The Impact of Augmented Reality on Product Purchase Intention in the Swedish Eyewear Industry
**Bachelor Degree Project in Business Administration**

**Title:** The Impact of Augmented Reality on Product Purchase Intention in the Swedish Eyewear Industry.

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**Key terms:** Augmented Reality, Swedish Eyewear Industry, Retail, Smart Devices, Product Purchase Intention, Synsam.

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**Abstract**

**Background:** During the recent years, the applications of Augmented Reality (AR) have increased due to advances in technology and improved accessibility of smart devices. The novel technological use of Augmented Reality is being introduced in the retail sector to create value both for retailers and customers. Through Augmented Reality, potential customers can virtually try and interact with different products on online platforms, saving both time and efforts needed to make their purchase decisions.

**Purpose:** The purpose of this study was to examine the impacts of Augmented Reality on Product Purchase Intentions among millennials in the Swedish eyewear industry; and whether there was a relationship between the use of the technology and the purchasing decisions of customers. Due to the novelty of AR technology and its applications in the eyewear retail industry, there is a lack of theoretical development on the impacts of this technology on purchasing intention of eyewear products.

**Method:** The study was based on the theory of Technology Acceptance Model (TAM), and the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2). A quantitative research and an explanatory research approach were conducted and followed by surveying (103) participants belonging to Generation Y in Sweden. The AR mobile application of the largest Scandinavian eyewear retailer, ‘Synsam’ that sells various brands was utilised to carry out the research. Multiple Linear Regression was used to test for the relationship between use of AR technology determinants and the purchase intentions of eyewear products of customers.

**Conclusion:** The findings of this study showed that AR technology had an impact on Product Purchase Intentions. The technology characteristics that were of high importance included information about products (Product Information), virtual interaction with the product (Telepresence) and the enjoyment of using this technology (Hedonic Motivation). Furthermore, Millennials in Sweden have found that using the AR technology to be a useful method for purchasing eyewear products, and that such a technology assisted them in making their purchasing decisions. These findings are useful for managers to satisfy their customers and provide them with unique experiences through AR technology embedded in marketing channels, which serves as a powerful tool for retaining customers and building a unique competitive advantage.
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# Table of Contents

1 INTRODUCTION  
1.1 Background  
1.2 Problem Discussion  
1.3 Purpose  
1.4 Research Question  
1.5 Delimitation  

2 LITERATURE REVIEW  
2.1 Augmented Reality and its Evolution in the Retail Industry  
2.2 The Era of Smart Devices  
2.3 Eyewear Retail Industry  
2.4 Previous research on Augmented reality and Online Retailing  
2.5 Technology Acceptance Model (TAM)  
2.6 Unified Theory of Acceptance and Use of Technology (UTAUT)  
2.7 Research Conceptual Model  
2.7.1 Product information (PI)  
2.7.2 Telepresence  
2.7.3 Hedonic Motivation (HM)  
2.7.4 Perceived Ease Of Use (PEOU)  

3 METHODOLOGY  
3.1 Research Philosophy  
3.2 Research Approach  
3.3 Research Purpose  
3.3 Data Collection  
3.4 Sample  
3.5 Questionnaire Design  
3.7 Reliability and Validity  
3.8 Research Ethics  
3.9 Synsam AB  

4 EMPIRICAL FINDINGS  
4.1 Reliability Analysis  
4.2 Descriptive Statistics  
4.2.1 Constructs  
4.3 Multiple Linear Regression Analysis  
4.3.1 First Regression model with “Product Purchase Intention” as the dependent variable  
4.3.1.1 Pearson’s Correlation Analysis  
4.3.1.2 Normality of the residuals diagnostics  
4.3.1.3 Homoscedasticity of the Residuals Diagnostics
4.3.1.4 Multicollinearity 34
4.3.1.5 Model Evaluation of Product Purchase Intention as the dependent variable 34
4.3.1.6 Evaluation of Each of The Independent Variables 35
4.3.2 Second Regression Model with “Hedonic Motivation” as the dependent variable 36
4.3.2.1 Pearson’s Correlation Analysis 36
4.3.2.2 Normality of the Residuals Diagnostic 37
4.3.2.3 Homoscedasticity of the Residuals Diagnostics 38
4.3.2.4 Multicollinearity 39
4.3.2.5 Model Evaluation of Hedonic Motivation as the dependent variable 39
4.3.2.6 Evaluation of each of The Independent Variables 40
4.4 Hypotheses Testing 40

5 CONCLUSION 44
6 DISCUSSION 46
6.1 General Discussion 46
6.2 Revised Conceptual Model 49
6.3 Implications 50
6.4 Research Limitations 51
6.5 Further Research 52

7 REFERENCE LIST 53
8 APPENDIXES 66

Appendix I 66
Appendix II 72
Appendix III 73
Appendix IV 74
Appendix V 74
Appendix VI 78
List of Figures

Figure 1. An illustration of mixed reality spectrum using Synsam Mobile Application 2
Figure 2. Technology Acceptance Model by Venkatesh and Davis (1996) pp.453 10
Figure 3. Research Model: UTAUT2 by Venkatesh et al. (2012) pp.160 11
Figure 4. Theoretical model with proposed constructs to Product Purchase Intention (Conceptual model) 13
Figure 5. Different filters in the App (Frame Category, Form, Price, Brand, Material, Colour and Design). 26
Figure 6. The virtual try-on after choosing a certain product, with a front and side view. 27
Figure 7. Information available after choosing the product (The Price, Payment Plans, and booking an appointment at the nearest store). 27
Figure 8. Gender distribution across the group 29
Figure 9. Employment status of participants 29
Figure 10. Product Purchase Intention mean & Standard Deviation 30
Figure 11. Normal P-P Plot of Regression Standardized Residual 32
Figure 12. Jarque-Bera Normality Test 33
Figure 13. Scatterplot of Standardized Residual of PPI 33
Figure 14. Normal P-P Plot of Regression Standardized Residual 37
Figure 15. Jarque-Bera normality test 38
Figure 16. Scatterplot of Standardized Residual of HM 38
Figure 17. Results of multiple regression analyses (HM & PPI each as a dependent variable) 43
Figure 18. Revised Conceptual Model 49

List of Tables

Table 1. Questionnaire Construction 22
Table 2. Reliability of Constructs 28
Table 3. Descriptive Statistics of the Constructs 30
Table 4. Pearson correlation analysis 31
Table 5. Multicollinearity Diagnostics 34
Table 6. Multiple Linear Regression analysis (Beta coefficient and Sig. value) 36
Table 7. Pearson correlation analysis 36
Table 8. Multicollinearity Diagnostics 39
Table 9. Multiple Linear Regression analysis (Beta coefficient and Sig. value) 40
1 Introduction

The purpose of this chapter is to introduce the reader on the topic of Augmented Reality (AR). Primarily, the background to the technology of Augmented Reality and its uses in online retailing is explored, and then the problem discussion of the literature gap is conferred. Lastly, the research question, purpose and the delimitations of this study will be presented at the end of this chapter.

1.1 Background

According to Cerf (2014, p.7), “Whoever thinks computer science is boring has not been paying attention”. As the gradual but definitive progress of technology continues to impact online shopping, it becomes imminent that online apparel retailers will have to adopt new technologies to enhance their web efficacy and boost their sales (Yaoyuneyong, Foster & Flynn, 2014). There has also been seen growth in online purchasing, which is expected to continue in the future (Tiago, Alhinho, Rita & Dhillon, 2017; Lee, Sujin & Zachary, 2017). Likewise, customers are increasingly trying the products in physical shops and then decide to buy them online, or research online before purchasing them in stores (Ankosko, 2012; Kisseberth, 2014).

Mobile phones, tablets and wearable devices are increasingly becoming more popular tools for interaction rather than desktop-based communication (Nieuwdrop, 2007). Users now are increasingly interacting through pervasive computing, that can occur at any location, format or time (Ebling, 2016; Jungum, Mohamudally & Nissanke, 2016). The real and digital worlds are integrated into one, which enables new technology applications and businesses to be established (Olsson, Lagerstam, Kärkkäinen & Väänänen, 2011).

Augmented Reality (AR) is a concept of bringing parts of the virtual world into people’s perception by using a device to enhance their environment. AR is sometimes misunderstood with the idea of Virtual Reality (VR). Unlike VR that requires a user to inhabit a completely virtual environment, AR uses the user’s natural environment and overlays virtual information on it, thus enhances the real world. Hence, AR is closer to the real environment, as opposed to VR (Milgram & Kishino, 1994).
Figure 1. Demonstrates an illustration of how the mixed reality spectrum is formed. The image on the left was created using a VR inducing platform that creates a virtual avatar using a virtually implemented eyewear product. On the other hand, the image on the right shows a real environment situation of the participant trying on an eyewear product. The picture in the middle is a mixed reality (Augmented Reality), which is created using a smart device App of the Swedish eyewear retailer ‘Synsam AB’. This image is a combination of a real environment (the participant's real face) and a virtual input (the eyeglasses) creating a mixed AR (Lamantia, 2009).

Figure 1. An illustration of mixed reality spectrum using Synsam Mobile Application

1.2 Problem Discussion

The implications of AR have increased during the recent years due to the accelerated technological advancement and the higher accessibility of users to smart devices, compared to before (Javornik, 2016; Carmigniani et al., 2011). AR is not only introduced in fields such as tourism, education, medicine and military but also in businesses; where it has been used as a marketing tool to deliver products to consumers (Kim & Forsythe, 2008). Moreover, by using the technology of AR customers can try different products and assess alternatives on various platforms, therefore, saving time and efforts while having the ability to compare prices (Carmigniani et al., 2011).

Although online shopping has many perks compared to in-store shopping, customers do not have a physical interaction with the items nor a two-way communication, which might hinder their willingness to buy the products online (Beck & Crié, 2018). As a result, businesses tend to face a more significant challenge in how to reach out for customers, influence their online shopping experience and try to have a positive effect on consumers’ purchasing intentions (Javornik, 2016).
AR has been used in both high-involvement and low-involvement products. Eyewear products, for instance, are considered high involvement products in which consumers spend more time and put more efforts on assessing alternatives as well as gathering information compared to low involvement products. Therefore customers tend to be more critical while choosing such products (Kim & Forsythe, 2008; Zaichkowsky, 1985). Whereas buying low-involvement or fast fashion products such as daily clothing is accompanied by lower risk since they have lower price tag compared to high-involvement products. Thus, customers put fewer efforts when evaluating such alternatives (Hasan, Subhani & Osman, 2012).

According to Huang and He (2011), e-tailing is defined as a short term for “electronic retailing”, and it was defined as the process of selling products online instead of stores. The novelty of the AR technology and its implications particularly in e-tailing raises awareness to investigate more on this topic to gain a thorough understanding by addressing the existing literature gaps. The application of AR in the eyewear e-tailing industry and how could its implications influence the product purchasing intention of customers will be further studied in this paper. Previous research papers (Pantano, Rese & Baier, 2017; Javornik, 2016; Schwartz, 2011) have touched upon the topic of applying AR and how it affects customer behaviour. However, those papers directed their studies towards specific countries (Germany and Italy), while focusing their research on a single brand (Ray-Ban), rather than the overall market, and websites were the primary platform of application that was used.

A significant gap is noticed, and further research is needed to examine this relation in countries that were not investigated before using various eyewear brands as well as using an AR mobile application on smart devices rather than websites. Therefore, this study will concentrate on the Swedish market, since it was not examined earlier. Moreover, and for the sake of studying many brands instead of one, the mobile application of one of the most prominent Swedish retailers that sell various brands, ‘Synsam’, will be utilised while carrying out the study (Cvc.com, 2018). Hence, this paper could be considered as an original and an unprecedented work that contributes to the existing literature.

1.3 Purpose

The purpose of this research was to investigate the impact of AR in smart devices in the Swedish eyewear industry on Product Purchasing Intention (PPI) of consumers. Whether there was any direct relationship between the use of such technology and the buying intentions of an eyewear product was investigated. This paper focused on millennials in Sweden as a targeted population (Generation Y) and went in depth to investigate what are the AR technology determinants that best explain this relation. A theoretical framework was utilised, along with a progressive course of hypothesis and relationships in order to map the path between augmented reality in the eyewear industry and PPI. This theory along with hypotheses were analysed and examined through a quantitative empirical study to determine if this technology signifies purchasing intention of an eyewear product or not.
1.4 Research Question

RQ1: Does AR have a positive impact on the Product Purchase Intention in the Swedish eyewear industry among millennials in Sweden?
RQ2: If so, what are the AR technology determinants that have a positive impact on the Product Purchase Intention of eyewear products among millennials in Sweden?

1.5 Delimitations

A delimitation of this study was that it focused on the eyewear retail industry and its products, not on other retail sectors. Likewise, this research concentrated on the AR mobile application in the eyewear retail industry and its effect on Product Purchase Intention. Hence, other AR platforms in the industry such as websites and augmented mirrors were not investigated in this study (Pantano et al., 2017; Fera, 2014; Kugelmann et al., 2018).

This research was also limited to examining certain technology characteristics that may directly affect Product Purchase Intention through AR mobile applications. Hence, indirect or second-line constructs that might also have influenced PPI in the eyewear industry were not included in this research.

Furthermore, this study focused on effects of AR in smart devices on Product Purchase Intention of generation Y or the millennials in Sweden through surveying students at Jönköping University. Therefore, the results of this study could not be generalised on other generations or the population of Sweden as a whole (Graziano & Raulin, 2004; DePoy & Gitlin, 2005). Likewise, since the sample consists of millennials in Sweden, it may not be accurate for other nations due to cultural or economic differences (Tarhini, 2013; Polit & Beck, 2010).
2 Literature Review

The following frame of reference is elaborated and presented. It firstly discusses the technology that lies behind AR and its significance in the retail industry, and then the authors amplify the relevance of smart devices and the reasons behind investigating AR with the focus on smart devices. Secondly, the eyewear industry is reviewed and its presence in e-commerce is investigated. Moreover, The subsequent sections will discuss the previous research that has been conducted in this field, its focuses, and its limitations. From this perspective, further analysis of relevant frameworks is conducted and a model adapted to various motivational factors is constructed.

2.1 Augmented Reality and its Evolution in the Retail Industry

AR is a series of technologies that integrate virtual inputs with the real world by that enhancing the reality (Lamantia, 2009). AR is based on mechanisms developed for Virtual Reality (VR). However, it does not outplace the realness of the surrounding environment, but it applies the real environment as a background (Fonseca, Martí, Redondo, Navarro & Sánchez, 2014). The specification of AR that distinguishes it from current models of Virtual Reality (VR) is the feature of generating a “mixed reality” wherein the actual surrounding environment is real. However, the objects illustrated in this environment are virtually implemented (Cho & Schwarz 2010; Drascic & Milgram 1996). On the other hand, VR is an environment that is entirely formed by a synthetic set-up, in which it can mimic the real-world environment without having any real construct (Milgram & Kishino, 1994).

AR is considered to be one of the smartest and most recognised approaches that have the potential to create value for both retailers and customers (Huang & Liu, 2014; Pantano, 2014). The smart technology is said to add value to retailers by influencing customer engagement and customer decisions (Pantano, 2009). Nevertheless, applying this technology to retail industries boosts online customer experiences (Pantano & Timmermans, 2014), giving them a unique and meaningful involvement by allowing them to make decisions with more information and hence more certainty (Oh, Yoon, & Shyu, 2008). The lack of knowledge and inadequate product specifications restricts customers from making risky purchases, but AR can atone for this inadequacy of inputs, by creating a three-dimensional augmented stimulation of the products integrated with the shopper's environment, which allows buyers to better evaluate desired products (Kim & Forsythe, 2008).

Moreover, for many different products AR gives customers the possibility of trying on products that they never tried on before since the technology allows for fast and easy application, this offers customers the opportunity to experiment many more options that they would not normally consider while shopping (Drugstorenews, 2017). Lastly, other previous research has shown that AR can significantly increase the user's willingness to buy and hence influence their purchasing decisions in a way the traditional shopping platforms cannot attain (Poushneh & Vasquez-Parraga, 2017).
2.2 The Era of Smart Devices

Smart devices are personal communication tools that include smartphones, tablets, and smart wearable accessories that shifted multitasking from an industrial environment to an advanced smart environment at home or in the office (Zhang et al., 2013). Smartphones, in particular, have become an inseparable part of our daily lives, and according to Poushter (2016) smartphone ownership rates around 68% in advanced economies, and around 37% in emerging economies, which makes these tools an optimum mean of communication and interaction with people worldwide. Moreover, smart devices are considered a dream appliance for the developers of augmented reality, since the main input modules required to drive Augmented Reality are already built-in in these devices, this includes GPS sensors, camera and gravity sensors (Oh, 2014).

According to Dacko (2017), Mobile AR provides benefits that cannot usually be attained in a shopping experience, and most users of such smart apps expect them to be mainstream in the next five years, making it evident for retailers that investment in such technology is crucial for further growth. Mobile AR apps using smart devices are mobile services that progressively liberate customers from time and place constraints (Benou & Vassilakis, 2010). Therefore, discovering the different methods that mobile AR apps are used in retail can grant a great deal to the advancement of further theory and frameworks that would take the retail industry to a whole new level.

In this research, AR is thus appropriated to be a live mobile view of a real-world background whose aspects are being augmented by computer-generated inputs. Mobile AR on smart devices gives the users real-world surroundings, the advancement of being highly interactive and digitally malleable, detached from time and place restraints (Chen, Tsai, Vedantham, Grzeszczuk & Girod, 2009).

2.3 Eyewear Retail Industry

Retail Eyewear is divided into three different categories; Prescription Glasses, Sports-Oriented Sunglasses, and Frame Sales (for both fashionable sunglasses and prescription glasses) (Gailmard, 2008). According to a market research report that was carried out by Sperduto (2017), stated that the global eyewear market was worth 102.66 billion US Dollars in 2015. The increasing dependence on electronic gadgets has led to eyesight related issues, and the increase in the elderly population, are expected to increase the eyewear market significantly, making the eyewear one of the most prosperous markets in retail (Sperduto, 2017).
Just as the textile industry, the eyewear industry faces the challenge of being innovative and trendy as well as being customised in accordance with the different facial dimensions of the populations in various countries. Moreover, the challenges in the eyewear industry are more sophisticated since eyeglasses are used as a medical solution that requires specific criteria that differs from a state to another. Hence, high-involvement products face a more complex challenge compared to low-involvement products due to the development of the industry and the necessity of products customisation, medical standards, and aesthetic appearance (Montalto, Graziosi, Bordegoni & Di Landro, 2016).

Due to the ageing population, the Swedish eyewear market is expanding at a rate of five to eight percent per year and is worth 357 million euros (Challinor, 2004). The number of eyewear users is estimated to be five million in comparison to the whole population in Sweden, which is nine million. Last but not least, there are 800 to 850 optical selling points spread around Sweden (Challinor, 2004).

2.4 Previous research on Augmented reality and Online Retailing

Pantano, Rese and Baier (2017) have investigated consumer behaviour when using AR during online shopping. The outcomes of this study (Pantano et al., 2017) could be used as a blueprint for businesses to understand how and what technological characteristics to focus on when setting their online platforms, to take advantages of their implications. Hence, they can effectively exploit the technology of AR and impact their consumers’ behaviour positively. This study (Pantano et al., 2017) serves as a starting point for marketers since it investigated consumers’ motivation to interact with online products. As a consequence of this interaction, the consumer’s buying decision was proven to be influenced positively, since the utilisation of AR facilitated their buying decision. Moreover, these results could aid in constructing the marketing strategies following the economic context of the country where the company operates. The results depicted that consumers from diverse economic conditions appreciated the implication of AR and found it as a convenient tool in which it provides consumers with the ability to try the products and checking if they fit their needs or not; hence, making the right selection choice (Pantano et al., 2017). On the other hand, there are differences between countries when it comes to preferences regarding the elements of enjoyment while others focus on the usefulness of the platform and the quality of the information provided.
Another study that was carried out by Huang and Liao (2014) tested the same technology acceptance variables (usefulness, aesthetics, service excellence, playfulness, ease of use). This test was developed to examine the factors that make the consumer’s relation more sustainable when using AR. However, this study linked the level of user’s cognitive innovativeness and the using intentions with the previous technology acceptance framework. Moreover, they suggested that these two factors are connected to the continuity of the usage of this technology. People with high cognitive innovativeness sense the perk of accomplishing tasks when using advanced technologies, while people with lower cognitive innovativeness lack the ability to recognise the usefulness of this technology when solving tasks. This study found that users with higher cognitive innovativeness value usefulness, aesthetic quality and service excellence to accomplish a sustainable relationship with retailers. On the other hand, users that have lower cognitive innovativeness concentrated on playfulness and ease of use (Huang & Liao, 2014).

Beck and Crié (2018) established that the existence of Virtual Fitting Rooms on a retailer’s website as a sales aid increase the curiosity of customers, therefore influencing their exploratory behaviour and their buying intentions online and in-store. Furthermore, Schwartz (2011) initiated a study to check if there is a direct interaction between AR and the purchasing intention of consumers in the retail industry. The application of AR provides more product information, and the direct interaction increases the product knowledge, thus, boosting the purchasing probability. However, Dacko (2017) examined the positive role of mobile applications on the consumer’s shopping experience by ensuring that the bought item is what the consumer wanted. Consumers attained both extrinsic benefits such as efficiency and better shopping value, as well as intrinsic benefits like entertainment when using mobile applications.

Rese et al. (2017) carried out a study on four different mobile applications in which two have a virtual mirror (marker-based) while the others used a combination with products catalogue (marker-less). Marker-based applications such as Ray-Ban proved to have a greater enjoyment effect on perceived usefulness; however, marker-less applications like IKEA were found to have informativeness on perceived usefulness. The study concluded, that marker-less applications surpass marker-based ones in terms of recommendations and using intentions, since they are more informative and can be used to get further knowledge on the products.

On the other hand and according to Poushneh, Vasquez-Parraga and Arturo (2017), AR Technology could have adverse effects on customers if there is a variance between the anticipations they have in mind about this technology compared to the experience they gain after utilising it. For instance, if the quality of AR is low or customers cannot interact and get a quick response while using this technology, then customers will not enjoy their experience. Hence, the less the interactivity of the customer's, the less the probability of the customers getting positively affected by the AR technology.
A common point was found in the studies mentioned above; likewise, in Javornik (2016) and Pantano (2009), they indicate the importance of creating a pleasant experience for customers through a more realistic and interactive design to make it extra beneficial for users. As well as, grant more information to customers in which the risk is reduced. Nevertheless, providing vivid experiential perks while reducing the gap between online and in-store selling, would make the implications of AR appealing to a limitless number of consumers. Moreover, all prior studies agreed on the potential that this technology would have on consumers, and its ability to influence their buying intentions.

However, after conducting the preceding thorough research on previous peer-reviewed studies in the field of interest, the authors discovered a significant gap in these papers. It was found that no previous study examined the purchasing intentions of customers while using AR mobile application in the eyewear industry. Thus, the effects of this technology on this specific retail sector is seen to be of high importance, and the need to examine its outcomes is of great value, to help guide businesses into more progressive and effective practices.

2.5 Technology Acceptance Model (TAM)

End-user technology acceptance is one of the prominent areas in various systems research, and this is mainly because consumer acceptance is a vital aspect of the market success of any rising technology (Sutherland, 1964). According to Davis (1986, 1989), Technology acceptance model (TAM) suggested the factor that motivates users to use a system is best described by the users' Attitude towards using (AT). Both Perceived Usefulness (PU) and Perceived Ease Of Use (PEOU) explain AT, and TAM is seen to be a direct predictor of Behavioural Intentions to use (BI) an innovative system. Numerous empirical studies have stated that TAM frequently explained a substantial amount of the variance of behavioural intentions of use (around 40%) and that the model approvingly agrees with alternative models such as the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB) (Venkatesh, 1999).

However, TAM as a framework has often been criticised due to its modesty, and its likelihood to turn the research target away from “design and implementation based antecedents” (Benbasat & Barki, 2007, p.212). Hence, the TAM framework was enlarged with different variables that add antecedents to PU and to PEOU, e.g. the TAM2 and TAM3 models (Venkatesh & Davis, 2000; Venkatesh & Bala, 2008) that were focusing on different features of different Information Technology (IT) systems.
Perceived Ease of Use (PEOU) is defined as the extent of how much this application is user-friendly, effortless to utilise or learn how to work with. PEOU could be measured by many factors; one of them is the number of instructions that should be read by users. Perceived Usefulness (PU) represents the user’s acknowledgement on how much added value this system has for the user, and how convenient it is while using. Attitude towards using (AT) describes the user’s evaluation of the system’s quality and the features it has. Finally, Behavioural intentions (BI) indicate the degree of the user’s tendency to utilise the system (Pantano et al., 2017).

2.6 Unified Theory of Acceptance and Use of Technology (UTAUT)

There are several theoretical models that try to explain individual acceptance and use of technology. A combination of eight of these models, including the TAM model have resulted in the Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh, Morris, Davis and Davis (2003). Since it was introduced, UTAUT has been used as a framework applied to many studies of acceptance and use of technologies (Venkatesh, Thong & Xu, 2012). The UTAUT suggests four key factors that influence technology-use intentions. These factors include first, performance expectancy or the benefits gained when using technology. Effort expectancy or the ease associated with the use of the system is the second key factor, followed by the social influence as the influence of others on individuals technology use. Facilitating conditions or the availability of resources to aid the use of technology is the last key factor that influences using intentions (Venkatesh et al., 2003).
The first three constructs are direct determinants of behavioural intention. However, the fourth is a direct determinant of use behaviour as seen in Figure 3. According to the theory, Gender, Age and Experience moderate the impact of the four factors on the usage intention and behaviour (Venkatesh et al., 2003). The UTAUT model has been later extended to UTAUT2 due to gained popularity and to better suit different contexts (Figure 3). UTAUT was extended by the addition of new constructs that help explaining user intention (Venkatesh et al., 2012). The three new constructs include Hedonic Motivation defined as the ‘fun or pleasure derived from using a technology’ (Venkatesh et al., 2012), Price Value or the tradeoff between benefits and monetary cost of the technology use (Dodds, Monroe & Grewal, 1991), and Habit or the extent individuals perform behaviours due to prior learning (Limayem, Hirt & Cheung, 2007).

The UTAUT2 offered a significant improvement to the variance explained by technology acceptance of users (from 56 to 74 percent) and use (from 40 to 52 percent) (Venkatesh et al., 2012). The key limitation of the model is that it focuses on a single task at a given point in time. However, longitudinal studies have been suggested to provide better generalisations (Williams, Rana & Dwivedi, 2015).

Figure 3. Research Model: UTAUT2 by Venkatesh et al. (2012) pp.160
2.7 Research Conceptual Model

Intentions in the retail industry using e-commerce digital-apps and websites was analysed through various theoretical frameworks in previous research (Pantano et al., 2017; Huang & Liao, 2014; Beck & Crié, 2018; Rese et al., 2017; Vijayasarathy, 2004; Venkatesh et al. 2012). Among the most discussed is the Technology Acceptance Model (Davis, 1989) in Figure 2, as well as the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) in Figure 3 (Venkatesh et al. 2003). The TAM model was developed to explain the phenomenon of the use of technology in determining different behavioural intentions, both from psychological and sociological points of view (Davis 1989). Various previous empirical findings had shown that TAM is a robust model for the acceptance of new technologies (Gefen & Straub, 2000). On the other hand, the UTAUT model had been a popular theoretical choice in the field of information and communication technology, which explained acceptance and usage of technology by employees (Williams, Rana, Dwivedi & Lal, 2011). The UTAUT explained a substantial amount of employee behaviour intention and technology use (Venkatesh et al. 2003). Additionally, it has also been applied to the consumer context in many studies, which had later lead to the development of UTAUT2 to specifically explain consumer acceptance of information and communication technologies (Venkatesh et al. 2012).

The developed model (Figure 4) is constructed using the two frameworks that were mentioned earlier. The purpose of this study is to examine the intentions to purchase an eyewear product using AR technology, which will focus on four main constructs; Perceived Ease of Use, Hedonic Motivation, Product Information, and Telepresence. Since these variables are excessively studied in the previous related literature as the leading AR technology characteristics and are said to be significant determinants of attitudes and intentions (Pantano et al., 2017; Rese et al., 2017; Vijayasarathy, 2004; Schwartz, 2011; Huang & Liao, 2014).

Product Purchase Intention (PPI) is seen as the intention to purchase a product (Fiore, Kim & Lee, 2005). In this study, PPI is defined as the intention of a consumer to buy a product using AR technology on a smart device, regardless of the chosen retailer or provider. This definition will allow the study to examine the effects of AR on the purchase intention of eyewear products, irrespective of external market factors.
Primarily, this model will discover whether AR has a positive effect on the purchase intention of an eyewear product, answering the research question that was introduced earlier. Virtual model technology is seen as a tool that enhances customer purchase intention when shopping online (Fiore et al., 2005). Nevertheless, when examining the effects of AR on purchase intention in retail Schwartz (2011) discovered no significant impact of the former on the latter. However, these assumptions were based on a low involvement product. The authors suggested the possibility that a high involvement product might lead to a positive purchase intention and assumed that their results might be product specific and hard to generalise on different apparel (Schwartz, 2011). Consequently, this research implies that AR technology imposes a positive effect on the intentions of eyewear customers to purchase a product through four different technology characteristics. Thus, Hypothesis 1 is as follows:

H1: The interaction with the product via using AR application leads to a positive intention to purchase an eyewear product.

Figure 4. The Theoretical model with proposed constructs to Product Purchase Intention (Conceptual model)
2.7.1 Product information (PI)

Kim and Lennon (2008) found that despite the importance of the visual presentation of a product, product information nonetheless is very critical to positively influence online consumers to purchase a product. Increased product information also resulted in more knowledgeable customers that can take more informed decisions (Cook & Coupey, 1998; Glazer, 1991).

Internet shopping is often associated with a higher level of risk or uncertainty due to the incompetence of the platform to provide a physical inspection of the product (Park, Lennon & Stoel, 2005), and this risk has an adverse effect on the behaviours and intentions (Kim & Lennon, 2000). As a solution to this risk, the higher level of product information available acts as a risk-reducing strategy that combats the high risk associated with online shopping and hence has a positive effect on shopping outcomes (Kim & Lennon, 2000). Park et al. (2005) have found that product presentation and information has a direct positive impact on the apparel purchase intention of customers. Hence, Hypothesis 2 is as follows:

H2: Eyewear product information has a positive effect on Product Purchase Intention.

2.7.2 Telepresence

Presence and Telepresence are Two terms that have been utilised reciprocally by previous researchers (Mollen & Wilson, 2010; Huang & Liao, 2014; Steuer, 1992; Schwartz, 2011). According to Steuer (1992) and Witmer and Singer (1998), presence was defined as the experience of being located in an environment or a place even though that person is physically situated in a different location. While, Telepresence is built on the former definition and it means being present in an environment with the help of a communication medium (Steuer, 1992).

It is of great importance for this research to include the term “Telepresence” in the framework since there is no physical interaction between the product and the consumer. Hence, the retailer’s ability in delivering the products to the consumer with the usage of the AR technology is crucial to be examined. Moreover, previous related studies have found Telepresence to have a significant effect on the purchasing intentions and attitudes of consumers purchasing online (Fiore et al., 2005; Schwartz, 2011; Huang & Liao 2014). Thus it is assumed that Telepresence positively affects Product Purchase Intention, hence, Hypothesis 3a is:

H3a: Telepresence positively affects the Product Purchase Intention.
Moreover, former studies found a connection between Telepresence and Hedonic Motivation (HM) (Sautter, Hyman & Lukosius, 2004; To & Sung, 2018). The better the ability of the retailer to deliver the store environment, the higher the consumer enjoyment factor is; meaning that the better the Telepresence, the higher the hedonic motivations (Fiore et al., 2005). Thus, Hypothesis 3b is:

H3b: Telepresence has a positive effect on Hedonic Motivation.

2.7.3 Hedonic Motivation (HM)

Another factor that was added to this framework is HM. It is the extent of perceived enjoyment, fun and pleasure that online shopping experience gives consumers (Rese et al. 2017; Babin, Darden & Griffin, 1994). Previous studies found that enjoyment and hedonic factors are vital factors when it comes to using of a new technology (Childers, Carr, Peck, & Carson, 2000; Brown & Venkatesh, 2005), and had a direct impact on purchasing intention and decision-making (Venkatesh et al., 2012). Hence, Hypothesis 4 is as follows:

H4: Hedonic motivation has a positive effect on Product Purchase Intention.

2.7.4 Perceived Ease Of Use (PEOU)

PEOU is explained as the “degree to which a person believes that using a particular system would be free of effort” (Davis, 1989). The word ‘Ease’ in this factor is defined as “the freedom from difficulty or great effort”. An effort is an unlimited resource that could be allocated by an individual to a specific activity (Radner & Rothschild, 1975). According to Gefen, Karahanna and Straub (2003), PEOU was found to directly impact the user's intentions when using new technology. Nevertheless, a technological application that is perceived to be easy to use has a higher chance of being accepted by users (Davis, 1989). On a study case on AR effects on consumer intentions, PEOU was found to be a significant variable determining user intentions (Vijayasarathy, 2004). Lee, Fiore, and Kim (2006) also found that PEOU had a critical effect on deciding behavioural intentions of online customers. Given these findings and the significance of PEOU in accepting new technologies, Hypothesis 5a is as follows:

H5a: Perceived Ease Of Use of the AR application positively affects the intention to purchase a product.

Nevertheless, according Davis, Bagozzi, and Warshaw (1992), empirical findings supported a robust positive relationship between PEOU and hedonic values; the easier the use of a particular application implied that users would enjoy the experience a lot more. Hence, it is hypothesised that:

H5b: Perceived Ease Of Use of the AR application has a positive effect on Hedonic Motivation.
3 Methodology

The purpose of this chapter is to present the methodological approaches used for this research. Primarily, the research philosophy that underpins author’s assumption is justified, followed by the research approach and purpose. Then, the methods of data collection and sampling are described. Furthermore, the questionnaire design and data analysis methods are presented, followed by reliability and validity discussion as well as ethics in this research. Lastly, the company of Synsam AB and its online AR mobile application is discussed and explained.

3.1 Research Philosophy

The research philosophy that was adopted holds significant assumptions on the way the world is viewed as a whole, which in return underpinned the research strategy and the methods chosen (Saunders, Lewis & Thornhill, 2009). As business and management researchers need to be conscious of the philosophical choices they make since such decision will have significant effects on how they reach an understanding of what is investigated (Saunders et al., 2009). However, the more critical aspect was defending the reasons behind the adopted philosophy in relation to other philosophies that could have been selected (Johnson & Clark, 2006).

Alavi and Carlson (1992) have found that the philosophy that was widely applied and popular in Information systems was Positivism. Moreover, many links between Positivism and the field of social sciences as well as business studies were found (Orlikowski & Baroundi, 1991). Positivism as a research philosophy argues that social sciences should deal with common methodological principles that deal with facts and observations, and not values. The philosophy also states that the inquiry should be based on scientific observations, and therefore on empirical methods (Gray, 2014). The positivist usually adopts a framework for research by using existing theories, from which hypotheses are then developed and tested (Saunders et al., 2009).

This study used the positivism philosophy for researching AR’s impact on Product Purchase Intention, as it used existing theories and previous studies. The current research found on this topic provided a base on which the hypotheses and constructs were derived, and which will be either confirmed or rejected (Saunders et al., 2009).

Likewise, according to the positivist philosophy the research builds on what has already been known or studied and can be observed and measured objectively. For example, ”Even Einstein’s radical theories are a development from Newton’s” (Walliman, 2011, p.21). Therefore, the findings of this research should apply to certain generalisations and should allow other people to replicate it (Welman, Kruger & Mitchell, 2005). Hence, the positivist philosophy calls for quantitative data that can be statistically analysed to make generalisations (Saunders et al., 2009).
3.2 Research Approach

The aim of the literature review varies in accordance with the research approach that is going to be applied by the researcher (Saunders et al., 2009). If the researcher is planning to use the inductive approach, he/she commences with looking into the data he/she has, and later derive new theories relying on the data examination results (Ade Bilau, Witt & Lill, 2018). Hence, it is more interpretivism (Easterby-Smith, Thorpe & Jackson, 2008). While if the deductive approach is going to be applied, first the researcher uses the theories that were found in previous literature and uses them to develop hypotheses to subsequently test them using the collected data (Ade Bilau et al., 2018).

The research approach needed to be linked to the previously chosen research philosophy (Malhotra & Birks, 2006). Since a quantitative approach was more likely to be associated with a deductive approach, this approach was used (Greener, 2008). The study built on previous theoretical framework found in the literature review and focused on expanding the current frameworks in different settings.

The constructs used and the hypotheses developed were based on previous research. The proposed conceptual model was designed from TAM and UTAUT2 models using earlier studies on AR in the retail context. By testing the theory in a new setting, the research contributes to the existing research (Malhotra & Birks, 2006). This paper examined a developed conceptual, theoretical model that adjusted to different settings of AR mobile applications in the eyewear industry, and within individuals belonging to generation Y in Sweden.

Nevertheless, Quantitative research quantifies observations and findings and analyses them through mathematical relations using statistical methods, while a qualitative approach involves the collection of descriptive data and analysing it through interpretative methods (Greener, 2008). Furthermore, according to Curwin and Slater (2007) quantitative approach allows for higher accuracy in the results it provides when it is compared to the qualitative approach since it studies a larger sample which makes it applicable to generalisations. Nevertheless, Scholars (Polit & Beck, 2008; Steen & Roberts, 2011) assert that the Positivist philosophy is linked to quantitative research. Therefore, This study used the quantitative method that goes in line with the positivist research philosophy, which was statistically analysed and tested for hypotheses.
3.3 Research Purpose

The research purpose was to answer the introduced research questions; this could be achieved by enforcing different forms such as exploratory purpose, which was to discover new insights or to give a better understanding of a phenomenon. A descriptive purpose could also be used; which is to depict the features of a phenomenon or individuals. An explanatory purpose is another form that finds relations or effects of different constructs in a tested situation (Kothari, 2004). Thus, this research adopted an explanatory purpose, to discover the effects or impact of using AR technology on the Product Purchase Intention in the Swedish eyewear industry, and what technology characteristics cause such impact, if it occurred.

With regards to the time constraints, the research can either take a cross-sectional or longitudinal format (Saunders et al., 2009). Most academic research on social sciences tend to be cross-sectional as they are usually completed in a limited time. Longitudinal studies on the other hand typically need external funding to protract the extended time period (Greener, 2008).

Cross-sectional studies are used to gather information at a single point in time, and such studies would be able to determine the impact of a certain factor on another (Macdonald & Headlam, 2008). Since our research did not study change or development over time, it did not require a longitudinal time horizon (Saunders et al., 2009). Therefore, according to the time constraints, the means available in conducting this research, and the purpose of this research, the cross-sectional time horizon was used.

3.3 Data Collection

To make the data in this research more reliable, a combination of both primary and secondary data was to be utilised (Saunders et al., 2009). The collection of the primary data depends on the research approach to the research if it is qualitative or quantitative. If it is quantitative, then the applied strategies to gather primary data are experiments or surveys. While if the qualitative approach is being carried out, researchers can gather primary data by doing intensive interviews attaining a significant amount of information from a small sample or conduct a focus group for instance (Hox & Boeije, 2005).
For this research, secondary data was firstly used due to the chosen deductive research approach. Secondary data was the data that has been firstly collected by previous researchers or organisations for a different purpose or study and was reused in later research (Hox & Boeije, 2005). The secondary data was used to explore previous theories of TAM, UTAUT2 and studies that were carried out on the influence of AR on purchase intentions, from which a literature review was then derived. The TAM along with UTAUT2 models were used in previous research, and were employed to build the research model for this study as well as to construct the hypotheses. The secondary data were mainly gathered from Jönköping University’s online library database ‘Primo’ and Google Scholar. The searched keywords that were used to find previous studies were ‘augmented reality’, ‘eyewear industry’, ‘purchase intention’, ‘TAM’, ‘UTAUT’, ‘UTAUT2’, ‘consumer behaviour’, ‘smart devices’, ‘research methodology’ and also a combination of these keywords. It is worth mentioning that all of the collected secondary data were peer-reviewed articles to assure the reliability of this paper and to be able to build on trustworthy resources.

Primary data was the data collected by the researchers specifically for answering their research purpose and objectives. The main reason for the collection of primary data is due to the lack of information to answer the research questions in addition to that previous secondary data were gathered to test different times (Hox & Boeije, 2005). In this study, primary data was collected through a survey to make sure that the research questions were tackled, and the received data suited the research problem.

A survey is a research strategy that collects information about the experiences, feelings or opinions of the participants by asking standardised questions that are previously constructed by the researcher (Hox & Boeije, 2005; DePoy & Gitlin 2005). Therefore, all participants got the same questions listed in a fixed order. Researchers were able to attain many perks when using surveys to collect primary data, such as higher accessibility to a larger number of responses and low expenditure. To sum up, the intention of collecting a primary data for this study was to give valuable information on the different constructs that affected Product Purchase Intention.

3.4 Sample

A population is a group of people or objects of primary interest to the researchers (Lohr, 2009; Singh, 2007). On the other hand, a sample is a subgroup of a population (Levy & Lemeshow, 2008). In a positivist research study, the sample is used to be a representative of the whole population (Collins & Hussey, 2013). The population identified for this research was composed of people belonging to the Generation Y (Millennials) in Sweden. These individuals are generally defined as the generation cohort born between early 1980’s to early 2000’s (Brosdahl & Carpenter, 2011; Shepherdson, 2000; Muskat, Muskat, Zehrer & Johns, 2013). The key characteristic of Generation Y (Millennials) is that they are early adopters and regular users of technology (Immordino-Yang, Christodoulou, & Singh, 2012; Bolton et al., 2013; Martin 2005).
Moreover, individuals belonging to generation Y have a higher purchasing power comparing to previous generation cohorts (Straus, Howe & Markiewicz, 2006), they are highly brand-conscious and demanding customers (Morton, 2002). Therefore, the population of this research consisted of individuals belonging to Generation Y (millennials), specifically those born between the years 1981 to 1999, due to the aforementioned reasons (Bolton et al., 2013).

Since most of the students at Jönköping University were born between 1981 and 1999 (J. Johansson, personal communication, April 6, 2018), this research applied both convenience and self-selection sampling of the Jönköping University students, due to time and resource constraints. Convenience sampling is a type of non-probability sampling that involves the sample to be drawn from a population that is easy to reach or get in contact with (Singh, 2007). Furthermore, there is no other criterion to convenience sampling apart that the people are willing to participate in the study (El-Masri, 2017). Researchers due to its advantages often use convenience sampling. Their advantages include easiness, time efficiency and cost-effectiveness (Henry, 1990). Although convenience sampling is easy to acquire, it has the disadvantage of being prone to sampling bias since the participants do not have an equal probability to be selected (Bornstein, Jager & Putnik, 2017; Cooper & Schindler, 2011), and therefore may not correctly represent the population. However, the sampling bias is less when there is lack of variation in the population (Bornstein et al., 2017; Saunders et al., 2009).

Self-selection sampling is also a non-probability sampling method in which the individuals show the willingness to take part in the study (Saunders et al., 2009). The critical component is that the individuals volunteer to take part in the study rather than being persuaded by researchers directly (Doyle, 2011). The research used self-selection sampling in addition to the convenience sampling, for individuals who want to take part in the study and they will be reached through publicising the survey on various online platforms. The utilised publicity platforms were social media such as Facebook groups, Messenger and emails. Individuals that were willing to participate in the study through self-selection were interested in the research topic and considered it important (Saunders et al., 2009).

When it comes to the non-probability samplings, the question of sample size is vague, and unlike in probability sampling, there are no specific rules (Saunders et al., 2009). The sample size in non-probability sampling is dependent on the research question and purpose (Patton, 2002). Likewise, according to Yin (1994), the grounds for generalisation from non-probability case studies are based on expanding and generalising theories or ‘analytical generalisations’ instead of measuring frequencies or ‘statistical generalisations’. Since the purpose of this research was to test the impact of AR on Product Purchase Intention, the size of the sample was made as large as possible with the time and resources constraints and was aimed at around 100 participants.
3.5 Questionnaire Design

There are different instruments for surveys according to Graziano and Raulin (2004), for this research a questionnaire was carried out to collect the primary data. Questionnaires could be self-administered or interviewer-administered. Interviewer-administered questionnaires are accompanied with the interviewer being with the participants to explain the questions and give further information to the participants when needed (Saunders et al., 2009; Graziano & Raulin, 2004). Thus, this study adopted the interviewer-administered questionnaire, where participants were going to fill out the survey that was constructed for this study with the assistance of the researchers of this paper. The reason for joining the participants during the questionnaire was to answer their inquiries and to make further explanations regarding the survey or the AR mobile application in the case of any.

The questions used were closed as in accordance with a quantitative research method (Stone, 1993). Closed questions are composed of alternative answers from which the participant is asked to choose (Dillman, 2007). The advantages of closed questions are that they are quicker and more straightforward to answer, as they require minimal writing effort. Likewise, the responses from closed questions are easier to compare. The type of closed items that was utilised is rating questions, where questions were presented on a standard scale, usually from negative to positive (David & Sutton, 2004).

Many researchers (Dillman, 2000; Brace, 2004), found that five to seven scales responses are the most frequently used while designing questionnaires. On the other hand, many argue against five, and favour seven scale responses (Jamieson, 2004). For this study, the researchers wanted to examine the extent to how much people agree or disagree with the introduced statements in the questionnaire (Dillman, 2007). Therefore, a Likert-style scale with seven-scale response, which ranges from 7 ‘Strongly Agree’ to 1 ‘Strongly Disagree’, was used. A Likert-scale is a commonly used scale in surveys and gauges the attitude of participants (Jamieson, 2004; Awang, Aftanorhan & Mamat, 2016).

Last but not least, three screening questions were used at the beginning of the questionnaire to help to eliminate and filter the participants who are not eligible or applicable to this study (Rea & Parker, 2014). For instance, if a participant did not wear prescription glasses or sunglasses, or if he/she did not belong to generation Y, or if they have not tried all the features that are included in the mobile application; the researchers disregarded their answers when analysing the collected data (Appendix I). Table 1 shows the different questions that were used for every construct.
<table>
<thead>
<tr>
<th>Constructs</th>
<th>References</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Ease of Use</td>
<td>Davis (1986)</td>
<td>How would you describe the mobile application:</td>
</tr>
<tr>
<td></td>
<td>Lee et al. (2006)</td>
<td>• It was clear and understandable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Does not require a lot of mental effort</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• It was easy to use</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• It was easy to learn</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• There were easy steps to try the glasses on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The virtual try on was intuitive to use</td>
</tr>
<tr>
<td>Hedonic Motivation</td>
<td>Venkatesh et al. (2012),</td>
<td>How would you describe your experience after using the app:</td>
</tr>
<tr>
<td></td>
<td>Lee et al. (2006)</td>
<td>• It was entertaining</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• It was very interesting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• It was appealing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• It was enjoyable</td>
</tr>
<tr>
<td>Telepresence</td>
<td>Schwartz (2011), Fiore et al. (2005)</td>
<td>How would you describe your feelings after using the application:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• I felt that the glasses were real</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• I felt that I was interacting directly with the glasses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• I felt separated from my real world environment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• I felt connected and emotionally attached to the glasses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• It created a shopping experience similar to the one I would experience in stores</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• It allowed me to interact with the product as I would in the store.</td>
</tr>
<tr>
<td>Constructs</td>
<td>References</td>
<td>Questions</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Product information</td>
<td>Kim et al. (2016)</td>
<td>How would you describe the informativeness of the application:</td>
</tr>
<tr>
<td></td>
<td>Kim and Lennon (2000)</td>
<td>• Improved my information seeking performance</td>
</tr>
<tr>
<td></td>
<td>Pantano et al. (2017)</td>
<td>• It made it easier to seek information</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• I found it useful in seeking information.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• I have learned a great deal about the product</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• It helped me make a more informed purchase decision</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• I can fully trust information given by the app</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The virtual try-on provided needed information about eyeglasses</td>
</tr>
<tr>
<td>Product Purchase Intention</td>
<td>Schwartz (2011)</td>
<td>How do you agree with the following statements:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• I believe I have enough information to make a purchase decision</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• If I were to make a purchase decision I would feel confident doing that decision</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• I feel that the virtual try-on helped me decide to buy a product</td>
</tr>
</tbody>
</table>

### 3.6 Data analysis method

As mentioned earlier the quantitative approach was applied for analysing the collected data. Firstly, descriptive statistics were implemented since it permitted the researchers to summarise a significant amount of data as well as simplify them applying measurements that were easy to be used by the researchers. Thus, gender and employment status in the questionnaire were analysed using descriptive statistics. Likewise, descriptive statistics were used to measure both the central tendency and variability of the constructs. The central tendency measures include the mean, mode and median. While variability measures are the range, standard deviation and variance (Graziano & Raulin, 2004; Burns, 2000).

The strength and the direction of the relationship between variables were measured using correlation as it gauges the possible link between variables. Pearson correlation was applied since it computes the linear relationship between variables and it varies from -1.00 to +1.00 in which the first indicates a perfect negative relationship and the latter indicates a perfect positive relationship (Burns, 2000).
Inferential statistics aids researchers to explain, understand and generalise the results obtained from the sample (Graziano & Raulin, 2004; Burns 2000). Hence, inferential statistics allows for hypothesis testing and uses data for making deductions about the population. Furthermore, Multiple Linear Regression was used, since it is one of the inferential statistical procedures that will model the relationship between two or more explanatory variables and the dependent variable (Pallant, 2005). SPSS and E-Views were both used for data analysis.

3.7 Reliability and Validity

The reliability and validity of the measurements that were applied during the research were of great importance. Commencing with reliability, which means attaining stable, consistent and accurate data since it is of a great significance to base the conclusions on them, otherwise, researchers will not be able to rely on the gathered data if they are not consistent (Burns, 2000). There are different types of methods for reliability estimates such as alternate forms method, test-retest reliability, split-half method, and internal consistency reliability (Graziano and Raulin, 2004). Internal consistency method was developed by Kuder and Richardson, is the ability of the measurements to quantify or assess the same constructs (Litwin, 1995; Thigpen, Kappenman & Keil, 2017).

According to Graziano and Raulin (2004), proper measurements give stable outcomes, and one of the commonly used internal consistency measurement is Cronbach coefficient alpha which measures the consistency of variables, and it can be done using SPSS (Burns, 2000; Streiner, 2003). For this paper, the Cronbach coefficient was tested to assure the reliability of the collected data since it has been extensively used (Thigpen et al., 2017). In accordance with Hinton, McMurray, and Brownlow (2004) findings, Cronbach's alpha above 0.90 demonstrates excellent internal consistency. While if it ranges between .70 and .90, it indicates high internal consistency, and alphas from .50 to .70 show intermediate internal consistency, last but not least if a coefficient is below .50, it is considered inferior.

On the other hand, the validity of the quantitative research is to which degree does the research measurements measures the constructs in which the examiner is interested in (Balnaves & Caputi, 2001). Same as reliability, there are different types of validity such as construct validity, internal validity and external validity. However, for this research face validity as well as content validity were applied to assure the validity of this research. Face validity is the process of asking people who do not have a broad knowledge on the examined topic to make sure that the questions are clear and easy to understand, and the constructed instruments measure the proposed topic (Burns, 2000; Heale & Twycross, 2015). Whereas content validity is the extent to which the designed instruments measure the constructs that are intended to be studied by the researcher (Heale & Twycross, 2015; Litwin, 1995). Since the survey questions were constructed and selected from peer-reviewed previous studies that have already examined the same constructs, content validity was achieved in this research.
3.8 Research Ethics

Ethical issues in research can be associated with the subject of inquiry, its method as well as to its procedures (Burns, 2000). The individuals participating in research must be protected against deception, privacy invasion and psychological/physical harm (Graziano & Raulin, 2004).

According to the principle of informed consent, the researchers must give clear and honest information about the research for participants to make an informed decision whether to take part in the study or not (Rosenthal, 1994; DePoy & Gitlin 2005). Hence, in this research, the participation was voluntary, where the contributor was informed on the nature and purpose of this research and had the chance to agree or disagree to taking part in the survey. This was done by stating the purpose of the study and benefits at the beginning of the survey. As the research specifically aimed for contributors that belong to millennial generation (age 19 to 37), no prior parental consent for 18-year-olds was needed (DePoy & Gitlin, 2005).

Moreover, the right to privacy found both in international and national legislation, represents an essential human right. In order not to violate this right, the data collected was anonymous by excluding participants’ names in the questionnaire. Likewise, the contributor was informed at the beginning of the survey that their answers would be kept confidential. The gained information and data were only used for this research and not shared with any other parties (DePoy & Gitlin, 2005; Burns 2000).

Although not telling the real purpose of the carried study might assure that people will give honest answers and be more natural, yet deceiving participants is unethical (Graziano & Raulin, 2004). Therefore, this study did not mislead participants in any way. As mentioned earlier, contributors were given the anonymity, which will make them more confident and hence act natural (Reynolds et al., 2001).

3.9 Synsam AB

Synsam is a market leader in the eyewear industry in the Nordic region with over 28% market share in Sweden. The company holds number One market position in Sweden, Denmark and Norway, with a turnover of around 2.5 billion Swedish Kronor and 1500 Employees (Cvc.com, 2018). Synsam was established in 1968 (Synsam.se, 2018), and today it consists of more than 185 stores in Sweden and 500 in the Nordic Region (Norway, Denmark, and Finland) (Challinor, 2004). The oldest stores that the company owns have over a hundred years of experience and knowledge (Synsam.se, 2018). As of May 2014, the company was acquired by CVC Capital Partners; a leading American private equity and investment advisory firm (Cvc.com, 2018). The fact that Synsam is the largest optical retailer in the region, and that it is a pioneer in implementing AR technology in its online platforms makes it significantly pertinent to use in this research.
The company introduced a mobile application that uses AR technology to enhance the customer experience and allow users to virtually try out glasses while using their smart devices. This App was introduced on IOS operating devices and is available for free download on ‘Apple Store’. It was also introduced on Android operating devices and is available for free download on ‘Google Play’. The App is to be found under the name ‘Stylelab’, and the following figures illustrate the different features available on this App.

Figure 5. Different filters in the App (Frame Category, Form, Price, Brand, Material, Colour and Design).
Figure 6. The virtual try-on after choosing a certain product, with a front and side view.

Figure 7. Information available after choosing the product (The Price, Payment Plans, and booking an appointment at the nearest store).
4 Empirical Findings

The following chapter presents the demographics of the research sample followed by multilinear regression analyses to test the suggested hypotheses. Finally, a model evaluation and hypotheses test are carried out.

4.1 Reliability Analysis

The reliability scores were calculated using Cronbach’s alpha to investigate the internal consistency of the scales used to measure each construct, and whether items were homogeneous and had the same attribute to the constructs (Pallant, 2005). Keeping in mind that Cronbach’s alpha does not provide reliability sources to single item constructs (Gliem & Gliem, 2003), each construct had a range from a minimum of three items, to a maximum of seven items in this study. Table 2 below shows the different constructs along with how many items were used for each one, and the Cronbach’s alpha for each construct was calculated using SPSS (see Appendix II). As shown in Table 2, all constructs had a Cronbach’s alpha that ranged from 0.805 at the lowest, and 0.884 at the highest. These scores are higher than what is considered to be an adequate measure of internal reliability, which is set at 0.7 (George & Mallery, 2003). This means that all the items used for each construct are highly internally reliable and acceptable (Bryman & Bell, 2015).

Table 2. Reliability of Constructs

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Number of Items</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Ease of Use</td>
<td>6</td>
<td>0.884</td>
</tr>
<tr>
<td>Hedonic Motivation</td>
<td>4</td>
<td>0.805</td>
</tr>
<tr>
<td>Telepresence</td>
<td>6</td>
<td>0.850</td>
</tr>
<tr>
<td>Product Information</td>
<td>7</td>
<td>0.880</td>
</tr>
<tr>
<td>Product Purchase Intention</td>
<td>3</td>
<td>0.895</td>
</tr>
</tbody>
</table>
4.2 Descriptive Statistics

This study consisted of 103 respondents that were approached at Jönköping University campus. They were between the ages of 19 to 37 years old, were users of eyewear products, and have tried out the Synsam application before answering the questionnaire. As it is clearly shown in Figure 8 Male respondents in this study accounted for 47% while Females were 53%. Therefore, both genders were roughly equally represented in this research sample (see Appendix III).

![Gender Distribution](image)

**Figure 8. Gender distribution across the group**

Moreover, most of the respondents that took part in this study were unemployed undergraduate and graduate students at the university and amounted to around 78% of the total number of respondents. While were full-time employees and part-time employees were 11% each (see Appendix III). The majority of the respondents were students due to the location of the conducted study, as well the limited means the researchers have at hand in conducting this research. Figure 9 shows the distribution of the respondents according to their employment status.

![Employment Status](image)

**Figure 9. Employment status of participants**
### 4.2.1 Constructs

The central tendency and the variability of constructs were calculated using SPSS. Table 3 shows the Mean of each construct as a measure of central tendency and the Standard Deviation of every construct as one of the variability tools. The summated scales are the Means of all the items combined that make up the constructs. Their values can be interpreted with one, as the lowest (Strongly Disagree), four, as the centre point (Neither Agree nor Disagree), and seven, as the highest (Strongly Agree). Moreover, the range, variance and other statistical measurements were also calculated using SPSS and can be found in Appendix III. Perceived Ease of Use scored the highest mean (6,2832), while Product Purchase intention has the highest Standard Deviation between all the constructs and it is equal to (1,39315) (see Appendix III). Since Product Purchase Intention Mean (4,88) was significantly high after using the AR application as shown in Figure 10, and most of the participants confirmed that this technology indeed enhanced their intentions to buy a product, hence, the null hypothesis is rejected, and the alternative below cannot be rejected: 

**H1: The interaction with a product via using AR application leads to a positive intention to purchase an eyewear product.**

![Figure 10. Product Purchase Intention Mean & Standard Deviation](image)

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Ease of Use</td>
<td>6,2832</td>
<td>0,65423</td>
</tr>
<tr>
<td>Hedonic Motivation</td>
<td>5,9587</td>
<td>0,68070</td>
</tr>
<tr>
<td>Telepresence</td>
<td>4,2524</td>
<td>1,16219</td>
</tr>
<tr>
<td>Product Information</td>
<td>5,3870</td>
<td>0,90542</td>
</tr>
<tr>
<td>Product Purchase Intention</td>
<td>4,8803</td>
<td>1,39315</td>
</tr>
</tbody>
</table>
4.3 Multiple Linear Regression Analysis

Two Regression analyses were applied in an attempt to achieve the goal of this thesis. Prior to the Regression Analysis, Correlation, Normality, Homoscedasticity, and Multicollinearity diagnostic tests were conducted to prove the reliability and validity of the proposed constructs, and the whole model overall (Pallant, 2007). Therefore, the prerequisites for the regression analysis were fulfilled and completed before the evaluation of the conceptual model and the independent variables.

4.3.1 First Regression model with “Product Purchase Intention” as the dependent variable

4.3.1.1 Pearson’s Correlation Analysis

To study the relation between the independent variables and the dependent variable that is the Product Purchase Intention, in this case, Pearson Correlation was calculated. Pearson Correlation ranges from -1 to +1, whereas -1 indicates a negative correlation between variables, zero shows no correlation, and +1 demonstrates a positive correlation. As shown in Table 4, the linear relationship is positive between all the variables and the product purchase intention (Bryman & Bell, 2015). Looking at Table 4, the highest Pearson Correlation was found between Telepresence and the dependent variable product purchase intention and it was 0.757. However, the lowest correlation was discovered between Perceived Ease of Use, and Product Purchase Intention and it scored 0.382 (see Appendix IV).

Table 4. Pearson correlation analysis

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Product Purchase Intention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Purchase Intention</td>
<td>1.000</td>
</tr>
<tr>
<td>Perceived Ease of Use</td>
<td>0.382</td>
</tr>
<tr>
<td>Hedonic motivation</td>
<td>0.567</td>
</tr>
<tr>
<td>Telepresence</td>
<td>0.757</td>
</tr>
<tr>
<td>Product Information</td>
<td>0.707</td>
</tr>
</tbody>
</table>
Prior to conducting Multiple Linear Regression, the assumption of normality of the residuals was tested through a Normal Probability Plot (Anderson, Sweeney, Williams, Freeman & Shoesmith, 2014). If the points on the plot lie near the diagonal line, then the distribution of the residuals is said to be normal. Based on the Normality Probability Plot of the Regression Standardised Residual found in Figure 11, there were no significant deviations from normality since the points lie very close to the straight line from the bottom left to the upper right of the diagonal (Pallant, 2007).

Furthermore, the Jarque-Bera normality test is conducted using E-Views to examine if the residuals are normally distributed or not. The null and the alternative hypothesis for Jarque-Bera normality test are:

H₀: Normal distribution
H₁: Non-normal distribution

The result of Jarque-Bera normality test is 1.81 with the p-value of 0.40. Since 0.40 is higher than the chosen Significance level of 0.05, H₀ cannot be rejected. This means that there is no evidence of non-normality in the residuals, which can also be seen in a somewhat bell-shaped histogram found below in Figure 12 (Gujarati & Porter, 2009).
4.3.1.3 Homoscedasticity of the Residuals Diagnostics

Another assumption of multiple linear regression is homoscedasticity or that the variance of the residuals of the dependent variable should roughly be the same for all predicted values (Pallant, 2007). If there can be found a somewhat rectangular distribution, and that the values are concentrated around point zero in the scatterplot of the standardised residuals, it means that there is not a violation of homoscedasticity (Tabachnick, Fidell & Osterlind, 2001). Based on the Scatterplot of Standardized Residuals in Figure 13 it can be concluded that the scores were being roughly rectangular shaped and mostly concentrated towards the centre, which means that the assumption of homoscedasticity was not violated (Pallant, 2007; Anderson et al., 2014).
4.3.1.4 Multicollinearity

When two of the independent variables have a strong correlation between each other, this phenomenon is called multicollinearity. The tolerance and the variance inflation factor (VIF) are widely used indicators to prove the existence of multicollinearity, whereas the rule of thumb indicates that if the tolerance is less than 0.10 and the VIF is above 10, then a multicollinearity issue is demonstrated (O'brien, 2007). SPSS was utilised to check if the examined data has the problem of multicollinearity, Table 5 summarises the results that were found, and the results did not violate the ride of thumb that was mentioned above. Thus, there was no multicollinearity issue in the studied data (see Appendix V).

Table 5. Multicollinearity Diagnostics

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Ease of Use</td>
<td>0.782</td>
<td>1.280</td>
</tr>
<tr>
<td>Hedonic motivation</td>
<td>0.648</td>
<td>1.543</td>
</tr>
<tr>
<td>Telepresence</td>
<td>0.392</td>
<td>2.550</td>
</tr>
<tr>
<td>Product Information</td>
<td>0.353</td>
<td>2.836</td>
</tr>
</tbody>
</table>

4.3.1.5 Model Evaluation of Product Purchase Intention as the dependent variable

The behaviour of a dependent variable is rarely explained by just one independent variable. It usually needs two or more independent variables as a combination to offer a valid explanation (Lee and Lings, 2013). A standard Multiple Linear Regression analysis was conducted using SPSS, with PPI as the dependent variable and PEOU, HM, Telepresence, and PI as the independent variables. R square in this model summary was (0.635) (see Appendix V) indicating that 63.5% of the variance in PPI is explained by the independent factors (PEOU, HM, Telepresence, and PI). According to Malhotra and Birks (2006), if R square value is as high, it indicates that the model was of high explanatory value. The Adjusted R Square explains the sum of independent variables, and the closer it is to the R Square the better explanation provided by all the independent variables (Shiu, Hair, Bush & Ortinau, 2009). In this case, the Adjusted R square was (0.62), which was almost equal to the value of R Square. Therefore, it can be concluded that this regression model is a good predictor of the dependent variable (PPI).
The ANOVA table tests the statistical significance of the regression model, and it also assists in testing the null hypothesis (Lee and Lings, 2013). In other words, ANOVA tests if the variances between populations are significantly different. When the p-value is lower than the significance level, the null hypothesis is rejected ($R^2 = 0$), and the alternative (theoretical) hypothesis hence cannot be rejected, which is that ($R^2 \neq 0$). In this study, the significance level chosen was 5% (0.05), which is considered the most frequently used significance level in research (Malhotra & Birks, 2006).

In the ANOVA table (see Appendix V) the p-value of this study was (0.000), which is less than the Sig. Level (0.05), nevertheless the Fisher ratio is (42.606), which is considered large and significant (Lee and Lings, 2013). The larger the F Ratio, the lower the differences between groups are. Hence the null hypothesis of ($R^2 = 0$) is rejected in this case, and the alternative was not rejected. This makes this regression model highly significant and can predict the dependent variable since it has evident explanatory power.

4.3.1.6 Evaluation of Each of The Independent Variables

The results obtained from the linear regression analysis (see Appendix V) shows that three out of four predictors have significant positive effect on Product Purchase Intention; Hedonic motivation ($\beta = 0.371$, Sig. = 0.019), Telepresence ($\beta = 0.578$, Sig. = 0.000), and Product Information ($\beta = 0.330$, Sig. = 0.040). B values range from +1 to -1, where +1 stands for a full positive effect on the dependent variable, -1 stands for a full negative effect, and 0 means that there is no impact at all (Hair, Anderson & Tatham, 2006). For example, if Telepresence increases by one unit, Product Purchase Intention increases by 57.8%. As for Perceived Ease of Use, and since its p-value was higher than the significance level, it was considered of no significance under this regression analysis ($\beta = 0.087$. Sig. = 0.554).

According to the preceding findings, HM, Telepresence, and PI are statistically significant. Hence, the null hypothesis was rejected, and the alternative cannot be rejected. This means that these constructs had a compelling capacity for predicting the Product Purchase Intention of eyewear products. On the contrary, PEOU was said to have no significant role in predicting PPI. Thus the null hypothesis cannot be rejected in this case, and the alternative was rejected.

As mentioned above, the Beta coefficient was used to compare the contribution of an independent variable, when all other independent variables were held constant (Hair et al., 2006). Telepresence had the highest Beta value (0.578), followed by Hedonic motivation (0.371), Product information had the lowest Beta (0.330) meaning that it had the lowest predicting capacity of PPI when compared to HM and Telepresence. Table 6 shows the Sig values and the Beta of all the independent variables in this Regression Analysis.
Table 6. Multiple Linear Regression analysis (Beta coefficient and Sig. value)

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Unstandardized Coefficients</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Ease Of Use</td>
<td>0.087</td>
<td>0.554</td>
</tr>
<tr>
<td>Hedonic Motivation</td>
<td>0.371</td>
<td>0.019</td>
</tr>
<tr>
<td>Telepresence</td>
<td>0.578</td>
<td>0.000</td>
</tr>
<tr>
<td>Product Information</td>
<td>0.330</td>
<td>0.040</td>
</tr>
</tbody>
</table>

4.3.2 Second Regression Model with “Hedonic Motivation” as the dependent variable

4.3.2.1 Pearson’s Correlation Analysis

Another Pearson Correlation analysis was carried out to examine the relationship between the dependent variable (Bryman & Bell, 2015). The dependent variable was Hedonic Motivation, and the independent variables were Telepresence and Perceived Ease of Use. Telepresence scored (0.518) and had a stronger correlation to the dependent variable compared to the Perceived Ease of Use, which had a lower correlation of (0.379) (see Appendix IV).

Table 7. Pearson correlation analysis

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Hedonic Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hedonic Motivation</td>
<td>1.000</td>
</tr>
<tr>
<td>Telepresence</td>
<td>0.518</td>
</tr>
<tr>
<td>Perceived Ease of Use</td>
<td>0.379</td>
</tr>
</tbody>
</table>
Prior to conducting Multiple Linear Regression for HM as the dependent construct, the assumption of normality of the residuals was tested through a Normal Probability Plot (Anderson et al., 2014). Based on the Normality Probability Plot of the Regression Standardised Residual found in Figure 14 below, there were no major deviations from normality as the points lie close to the straight line from the bottom left to the upper right of the diagonal (Pallant, 2007).

![Figure 14. Normal P-P Plot of Regression Standardized Residual](image)

Furthermore, the Jarque-Bera normality test was conducted using E-Views to examine if the residuals were normally distributed or not as seen in Figure 15 below. The null and the alternative hypotheses for Jarque-Bera normality test are:

- \( H_0 \): Normal distribution
- \( H_1 \): Non-normal distribution

The result of Jarque-Bera normality test was 3.52 with the p-value of 0.17. Since the 0.17 is higher than the Significance level of 0.05, \( H_0 \) cannot be rejected, concluding that there was no evidence of non-normality in the residuals for HM as the dependent construct. This can also be seen in the somewhat bell-shaped histogram found below in Figure 15 (Gujarati & Porter, 2009).
4.3.2.3 Homoscedasticity of the Residuals Diagnostics

Prior to conducting multiple linear regression, the assumption of homoscedasticity was tested for hedonic motivation as the dependent variable. In the Scatterplot of the Standardized Residuals found in Figure 16 below, the scores were concentrated towards the centre (zero) and following a slightly rectangular shape. This implies that the assumptions of homoscedasticity of the residuals for Hedonic Motivation as the dependent construct were not being violated (Pallant, 2007).
4.3.2.4 Multicollinearity

To ensure that the multicollinearity problem does not exist between the two independents variables which are Telepresence and Hedonic Motivation. The two indicators, VIF and the Tolerance were applied to illustrate the Multicollinearity level (O’brien, 2007). As seen in Table 8, the Tolerance level exceeded (0,10), and the VIF level was below (10). Hence, the results prove that multicollinearity issue did not exist between the variables (see Appendix VI).

Table 8. Multicollinearity Diagnostics

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telepresence</td>
<td>0,863</td>
<td>1,159</td>
</tr>
<tr>
<td>Perceived Ease of Use</td>
<td>0,863</td>
<td>1,159</td>
</tr>
</tbody>
</table>

4.3.2.5 Model Evaluation of Hedonic Motivation as the dependent variable

The second standard Multiple Regression Analysis was conducted with HM as the dependent variable. PEOU and Telepresence as the independent variables. R Square in this study was (0,309) (see Appendix VI), which indicates that 30,9% of the variance of HM was explained by the two independent factors (PEOU & Telepresence). This result shows that R Square was not very high, which in return means that this model did not have a very high explanatory value. The Adjusted R Square, on the other hand, was (0,295), which is quite similar to the R Square value however it shows that the sum of the two independent variables explained only 29,5% of the variance of HM.

As stated earlier, the ANOVA assists in testing the null hypothesis through examining the statistical significance of the regression model (Lee & Lings, 2013). In this study, the Significance level chosen was 5% (0,05), and in the ANOVA table, the p-value was (0,000), which is less than the Significance level. This means that the null hypothesis, in this case, was rejected, and the alternative cannot be rejected, which means that this model is highly significant with an explanatory power of around 30%. The low R Square does not contradict the fact that this model is of high statistical significance (R² ≠ 0). It indicates that the predictor variables still provide information about the variance in HM. However, the predictions have high intervals when compared to the regression line (Saunders et al., 2012).
4.3.2.6 Evaluation of each of The Independent Variables

The linear regression analysis results (see Appendix VI) indicate that both independent variables have a significant positive effect on HM; PEOU (β = 0.225, Sig. = 0.017) and Telepresence (β = 0.256, Sig. = 0.000). B values reveal that a one unit increase in PEOU and Telepresence leads to an increase in HM by 21.7% and 43.8% respectively. The p-values of both factors were below the significance level (0.05), which means that the null hypothesis for both variables was rejected, and the alternative cannot be rejected. Both PEOU and Telepresence had a significant prediction capacity for HM. Table 9 shows a summary of the two independent variables obtained from the Regression Analysis.

Table 9. Multiple Linear Regression Analysis (Beta coefficient and Sig. value)

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Unstandardized Coefficients Beta</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Ease Of Use</td>
<td>0.225</td>
<td>0.017</td>
</tr>
<tr>
<td>Telepresence</td>
<td>0.256</td>
<td>0.000</td>
</tr>
</tbody>
</table>

4.4 Hypotheses Testing

According to Kothari (2004), hypothesis testing is an approach that allows researchers to test their assumptions about a population and permit them to assess if a generalisation could be made from their sample data. The p-value approach was applied for testing the previously stated hypotheses instead of the classical approach. A hypothesis is a statement that anticipates relations between variables in which they are going to be examined by applying statistical methods (Macdonald & Headlam, 2008; Kothari, 2004). The null hypothesis that is denoted as H₀, states that there is no relation between the research constructs (Saunders et al., 2009). Whereas the alternative hypothesis which is designated as H₁ is the hypothesis that will not be rejected in the case of rejecting the null hypothesis and confirming the existence of a relation between variables (Curwin & Slater, 2007). By comparing the significance level to alpha, which is (0.05), the null hypothesis cannot be rejected if the p-value exceeded (0.05) and rejected if it falls below 0.05 (Taeger & Kuhnt, 2014). Figure 17 below shows the conceptual model’s Beta coefficients and p-values of all the independent variables, and they were used to test the following hypotheses.
Hypothesis testing for H2:

H20: Eyewear Product Information does not have a positive effect on Product Purchase Intention.

H21: Eyewear Product Information has a positive effect on Product Purchase Intention.

The p-value of the Product Information construct was (0.040), which is smaller than the Sig. level of (0.05). Thus, Product Information did not have a statistically significant contribution to the prediction of Product Purchase Intention. Furthermore, the Beta value for Product Information is (0.330), which implies that Product Information had a positive effect on Product Purchase Intention, and could explain 33% of the variations of PPI (Pallant, 2007). Hence H20 is rejected, and the alternative H21 cannot be rejected:

H2: Eyewear Product Information has a positive effect on Product Purchase Intention.

Hypothesis testing for H3a:

H3a0: Telepresence does not positively affect the Product Purchase Intention.

H3a1: Telepresence positively affects the Product Purchase Intention.

Telepresence proved to have a statistically significant contribution on the intention to purchase a product since the p-value equals to (0.000) and it is lower than the Sig. level of (0.05). Furthermore, the Beta value for Telepresence is (0.578), which implies that Telepresence had a positive effect on Product Purchase Intention, and could explain 57.8% of the variations of PPI (Pallant, 2007). Thus, the null hypothesis of Telepresence not positively affecting the Product Purchase Intention is rejected, and the alternative cannot be rejected:

H3a: Telepresence positively affects the Product Purchase Intention.

Hypothesis testing for H3b:

H3b0: Telepresence does not have a positive effect on Hedonic Motivation.

H3b1: Telepresence has a positive effect on Hedonic Motivation.

Telepresence proved to have a statistically significant contribution to Hedonic Motivation since the p-value equals to (0.000) and it is lower than the Sig. level of (0.05). Furthermore, the Beta value for Telepresence in this model is (0.256), which implies that Telepresence had a positive effect on HM, and could explain 25.6% of the variations of PPI (Pallant, 2007). Thus, the null hypothesis of Telepresence not positively affecting Hedonic Motivation is rejected, and the alternative cannot be rejected:

H3b: Telepresence has a positive effect on Hedonic Motivation.
Hypothesis testing for H4:

H4₀: Hedonic Motivation does not have a positive effect on Product Purchase Intention.
H4₁: Hedonic Motivation has a positive effect on Product Purchase Intention.

The p-value of the Hedonic Motivation construct is (0,019), which is smaller than the Sig. level of (0,05). Thus, HM did have a statistically significant contribution to the prediction of Product Purchase Intention. Furthermore, the Beta value for HM is (0,371), which implies that HM had a positive effect on Product Purchase Intention, and could explain 37,1% of the variations of PPI (Pallant, 2007). Hence H4₀ is rejected, and the alternative H4₁ cannot be rejected:

**H4: Hedonic Motivation has a positive effect on Product Purchase Intention.**

Hypothesis testing for H5a:

H5a₀: Perceived Ease of Use of the AR application does not positively affect Product Purchase Intention.
H5a₁: Perceived Ease of Use of the AR application positively affects Product Purchase Intention.

Perceived Ease of Use proved to have no statistically significant effect on Product Purchase Intention since the p-value is (0,554), and it exceeds the chosen Sig. level of (0,05) (Pallant, 2007). Therefore, the alternative hypothesis is rejected, and the null hypothesis that Perceived Ease of Use does not positively affect the Product Purchase Intention cannot be rejected:

**H5a: Perceived Ease of Use of the AR application positively affects Product Purchase Intention.**

Hypothesis testing for H5b:

H5b₀: Perceived Ease of Use of the AR application does not have a positive effect on Hedonic Motivation.
H5b₁: Perceived Ease of Use of the AR application has a positive effect on Hedonic Motivation.

The p-value of the Perceived Ease of Use is (0,017), and it falls below the chosen Sig. level, which is (0,05). Furthermore, the Beta value for PEOU is (0,225), which implies that PEOU had a positive impact on HM, and could explain 22,5% of the variations of PPI (Pallant, 2007). Hence H5b₀ is rejected, and the alternative H5b₁ cannot be rejected:

**H5b: Perceived Ease of Use of the AR application has a positive effect on Hedonic Motivation.**
Figure 17. Results of multiple regression analyses (HM & PPI each as a dependent variable)
5 Conclusion

This chapter’s purpose is to make an interference of the empirical findings found in the previous chapter. Likewise, it reconnects to the purpose as well as the research questions, and draws a conclusion of this study.

The purpose of this research was to examine the direct effects of AR in smart devices on PPI in the eyewear industry. The research questions identified were: whether AR technology in the eyewear industry has a positive impact on the Product Purchase Intention among Millennials in Sweden? And if so, what are the AR determinants that have a positive effect on PPI? This study contributed by filling the literature gap through investigating AR technology in smart devices in the eyewear industry, and among the millennials in Sweden. The proposed conceptual model was developed by the authors based on previous theories of TAM, UTAUT2 as well as previous research on determinants of Purchase Intention of customers.

To carry out the purpose of this study, Cronbach’s alpha, Pearson’s correlation, multicollinearity, normality, heteroscedasticity and multiple linear regression analysis were utilised. The results of Cronbach’s alpha analysis showed that all the items used for each construct were internally consistent and reliable (Bryman & Bell, 2015; Pallant, 2005). The Pearson’s correlation calculated indicated that there existed a positive linear relationship between all the independent variables and Product Purchase Intention (Burns, 2000). Likewise, there was no multicollinearity problem of the studied data (O’brien, 2007). Moreover, normality test proved that residuals are normally distributed, and the variance of the results was roughly the same for all predicted values (homoscedasticity) (Pallant, 2007).

The first Regression Analysis in the conceptual model (PPI as the dependent variable) had an explanatory power of (0,635); which means that 63,5% of the variance in PPI was explained by the following factors Telepresence, HM and PI. When it comes to the second regression analysis (HM as the dependent variable), it was found that 30,9% of the variance of HM was explained by the two independent factors (PEOU & Telepresence). In total, there were six hypotheses proposed in the conceptual model that map the impact of AR and it’s determinants on PPI in the eyewear industry. From these, five hypotheses were not rejected, and one was rejected to have a direct effect on PPI. The constructs that have been proven through the first multiple linear regression to affect PPI from the highest to lowest predictive values were; Telepresence, HM and PI. However, PEOU construct was not found to have any direct effect on PPI. Furthermore, Telepresence and PEOU were both found to have a direct positive impact on HM. Hence, despite the result that PEOU had no direct positive effect on PPI, it still proved to have an indirect yet positive effect on PPI; through directly and positively impacting HM.
According to this established study, most millennials in this dataset agreed that AR technology was a useful tool to be adopted for motivation purchase intentions of eyewear products (Mean: 4.88, Std. Deviation: 1.39). According to the conceptual model, this technology was able to change the participants’ buying intentions mainly because of the technology characteristics (HM, Telepresence and PI). This study confirms that HM, Telepresence and PI are AR technology characteristics that have a direct positive influence on the Product Purchasing Intentions of customers belonging to generation Y in Sweden. PEOU and Telepresence, on the other hand, were seen as primary determinants of HM. Therefore, they also had a direct positive influence on determining the level of Hedonic Motivation. This information could imply that the role of AR technology impacts customers purchase intentions, in terms of availability of product information (PI), interaction with the eyewear products (Telepresence), and the enjoyment factor of using this technology (HM). Nevertheless, PEOU was proved not to have a direct impact on PPI, but it had a significantly positive effect on HM; which implies that PEOU indirectly positively impacts PPI.
6 Discussion

This chapter discusses findings of this research and compare them to the findings obtained from previous research. The conceptual framework will be presented and discussed in its revised version. Practical implications that could be derived from these results are introduced along with the limitations that faced this study. Nonetheless, further research is suggested at the end of this chapter.

6.1 General Discussion

This paper contributes to the existing literature by filling the gap that was found in the previous research; which is whether AR technology has a positive impact on the Product Purchase Intention in the Swedish Eyewear Industry, and what are the direct drivers of this impact if it existed. According to the statistical results, Product Information, Telepresence and Hedonic Motivation proved to positively and directly affect the Product Purchase Intention. Whereas Perceived Ease of Use had no direct effect on the Product Purchase Intention of consumers, but had an indirect effect on PPI through positively impacting HM.

Nearly all of the 103 participants were impressed while trying the mobile application and that was seen in their reactions and verbal feedback. Females were more interested in trying the different types of glasses, using the selfie feature. On the other hand, Males were further interested and commented on the technological sides of AR. However, few participants brought up the point of using the application as a tool to filter their available options before visiting the store to save efforts and shorten the time spent in stores. Some participants also frequently mentioned that they would still prefer to go to the store to feel and touch the glasses, since they were worried about the measurements of the glasses in accordance to their faces, and the weight of the product to assure the comfort while using them. Nevertheless, many participants from both genders thought that their AR application experience provided a great incentive to choose a product to buy.

Firstly, since the mean for Product Purchase Intention after the use of the AR mobile application was high (4.88) on the Likert 7 scale measurement used in this study, it was concluded that AR technology certainly does lead to a positive intention to purchase an eyewear product. Based on Schwartz (2011) that examined the impacts of AR technology on Purchase Intention of low involvement products, there was no significant effect of the former on the latter, and the author suggested that the results could be product specific and advised for further research on high-involvement products. On the contrary, and according to Fiore et al. (2005) image interactive technology was proven to positively affect consumer’s attitudes and willingness to purchase online, regardless of the level of product involvement. Nevertheless, eyewear products are recognised as high involvement products, since consumers spend more time and efforts on assessing alternatives, as well as gather more information in comparison to low involvement products (Kim & Forsythe, 2008; Zaichkowsky, 1985). Hence, it can be conferred that AR technology imposes positive effects on the intentions of consumers to purchase high involvement goods such as eyewear products.
Secondly, the results of the study showed that Product Information has a robust positive effect on Product Purchase Intention. It was the third most significant construct in the conceptual framework that had a direct positive impact on Product Purchase Intention. Product Information explained 33.0% of the variations in the Product Purchase Intention. Kim and Lennon (2008) found that although visual information of a product is of importance, product information still has a significant effect on consumer purchase intention. The results of their study supported product information as superior and to positively influence Consumer Purchasing Intentions in online shopping which goes in line with the findings of this study.

Thirdly, Hedonic Motivation explained 37.1% of the changes in the Product Purchase Intention. Nevertheless, it confirmed to have a positive direct effect, as well as a high correlation level with the consumer intention of buying a product. The established results go in line with the previous findings in the literature, where Venkatesh et al. (2012) stated that Hedonic Motivation had a direct effect on the consumer decision-making process and Purchase Intentions. Furthermore, Hedonic Motivation is seen as a significant factor when it comes to the user acceptance of technology (Venkatesh et al., 2012).

Also, Telepresence had a very high explanatory value and explained over 57.8% of the variations of Product Purchase Intention. The first regression analysis showed that Telepresence directly and positively affects Product Purchase Intention, and had the most significant explanatory value out of all the constructs in the conceptual model. Moreover, According to Fiore et al. (2005) Telepresence exhibited a significant positive effect on willingness to purchase. Schwartz (2011) also found that Telepresence was a predictor of Purchase Intents when using AR technology in online shopping. These preceding studies coincide with the findings of this research and confirm that Telepresence positively impacts the intentions to purchase eyewear products when using AR technology.

Furthermore, the results of this study also indicated that Telepresence positively affected and explained 25.6% of the changes that occur in Hedonic motivation, and most participants said that the fact that the technology was able to approximate a real-life try-on experience made it a lot more “fun” and entertaining to use. These findings and the participants' opinions are in line with previous research that had also found that Telepresence was a powerful predictor of Utilitarian (Hedonic) motivations. Sautter et al. (2004), found that a customer's enjoyment can be significantly affected by the ability of the AR technology to create a real-life experience.
On the other hand, Perceived Ease Of Use in this study failed to explain the variations of Product Purchase Intention. The construct had a very low explanatory power in the conceptual model (first Regression Analysis), and a p-value of (0.554) higher than the chosen Significance level (0.05). Hence, the assumption that PEOU had positive direct effect on PPI was rejected. The facts mentioned above show that PEOU had no direct impact on the outcomes of PPI. More specifically, the Mean result of the items used to measure PEOU was (6.2832), while that of the PPI was (4.8803). This shows that despite the fact that the majority of the participants found the mobile application very easy to use, they still did not anticipate the same levels of buying intentions.

According to Gefen et al. (2003), PEOU was a significant determinant of intentions to transact from electronic vendors. However, their results were derived from experienced customers that were familiar with the use of technology. Moreover, Lee et al. (2006) have found that PEOU had a significant effect on Purchasing Intentions when using Image Interactivity Technology (IIT), which contradicts the findings of this research since such relation was not detected when studying the direct link between PEOU and PPI using AR technology. A possible explanation for these contradictions of findings between primary and secondary research data could be that the familiarity of a particular technology plays a mediating role in determining the buying intentions of products. Nearly all of the participants in this study stated that this was their first experience using AR technology as a shopping tool and that they were more aware of it as an entertainment tool used on social media platforms.

Moreover, PEOU positively affected HM, and it was able to explain 22.5% of its’ variations. Davis et al., (1992) have also discovered a strong relationship between PEOU and hedonic values, which meant that the easier the use of a specific technology, the higher the enjoyment that users would experience. These findings go in line with the results obtained in this research. PEOU, as mentioned above, was not able to directly explain the variations of PPI, but it was able to explain HM. These results show that PEOU was crucial in making the experience of AR technology entertaining, and these hedonic values were in return, and as mentioned earlier (First Regression Analysis) are significant in determining the Purchase Intentions of eyewear products. Hence according to these findings, PEOU had an indirect positive effect on PPI, but not a direct one.
6.2 Revised Conceptual Model

Regression analysis helped this study differentiate supportive and non-supportive factors in the conceptual model. Supportive relations in Figure 18 were drawn with red arrows for the First Regression Analysis, and blue for the Second Regression Analysis in this revised version of the conceptual model. As discussed and explained earlier, Telepresence, PI, and HM have direct positive effect on PPI. Moreover, PEOU and Telepresence have a direct positive impact on HM. Hence in this revision, PEOU is seen as an antecedent to HM, and not directly connected to PPI.

Figure 18. Revised Conceptual Model
6.3 Implications

The results of this research showed that AR Technology proved to impact consumers Product Purchase Intention positively, and that goes in line with Fiore et al. (2005) study which stated that AR technology increases the willingness to buy online. Hence, this paper draws the attention of managers to the financial benefits that can be harvested if such technology is implemented.

Many researchers (Kang & Young, 2014; Poushneh, Vasquez-Parraga & Arturo, 2017) agreed on the necessity of developers continuously improving the quality of the AR technology to satisfy consumers, and provide them with a rich experience. This will ensure their long-term use of the company’s website or mobile application as well as build a sustainable competitive advantage for the company compared to its rivals. Poushneh and Vasquez-Parraga (2017) highlighted the fact that it is of great importance to present high level of interactivity, informativeness and telepresence to achieve consumer satisfaction that ultimately boosts sales and go beyond just providing entertainment to customers.

Therefore, developers and managers in the retail sector, and specifically in the eyewear industry, should work on providing a high quality of interactivity (Telepresence), as well as accurate information of products, since in this study they were considered to be significant factors that impact millennials’ intentions to buy an eyewear product in Sweden. Nevertheless, developers should keep in mind that hedonic values are crucial to making the customers experience more influential and be able to persuade a specific target group (millennials) to buy their products.

Although PEOU did not directly impact PPI, yet it did positively affect HM. This was also confirmed by Davis et al. (1992), that the easier the platform navigation is, the more entertaining it is for customers. Hence, developers should provide easy and user-friendly AR applications since it was seen as a significant factor that positively impacted the intentions of millennials (Generation Y) in Sweden to purchase a product, and specifically Students the belong to Generation Y.

Last but not least, if the aforementioned factors were put into perspective and implemented by eyewear retailers, they could provide a unique competitive advantage to such firms. Since millennials, today have a high purchasing power (Straus et al., 2006), and the eyewear industry is growing vastly in the retail sector (Sperduto, 2017). Therefore, such competitive advantage would be crucial to ensure the success of eyewear retailers in Sweden.
6.4 Research Limitations

The first limitation of this research is that it used non-probability sampling method. Non-probability sampling does not give an equal chance for the individuals in a population to be selected (Cooper & Schindler, 2011). Furthermore, in non-probability sampling human judgement is likely to affect the sampling by making some individuals more likely to be chosen than others (Bryman & Bell, 2015; Curwin & Slater, 2002). As a result, the generalisations of the findings should be conducted with caution (Cooper & Schindler, 2011).

Another possible criticism of the study is the sampling size, which consisted of 103 participants and the self-reporting bias of using surveys as a method. However, the non-probability sampling of 103 participants enabled this study to collect all the needed data for driving the analysis through Multiple Linear Regression, in spite of the time and resources constraints. Likewise, the purpose of this study is to develop and test the theory of AR impact on customers’ decisions, rather than to make statistical generalisations about the population (Yin, 1994). Therefore, the use of the non-probability method for this study can be seen as sufficient for mapping the effects of AR technology on customer purchase intentions.

Another limitation is the lack of variation of participants, as most of the participants in this study were students at Jönköping University that accounted for 78% of the total number of respondents. Therefore, the data gathered in this study might not be able to represent the population since it did not cover other locations, occupations or earnings. Furthermore, this study did not include information about participants’ age, which may have also had an impact on findings regarding the lack of differentiation between early or late millennials.

Last but not least, the fact that just one optical retailer, (Synsam) that sells numerous brands of eyeglasses was included in the research might be another limitation to this research. Nevertheless, Synsam is the biggest retailer in Sweden as well as in the Nordic region (Cvc.com, 2018) and a pioneer in implementing AR technology in retailing. However, due to time and resources constraints, this study focused only on the retailer’ Synsam’, and is the first study on the novel AR technology use in the Swedish Eyewear Retail Industry.
6.5 Further Research

This research examined constructs that directly impact purchase intention of Eyewear products through AR mobile applications. Indirect or second-line constructs that may also affect PPI represent an opportunity for further research. Likewise, more retailers in the Eyewear Industry and their AR uses may be studied to gain better generalisations about the industry, especially outside Sweden.

Another suggestion for further research is to investigate how AR technology affects purchase intention of other products in different business areas. Moreover, since this study focused only on AR mobile application, other AR platforms such as Augmented Mirrors and Websites could be more investigated, and the study replicated to produce more information about purchasing intentions and customer behaviours.

As the study was focused on Millennials in Sweden as the targeted population, other age groups, generational cohorts and professions could be examined to conclude AR technology’s impact among these different groups. Moreover, the study’s participants were undergraduate or postgraduate students, which makes room for other research to cover Millennials from other occupational and educational backgrounds. Lastly, future research could include other nations and cultures that would give insights on how cultural or economical differences may affect purchasing intentions using AR technology.
7

Reference list


Appendix I

Questionnaire

**Questionnaire on Augmented Reality application**

This questionnaire aims to study your feedback after using the Synsam mobile application that is found under the name (Synsam Style Lab) on both (App store) on Apple products, and on (Google play) on Android operating smart devices. The results of this questionnaire are used to conduct a scientific research on the impact of this technology on customers decisions. Nevertheless, your identity is kept confidential and will not be shown nor used in any part of this study or any future research.

* Please note: this questionnaire will take around 7 to 10 minutes to complete.

* Required

**Are you between the age of 19 and 37?**

- [ ] Yes
- [ ] No

**Do you wear eye glasses of any sort? (eg. Sunglasses or Optically worked glasses)**

- [ ] Yes
- [ ] No
Did you use the virtual try-on feature in Synsam Mobile App? *

☐ Yes
☐ No

What is your gender? *

☐ Female
☐ Male
☐ Prefer not to say
☐ Other: 

What is your current employment status? *

☐ Fully employed
☐ Part time employee
☐ Student
☐ Unemployed
### How would you describe the Mobile Application after using it? *

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree Somewhat</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree Somewhat</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>It was Clear and Understandable</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Did not require a lot of mental effort</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>It was easy to use</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>It was easy to learn</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The steps were easy to try the glasses on</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The virtual try-on was intuitive to use</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

### How would you describe your experience after using the App? *

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Disagree Somewhat</th>
<th>Neither Agree nor Disagree</th>
<th>Agree Somewhat</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>It was entertaining</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>It was rather interesting</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>It was appealing</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>It was enjoyable</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
**How would you describe your feelings after using the Application?**

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Disagree Somewhat</th>
<th>Neither Agree nor Disagree</th>
<th>Agree Somewhat</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I felt that the glasses were real</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I felt that I was interacting directly with the glasses</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I felt separated from my real-world environment</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I felt connected and emotionally attached to the glasses</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>It created a shopping experience similar to the one I experience in stores</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
How would you describe the informativeness of the Application?

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Disagree Somewhat</th>
<th>Neither Agree nor Disagree</th>
<th>Agree Somewhat</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved my information seeking performance</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Made it easier to seek information</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I found it useful in seeking information</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I have learned a great deal of the product</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>It helped me make a more informed purchase decision</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I can fully trust information given by the App</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The virtual try-on provided needed information to compare eye-glasses</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
### Please rate how do you agree with the following statements *

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Disagree Somewhat</th>
<th>Neither Agree nor Disagree</th>
<th>Agree Somewhat</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I believe the overall App experience helped me make a purchase decision</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>If I were to make a purchase decision, I would feel confident doing that decision</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I feel that the virtual try-on helped me decide to buy a product</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
### Appendix II
Reliability Analysis

#### Perceived Ease Of Use cronbach alpha

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
<th>Cronbach's Alpha Based on Standardized Items</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach's Alpha</td>
<td>.881</td>
<td>.884</td>
</tr>
</tbody>
</table>

#### Hedonic Motivation

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
<th>Cronbach's Alpha Based on Standardized Items</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach's Alpha</td>
<td>.805</td>
<td>.808</td>
</tr>
</tbody>
</table>

#### Telepresence

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
<th>Cronbach's Alpha Based on Standardized Items</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach's Alpha</td>
<td>.850</td>
<td>.849</td>
</tr>
</tbody>
</table>
### Product Information

<table>
<thead>
<tr>
<th>Cronbach's Alpha</th>
<th>Cronbach's Alpha Based on Standardized Items</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.880</td>
<td>.888</td>
<td>7</td>
</tr>
</tbody>
</table>

### Product Purchase Intention

<table>
<thead>
<tr>
<th>Cronbach's Alpha</th>
<th>Cronbach's Alpha Based on Standardized Items</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.895</td>
<td>.902</td>
<td>3</td>
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</table>

### Appendix III

#### Descriptive Statistics

<table>
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<tr>
<th></th>
<th>N</th>
<th>Range</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived ease of use</td>
<td>103</td>
<td>3.83</td>
<td>3.17</td>
<td>7.00</td>
<td>6.2832</td>
<td>.6543</td>
<td>.428</td>
</tr>
<tr>
<td>Hedonic motivation</td>
<td>103</td>
<td>3.00</td>
<td>4.00</td>
<td>7.00</td>
<td>5.9587</td>
<td>.6807</td>
<td>.463</td>
</tr>
<tr>
<td>Telepresence</td>
<td>103</td>
<td>5.17</td>
<td>1.83</td>
<td>7.00</td>
<td>4.2524</td>
<td>1.1621</td>
<td>1.351</td>
</tr>
<tr>
<td>Product information</td>
<td>103</td>
<td>4.00</td>
<td>3.00</td>
<td>7.00</td>
<td>5.3870</td>
<td>.9054</td>
<td>.820</td>
</tr>
<tr>
<td>Product purchase intention</td>
<td>103</td>
<td>6.00</td>
<td>1.00</td>
<td>7.00</td>
<td>4.8803</td>
<td>1.3931</td>
<td>1.941</td>
</tr>
<tr>
<td>Valid N (listwise)</td>
<td>103</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix IV
Correlation

<table>
<thead>
<tr>
<th></th>
<th>Product_purchase_intention</th>
<th>Perceived_ease_of_use</th>
<th>Hedonic_motivation</th>
<th>Telepresence</th>
<th>Product_information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>1,000</td>
<td>,382</td>
<td>,567</td>
<td>,757</td>
<td>,707</td>
</tr>
<tr>
<td>Perceived_ease_of_use</td>
<td>,382</td>
<td>1,000</td>
<td>,379</td>
<td>,371</td>
<td>,438</td>
</tr>
<tr>
<td>Hedonic_motivation</td>
<td>,567</td>
<td>,379</td>
<td>1,000</td>
<td>,518</td>
<td>,561</td>
</tr>
<tr>
<td>Telepresence</td>
<td>,757</td>
<td>,371</td>
<td>,518</td>
<td>1,000</td>
<td>,773</td>
</tr>
<tr>
<td>Product_information</td>
<td>,707</td>
<td>,438</td>
<td>,561</td>
<td>,773</td>
<td>1,000</td>
</tr>
</tbody>
</table>

|                  | Product_purchase_intention | Perceived_ease_of_use | Hedonic_motivation | Telepresence | Product_information |
| Sig. (1-tailed)  |                             |                        |                    |              |                     |
| Product_purchase_intention | .                        | ,000                   | ,000               | ,000         | ,000                |
| Perceived_ease_of_use | ,000                       | .                      | ,000               | ,000         | ,000                |
| Hedonic_motivation | ,000                       | ,000                   | .                  | ,000         | ,000                |
| Telepresence      | ,000                       | ,000                   | ,000               | .            | ,000                |
| Product_information | ,000                       | ,000                   | ,000               | ,000         | .                   |

|                  | Product_purchase_intention | Perceived_ease_of_use | Hedonic_motivation | Telepresence | Product_information |
| N                | 103                        | 103                    | 103                | 103          | 103                 |

Appendix V
Multiple Linear Regression with (PPI) as the dependent variable.

<table>
<thead>
<tr>
<th>Model Summary</th>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>,797a</td>
<td>,635</td>
<td>,620</td>
<td>,85879</td>
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</tbody>
</table>
a. Predictors: (Constant), Product_information, Perceived_ease_of_use, Hedonic_motivation, Telepresence

b. Dependent Variable: Product_purchase_intention

### ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>31,423</td>
<td>42,606</td>
<td>.000b</td>
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<tr>
<td>Residual</td>
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<td>98</td>
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<tr>
<td>Total</td>
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</tbody>
</table>

### Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>95.0% Confidence Interval for B</th>
<th>Correlations</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower Bound</td>
<td>Upper Bound</td>
<td>Zero- order Part</td>
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<tr>
<td>(Constant)</td>
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<tr>
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<td>.147</td>
<td>.041</td>
<td>.594</td>
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<td>.040</td>
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<td>.181</td>
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<td>.063</td>
<td>.000</td>
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<td>Telepresence</td>
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<td>.482</td>
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<td>.000</td>
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<tr>
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<td>.214</td>
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<td>.016</td>
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</table>

a. Dependent Variable: Product_purchase_intention

b. Predictors: (Constant), Product_information, Perceived_ease_of_use, Hedonic_motivation, Telepresence
### Collinearity Diagnostics

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimension</th>
<th>Eigenvalue</th>
<th>Condition Index</th>
<th>(Constant)</th>
<th>Perceived ease_of_use</th>
<th>Hedonic motivation</th>
<th>Telepresence</th>
<th>Product_information</th>
</tr>
</thead>
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<tr>
<td>2</td>
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<td>0.03</td>
<td>0.02</td>
<td>0.01</td>
<td>0.38</td>
<td>0.01</td>
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<td>0.05</td>
<td>0.12</td>
<td>0.02</td>
<td>0.56</td>
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</tr>
<tr>
<td>4</td>
<td>4</td>
<td>0.007</td>
<td>26.554</td>
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<td>0.38</td>
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<td>0.12</td>
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<tr>
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<td>5</td>
<td>0.005</td>
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<td>0.92</td>
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<td>0.29</td>
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*a. Dependent Variable: Product_purchase_intention*

### Casewise Diagnostics

<table>
<thead>
<tr>
<th>Case Number</th>
<th>Std. Residual</th>
<th>Product_purchase_intention</th>
<th>Predicted Value</th>
<th>Residual</th>
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</thead>
<tbody>
<tr>
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*a. Dependent Variable: Product_purchase_intention*

### Residuals Statistics

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<thead>
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<th>Minimum</th>
<th>Maximum</th>
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<th>Std. Deviation</th>
<th>N</th>
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*a. Dependent Variable: Product_purchase_intention*
Appendix VI

Multiple Linear Regression with (HM) as the dependent variable.

### ANOVA

<table>
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<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
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<th>Sig.</th>
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a. Dependent Variable: Hedonic_motivation  
b. Predictors: (Constant), Telepresence, Perceived_ease_of_use

### Model Summary

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<thead>
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<th>Model</th>
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<th>Std. Error of the Estimate</th>
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a. Predictors: (Constant), Telepresence, Perceived_ease_of_use  
b. Dependent Variable: Hedonic_motivation

### Coefficients

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<th>Beta</th>
<th>t</th>
<th>Sig.</th>
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<th>Correlations</th>
<th>Collinearity Statistics</th>
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<tr>
<td></td>
<td></td>
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<td></td>
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<td>Zero-order</td>
<td>Tolerance</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Upper Bound</td>
<td>Partial</td>
<td>Part</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Model</td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td>t</td>
<td>Sig.</td>
<td>95.0% Confidence Interval for B</td>
<td>Correlations</td>
<td>Collinearity Statistics</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Lower Bound</td>
<td>Zero-order</td>
<td>Tolerance</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Part</td>
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a. Dependent Variable: Hedonic_motivation
### Collinearity Diagnostics

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<th>Eigenvalue</th>
<th>Condition Index</th>
<th>(Constant)</th>
<th>Perceived_ease_of_use</th>
<th>Telepresence</th>
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<tbody>
<tr>
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a. Dependent Variable: Hedonic_motivation

### Casewise Diagnostics

<table>
<thead>
<tr>
<th>Case Number</th>
<th>Std. Residual</th>
<th>Hedonic_motivation</th>
<th>Predicted Value</th>
<th>Residual</th>
</tr>
</thead>
<tbody>
<tr>
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<td>-1,80447</td>
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</tbody>
</table>

a. Dependent Variable: Hedonic_motivation

### Residuals Statistics

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>Standard Error of Predicted Value</td>
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<td>.091</td>
<td>.035</td>
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</tr>
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<td>Adjusted Predicted Value</td>
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<tr>
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<td>1.013</td>
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a. Dependent Variable: Hedonic_motivation