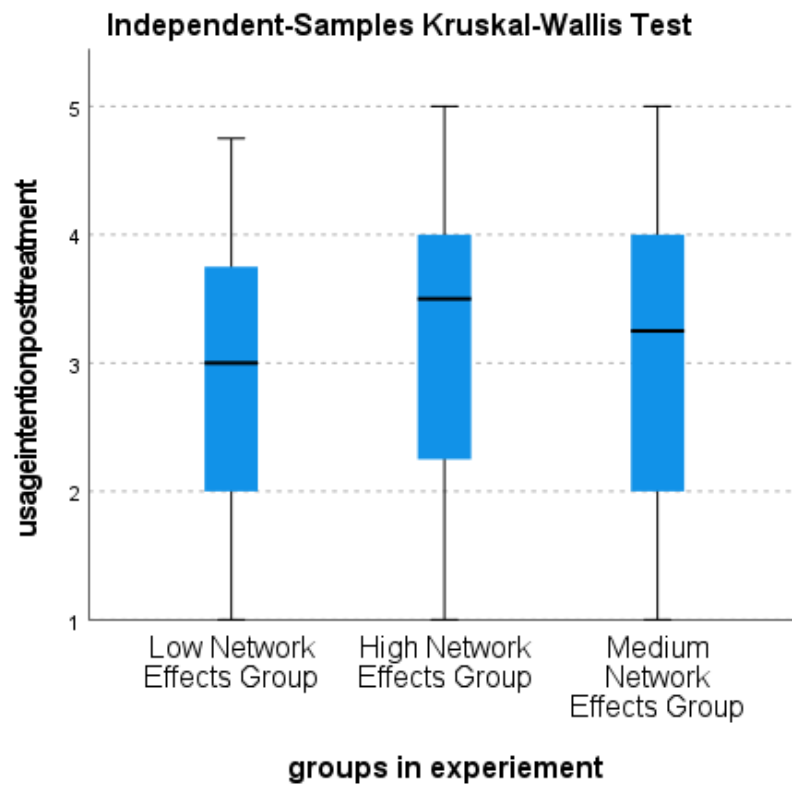


Figure 25 Boxplot Usage Intention between groups