The role of augmented reality in enhancing the online shopping experience in the beauty industry

Master Thesis submitted in fulfillment of the Degree

Master of Science

in Management

Submitted to Marion Garaus, PhD

Nina Rössler, BBA

1811079

Vienna, 11 June 2023

AFFIDAVIT

I hereby affirm that this Master's Thesis represents my own written work and that I have used no sources and aids other than those indicated. All passages quoted from publications or paraphrased from these sources are properly cited and attributed. In particular, I did not use any text generators or other paraphrasing tools. My thesis was not proofread.

The thesis was not submitted in the same or in a substantially similar version, not even partially, to another examination board and was not published elsewhere.

11.06.2023

Date   Signature

ABSTRACT

As of today, one-fifth of all purchases take place online, and with a current growth rate of 9%, this fraction of active online shoppers will continuously increase over the next years (Baluch, 2023). Accordingly, the beauty and cosmetic industry, one of the fastest-growing consumer goods industries, has also been confronted with the most momentous movements in recent years. Although beauty retailers can benefit in various aspects from the shift to e-commerce, there are unsettled issues impacting the customer experience. The cosmetic sector, consisting largely of experience products, suffers from the non-existent direct product experiences as they are associated with non-transparency, intangibility, and limited sensory data, thereby hindering customers to conduct important pre-purchase product examinations. As a result, customers present themselves uncertain about the new way of shopping, which is demonstrated by high shopping cart abandonment rates and higher return rates that are attributed to post-purchase dissatisfaction.

Intending to overcome these major obstacles, increasingly more e-marketers started applying technological advancements, whereby augmented reality emerged as one of the most disruptive innovations in the beauty industry. Although many scholars have already addressed the topic of augmented reality in online retailing, there are still many unresearched aspects due to the technology's novelty. Therefore, the present study aims to reveal if and to what extent augmented reality can enhance the online shopping experience in the beauty industry, by emphasizing the pre-defined constructs: imagination, uncertainty, anticipated emotion, attitude towards buying online, and online purchase intention.

For this purpose, a quantitative research approach was applied, whereby a one-factor between-subject experiment was conducted within a sample representative of the Austrian population. The respondents of both groups were exposed to L'Oréal's online shop. However, only the experiment group was treated with L'Oréal's virtual try-on function, whereas the control group was limited to the brand's two-dimensional product presentation. The results of the experiment revealed a significant difference between the two groups, indicating that augmented reality stimulates customers' imagination abilities stronger as compared to the non-augmented condition. Moreover, the collected data demonstrated that imagination reduces uncertainty while at the same time increasing anticipated emotions. However, other than expected, only anticipated emotions but not uncertainty impact attitude toward buying online which in turn affects online purchase intention. Overall, it can be concluded that augmented reality offers beauty e-retailers valuable opportunities. Thus, the implementation should be emphasized by businesses that seek to build a strong omnichannel presence that offers customers superior online shopping experiences.

ACKNOWLEDGMENTS

I would like to express my sincere gratitude to my supervisor, Dr. Marion Garaus, who has supported, inspired, and encouraged me throughout the process of writing this thesis.

In addition, I would like to take this opportunity to thank MODUL University Vienna and all the faculty and staff at the institution who have guided me on my academic journey over the past five years. I am grateful for having been able to expand my theoretical and practical knowledge and for the personal development I have undergone, which has made me the person I am today.

Finally, I would like to thank my family, friends, and everyone else who supported me during the writing process, for motivating and encouraging me.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

AR – Augmented Reality

CPI – Cost per interview

E.g. – Exempli gratia

H – Hypothesis

KPI – Key Performance Indicator

RQ – Research Question

VR – Virtual Reality

1 Introduction

1.1 Context and previous research

Over the past decade, e-commerce has experienced remarkable growth and has become omnipresent in today's business world. This trend was reinforced by the Covid-19 outbreak, which led to strict measures on physical distance, including restrictions on in-store purchases in brick-and-mortar stores. While global e-commerce sales were about $1.3 trillion in 2014, that figure has since doubled (Statista, 2022a). Until recently, worldwide sales have reached 5.7 trillion U.S. dollars, and at a current growth rate of around nine percent, this figure is projected to surpass eight trillion U.S. dollars in 2026 (Statista, 2022a). These predictions are further supported by Forbes Advisor, indicating that customers show themselves inclined to online shopping, as presently one-fifth (reaching a quarter by 2026) of all purchases take place online (Baluch, 2023).

In parallel, the cosmetics industry is also currently experiencing a significant upswing. According to Statista (2023), it recorded an annual growth rate of eight percent in 2021, thereby reaching a development progress level that is comparable to that of the global e-commerce movement. Although the Covid-19 pandemic caused a significant decline in growth in the beauty industry, resulting in a drop in sales of approximately 15 percent in 2020, the sector managed to recover quickly and return to normality, unlike many other industries (Marchessou & Spagnulo, 2021). Similarly, the beauty sector appears to be less impacted by the effects of economic regression than other industries (Terlep, 2022). As of 2019, the global beauty industry has been estimated to be a 500 billion U.S. dollar business, and despite lower purchasing power caused by inflation, the cosmetic industry managed to surge by 70 billion U.S. dollars since then (Statista, 2023). Consumers continue to indulge in luxury goods such as cosmetics, which has been identified as the so-called "lipstick effect" (Danzinger, 2019).

However, the latest events have once again emphasized the necessity for beauty brands to stay up-to-date and be innovative to flourish in the fast-paced environments they are currently operating (Marchessou & Spagnulo, 2021). While the beauty industry has always been susceptible to change due to ever-changing trends, the sudden shift to e-commerce, accompanied by new consumer demands, has been the most momentous movement in recent years (Marchessou & Spagnulo, 2021). Despite the promising future of e-commerce offering many new opportunities to beauty retailers, e-marketers are confronted with unsettled issues concerning the improvement of customer experience (Smink et al., 2019). Having made multiple interventions, ranging from online ratings to third-party assurances, consumers continuously present themselves as uncertain about the new way of shopping for cosmetic products, as determined by high return and shopping cart abandonment rates (Smink et al., 2019; Sun et al.,

2022). In this context, the non-existent direct product experiences, arising from an absence of physical touchpoints, turned out to be the main obstacle beauty online retailers must deal with (Niven-Phillips, 2019). Due to limited sensory experience, customers are hindered to conduct pre-purchase product examinations, which in turn significantly restricts them from imagining the hedonic and/or utilitarian value offered in the post-purchase consumption phase (Sun et al., 2022).

To overcome the gap between online and stationary shopping, increasingly more retailers started using technological advancements (Smink et al., 2019). Among these, augmented reality has emerged as the most disruptive innovation in the beauty industry (Kanuganti, 2019). By integrating digital layers with the physical world, augmented reality technology enables customers to obtain more realistic representations of products (Kanuganti, 2019). In beauty e-commerce, the most prevalent augmented reality applications allow customers to virtually try on products and receive additional information that can influence purchase decisions (Jaswal, 2021).

Due to the technology's novelty, existing research in the field of cosmetics on augmented reality's effects on customer experience is limited. Despite its rapid increase in popularity in recent years, only a few studies focused on augmented reality's ability to support customers' imagination of post-purchase consumption. Many researchers identified the utilitarian and hedonic benefits of augmented reality in retailing. Out of these, only a minority of studies examined the relationship between augmented reality, uncertainty reduction, and anticipated emotions. However, both constructs have been identified as important predictors of purchase intentions (Heller et al., 2019; Kotabe et al., 2019). Furthermore, while many scholars studied customers' attitudes toward using augmented reality by building on the technology acceptance model (Hsu et al., 2021; Oyman et al., 2022; Perannagari & Chakrabarti, 2019), little research has been conducted to identify the relationship between three-dimensional product presentation with augmentation and customers attitudes and intention to purchase cosmetics online. Consequently, it remains unclear whether three-dimensional beauty product presentations are superior to two-dimensional ones and to what extent virtual try-on functions can enhance online purchase intention by encouraging imagination, uncertainty reduction, and anticipated emotions.

1.2   Research aims and objectives

With the purpose to contribute the aforementioned research gaps, this thesis focuses on the enhancement of the customer experience in the beauty industry. By further understanding which aspects of the customer journey can or cannot be improved by implementing augmented reality as an additional online product presentation tool, retailers should be supported in

developing effective point-of-sale marketing strategies. However, this research should not only benefit businesses but also customers by discovering methods that include sufficient information for pre-purchase product inspections and facilitate purchase decision-making, despite spatial separation. Considering this, the following research questions have been formulated:

RQ1: How can online product presentation using augmented reality technology enhance the customer experience?

RQ2: To what extent does the use of augmented reality in the online presentation of cosmetic products influence consumers' online purchase intentions?

To answer these two questions, a one-factor, between-subject experiment with augmented reality representing the manipulated factor is conducted. The target sample, consisting of people that use cosmetic products regularly, is acquired through an online panel assuring a representative sample in terms of age, gender, and education. This experimental design is applied to test the causal relationship between product presentations with augmented reality and imagination, uncertainty, anticipated emotions, attitude toward buying online, and intention to purchase online.

1.3   Thesis structure

This section briefly describes the structure of the present thesis, which can be divided into five main chapters: introduction, literature review, methodology, results, and discussion & conclusion. The literature review, as the first chapter (section 2) following the introduction, collects relevant information from existing scientific research and draws on well-established theories, such as the theory of planned behavior. Subsequently, the methodology chapter (section 3) discloses the research method that has been selected to answer follow the research objective of this thesis. In this regard, explanations of the study design and procedure, sampling method, and data collection are provided. With the help of descriptive and inferential statistics, the findings of the primary research of this thesis are then discussed in the next chapter (section 4). Ultimately, the final chapter (section 5) includes a summary of the results as well as answers to the proposed research questions. Additionally, potential limitations within the scope of this research along with managerial implications and suggestions for further research are given at the very end of this thesis.

2 LITERATURE REVIEW

2.1 E-Commerce

As this thesis is concerned with the impact of augmented reality in online retail, it is crucial to understand e-commerce and its evolution in the beauty industry to determine its current state and future opportunities. In addition, the upcoming sections discuss different types of beauty product presentations, followed by potential barriers to e-commerce and its effects on the online shopping experience. Building on this, the final part discusses mental imagery and its relevance to e-commerce.

E-commerce (electronic commerce) is defined as "the transaction over electronic system (e.g. internet and other computer networks) for buying or selling products while transferring funds online" (Alashaddadi, 2021, p. 76). However, since one needs to consider the different models of e-commerce, which vary according to the parties involved in the business interaction, the term cannot be fully generalized (Babenko et al., 2019). The most common (e-) commerce relationships include business-to-consumer (B2C) to generate direct sales with end consumers (Babenko et al., 2019). In line with the objective of this thesis, the following sections will focus exclusively on B2C commerce relationships.

The emergence of e-commerce retailing can be traced back to the 1990s, also considered the early days of the Internet (Chi Lin, 2003). However, more time passed between its first appearance and the time when e-commerce was seen by customers as a useful complement to physical stores (Chi Lin, 2003). The expansion of Internet access in the 2000s contributed to online shopping's growing popularity, through which it became more widely used by both businesses and customers (Chi Lin, 2003). In parallel with the rise in popularity, the density of online stores has steadily increased over the years, with most established B2C stores slowly starting to have an omnichannel presence (Babenko et al., 2019). This trend movement had a major impact on the present retail world by changing people's shopping behavior and introducing some of the most successful business models, such as the online marketplace Amazon (Babenko et al., 2019). Overall, most B2C segments have upward-going trends in revenue and sales figures, that are attributable to the expansion of online retailing (Statista, 2022b). By having held the largest share of online retailers and generating the highest revenues from the early beginning, the fashion industry is currently the leader in e-commerce (Statista, 2022b). The beauty and cosmetics industry, which is the focus of this study, has also seen promising development in e-commerce in recent years., which will be discussed in more detail in the following subsection.

2.1.1 E-commerce in the beauty industry

This subchapter is devoted to the evolution of online retailing in the cosmetics industry. The development is presented in its individual phases, starting with its emergence and concluding with future assumptions. Afterward, the potential of e-commerce in the cosmetics industry is emphasized based on the benefits it offers to both customers and companies.

Although the introduction of beauty online retailing can be traced back to the early years of e-commerce, the sector faced difficulties shifting retail channels from brick-and-mortar stores with physical sentiment touchpoints to virtual marketplaces (Jaswal, 2021). During the second half of the 2000s, when the electronic and fashion industries established themselves as prominent players in e-commerce, the cosmetics industry gradually began to complement its offline with online commerce (Park & Lee, 2021). However, the belated entry has not hindered the success of the beauty sector but rather ensured an accelerated establishment that pointed to a promising future (Park & Lee, 2021). Consequently, within a relatively short period, more and more beauty businesses joined the pioneers (Park & Lee, 2021).

The sudden change in consumer behavior as well as the multiplication of businesses operating in the cosmetic sector resulting from the trend movement can be attributed to two events that affected the whole market (Halzack, 2021; Yan et al., 2016). The first occurrence that had a profound impact was the expansion of major beauty resellers (Halzack, 2021). Sephora, as one of the most prevalent retailers of beauty products, expanded its business by entering new markets in 2007 while launching its first online store, resulting in rapid growth (Halzack, 2021). Sephora became an internationally known business that managed to attract not only a wider range of customers but also labels wanting to be featured by the famous reseller (Halzack, 2021). Moreover, as a best-practice example, resellers such as Sephora inspired also smaller individual brands and therefore had a significant implication on the development of beauty e-commerce (Halzack, 2021). Additionally, the increasing popularity of social media has also contributed to many cosmetic companies opting for online commerce (Yan et al., 2016). Around 2010, social media platforms such as Facebook, Instagram, and YouTube began to boom and recorded steadily increasing numbers of active users (Statista, 2022c). The wide reach aroused strong social networks that were able to connect diverse people (Yan et al., 2016). New touchpoints between different actors have been created, particularly impacting brand communication, as two-way communication channels in social media also allowed external stakeholders to express their views publicly (Yan et al., 2016). As a result, more and more individuals, including those with large numbers of followers, started to share their opinions on certain topics with their followers, which ultimately facilitated the optimization of word-of-mouth (WOM) marketing (Doh & Hwang, 2009). Word-of-mouth (WOM), as the sharing of experiences and recommendations by well-known people in the traditional sense, has a major influence on the decisions of others because of perceived trustworthiness but covers only a limited scope (Buttle,

1998). However, the digital development has overcome this limitation by allowing people to share their thoughts publicly, such as in the form of comments, blog posts, or even in the form of videos, thus introducing e-WOM (Berger, 2014). The cosmetics industry has been particularly affected by the emergence of beauty videos on YouTube, where users have begun to indirectly promote products by showing them in makeup tutorials. Businesses quickly realized they needed an online presence to fully realize the potential of user-generated content (UGC), which further fostered the development of e-commerce in the beauty sector (Yan et al., 2014).

In the year 2020, the outbreak of Covid 19 has shocked global commerce. The emergence of the fast-spreading virus resulted in a pandemic that presented many socioeconomic challenges with most sectors being affected (Kopot & Reed, 2022). Public authorities imposed regulations that gravely restricted people in their day-to-day lives have been imposed by public authorities, ranging from travel restrictions to temporary closures of stores to reduce the spread, (Mustika & Wahyudi, 2022). Although in most countries brick-and-mortar drugstores remained open, customer traffic declined considerably which can be attributed to the high-risk exposure and shifts in behavioral patterns (Gerstell et al., 2020). The enforced isolation, which resulted in fewer events, had, for example, caused lower demand for makeup products and perfumes (Marchessou & Spagnuolo, 2021). This change resulted in an eight percent annual degrowth of the cosmetics market in 2020 (L'Oréal, 2022). Although this decline hit many players dramatically, sales returned close to normal in 2021, largely due to another major trend that emerged in response to social distancing (Marchessou & Spagnuolo, 2021). Technology became an integral part of people's lifestyles by playing a critical role in many areas, including social interactions, education, telecommuting, and retailing (Mustika & Wahyudi, 2022). By allowing people to compensate virtually for the sacrifices they had to make, digitization accelerated, prompting sellers to prioritize e-commerce and thus expand their digital capabilities (Gerstell et al., 2020). Beauty online shopping started booming across geographies, whereby retailers received additional digital traffic resulting in online sales noticeably exceeding pre-pandemic levels (Marchessou & Spagnuolo, 2021).

Although the everyday lives of most have now, three years after the outbreak of Covid-19, returned to normal, the effects of the pandemic led to a permanent channel shift, with many customers continuously preferring to purchase beauty products online rather than in physical stores. The e-commerce market currently holds a market share of more than twenty percent and is expected to have an annual growth rate of nine percent (Statista, 2021). This change in purchasing behavior that is leading to a steady upward trend in e-commerce sales is attributable to the various benefits offered to customers. In addition to reduced vulnerability to, for example, infection risks, which has been the most prevailing reason for online purchases in 2020, e-commerce is very convenient (Taher, 2021). First, e-commerce websites offer customers an effortless shopping experience that probably no brick-and-mortar store could ever provide (Taher, 2021). Online shops are typically well-organized, e.g., through filtering functions, which

makes finding a desired product significantly easier (Safa & Von Solms, 2016). Also, nowadays only a few user-friendly steps are required for check-out which considerably accelerates the buying process (Safa & Von Solms, 2016). Furthermore, online stores are independent of location and time, i.e., they are available 24 hours a day and can be used from anywhere, requiring only an Internet-enabled device and a well-functioning Internet connection (Taher, 2021). Another important argument for buying online is the ability to compare products, prices, and suppliers before making a purchase decision (Taher, 2021). While comparisons in physical stores would require time-consuming efforts, the Internet allows users to switch between shops within seconds (Nguyen, 2020). Online resellers such as Amazon even provide comparisons without the need to leave the website (Nguyen, 2020). Overall, brands with an omnichannel presence usually offer a wider selection of products (Safa & Von Solms, 2016). This includes the product range in terms of sizes, colors, or materials, which increases the likelihood of attracting more customers (Taher, 2021).

Furthermore, the growth of e-commerce can also be attributed to the advantages offered to businesses. First of all, the above-mentioned non-existent geographical limitation of online retailing allows companies to tap into cross-border markets and thus reach a larger number of customers (Taher, 2021). Data collection is also much more efficient, as larger volumes of customer data can be captured (Taher, 2021). The information obtained can then be used to effectively develop methods for reaching the target group (Taher, 2021). Second, compared to brick-and-mortar stores, online shops have significantly lower operational costs which can specifically be beneficial for start-ups (Safa & Von Solms, 2016).

Overall, the future forecasts of online retailing are promising, leaving it to retailers to leverage the potential and further enhance customers' online shopping experiences (Marchessou & Spagnuolo, 2021). In this regard, the following subsections discuss potential risks that online retailers need to be aware of and how they can mitigate them.

2.1.2 Perceived risks of online retailing

Before being able to identify the existing limitations and the associated perceived risks of e-commerce, the different phases of customer experience and their role in customer experience must first be explained.

The customer experience, regardless of whether it occurs in stationary or virtual stores, is a multi-dimensional construct that can be segmented into three distinct stages: pre-purchase, purchase, and post-purchase (Theophilus et al., 2021). Each of these stages involves different activities that include behavioral, cognitive, emotional, sensorial, and social aspects that collectively shape the evaluation of the customer's experience (Theophilus et al., 2021). As implied by its name, the pre-purchase stage summarizes all points of contact before the actual purchase of a product or service. During this stage, no commitment between the buyer and the

seller exists. In most cases, the pre-purchase stage is triggered by the recognition of a "problem", typically a need or a desire, that requires a solution. By identifying the problem, the customer becomes aware of the products or brands that can satisfy his needs. This so-called awareness phase, thus, becomes the first step in the decision-making process, in which the customer selects products to be further investigated in subsequent phases (Cheng et al., 2022). Accordingly, the following phase contains the consideration of the short-listed products. The consideration phase plays an essential role in purchase decision-making as customers review the products in more detail to be able to deeply evaluate them (Cheng et al., 2022). It is imperative to provide customers with adequate information regarding the product to support customers in estimating the product usage experience (Cheng et al., 2022). In this stage, customers are asked to use higher cognitive efforts to effectively contribute to the upcoming decision-making (Cheng et al., 2022). During the consideration phase, the pre-selected list of products is further downsized so that only a small portion of products enter the intent phase (Jang et al., 2012). This last pre-purchase phase permits the ultimate evaluations and comparisons needed for the final decision-making (Jang et al., 2012). If the pre-purchase stage fails, and customers opt not to purchase the product, the customer experience concludes, at the latest, at this point (Roberts & Nedungadi, 1995). If, however, the customer got convinced and built sufficient confidence regarding the product, the second major stage, the purchase stage, commences (Robert & Nedungadi, 1995). This stage tends to be the shortest as it only comprises the period between the decision-making and the purchase transaction (Chen-Yu & Kincade, 2001). The third and final stage of the customer experience refers to the post-purchase stage describing the aftermath of the purchase (Chen-Yu & Kincade, 2001). The post-purchase phase is of great importance for both buyers and sellers, as this is the first-time customers can experience the product's features firsthand and take advantage of its benefits (Kuo et al., 2009). Thereby, customers analyze whether the product fulfills their needs and meets their expectations (Chen-Yu & Kincade, 2001). Based on this evaluation buyers may repeat purchases and eventually become loyal customers (Kuo et al., 2009). Consequently, customer experience has been proven to have an impact on customer satisfaction and loyalty which in turn affects purchase intention (Theophilus et al., 2021). During the different stages of the customer journey, a multitude of aspects determining the final evaluation of the experience must be considered by both parties (Sarkar & Das, 2017). While the procedure tends to be the same, buyers and sellers must deal with different conditions in online and physical retailing settings (Sarkar & Das, 2017). In this regard, the subsequent sections will focus on inherent inefficiencies of online retailing and the associated factors that are posing risks to the online customer experience.

The most prominent inefficiency in virtual environments is the absence of physical interactions, resulting from the spatial separation of sellers, buyers, and products (Zhou et al., 2018). On the one hand, the spatial separation of sellers and buyers actively restricts interpersonal communication which thereby limits the available information of both entities (Zhou et al.,

2018). As a result of that, the transacting parties of the online retail process are perceived as faceless and more anonymous (Chatterjee & Datta, 2008). On the other hand, in e-commerce also a spatial separation of customer and product exists, impeding product appraisal in the pre-purchase stage due to the unavailability of physical examination (Zhou et al., 2018). Furthermore, a temporal separation between payment and delivery services exists preventing buyers from receiving the product immediately after the purchase transaction (Zhou et al., 2018). These conditions contribute to a lack of transparency, affecting both sellers and buyers (Chatterjee & Datta, 2008). Transparency refers to the practice of disclosing information and being clear about operations that are necessary to stakeholders (Zhou et al., 2018). In e-commerce, transparency can take different forms. On the one hand, process transparency enables stakeholders to gain an understanding of task-related steps and actions (Chatterjee & Datta, 2008). Seller transparency, on the other hand, refers to the accessibility of information about the identity of the seller (Zhou et al., 2018). Finally, product transparency – which this thesis will mainly focus on – is about providing important information about the product's characteristics and physical and abstract attributes (e.g., color and quality) (Zhou et al., 2018). A lack of product transparency is a common concern of e-commerce that arises from the non-traditional customer experience. Two distinct types of experiences could be identified that can be discerned based on the level of interaction (Park et al., 2005). Direct experiences entail the stimulation of all sensory abilities of an individual, while indirect experiences inhibit one or more senses (Park et al., 2005). Online shopping perfectly exemplifies indirect experiences as it only entails touchpoints with the representation of the product rather than with the physical product itself (Park et al., 2005). Due to this spatial separation, e-commerce thus offers only severely limited sensory cues leading to physical and possibly mental intangibility (Song & Kim, 2012). The physical interaction with a product, however, is an important source of information that adds both utilitarian and hedonic value to the pre-purchase stage of the customer experience (González-Benito et al., 2015). In this regard, various researchers have highlighted the importance of haptic information (González-Benito et al., 2015; Rathee & Rajain, 2019; Silva et al., 2021). This importance is attributable to the need for touch which can be defined as "the preference to obtain and use information through the sense of touch or the haptic system, which refers to how humans search for and gather information using essentially the hands" (Silva et al., 2021, p. 2). According to Rathee and Rajain (2019), the need for touch can be categorized into autotelic and instrumental. In this context, autotelic describes the hedonic and instrumental utilitarian motivation to touch something (Rathee & Rajain, 2019). In general, retailers should consider the impact of touch on the customer experience, as a series of studies have provided evidence of the positive relationship between tactile information and product evaluation and decision-making. For instance, Grohmann et al. (2007) found that customers who were able to physically touch products were more likely to evaluate them favorably. This finding was supported by Williams and Ackerman's (2011) research, which showed that physical attributes such as hardness, warmth, and weight (which can only be perceived through touch) had a significant impact on customers' decision-making. However, while touch is unquestionably an

important factor in consumer behavior, the expression of the need for touch is subjective and cannot be fully generalized to the entire population (Rathee & Rajain, 2019). The level of need for touch is determined by multiple intrinsic and extrinsic factors. Intrinsic factors pertain to individual characteristics that influence the personal need for touch (González-Benito et al., 2015). These factors may include personality traits and the present emotional state, which can result in a higher or lower need for touch (González-Benito et al., 2015). Sensory information needs are also closely related to the personal risk attitude of the consumer. Risk attitudes describe the tendency of how someone reacts to uncertainty (Holt & Laury, 2002). The three major risk attitude consumer groups are risk averse, risk neutral, and risk seeking (Holt & Laury, 2002). In the e-commerce context, it is crucial to consider that most people consider themselves risk-averse indicating that they are very sensitive to a lack of information whereby the need for touch increases (Pindyck & Rubinfeld, 2012). Additionally, previous studies indicate that also demographic variables, such as age, gender, origin, and cultural norms, impact the degree of need for touch (Pindyck & Rubinfeld, 2012). For instance, Rathee and Rajain (2019) reported that women tend to exhibit a higher need for touch.

In addition to that, also external factors play a significant role in determining the need for touch. The most influential extrinsic factor that could be identified by various past research is the product category (González-Benito et al., 2015; Hong & Pavlou, 2014; Song & Kim, 2012). The need for touch can be associated with the availability of tangible attributes of the products (González-Benito et al., 2015). Search products consist of a relatively small number of tangible features whereby customers can obtain relevant information without physical interaction and evaluate the product already in the pre-purchase stage (Song & Kim, 2012). Besides fully intangible products, such as software, electronics are a good example of search products (Song & Kim, 2012). The relevant information on electronics' features, quality, price, and intended use does not include many sensory cues and can therefore be gathered without physically examining the product (Song & Kim, 2012). In contrast, experience goods are characterized by attributes that are primarily revealed through direct experiences and cannot be fully assessed without physical interaction with the product (Song & Kim, 2012). Consequently, in the case of spatial separation, such as in e-commerce, information about experience goods is communicated with greater difficulty, resulting in a higher likelihood of information gaps (Hong & Pavlou, 2014). Therefore, to avoid misunderstandings when purchasing experience goods, customers place greater importance on sensory information which significantly increases the need for touch (Song & Kim, 2012 Most beauty products such as perfumes and makeup are experience goods as the attributes that are most relevant for customers cannot be transmitted simply by indirect experiences (Hong & Pavlou, 2014). In addition to visually examining these products, customers usually want to touch, smell, and even try them on before making purchase decisions (Hong & Pavlou, 2014). This is because the effectiveness of cosmetic products depends on individual factors such as skin type compatibility, which is difficult to judge without physical evaluation (Hong & Pavlou, 2014). Furthermore, products can also be categorized based on the level of

customer involvement needed for decision-making. Customers typically do not spend much effort such as by deeply considering the product's features when making routine purchases (Stephen et al., 2013). In such cases, one speaks about low-involvement products. In contrast, high-involvement products are often one-time purchases (Stephen et al., 2013). They are usually high-priced and associated with increased risk which therefore requires higher deliberation in the decision-making process (Stephen et al., 2013). Consequently, sensory information is more important for high-involvement decisions than for low-involvement decisions (Stephen et al., 2013). Additionally, sellers have an influence on customers' need for touch through the type and format of information they choose to present in their product offerings, which introduces the next major obstacle to product transparency in online retailing.

Information asymmetry, according to Pindyck and Rubinfel (2012, p.632), can be described as a "situation in which a buyer and a seller possess different information about a transaction". This asymmetry can occur in various business situations but is particularly common in online stores due to spatial and temporal separation and unequally distributed information (Hong & Pavlou, 2014; Pindyck & Rubinfeld, 2012). The principle-agent problem, describing a conflict of interest between the seller (agent) and buyer (principal), is a prevalent consequence of information asymmetry in retail scenarios (Zhou et al., 2018). In the context of e-commerce, imperfect information is typically provided in favor of the agent (Zhou et al., 2018). The existence of asymmetric information significantly hinders customers to differentiate between low- and high-quality products (Zhou et al., 2018). This issue was first acknowledged by Akerlof (1970) who referred to markets affected by information asymmetry as "markets for lemons". The author proposes that in such a market, the sellers of high-quality goods are reluctant to sell because they fear receiving the same price as the sellers of low-quality goods (lemons) (Akerlof, 1970). This leads to a situation where only low-quality goods are offered for sale, which in turn drives down the average price and further discourages the sellers of high-quality goods (Akerlof, 1970). In this regard, asymmetric information hinders customers from making informed decisions and therefore has been proven to harm various aspects of customer experience, including purchase intention, product evaluation, and customer satisfaction, which can potentially affect a whole market in the long run (Zhou et al., 2018).

Transparency is a significant determinant in decision-making. However, due to the existing separations in the virtual world that lead to intangibility and asymmetric information, e-commerce platforms typically lack transparency. As a result, customers are more likely to evoke uncertainties toward the purchase (Al-Adwan et al., 2022). The term uncertainty appears in a variety of contexts leading to different definitions. Knight (1985, p. 199), for example, defines uncertainty as "neither ignorance nor complete and perfect information, but partial knowledge". Therefore, uncertainty refers to the lack of valuable knowledge, which means that the future cannot be accurately predicted (Al-Adwan et al., 2022; Chatterjee, 2008). Risk and uncertainty are often mentioned in the same context, although they are two different concepts

(Chatterjee, 2008). Since there are no prior probabilities, uncertainty is subjective and depends on the situation (Chatterjee, 2008). In contrast, risk can be calculated in terms of probabilities and is therefore objective (Chatterjee, 2008). In the context of e-commerce, customers' perceived uncertainty is "the extent to which they cannot anticipate the results of a transaction due to uncertainty related to the seller and the product " (Al-Adwan et al., 2022, p. 2). In retailing, therefore, a distinction can be made between seller uncertainty, which describes the inability to accurately assess seller behavior due to, for example, information asymmetries, and product uncertainty, which is the focus of this paper (Al-Adwan et al., 2022). Product uncertainty is a multidimensional concept that refers to the difficulty of evaluating a product's attributes and associated performance concerning the future (Al-Adwan et al., 2022). Customers often face product uncertainty due to inadequate information provision (Al-Adwan et al., 2022). With regard to product uncertainty, one must further differentiate between product fit uncertainty and product quality uncertainty (Jha et al., 2019). The latter refers to the difficulty of predicting a product's future performance and used to be the only dimension of product uncertainty (Hong & Pavlou, 2014). However, research has shown that customers' pre-purchase concerns go beyond product performance, leading to the adoption of product fit uncertainty as another dimension of product uncertainty (Hong & Pavlou, 2014). Product fit uncertainty refers to a customer's inability to predict the match between their personal preferences and a product's features (Hong & Pavlou, 2014; Jha et al., 2019). Product quality uncertainty usually concerns attributes that offer common utility to the customer whereas product fit uncertainty deals with experiential and heuristic aspects (Hong & Pavlou, 2014). In the context of beauty products, taking L'Oreal True Match Foundation as an example, uncertainty about product quality may arise from a customer's uncertainty about the foundation's coverage, bendability, and finish, while uncertainty about product fit may refer to the match between the foundation's shade and the customer's skin tone. It is worth noting that product fit and quality uncertainties can occur individually or simultaneously (Hong & Pavlou, 2014), for example, when the customer is unsure whether a foundation fits both in terms of color and coverage.

When sellers are unable to compensate for the limited sensory information available to customers, the likelihood of high product uncertainty increases (Hong & Pavlou, 2014). Likewise, products sold by salespeople who intentionally withhold information to their advantage are also likely to be associated with high levels of uncertainty. However, reducing product uncertainty should be a priority for sellers, as it negatively affects various aspects of the customer experience including customers' ability to make decisions (Hong & Pavlou, 2014). Uncertainty, regardless of being product performance- or product fit-related, has been proven to significantly interfere with customers' capability to decide (Jha et al., 2019). Customers reported having a harder time assessing the potential value that comes from buying a product and weighing it against the potential consequences when faced with uncertainty (Jha et al., 2019). This effect not only significantly decelerates decision-making, but also often leads customers to refrain from making a purchase, which can be manifested in the accumulation of shopping cart abandonments of

customers (Egeln & Joseph, 2012). The term "shopping cart abandonment" describes the scenario of resigning to buy products they have before added to their shopping cart and thereby not completing their purchase (Egeln & Joseph, 2012). Globally, close to 70% of all digital shopping carts are abandoned (Statista, 2022d). In the majority of cases, these last-minute purchase withdrawals are caused by perceived uncertainty regarding the product arising from incomplete or conflicting information (Egeln & Joseph, 2012). Shopping cart abandonment should be avoided at all costs, as it can negatively impact customer experience by evoking feelings such as frustration which might ultimately lead to negative associations with the brand (Egeln & Joseph, 2012).

Moreover, research has shown that uncertainty significantly affects customers' spending behavior (Al-Adwan et al., 2022). According to Al-Adwan et al. (2022), customers confronted with high levels of uncertainty tend to limit their purchases to low-value products to reduce the risk of post-purchase dissonance. The phenomenon of post-purchase dissonance is a major issue in online shopping and can be described as a feeling of discomfort that evokes after making a purchase (Lee, 2015). In other words, it refers to the case of product uncertainty going beyond the pre-purchase stage to the post-purchase stage (Mitchell & Boustani, 1994). Customers that are confronted with post-purchase dissonance are uncertain whether they made the right choice, which is a common reaction, especially in the context of high-value products (Lee, 2015). In many scenarios, these doubts are proven unfounded in the evaluation stage. However, there is a significant number that can be substantiated which advocates post-purchase satisfaction. According to the expectation-confirmation theory originally proposed by Oliver (1976), customers' pre-purchase expectations toward products' fits and performances are most likely affecting their post-purchase evaluation. Regarding this, the theory suggests that post-purchase satisfaction can be described as the ratio of received product utility and expectation (Hong & Pavlou, 2014). On the one hand, if the product meets or exceeds the buyer's expectations, they are more likely to continue using it and recommend it to others. If, on the other hand, their expectations are not met, they may be dissatisfied and develop a negative attitude toward the product or service. A causal effect of product uncertainty on post-purchase satisfaction could be identified by various researchers. The effect could be explained by customers' inability to assess the product's performance as well as the compatibility between the product's features and their personal preferences due to lacking transparency (Chatterjee & Datta, 2008; Hong & Pavlou, 2014).

In response to the disappointment arising in the post-purchase stage, many buyers end up returning the products to the sellers. Studies have shown that the return rates in online stores tend to surpass 30% even though an excess of 20% already poses a significant threat to customer experience and the economic well-being of a business (Jha et al., 2019). Product returns entail high operational costs and lead to revenue loss for sellers (Jha et al., 2019). Besides that, by requiring customers to initiate and go through the process, product returns are associated with

higher efforts, which negatively affects the customer experience (Al-Adwan et al., 2022). In contrast to e-commerce, in physical stores, only less than 10% of all purchases result in product returns which highlights the importance of physical product experiences in the pre-purchase stage (Jha et al., 2019). In this regard, the upcoming chapters aim to discuss ways to overcome product uncertainty to guide online retailers in enhancing customer experience

2.1.3 Mental imagery

After having discussed the risks associated with e-commerce the next sections investigate methods to reduce existing information gaps. More specifically, this subchapter introduces the theory of mental imagery and the role it plays in online retailing.

Mental imagery as an important theory in consumer psychology appeared in a variety of research contexts resulting in different interpretations of the term. Richardson (1969, p. 2), for example, conceptualized mental imagery to be "(1) all those quasi-sensory or quasi-perceptual experiences of which (2) we are self-consciously aware, and which (3) exist for us in the absence of those stimulus conditions that are known to produce their genuine sensory or perceptual counterparts ". In contrast to that, MacInnis and Price (1987, p.473) defined mental imagery as "the process by which individuals represent sensory or perceptual experience, such as thoughts, emotions, and memories in individuals' memory processing". Similarly, Gossens (2020, p. 306) identified it to be "a mode of information processing which includes sensory representations (images) in working memory that are used in the same way as perceptions of external stimuli". Based on these definitions, mental imagery is triggered by external stimuli which subsequently generate a mental image. Thereby the stimulus can be auditory, visual, literal, or haptic and can activate mental imagery in different scenarios (Heller et al., 2019). In consumer consumption and decision-making contexts, visual stimuli, which will be discussed in more depth in chapter xy, are seemingly dominant (Heller et al., 2019). However, irrespective of their type, it is important to note that incoming stimuli are not always imagery-evoking (Park & Yoo, 2020). Whether a stimulus is capable of activating mental imagery is decided by cognitive processes (Cheng et al., 2022). In these cognitive processes, the information conveyed by the stimulus is analyzed and compared with the information stored in long-term memory (Park & Yoo, 2020). If correspondences with previously obtained memories can be established, mental images are likely to emerge (Park & Yoo, 2020). These mental images are therefore based on previous experiences (Lee & Gretzel, 2012). They facilitate the ability to imagine which in turn positively affects uncertainty reduction by filling informational gaps (Park & Yoo, 2020). In this regard, imagery-evoking stimuli have the potential to conjure sensory information (Cheng et al., 2020). The visualization of mental images as a result of mental imagery thus can be considered a quasi-perceptual experience (Cheng et al., 2020).

When talking about mental imagery it is important to distinguish between its two stages: imagery generation and imagery transformation (Heller et al., 2019). The generation phase

arises from immediate sensory information (stimulus) within a meaningful context as it has already been described in the paragraph prior (Heller et al., 2019). It must be added, however, that mental images require maintenance, as the mental images that appear in the generation stage tend to dissolve rapidly due to limited memorial capacity (Pearson et al., 2013). In the next step, after the imagery has successfully been generated and subsequently properly maintained, the mental image can be transformed to then be used in further cognitive processes (Heller et al., 2019). The transformation of mental images is an important part of creative thinking and problem-solving (Heller et al., 2019). By mental rotation, an aspect of mental transformation, cognitive efforts can be reduced which in turn facilitates the process of integrating the new information into the pre-existing environment (Heller et al., 2019). The rotation can go as far as reconstruction, e.g., in size or color, or the relocation of an object to support imagination (Levin et al., 1985).

The multi-dimensional concept of mental imagery is a vital component of information processing and may therefore influence people's actions in various life situations (Park & Yoo, 2020). According to Lee and Gretzel (2012), people often subordinate additional information obtained through mental imagery to other indicators. They expound that this phenomenon is due to self-generated processing, the results of which are deemed more relevant leading to self-persuasion and greater beliefs (Lee & Gretzel, 2012). Self-generated cognitive responses, such as in mental imagery, therefore, form stronger attitudes that are characterized by accelerated generation, longer persistence, higher resistance to counter-persuasion attempts, and greater influence on behavioral intentions (Lee & Gretzel, 2012). Moreover, mental images heighten the likelihood of emotional evocation which reinforce self-generated attitudes (Park & Yoo, 2020).

Consequently, mental imagery is highly relevant for the retail industry as it also affects consumers and their decision-making. As it has been discussed in the previous chapter, the evaluation of a product as well as the ease of making decisions is strongly reliant on the availability of context-specific resources (Park & Yoo, 2020). Uncertainty, as a result of insufficient qualitative information, has a negative impact on effective decision-making, by decelerating or even hindering the process (Park & Yoo, 2020). Digital environments, such as e-commerce, are particularly affected by this phenomenon, as the availability of sensory information to assist customers in reviewing products is severely limited (Park & Yoo, 2020). Therefore, to overcome this limitation, retailers should strive to provide quasi-perceptual experiences to their customers (Park & Yoo, 2020). If online shops manage to implement stimuli that trigger mental images for viewers, chances increase that they feel more certain about the presented products, which ultimately contributes to higher confidence in the decision-making process (Steinman et al., 2014). Stimuli that create mental images are proven to be highly desirable for retailers from all different industries. The research of Lee and Gretzel (2012), for example, demonstrated that mental images are an effective source of information in enhancing expectations and simplifying purchase decisions for tourism products. Similarly, Cheng et al.,

(2022) concluded that mental imagery positively impacts decision-making in fashion and apparel online shopping.

Mental imagery significantly supports the imagination of product attributes that are not visible at first sight (Cheng et al., 2022). Thereby, customers use mental images to fill in important information that is not available to them (Heller et al., 2019). The reduction of informational gaps can be achieved through re-experiencing situations they have encountered with analogous products (Lee & Gretzel, 2012). This may include recollecting touchpoints with sensory attributes of a product such as the texture of a fabric, the aroma of a fragrance, or the flavor of a food item (Lee & Gretzel, 2012). However, mental imagery that successfully stimulates sensory perception can yield even more detailed information that contributed to the prior product experience (Steinman et al., 2014). These details could involve moments that are not directly related to the quality of a product (Steinman et al., 2014). Typical examples of that would be the sensory experience of opening the packaging of an iPhone, the sound of opening a Coca-Cola can, or the smell when entering a Victoria's Secret shop. While none of these attributes truly concern the purpose or define the performance of a product, they unconsciously encourage purchase decisions (Steinman et al., 2014). On the other hand, mental imagery can make consumers also conjure experiences even if they have not yet been made before (Lee & Gretzel, 2012). Through the combination and manipulation of already existing mental representations, mental images can be generated which realistically stimulate novel scenarios (Lee & Gretzel, 2012). For example, a person who has never visited a tropical beach may create a quasi-realistic mental representation of the experience by integrating sensory information from previous trips to the Mediterranean, such as the sound of ocean waves, the smell of sunscreen, and the sensation of walking barefoot on sandy beaches (Lee & Gretzel, 2012). This can also be applied to the experience of using a product from a beauty brand although, in reality, this has never been the case (Heller et al., 2019). For example, the person might recall the taste and aroma of raspberries and combine this with the haptic impression of a comparable-looking lip gloss to create a mental image of the product's user experience (Heller et al., 2019). The advanced implementation of imagery-evoking stimuli can be advanced to the point where individuals create mental representations of hypothetical scenarios that do not have any similar past experiences as a foundation, such as a woman imaging shaving beard hair when searching for a razor for her boyfriend (Heller et al., 2019).

Regardless of how hypothetical the mentally represented scenarios are, the additional information can enrich the shopping experience tremendously (Lee and Gretzel, 2012). Mental imagery allows customers to create visual maps that guide them through the purchase decision-making process (Park & Yoo, 2020). These maps reduce uncertainty by enabling customers to envision future consumption and empowering them to make informed decisions about whether to acquire a product (Park & Yoo, 2020). Outstanding questions about product features that are not obvious at first glance, such as durability, adaptability, or compatibility with other products,

can be clarified with the help of the information obtained through mental imagery (Lee and Gretzel, 2012). The accuracy of the anticipated post-purchase experience can be increased which is equally important to customers and retailers (Lee and Gretzel, 2012). As discussed in the previous chapter, the post-purchase phase shapes the customer's overall sentiment toward the brand. If actual product consumption falls short of the expectations set in the pre-purchase phase, customers are likely to regret their decision (Jha, Kemper & Brettel, 2019). This indicates that they are unsatisfied which in turn considerably decreases the likelihood of future re-purchases (Jha, Kemper & Brettel, 2019). At the same time, the probability of negative WOM rises, thereby risking the brand's reputation (Sun et al., 2021). Consequently, if the gap between expectation and reality can be narrowed through mental images both parties benefit.

Furthermore, according to the research conducted by Park and Yoo (2020), customers who possess these above-mentioned visual maps are more involved in product evaluation and are therefore more engaged in decision-making. Mental imagery also serves as a motivator for customers to buy products (Park & Yoo, 2020). Even if there is no specific need or intention to buy a particular product, consumers who have pictured themselves using the product often feel an increased desire to acquire it (Park & Yoo, 2020). The phenomenon can be explained by the fact that mental imagery can evoke emotional responses which in turn contribute to developing emotional attachment towards a product or a brand (Libby & Eibach, 2011). Since mental imagery is largely based on past experiences emotional associations, ranging from joy and excitement to comfort and security, are a common result (Libby & Eibach, 2011).

In conclusion, mental imagery can be viewed as a multifaceted tool that serves consumers' hedonic and utilitarian purposes. Mental imagery enriches the shopping experience by creating sensory associations resulting from previous experiences. In response to that, emotions evoke, and intrinsic motivation tends to increase. Additionally, by bridging information gaps, mental imagery can support consumers in their decision-making process. The additional information that can be obtained from mental images allows consumers to foresee future consequences that would follow from acquiring the product more accurately which minimizes the risk of post-purchase regret.

The impact of mental imagery on consumer behavior is substantial, particularly in online decision-making, and should therefore be considered by retailers. The means of creating mental images for customers will be explicated throughout the duration of this thesis. In this regard, the subsequent section examines different approaches utilized by retailers to display their products online and evaluates their potential to evoke mental imagery and their ability to mitigate uncertainties among consumers.

2.1.4 Online product presentation

Consumers' capability to imagine a product and create synapsis with previous experiences, especially in virtual environments such as online shopping, strongly depends on the (virtual) product presentation (Steinman et al., 2014). According to Song and Kim (2012, p. 347), the term "product presentation" can be defined as "the consciously designed display of chosen merchandise in a specific area". Product presentation accounts for an important component of retailing as it allows sellers to display and therefore present their goods to a broad audience including important potential buyers (Song & Kim, 2012). It greatly influences various aspects of the customer experience, thus underscoring the importance for sellers to regard product presentation as a critical determinant in decision-making (Park et al., 2005). However, even though product presentation is a crucial consideration in all retail settings, it is essential to recognize that distinct retail forms and product categories necessitate unique approaches due to varying circumstances and associated opportunities (Buda & Zhang, 2000). As has already been discussed over the course of this thesis, physical stores, compared to online shops, provide by nature more sensorial elements to customers, whereby the need for media supporting the product presentation declines (Buda & Zhang, 2000). Therefore, if a product is tangible and thereby can be physically evaluated from different perspectives by customers less emphasis is required on informational elements as part of the product presentation process (Buda & Zhang, 2000). In contrast, the intangibility given in virtual environments or sales of services calls for higher support through product presentation to close informational gaps (Kim et al., 2009). However, since product presentation affects multiple stages in the shopping experience, which will be discussed in more depth in the upcoming paragraphs, it is relevant in all types of retail scenarios (Kim et al., 2009).

The display of goods that customers encounter holds importance in both physical and digital stores as it is a significant factor in shaping the atmosphere of a retail environment (Song & Kim, 2012). Store atmosphere refers to the physical and psychological environment that is created by sensory elements (Park et al., 2005). Similarly, Kotler (1974, p. 50) refers to atmospherics as "the conscious design of the store environment to positively affect the consumer". By intentionally utilizing atmospheric cues, store owners can establish a desirable shopping environment that ultimately attracts target customers and facilitates successful buyer-seller interactions (Kim et al., 2009). Atmospheric cues refer to environmental stimuli that are processed into relevant information necessary to comprehend the environment (Tang & Zhang, 2020). Given that these cues have varying impacts on customers and their behaviors, they should be thoughtfully implemented to effectively achieve the predetermined atmospheric objective (Kim et al., 2009). Atmospheric cues are somewhat dependent on their particular environment, with some cues being exclusively applicable to shopping experiences featuring tangible products (Kim et al., 2009). Tang and Zhang (2020) categorized atmospheric cues into three distinct groups: task-relevant cues, mood-relevant cues, and social cues. Task-relevant

cues serve utilitarian purposes and are critical determinants of the efficiency and effectiveness of tasks, particularly in the context of retail transactions (Tang & Zhang, 2020). Task-relevant attributes of a shopping environment can provide important information and consequently fill existing information gaps, which is particularly important in the context of e-commerce (Song & Kim, 2012). Therefore, by including task-relevant cues in product presentation, customers obtain more comprehensive information, which is needed to better understand the product (Park et al., 2005). Effective product presentation informs customers about the product's value proposition, which is especially important for first-time customers of a product or brand (Park et al., 2005). Thereby, the effectiveness is determined by both the quality and quantity of task-relevant cues, which can be controlled by salespeople (Park et al., 2005). However, it also heavily depends on the customer's attentional capacity and willingness to learn about the product (Park et al., 2008) and the extent to which the information provided matches the information customers are looking for (Cheng et al., 2022). Effective product presentation, therefore, plays a crucial role in informing customers about the product's value proposition and thereby is of high essence for first-time customers that are unfamiliar with the brand and/or product (Cheng et al., 2022). This transmitted information can include product features, benefits as well as intended use, which ultimately can support customers in making informed decisions (Park et al., 2005). The additional information available in product presentation generally results in higher transparency of both the single product but also the total brand. Transparency, as has been stated in a previous chapter, is essential for customers to build trust and increase confidence (Buda & Zhang, 2000). Thus, by providing information that appears relevant to customers, product presentation can significantly alleviate uncertainty, which in turn accelerates the decision-making of customers that are hesitant to purchase the product (Park et al., 2005). This utilitarian aspect of product presentation is undeniably important for online retailing and must not be underestimated (Tang & Zhang, 2020). Nevertheless, another aspect of product presentation relates to mood-relevant cues that address the hedonic shopping experience.

Mood-relevant cues, the second important group of atmospheric cues, are considered low task-relevant (Tang & Zhang, 2020). They are not directly responsible for the fulfillment and thereby the effectiveness of the shopping task (Tang & Zhang, 2020). Instead, mood-relevant cues strongly affect the hedonic aspects of the shopping experience (Tang & Zhang, 2020). Therefore, they rather refer to elements within the product presentation that enhance the shopping environment's emotional atmosphere (Tang & Zhang, 2020). As suggested by their name, mood-relevant cues influence the perception or mood of customers (Park et al., 2005). Jean (1990, p.24) defined the term mood as "a type of affective state which is transient and particular to a specific time and situation". An individual's mood significantly impacts their behavior and actions, rendering it a critical factor in various situations, including the different stages of the customer journey (Park et al., 2005). In terms of moods, one must differentiate between positive and negative moods (Tang & Zhang, 2020). On the one hand, positive moods are associated with higher confidence and optimism as well as greater freedom and personal power (Park et al.,

2005). Additionally, positive affective states tend to enhance behavior performance and result in better outcomes (Park et al., 2005). This can be explained by the fact that people with positive moods tend to apply exploratory approaches in their decision-making (Zeelenberg et al., 2008). In this regard, critical thinking is broadened leading to the availability of an expanded range of possibilities (Zeelenberg et al., 2008). Positive moods contribute to more active participation in problem-solving by enhancing cognitive processes, including attention, memory, and judgment (Park et al., 2005). Overall, in decision-making scenarios, people with positive mindsets are more likely to make creative and innovative decisions (Zeelenberg et al., 2008). On the other hand, negative moods are typically associated with higher risk aversion levels, as individuals prioritize avoiding potential losses over seeking potential gains (Hockey et al., 2010). During such negative states, individuals are more hesitant to take risks, hindering their decision-making and increasing the likelihood of suboptimal outcomes (Hockey et al., 2010). Irrespective of being positive or negative, mood-relevant cues have been found to elicit emotions in the recipient (customer) (Flavián et al., 2017). This phenomenon enhances the likelihood of creating associations with past experiences, thereby promoting mental imagery (Flavián et al., 2017). Given the impact of mood on purchase decision-making, sellers should create store atmospheres by utilizing cues integrated into the product presentation that have a positive influence on customers' moods and create positive mental images (Hockey et al., 2010). Mood-related cues have been found to have an influence that extends beyond the decision phase, which was confirmed by Lodén et al.'s (2007) study showing the aftereffect of product presentation. The authors conducted an experiment that included three groups of participants to investigate the effect of product presentation on perceived product usage behavior (Lodén et al., 2007). All participants were instructed to apply anti-wrinkle cream to their skin for six weeks and subsequently report on their usage behavior and product experience (Lodén et al., 2007). However, while group A was treated with an expensive moisturizer that was presented as luxurious, group B was asked to use regular cream that was also presented as luxurious, and group C also used regular moisturizer but presented neutrally (Lodén et al., 2007). The results demonstrated a significant difference in product attitude and consumption patterns in favor of the luxurious presented products (Lodén et al., 2007). According to these findings, it can be concluded that mood-relevant cues can influence several phases of the customer journey. It is therefore recommended that they are effectively incorporated into the product presentation. The third and last group of product presentation elements shaping the shopping atmosphere are social cues. Just as mood-relevant cues, social cues are considered low task-relevant but aim to illustrate social presence in stores (Tang & Zhang, 2020). The social value of a product and/or brand influences customers' perceptions and thereby often affects their decisions (Tang & Zhang, 2020). For instance, other customers' experiences and opinions are often contributing to decision-making under uncertainty. In this context, positive social cues, such as recommendations, generally increase confidence whereas negative social cues encourage risk aversion. Furthermore, social cues tend to provide information regarding the social status of the product/brand, which for many people is a decisive aspect (Tang & Zhang, 2020). A typical

example is the bandwagon effect which describes the phenomenon of people "following the crowd" and adopting its behavior or belief which often results in the emergence of trends (Pindyck & Rubinfeld, 2012). Another common social cue influencing customers' decisions is the celebrity effect of famous people boosting single products and even whole brands by adding credibility through their notoriety.

Although atmospheric cues have been categorized into the three above-discussed groups (task-relevant, mood-relevant, and social cues) it is worth mentioning that product presentation methods can serve multiple (task-relevant and low task-relevant) purposes. There is a variety of possibilities to display products both online and offline. However, since this thesis focuses on beauty e-commerce emphasis will only be on methods appropriate for online shops.

According to Wang et al. (2019), product text descriptions (see Figure 1 as an example) are among the most commonly used mediums for displaying products on the internet. These descriptions typically consist of written information presented alongside a product, providing essential facts such as its intended use, features, and benefits to customers who may be unfamiliar with the product (Wang et al., 2019). Moreover, product text descriptions often include additional details such as the product's ingredients and materials, place of manufacture, dimensions, and specifications regarding guarantees and warranties (Wang et al., 2019). Due to their fact-based nature, the cues embedded in product text descriptions are primarily task-relevant, contributing to higher transparency and supporting hesitant customers in making informed purchase decisions (Wang et al., 2019). In some cases, however, the implementation of context-specific words can also evoke emotional responses and mental images (Cheng et al., 2022).

PRODUCT DETAILS —

True Match Super-Blendable Foundation now comes in a vegan formula with
an easy-to-use pump! Same hydrating formula, same natural-looking results.
So blendable it's like you can't tell where your foundation ends and your skin
begins. Plus, the lightweight formula:

- Is made with up to 6 pigments for
  our most precise match

- Adapts to any skin color and
  texture

- Locks in moisture

- Available in 47 true-to-skin
  shades

- Suitable for all skin types,
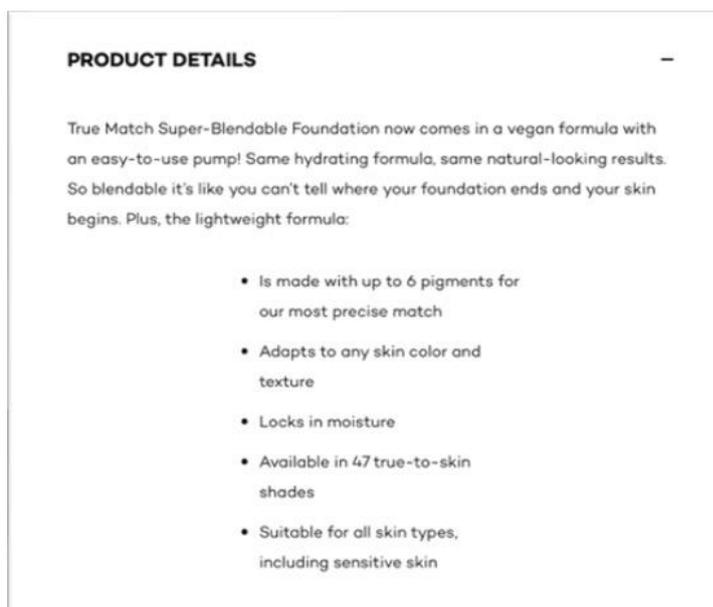 including sensitive skin

FIGURE 1: L'ORÉAL TRUE MATCH FOUNDATION PRODUCT DESCRIPTION

Besides verbal descriptions, also pictures are widespread tools used to present products online. In contrast to texts, images provide visual information about products which has proven to have a superior effect on purchase decision-making (Lee and Gretzel, 2012). For instance, Babin et al. (1992) that visual information tends to stay longer in memory than verbal information. This assumption can be verified by Walters et al. (2007) finding that pictures enhance the customers' visions. The researchers identified that the consumption of products can be imagined more clearly and concretely after having received visual information (Walters et al., 2007). Additionally, images have a greater impact on consumers' perceptions due to their ability to create associations (Lee and Gretzel, 2012). Visual stimuli are consequently significantly more effective in mental imagery processing (Walters et al., 2007).

One common way to present products in pictures is through pack shots, such as demonstrated in Figure 2, which are photographs that depict the standalone product (Hartmann et al., 2021). Typically, these shots are taken against a plain background to prevent any distractions from the product's visual attributes (Hartmann et al., 2021). The clean design leaves limited space for associations and interpretations and therefore primarily serves informative purposes (Scott, 1994).

FIGURE 2: L'ORÉAL TRUE MATCH FOUNDATION PRODUCT SHOT

Another way to visually present products is through lifestyle images (see Figure 3 as an example). This type of picture showcases the product in real-life settings, which is particularly valuable when the product is intangible. Seeing products in real-life scenarios strongly encourages imagination by being able to empathize with the situation (Cheng et al., 2022).
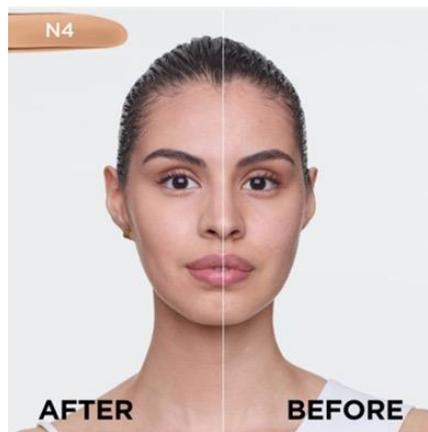
FIGURE 3: L'ORÉAL TRUE MATCH FOUNDATION LIFESTYLE IMAGE

The informational cues transmitted in lifestyle images are more effective in creating mental images of the consumption phase which allows customers to estimate product fit more accurately (Lee and Gretzel, 2012). Furthermore, lifestyle images mostly store human models and thereby include, next to task-relevant cues, important social cues (Yoo & Kim, 2012). As highlighted by Kim et al. (2009), when customers are unable to try products themselves, as is the case with online shopping, they prefer to see products displayed by other individuals. Human models are more likely to trigger emotional and cognitive responses which ultimately evoke mental imagery (Song & Kim, 2012). Additionally, the personal aspect of the models better transmits the social status of the product (Song & Kim, 2012). Customers are thereby more likely to perceive the product as popular among others if displayed on a person rather than on a solid background (Song & Kim, 2012). In many cases, products are advertised by famous people,

which has the advantage of creating a celebrity effect and enhancing the status of the product. However, when it comes to communicating the product's features and characteristics to customers to avoid ambiguity, the use of celebrities is less effective (Gune & Sur, 2021). Because of their name recognition, celebrities can become the center of attention and easily divert consumers' attention from the intended message.

The last image type mentioned in this research is product swatches, which can be seen in Figure 4. The use of swatches is limited to a rather small number of product categories but is specifically useful when displaying cosmetic products. The swatches refer to small samples of the product and are aimed to better illustrate its texture and color. In the context of beauty products, they are often displayed on different skin tones which allows customers to predict product match more accurately.

FIGURE 4: L'ORÉAL TRUE MATCH FOUNDATION PRODUCT SWATCHES

However, effective product images are not only determined by their dominant features but also by smaller attributes that often seem incidental at first glance. In this context, several researchers emphasize that the size of the image is an important aspect for consumers. For example, MacInnis and Price (1987) found a causal relationship between image size and image processing, noting that larger images stimulate mental imagination. Related to this is Percy and Rossiter's (1983) finding that larger images are better at directing attention to the product. Larger images are believed to be better at reducing mental intangibility and uncertainty, thereby evoking consumption imagery (Song & Kim, 2012).

Overall, the implementation of pictures in online shops considerably contributes to the enhancement of the shopping experience of customers. On the one hand, the utilitarian aspect of images helps customers overcome uncertainty and make well-informed decisions thereby minimizing the risk of post-purchase dissonance. On the other hand, images provide hedonic value by stimulating mental imagery and corresponding emotional responses through mood-

relevant and social cues. However, one limitation of using images in product presentation is their static nature. Static images are fixed and do not move, thus only allowing for a one-sided view of the product. The two-dimensional presentation of products in online shops makes it difficult for customers to visualize the product as a whole and is, therefore, a significant limitation of static images (Algharabat, 2018). One of the first methods used to overcome this limitation was by enabling customers to zoom. This functionality allows customers to view the finer details of the product to get a better sense of features, such as texture, color, and quality. Simultaneously, by allowing customers to actively decide which detail of the picture to be enlarged the interactivity aspect of pictures could be promoted (Won Jeong et al., 2009). Additionally, zooming also generates slight movements which increases vividness (Won Jeong et al., 2009). Another recent approach to overcoming the limitation of static images is product rotation, which utilizes 360-degree pictures to allow customers to examine the product from various angles. Three-dimensional product displays that are illustrated through 360-degree photos allow customers to interact with the product and thus, create a more immersive shopping experience.

Park et al. (2008) examined the causal effects of product rotation and both perceived informativeness and mood. To test the effect, a between-subjects experiment has been conducted. The experiment consisted of two treatment groups, with both being exposed to the online product presentation of pants. However, while the control group was given static images, the experimental group was able to rotate the image (Park et al., 2008). The responses of the experimental group highlighted a significantly higher level of satisfaction regarding information provision (Park et al., 2008). Furthermore, the participants indicated to perceive the overall shopping experience as more pleasurable (Park et al., 2008). Overall, the results provided evidence of the effectiveness of product rotation in mitigating the negative effects of intangibility in online shopping (Park et al., 2008).

Videos are an increasingly used medium for the online presentation of products. Unlike static images, videos provide dynamic information that is considered more descriptive (Cheng et al., 2022). Moreover, videos can also provide valuable auditory information (Cheng et al., 2022). In terms of product presentation, videos can be described as audiovisual resources that introduce products to customers and offer relevant information, such as product characteristics, to customers (Flavián et al., 2017; Orús et al., 2017). Consequently, their main objective is to assist customers in ensuring that their expectations will be met with the purchase of the presented product (Cheng et al., 2022). Due to their dynamic nature, product presentation videos are capable of depicting and describing products more vividly than pictures and texts (Cheng et al., 2022). Moreover, videos provide greater interactivity as customers can engage in the presentation phase such as by pausing and rewinding (Flavián et al., 2017). These attributes of videos offer a more realistic experience and significantly improve the online shopping experience by conveying a greater sense of tangibility (Cheng et al., 2022). Similar to product presentation pictures, it is important to distinguish between the different types of videos that

are commonly used to introduce products to customers. In the first step, one must differentiate between promotional and demonstration videos (Flavián et al., 2017). Promotional videos share similarities with traditional television ads due to their entertaining content (Flavián et al., 2017). They are designed to increase arousal and attract customers' attention (Flavián et al., 2017). In contrast, demonstration videos, also known as infomercials, are factual and thereby provide customers with concrete information about the product, which enhances the impression of having a direct experience with the product (Flavián et al., 2017). They are typically created in more realistic and less staged settings (Flavián et al., 2017). Subsequently, these demonstration videos can be divided into product appearance and product usage videos (Cheng et al., 2022). Whereas product appearance videos, as implied by their name, primarily contain information regarding the product's appearance, such as color, size, style, texture, and shape, product usage videos focus on the product's user experience (Cheng et al., 2022). The latter usually involves a demonstration of the product's function and the added value that is generated by the product (Cheng et al., 2022).

Several studies have examined and proven the effects of product presentation videos on customer experience. Park et al. (2008), for example, found that dynamic images were perceived as significantly more informative compared to static images. In this regard, customers noted lower levels of uncertainty due to the videos' information richness, which positively affected their decision-making (Park et al., 2008). Additionally, the authors found that due to their utilitarian and hedonic aspects, videos are more likely to produce positive emotional responses which in turn improved mental imagery (Park et al., 2008). Furthermore, also a causal effect of product presentation videos and customer attitude toward the product could be identified in previous research (Li et al., 2003; Jiang & Benbasat, 2007). Nonetheless, recent findings suggest that the effects on cognitive and affective attitudes vary among the different types of product presentation videos (Flavián et al., 2017). Within this context, Flavián et al.'s (2017) findings suggest that demonstration videos have a greater positive impact on product attitude than promotional videos, which could be supported by Orùs et al., (2017). Furthermore, the authors demonstrated a direct causal relationship between the presence of videos and purchase intention (Flavián et al., 2017). This finding was also observed by Kumar and Tan (2015) who explored that online retailers that provided videos yield higher sales numbers. The vivid information contained in videos leads to anticipated satisfaction and pleasure in product use, which, in turn, increases customers' desire to possess the product (Flavián et al., 2017). In addition to that, by transmitting more relevant information and offering some sort of close-to-realty experiences, factual videos specifically increase consumers' willingness to buy (Flavián et al., 2017). The provided information requires due to its higher complexity more cognitive efforts which in turn encourage higher engagement in the purchase decision-making process (Cheng et al., 2022).

Overall, several studies have provided evidence that videos are significantly more effective in showcasing products online than pictures and texts. Their ability to convey relevant information more vividly enriches customers' experience through the thereby added hedonic and utilitarian value. Despite all, various researchers, such as Jovic et al. (2012) and Yue et al. (2017) suggested the effectiveness of videos when combined with other presentation formats exceeds that of standalone videos, which is consistent with the dual coding theory. According to the dual coding theory which was proposed by Paivio (1971) information can either be presented verbally or pictorially, whereby the latter tends to be more dominant and therefore better remembered by the human brain. Overall, however, cognitive learning can be enhanced when information is presented in both visual and verbal formats as the activation of two different brain areas facilitates memory consolidation (Paivia, 1971). In addition, the accuracy of information encoding, and retrieval can be improved by using two codes. In scenarios where one of the codes is forgotten, the other can serve as a backup and facilitate information retrieval (Richardson, 1999 cited by Lee & Gretzel, 2012). Within this context, it has been found that customers perceived significantly lower risk toward products that were presented in multiple formats (texts, pictures, and videos) compared to one-coded presentations (Yue et al., 2017).

Despite the advantages offered by the combination of product presentation formats, high cognitive efforts are needed to evoke imagination. In this context, research has demonstrated that a considerable level of product fit uncertainty remains in online shopping when being exposed to one or more of the above-mentioned methods. To address these prevailing limitations of e-commerce, recent technological advancements offer alternative approaches to improve customer experience. In this regard, the following chapter seeks to extend the existing literature by exploring the potential of augmented reality.

2.2 Augmented Reality

The subsequent part of the literature review is dedicated to augmented reality (AR), its role in e-commerce, particularly in the beauty industry, and its ability to enhance customer experience. The chapter begins by providing the readers with a general understanding of AR, followed by an examination of its diverse fields of application. The scope is then reduced to the application of AR in beauty online retailing. Finally, emphasis is placed on augmented reality's utilitarian and hedonic value and its contribution to the customer journey.

2.2.1 A definition of augmented reality and its fields of application

Augmented reality (AR), hereafter referred to as AR, has appeared in numerous contexts and is considered one of the most revolutionary technologies of the 21st century due to its versatility to be applied in a variety of fields (Nayyar et al., 2018). AR is an interactive technology in which computer-generated information is superimposed on the user's real-world environment, enhancing the user's sensory experience of the physical world (Bonetti et al., 2018). Unlike other technologies, AR thereby manages to link virtuality with reality in real-time (McLean & Wilson, 2019). AR often appears in the context of virtual reality (VR) which describes a technology that generates fully digital environments (Berryman, 2012). In contrast to AR which combines virtual and physical aspects, VR is isolated from the real environment which restricts real-time interaction with the content (Javornik, 2016). Despite these major differences, AR can be considered a distinct form of VR (Berryman, 2012).

AR experiences consist of active and passive ingredients (Scholz & Smith, 2016). The active ingredients build the fundament that is needed for the experience. Each of the three active components is equally important and therefore irreplaceable (Scholz & Smith, 2016). AR content, as the first essential item, is regarded as virtual information which can be presented in different formats, such as pictures, videos, texts, and animations (Scholz & Smith, 2016). Depending on the number of informational cues implemented, the experience consists of one or more AR layers (Scholz & Smith, 2016). The AR content is superimposed by either movable digital devices, such as smartphones or wearables, or fixed devices, such as interactive screens and projectors (Javornik, 2016). Subsequently, the content must be captured by users, which are the people that actively participate and thereby directly experience the AR layer(s) (Scholz & Smith, 2016). Ultimately, the third active ingredient is the target, which refers to an entity in the real world that is augmented with the content (Scholz & Smith, 2016). These targets can be objects but also people depending on the type of AR which will be discussed over the course of this chapter.

On the other hand, passive ingredients describe elements that are not directly contributing to the augmentation. However, although they are just supporting actors, they profoundly impact how users perceive the experience (Scholz & Smith, 2016). The first passive element is the

background, which refers to the real or physical environment (Nayyar et al., 2018). The background itself is thereby not augmented but overlaid with AR layers (Nayyar et al., 2018). The physical environment plays a crucial role in the AR experience as it hosts the target and other objects, including the conditions responsible for creating the ambiance that strongly influences the mood of the experience (Scholz & Smith, 2016). Finally, also bystanders are a passive but determining factor in the AR experience (McLean & Wilson, 2019). Compared to the users, bystanders do not actively experience augmentation (Scholz & Smith, 2016). However, by being part of the background they become part of the experience of the users (Scholz & Smith, 2016). Besides that, bystanders can act as social motivators for users to participate in the experience (Scholz & Smith, 2016).

Although the technology appears to be relatively new to the public, AR has its roots in the 1960s, when it was used for air traffic control (Berryman & Hoy, 2012). AR technology advanced significantly in the following years, and by the mid-2000s, it had become commercially available (Berryman & Hoy, 2012). This ongoing development resulted in the appearance of different augmentation types applied in a wide spectrum of fields. In this regard, augmentation can be differentiated into four different types: projection, recognition, location, and outline (Katiyar et al., 2015). Projection is the most widely used augmentation type whereby physical or "real" objects get projected in the form of virtual content (Katiyar et al., 2015). The second type, recognition, is triggered by the detection of specific patterns such as characteristics of objects or faces (Katiyar et al., 2015). These items also serve as AR targets by layering additional information about the object or person. In contrast to that, location augmentation requires GPS data and is often used in tourism contexts, for which an example will be provided in the next paragraph (Katiyar et al., 2015). Lastly, the triggers and targets of outline augmentations are persons (Katiyar et al., 2015). Hereby either the full body or particular parts, such as the face are superimposed by the augmentation. AR is applied in various sectors and industries.

For instance, the healthcare sector uses AR during actual surgeries to provide surgeons with additional information (Berryman & Hoy, 2012). This could, for example, happen by overlaying the content (MRI or CT information) over the target (patient) to support the user (surgeon) (Berryman & Hoy, 2012). Additionally, AR is used for medical training, surgical planning, and patient education. Likewise, AR has become an enrichment in various fields of education, as it provides interactive experiences, such as virtual tours, which significantly enhance learning (Yuen et al., 2011). The interactivity that comes along with AR has also been identified as a great potential for the entertainment sector (Hung et al., 2021). In this regard, AR is widely used in gaming, allowing players to experience immersive gameplay that blends virtual and physical environments (Hung et al., 2021). Furthermore, AR is also used in movies and live events as well as in museums to offer more immersive experiences (Berryman & Hoy, 2012). Moreover, AR has been applied by many destinations to improve the tourist experience (McLean & Wilson, 2019). In the tourism context, the most commonly used AR type is the so-called geo layer (see

illustrated in Figure 5), which navigates visitors through the destination and provides additional information regarding sights, restaurants, transportation, and facilities (McLean & Wilson, 2019).

FIGURE 5: AR IN TOURISM

Another very prominent field of application of AR is advertising and marketing. One common type of AR marketing paradigm is active print whereby the AR target can be for example product packaging or a catalog (Scholz & Smith, 2016). In such cases, the AR experience is typically triggered by a QR code (Scholz & Smith, 2016). A famous example is the IKEA catalog, which allows users to project the demonstrated pieces of furniture into the user's physical environment via privately owned devices (Scholz & Smith, 2016). Another widely used form of AR ads is the so-called Bogus Window, which refers to a TV screen disguised as a glass window that augments the space behind the screen with digital objects (Scholz & Smith, 2016). An example of the use of a bogus window is given by the Pepsi Max campaign which augments a live street scene with fantastic images (Scholz & Smith, 2016). Finally, AR has become increasingly present in retail, specifically in online retail, as it has been found to enhance the customer experience in various aspects (Javornik, 2016), which will be discussed in more detail in the subsequent chapters. Popular brands ranging from Ikea to Adidas started implementing AR functions in their online shops (McLean & Wilson, 2019). However, depending on the product category, the AR content and target vary among the different types of e-commerce websites resulting in different experiences (Riar et al., 2021). Overall, AR in the retail context is used to enrich the experience either by offering more information or facilitating information searches (McLean & Wilson, 2019). Large online retailers such as Amazon and ASOS are already making use of the latter option by allowing customers to search for products by images (McLean & Wilson, 2019). In contrast to that, informational input can be provided by offering AR as an additional product presentation method that enables three-dimensional product views and virtual product trials (Riar et al., 2021). These new perspectives can be highly valuable for customers, specifically in environments with lacking transparency and associated higher

perceived risk (Riar et al., 2021). For instance, the IKEA application allows customers to "try out" furniture pieces before purchasing (McLean & Wilson, 2019). With their smartphone cameras customers (users) can project the selected furniture (content) into their room (target) to facilitate imagination and reduce the risk of post-purchase dissatisfaction (McLean & Wilson, 2019). Another example is given by fashion brands that enable customers to virtually try-on clothes items in so-called virtual fitting rooms (Beck & Crié, 2018). In response to the Covid-19 pandemic in 2020 that restricted customers to visit brick-and-mortar stores, Gucci introduced a solution to try on their sneakers before purchasing by offering an AR function in their app, as shown in Figure 6 (Berryman, 2012). In this case, customers are both users and targets as the content is projected on themselves.

FIGURE 6: AR IN FASHION

Furthermore, AR is increasingly used in relation to makeup products. Given that the focus of this thesis is on AR in the context of online beauty shopping, the upcoming chapter will be entirely devoted to the application of AR in the cosmetic industry.

2.2.2   Augmented reality in the beauty industry

As one of the fastest-growing industries, the beauty sector experienced a lot of change in recent years. To stay up-to-date with the market trends, build a competitive advantage, and ultimately further encourage growth, the technological development in the beauty industry got boosted (Wang et al., 2021). While some of these changes are geared toward optimizing internal processes, others have direct implications for customers' experiences and are therefore easily observable by the public (Wang et al., 2021). The latter was primarily driven by the shift of retail channels to online platforms as well as the increasing demand for higher personalization, interactivity, and vividness (Wang et al., 2021).

The term beauty product describes a broad field; therefore, they can be divided into subcategories, including skincare, haircare, makeup, fragrance, and personal care (Chisvert, 2018). Overall, customers consider a range of factors when buying products of any of these categories (Chisvert, 2018). Some of them, such as price and ingredients, can be recognized relatively easily in both online and offline retail channels. In contrast to that, the overall product quality appears to be more difficult to evaluate in the pre-purchase stage, as the information provided by the brand can be asymmetric (information possession is unfairly distributed between parties) or not entirely veridical (such as due to exaggeration) (Hong & Pavlou, 2014). Unbiased customer reviews which can typically be found in forums and on social media or can be directly accessed via the resell platforms might counteract imperfect information distribution regarding a product's overall quality (Wu et al., 2013).

However, certain determinants require customers to experience the product before being able to make accurate evaluations and informed decisions, as has already been highlighted. Due to the different usage purposes, the examinations of beauty products in the pre-purchase stage cannot be generalized (Chisvert, 2018). Skincare products, for example, normally have long-term effects, meaning that the ingredients show effects only after multiple applications (Hsu et al., 2017). Therefore, they are relatively difficult to evaluate before purchasing, as only secondary determinants can be identified (Hsu et al., 2017). This also applies to most haircare products as more time is required to determine the fit between active ingredients and the individual needs of one's hair (Hsu et al., 2017). In contrast, customers can decide relatively quickly whether they will be satisfied with a particular perfume when they can smell it, such as in physical stores.

Compared to perfumes and skincare products, the olfactory and chemical properties of makeup products are typically not the primary factors that influence consumers' purchase decisions. Studies have revealed that customers prioritize product fit when selecting makeup items (Javornik et al., 2016). Specifically, customers want to ensure that the product enhances their unique facial features and conceals imperfections (Team, 2016). The product's color is crucial, as it must be harmonious with the customer's skin tone (Team, 2016). Until recently, color matching for makeup products could only be done in physical stores using product testers (Whang et al., 2021). Consequently, in the case of online shopping, pre-purchase product trials were not feasible due to the intangibility of the products (Zhou et al., 2018). Other sources of information, such as customer reviews or visual lifestyle presentations, were found to be only moderately helpful, as each customer's skin is unique, making it difficult to assess whether the information is applicable to oneself (Whang et al., 2021). As makeup products generally exhibit their effects within a few minutes, evaluating compatibility does not require an extended period, but requires a product trial which used to be not given in online environments, thereby significantly hindering the success of makeup e-commerce (Wang et al., 2021).

Due to the various advantages that come along with e-commerce, it has been in great interest of marketers to find methods that allow customers to accurately predict the product fit of

makeup virtually to boost the anyway retarded development of beauty online shopping (Whang et al., 2021). Fortunately, the simultaneous technological advancement has offered new approaches, including the introduction of AR in the cosmetic industry (Whang et al., 2021). Since 2014, well-established beauty brands have been using AR, especially the "magic mirror" as illustrated in Figure 7, to promote online sales of makeup products (Whang et al., 2021). In the early stage, users were asked to upload a clear static image of their face, which is then augmented with makeup product content using facial recognition technology representing significant progress in beauty e-commerce (Jaswal, 2021).
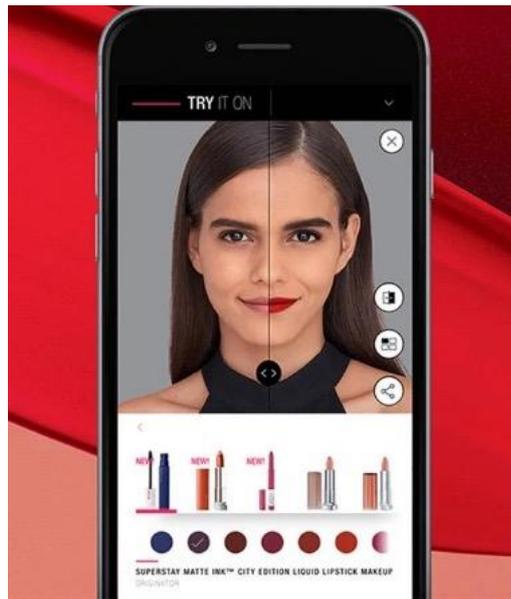

FIGURE 7: MAGIC MIRROR

However, due to the missing dynamic in pictures, physical product trials could not be fully substituted then (Algharabat, 2018). Fortunately, progressive development made it possible to offer real-time augmentation with the use of smartphone cameras (Team, 2016). Live-augmentation technology enables customers to interact with AR content in a highly immersive manner, such as by adapting to movements and changes in facial expressions (Wang et al., 2021). Unlike other online product presentation methods such as textual descriptions, images, and videos, live augmentation allows customers to view products from multiple perspectives, providing superior sensory information (Lavoye et al., 2021). The resulting virtual representations are more realistic and closely resemble the experience of looking into a physical mirror, thereby creating an online experience that is more akin to a physical store visit. (Gatter et al., 2021). Close-to-reality experiences tend to include a more diverse set of (sensorial) cues, suggesting that AR has the potential to address some of the existing challenges associated with intangibility, including mental imagery (Heller et al., 2019). Chapter 2.1.3 has previously established that mental imagery comprises two distinct stages, namely imagery generation and imagery transformation, both of which can be facilitated by AR. On one hand, realistic

representations generated through AR are expected to support imagery generation by aiding in the processing and retention of complex information (Heller et al., 2019). On the other hand, AR enables users to transform information with reduced cognitive effort, which also supports imagery transformation (Heller et al., 2019). These assumptions are supported by Gatter et al. (2021), who suggest that the processing of information conveyed through augmentation requires lower cognitive effort, thus encouraging mental imagery. Furthermore, Park and Yoo (2020) have demonstrated that the interactivity aspect of AR has a positive effect on the quality and elaboration of mental imagery. Therefore, it can be hypothesized:

H1: AR has a positive impact on imagination.

In addition to that, the existing literature has linked the use of AR in online retailing with a range of utilitarian and hedonic benefits, which will be further explored in the subsequent chapters.

2.2.3 The utilitarian value of augmented reality

The role of imagination in processing information has significant implications for customer behavior (Heller et al., 2019) as has already been highlighted in Chapter 2.1.3. Given this premise, this chapter aims to explore the functional significance of AR technology and the resulting higher imaginative capacity in enhancing the customer journey in uncertain environments.

Several previous studies have related AR to added utilitarian value (Gatter et al., 2021; Heller et al., 2019; McLean & Wilson, 2021), whereby the utilitarian value describes the efficiency and effectiveness of an action or process (Lavoye et al., 2021) and its rational benefits (Vieira et al., 2022). Consequently, higher utilitarian value is associated with a larger number of functional and goal-oriented benefits (Gatter et al., 2021). In retail environments, these utilitarian benefits often appear in relation to effective decision-making (Gatter et al., 2021).

As discussed in Chapter 2.1.2, retailers operating in virtual environments face challenges in ensuring effective online shopping experiences due to the spatial separation between customers and products. Scholars have found that media richness has a profound impact on the consequences of absent physical touchpoints, leading to the conceptualization of media richness theory (De Amorim, 2022). Initially developed by Daft and Lengel, the media richness theory has its origins in the mid-eighties but eventually gained prominence through the rise of electronic media communication (Ishii et al., 2019). The theory suggests that the effectiveness to transmit and processing information depends on the communication medium and the associated approach to conveying a message (De Amorim, 2022) and aims to facilitate the process of finding the right type of media (Maity & Dass, 2014). Generally, media that is rich in information is perceived as more trustworthy (De Amorim, 2022). To determine the "richness" of the medium, various

aspects that contribute to sufficient qualitative information must be considered (Ishii et al., 2019). Immediate feedback, language variety, and multiple information cues identify a medium's richness (Ishii et al., 2019). Based on these indicators researchers have found that face-to-face communication is the richest medium (Maity & Dass, 2014). It allows immediate feedback that is equally rich as the initial message which guarantees a qualitative exchange of information (Maity & Dass, 2014). Concomitantly, in face-to-face communication, various cues can be conveyed ranging from linguistic content and tone of voice to facial expressions and gestures (Maity & Dass, 2014). In retailing, face-to-face communication, such as between salesperson and customer, is proven to be highly valuable, as customers are provided with qualitative information that supports them in their decision-making (De Amorim, 2022). In contrast, text-based communication even if it is combined with static or dynamic videos, such as it is typically given in online shops, is limited in media richness, as information cues are considerably reduced which in turn hinders mental imagery (Maity & Dass, 2014).

Compared to conventional online product presentation methods, augmented reality (AR) technology offers customers a more immersive and engaging experience (McLean & Wilson, 2021). In the case of magic mirrors, for example, customers are provided with interactive product demonstrations that offer valuable additional information and facilitate information processing (Berryman, 2012). AR offers the key advantage of combining reality with virtual content whereby more detailed product information can be recorded by the customer (Heller et al., 2019). Simultaneously, interactivity and vividness, as found in AR experiences, encourage active participation and positively influence cognitive information processing (Noort et al., 2012; Petrova & Cialdini, 2008). Thus, according to the media richness theory, AR is a relatively rich communication medium (De Amorim, 2022). For instance, a clear representation of a specific lipstick being applied to one's face provides richer information than seeing the same lipstick on a model's face, as also the compatibility between product attributes and personal preferences can be predicted more accurately (Sun et al., 2022). Additionally, the clarity of visualizations affects the perceived local presence of an experience, as has been found by various scholars (Gatter et al., 2021; Lavoye et al., 2021; Li et al., 2003). Concerning online retailing, local presence can be referred to as "an authentic situated experience in which consumers believe they are actually trying on the offering " (Lavoye et al., 2021, p. 13). Thereby, local presence manages to narrow the spatial separation that is prevalent in e-commerce and counteracts the associated negative effects (Lavoye et al., 2021). As a result, customers perceive products as more tangible when presented with visualizations characterized by higher realism which positively affects sensory perception and stimulates their need for touch (Gatter et al., 2021).

These utilitarian benefits of AR collectively support the imaginative abilities of users, aligning with Hypothesis one proposed in the previous chapter. By being exposed to realistic, dynamic, and interactive product presentations that transfer rich qualitative information, cognitive image processing is facilitated, and imagination is encouraged (Heller et al., 2019). Reflecting on the

findings of Chapter 2.1.3, mental images are highly effective in filling information gaps, allowing customers to conduct pre-purchase product inspections that resemble real experiences (Park & Yoo, 2020). For example, by seeing different colors and tones mirrored on one's face, customers can better imagine the consumption experience which facilitates information evaluation of whether a product is suitable or unsuitable for them before the actual purchase (Sun et al., 2022). The realization of anticipated purchase decision consequences significantly reduces potential uncertainties regarding the products' quality and fit (Heller et al., 2019). Hence, despite the absence of relevant physical touchpoints, imagination, as the theoretical underpinning of AR, can be assumed to be beneficial in eliminating the risk of making the "wrong" decision resulting from product uncertainty. Therefore, it is hypothesized that:

H2: Imagination reduces uncertainty.

In addition to the utilitarian advantages that have been the central focus of this chapter, AR possesses features that are associated with the elicitation of hedonic value. Therefore, the following section of this thesis investigates AR through a hedonic lens.

2.2.4 The hedonic value of augmented reality

Besides providing perceived informativeness through its utilitarian functions, AR technology is characterized by several hedonic attributes (Smink et al., 2019). Overby and Lee (2006, p. 1161) defined the resulting hedonic value as "an overall evaluation of experiential benefits and sacrifices, such as entertainment and escapism". Therefore, according to that definition, the hedonic value of an experience can be examined by weighing out costs with benefits (Hsu et al., 2021). Hedonic value has been explored in various studies (see Hsu et al., 2021; Smink et al., 2019; Wang et al., 2021; Watson et al., 2018), and the existing literature suggests that hedonic value is closely linked to perceived enjoyment (Smink et al., 2019). Perceived enjoyment, according to the technology acceptance model, reflects the degree to which the interaction with the technology is enjoyed, regardless of the usage outcome and consequences (Venkatesh, 2000). Enjoyment and therefore hedonic value often appear in the context of affective benefits, such as pleasure, amusement, entertainment, and fun (Bonetti et al., 2018; Hsu et al., 2021; Watson et al., 2018). Thereby, hedonic attributes are capable to trigger emotions, which will be elaborated further in this chapter (Overby & Lee, 2006). In contrast to the utilitarian value, which is defined rather rationally and objectively, the perception of hedonic aspects is subjective and personal (Hsu et al., 2021). As suggested by scholars, these hedonic attributes and benefits have a significant impact on defining the AR user experience (Watson et al., 2018). In this regard, Huang and Liu (2014, p.83) referred to AR as a "persuasive technology, capable of forming and delivering experiential value rather than performing only as a functional technology".

The hedonic value resulting from augmented product presentation can be induced by multiple attributes. As has been highlighted during the course of this thesis, by transporting users to different realities, AR offers immersive experiences that are characterized by high interactivity and vividness (Smink et al., 2019). For instance, Yim and Park (2018) found that product presentation methods that consist of these immersive features, such as AR, are associated with higher levels of excitement, than regular two-dimensional formats. Other scholars suggest this effect to be attributable to the higher involvement making AR experiences more enjoyable (Kim & Forsythe, 2008; van Noort et al., 2012). Furthermore, AR often appeared in relation to playfulness suggesting that users, which are in the context of retail customers, are likely to associate AR features, such as the magic mirror, with a game that is designed to entertain (Gatter et al., 2021; Smink et al., 2019; Watson et al., 2018). According to this theorization, beauty customers value the ability to switch between different lipstick shades and virtually try them because of the playful and entertaining nature of AR. Another attribute of AR that contributes to its hedonic value is the novelty of the technology. According to Tokunaga (2013, p. 368), perceived novelty "reflects the view of a technology as new, interesting, and identifiably different from others used or understood at the time of the introduction". Novelty is therefore closely related to unfamiliarity which in turn inspires interest (Tokunaga, 2013). The evoked interest in the novel medium increases the need for further exploration which is linked to curiosity and excitement (Tokunage, 2013). AR is a relatively novel technology, leading to the fact that many people are still unfamiliar with the various forms of AR (Barhorst et al., 2021). Especially in the early stage of exposure, it is expected that customers are curious and excited to use the technology which significantly adds to AR's hedonic value (Barhorst et al., 2021). Additionally, AR can generate customized shopping experiences (Watson et al., 2018). In light of this, multiple studies have indicated a favorable impact of personalization on hedonic value (Hsu et al., 2021; Smink et al., 2019; Watson et al., 2018). In their research, Hsu et al. (2021) for example stated that customers highly appreciate the possibility of virtually adjusting their makeup styles by switching between different products and tones according to their personal preferences because they identified more fun and enjoyment during the experience. Moreover, being an active part of the product presentation versus seeing the product as a passive observer also contributes to perceived excitement and therefore the hedonic value of the experience (Maslowska et al., 2016).

As has been pre-announced at the beginning of this chapter, emotional responses are a frequent result of the hedonic benefits of AR (Steinman et al., 2014). Moreover, the evocation of emotions can further be supported by mental imagery generation and processing (Yoo & Kim., 2014). Besides spontaneous emotional reactions, such as feeling happy during the use of AR, mental imagery can lead to the creation of anticipated emotions (Holmes & Mathews, 2005). The term "anticipated emotions" refers to the cognitive process of "pre-factual appraisals," in which an individual imagines the emotional consequences that may result from achieving or not achieving a particular goal before deciding to act (Gleicher & Boninger, 1995 cited in Bettiga &

Lamberti, 2018). Consequently, anticipated emotions have a prospective orientation and can, therefore, also be defined as forward-looking affective reactions (Bagozzi et al., 2003). The anticipation of emotions requires the stimulation of hypothetical scenarios and experiences, which occurs through mental imagery (Kotabe et al., 2019). Thus, it can be postulated that the ability to imagine future consumption experiences including sensory details, such as the visual and tactile sensation of applying lipstick to one's lips, may result in the anticipation of the subsequent emotional response (Kotabe et al., 2019), leading to the following hypothesis:

H3: Imagination increases anticipated emotions.

Furthermore, the affective consequences of both successful and unsuccessful outcomes can be mentally stimulated, hence, anticipated emotions can be positive and negative (Bagozzi et al., 2003). Positive emotions (e.g., excitement, and happiness) arise from the prospect of achieving a goal in the future, while negative emotions (e.g., frustration, and sadness) arise from the realization that a goal is unattainable in the future (Bettiga & Lamberti, 2018). Anticipated emotions, thereby, contribute to decisions (Bagozzi et al., 2003), which will be explained in more detail in the next chapter.

2.2.5   Attitude toward buying online and online purchase intention

Decision-making, particularly concerning purchase transactions, is affected by various factors that consumers encounter along the decision-making journey (Overby & Lee, 2006). Consequently, elements such as those included in the two value dimensions (see chapters 2.2.3 and 2.2.4) play a vital role in shaping consumer behavior (Qin et al., 2021). According to the theory of planned behavior, as well as its predecessor the theory of reasoned actions, behaviors are defined by attitudes and subjective norms (Bagozzi et al., 2003; Hasan, 2009). The term attitude thereby refers to a learned predisposition to react positively or negatively to a stimulus (Fishbein & Ajzen, 1975 cited in Hasan, 2009). The stimulus in this context could refer to a particular object, person, event, or action (Fishbein & Ajzen, 1975 cited in Hasan, 2009). Concerning this definition, attitudes are the result of progressively gained information, knowledge, and experiences, and therefore evolve (Hasan, 2009). According to the findings acquired in the learning process, automatic responses are generated, that are activated when being physically or cognitively exposed to the stimulus (Fazio, 1995 cited in Bagozzi et al., 2003). Thus, by determining whether actions are performed favorably or unfavorably formed attitudes influence consumer behavior (Hasan, 2009).

Fishbein and Ajzen (1975) refer to attitude as a multidimensional construct consisting of cognitive, affective, and behavioral elements. The cognitive component reflects the information resources available to a person in relation to the stimulus (Hasan, 2009). As has been demonstrated in Chapter 2.2.3, AR comprises various utilitarian aspects that contribute to more effective information generation and processing. By being able to virtually experience (e.g., try-

on) the product, imagination increases which provides valuable information relevant to the purchase decision (Qin et al., 2021). As a result, customers who possess more knowledge are more certain about the presented product and its attributes which facilitates the learning process required to form attitudes (Heller et al., 2019). Hence, it can be hypothesized:

H4: Uncertainty decreases attitude toward buying online.

Compared to that, the affective component comprises the emotional responses that arise when being exposed to a stimulus (Qin et al., 2021). As suggested by Hasan (2009), the affective state is decisive in opinion formation as it determines to which extent the stimulus is liked or disliked. Chapter 2.2.4 of this thesis introduced the hedonic benefits of AR and discussed its ability to evoke emotions (Steinman et al., 2014). Besides spontaneous emotional reactions, such as enjoyment of the playful AR product representation, emotions can be future-oriented (Kotabe et al., 2019). Despite their hypothetical appearance, anticipated emotions can be crucial elements in customers' behaviors (Bettiga & Lamberti, 2018). In this regard, individuals who anticipate negative emotions when imagining product use (e.g., imagining that they will be dissatisfied when applying a particular lipstick) are more likely to refrain from using the product (Kotabe et al., 2019). Likewise, positively anticipated emotions increase motivation and desire (Kotabe et al., 2019). It is therefore hypothesized that:

H5: Anticipated emotions increase attitude toward buying online.

The cognitive as well as affective components are active contributors to attitude formation, whereas the ultimate, behavioral component can be considered the result of the learning process (Hasan, 2009). A formed attitude is typically associated with decision comfort, referring to being able to make decisions with ease and contentment (Heller et al., 2019). Therefore, attitudes facilitate decision-making by stimulating and predicting intentions (Hasan, 2009). In retail settings, these intentions mean whether a customer is inclined or disinclined to buy a product (Hansen et al., 2004). Consequently, it is hypothesized that:

H6: Attitude towards buying online increases online purchase intention.

2.3 Theoretical framework

The theoretical investigation of this thesis provided an overview of the main concepts and theories relevant to determining the impact of augmented reality in beauty e-commerce. Throughout the first part of the literature review, emphasis was given to online retailing and its limitations, the importance of mental imagery, and the associated role of online product presentation. In the second half the immersive technology of augmented reality (AR) was introduced together with its diverse fields of application, whereby the focus lay on the beauty industry. Ultimately, the technology has been analyzed from a utilitarian and hedonic perspective to discuss its impact on the two constructs: attitude and purchase intention. Through the exploration of these topics, a conceptual framework (see Figure 8) consisting of relevant variables originated. In this regard, six hypotheses were presented to the readers:

H1: AR has a positive impact on imagination.

H2: Imagination reduces uncertainty.

H3: Imagination increases anticipated emotions.

H4: Uncertainty decreases attitude toward buying online.

H5: Anticipated emotions increase attitude toward buying online.

H6: Attitude towards buying online increases online purchase intention.

For illustration purposes, the interconnection between these six hypotheses is depicted in the figure below.
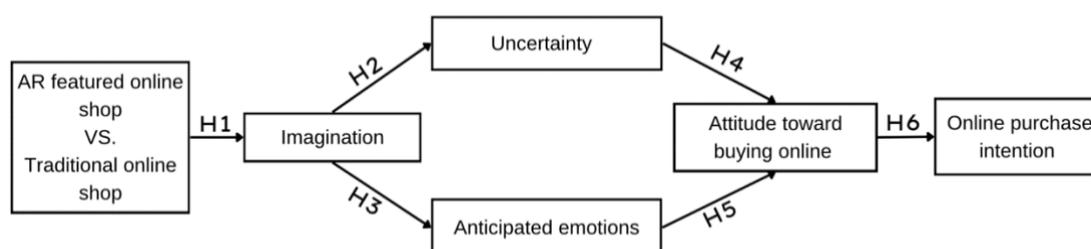

FIGURE 8: CONCEPTUAL FRAMEWORK

In essence, the theoretical model suggests that AR-featured beauty online shops compared to traditional ones, which solely include two-dimensional product presentations, encourage imagination, which in turn reduces uncertainty and increases anticipated emotions.

Furthermore, the framework implies that uncertainty reduces and anticipated emotions increase customers' attitudes toward buying online, which also affects their online purchase intentions.

After having established a theoretical framework, the subsequent chapter proceeds with the methodology of this research. Thereby the applied research methods are disclosed and explained to the reader.

3   METHODOLOGY

This section of the thesis is dedicated to the data collection procedure that is utilized to test the impact of augmented reality on the customer's experience and intention to buy makeup online. The chapter begins by introducing the chosen method and describing why it is deemed to be appropriate for this research. This is followed by the outline of the sampling method and participant acquisition. Finally, it is highlighted how the data was collected and ultimately analyzed.

3.1   Research design

To investigate the impact of augmented reality try-on features on the customer journey, more specifically on imagination, uncertainty reduction, expected emotions, as well as attitude towards and intention to purchase beauty products online, a quantitative research approach was identified as most appropriate. Within this paradigm, an experimental (causal) design was chosen to reveal and statistically examine the causal relationship between the pre-defined variables.

The decision of conducting quantitative research can be attributed to numerous reasons. According to Creswell (2014), one can differentiate between three research methods: quantitative, qualitative, and mixed methods. Quantitative methods (e.g., surveys and experiments) collect structured numerical data (Denscombe, 2001), that is then analyzed by mathematical tests (Creswell, 2014). The validity and reliability of quantitative research increase proportionally with the number of participants (Denscombe, 2001). To measure social reality, quantitative research predicts behavioral trends and thereby investigates causal relationships and correlations between different variables (Holton & Burnett, 2005). Thus, this method allows researchers to objectively test theories and make reliable assumptions, by statistically analyzing large amounts of collected data (Neuman, 2014). In contrast, qualitative research deals with non-numerical data (e.g., words or images) (Denscombe, 2001). The research scope is therefore limited to a pre-defined set of units which is specifically valuable in areas that are poorly studied (Creswell, 2014). Typical approaches to collect qualitative data are for example interviews, case studies, or focus groups (Denscombe, 2001). Ultimately, mixed methods are applied in research that obtains both qualitative and quantitative data and therefore combines the benefits of both methods (Creswell, 2014). As evidenced by the secondary data provided in the first part, this thesis is theory-based and aims to test resulting hypotheses to examine the causal relationship between multiple variables (Holton & Burnett, 2005). Consequently, collecting primary data quantitively is considered most appropriate for this research.

When aiming for a quantitative research approach, one must choose between four different methods: descriptive, correlational, quasi-experimental, and experimental. Non-experimental

research is based on "existing situations in the field to study phenomena" (Holton & Burnett, 2005, p. 32). In contrast, experiments can create specific conditions with the purpose to test theories (Holton & Burnett, 2005). According to Creswell (2014, p. 137), "the basic intent of an experimental design is to test the impact of a treatment on an outcome, controlling for all other factors that might influence that outcome." In experimental designs, researchers have more control over factors that might impact the tested effect, as extraneous relationships can be isolated from the phenomenon (Holton & Burnett, 2005). Experiments are, therefore, manipulated and either occur in artificial (laboratory experiments) or natural settings (field experiments) (Bhattacherjee, 2012). Laboratory experiments, which will be applied in this thesis, tend to be high in internal validity as they purposely simplify the complexity of the social world by excluding confounding variables (Neuman, 2014). However, due to their generalizability, they are low in external validity (Bhattacherjee, 2012).

The ability to manipulate independent variables and the associated control over external factors has been identified as the most compelling argument for choosing an experimental research approach for this thesis. In addition, the prevalence of experimental designs in existing studies in this field also advocates the choice of method for this research. A multitude of studies explored the causal relationship between product presentations with AR and online shopping experience by applying quantitative research with an experimental design (Smink et al., 2019; Whang et al., 2021; Sun et al., 2022). Smink et al. (2019) examined the positive and negative effects of AR product presentation by focusing on perceived informativeness and enjoyment. Similarly, Whang et al. (2021) conducted two studies with experimental designs to test the effect of AR on purchase intention and identify the potential mediators. The study of Sun et al. (2022), as the most comparable example to the present research, focused on the effects of AR on product uncertainty and product attitude. Through the chosen research procedure all three studies were able to offer relevant insights to marketers and verify pre-existing findings of other scholars (Smink et al., 2019; Whang et al., 2021; Sun et al., 2022).

Consequently, the decision of selecting an experimental research design as the primary research method is attributable to the possibility to manipulate and isolate extraneous variables that would otherwise distort the tested causal effect, as well as the prevalence in other studies within this specific field. In the subsequent sections, the experiment is tailored to the present study. In this regard also the stimulus, measurement scales, sampling method, and data collection are discussed more deeply.

3.2   Procedure

For a better understanding of the experimental research design used to verify the conceptual framework of this thesis, this chapter is entirely dedicated to the procedure used. This contains the description of the structure of the experiment and the item measurement. In addition, the processes of pretesting, sampling, and data collection are explained in more detail.

3.2.1   Experimental procedure

To be able to measure the causal attributions between the different variables, specific treatment manipulation is needed. The results of experiments originate from comparisons, which can be done in different ways (Neuman, 2014). This research will be a between-group experiment, meaning that as a form of control, the subjects will be grouped by either being administrated to the control group or the treatment/experimental group (Bhattacherjee, 2012). While both groups are exposed to the same structure, the stimulus relevant to measuring the causal effect differs in that only one group receives treatment (Creswell, 2014). This offers experimenters the opportunity to isolate whether the treatment or other factors are responsible for the outcome (Creswell,2014). According to Bhattacherjee (2012, p.83), "The treatment may be considered successful if subjects in the treatment group rate more favorably on outcome variables than control group subjects". Furthermore, for this research a true experimental design has been applied, indicating that group formation of the participants occurs with random assignments (Bhattacherjee, 2012). To create reliable comparisons with valid and unbiased results the groups must be equivalent and therefore demand automatic assignment processes (Neuman, 2014). Random group allocation, therefore, significantly strengthens the internal validity of this study (Neuman, 2014).

For the present research, the causal effect of virtual beauty product presentation on customer experience is tested using the L'Oréal website. To enable customers to virtually try beauty products before purchasing them, L'Oréal, the world's leading manufacturer of beauty products, has been working on AR technology for several years (Castellanos, 2019; Knowles, 2018). After a year-long collaboration with Canadian AR technology provider Modiface, L'Oréal acquired the startup in 2018 based on its promising prospects (Castellanos, 2019). In the following year, L'Oréal recorded significantly higher e-commerce sales, according to its Chief Digital Officer Lubomira Rochet (Castellanos, 2019; Knowles, 2018). Although no further details are provided by the company about the increase in online sales (Castellanos, 2019), the development points to an effect of AR on purchasing behavior.

In this regard, in the first part of the experiment, the participants of both groups (control and treatment) are asked to follow a link containing L'Oréal's lip make-up range as a landing page, as shown in Figure 9.
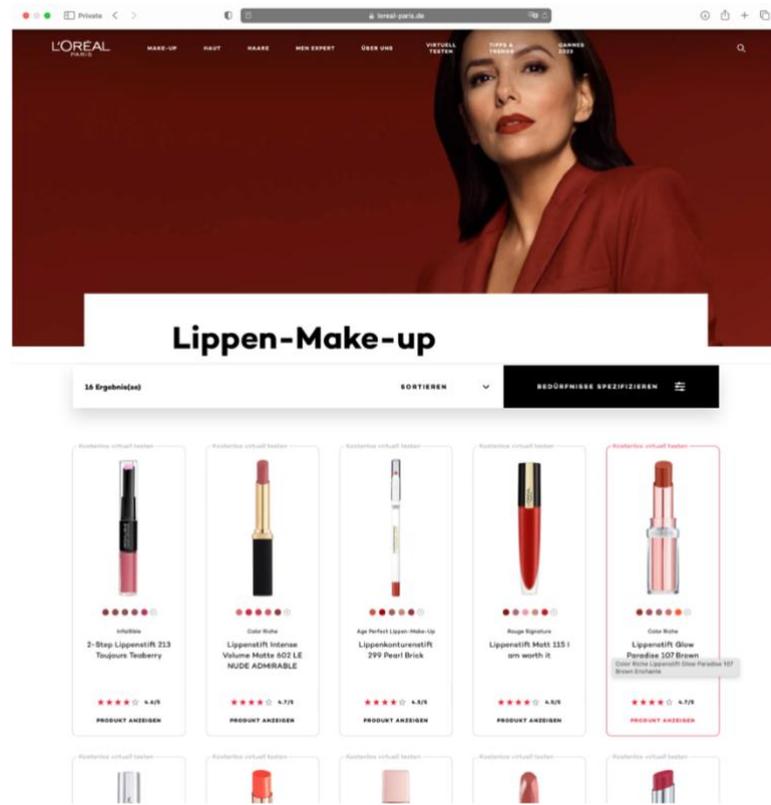
FIGURE 9: LANDING PAGE L'ORÉAL LIP PRODUCTS

Participants are then asked to browse through the lip products featured on the website. During their discovery, they are supposed to click on two to three lip products that appeal to them and then examine them in more detail. While the stimulus is the same for both groups up to this stage, participants that were randomly assigned to the treatment group are now requested to use the virtual try-on function, which can be accessed by clicking a button below the pictured product (see Figure 10). In the next step, it is important that the participant selects the "Live Try-on" (in German "Live auftragen") option and gives L'Oréal their consent to use their camera.
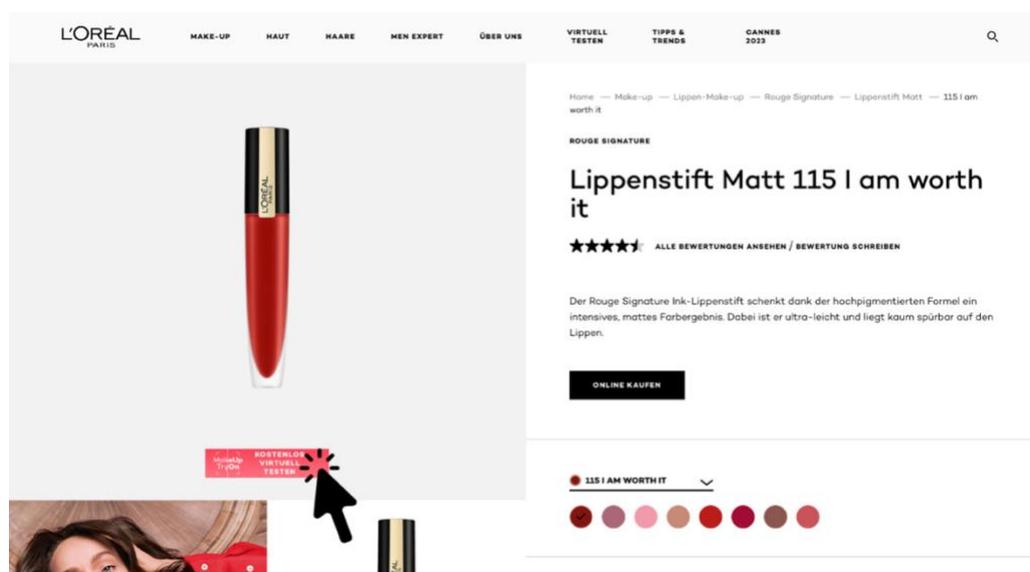
FIGURE 10: DEMONSTRATION OF EXPERIMENT GROUP STIMULUS

After having successfully followed the instructions, participants of the treatment group can see the selected product being augmented on their lips. Thereby, the makeup augmentation serves as the treatment for this experiment. In contrast, participants in the control group are asked to refrain from using the try-on function and to study only the verbal and two-dimensional visual product descriptions. To ensure that all participants review the website and do not rush back to the questionnaire, a ninety-second timer restricting them from continuing to the next page is implemented.

In the next part, the respondents (of both groups) encounter questions with the purpose to check whether the manipulation was successful. In this regard, they are asked whether they used the virtual try-on and to describe the landing page and elaborate in a few sentences on their experience with the L'Oréal website, such as by listing the taken steps. In addition, participants of the treatment group are requested to rank the AR experience and select out of three buttons the one that needs to be clicked to use the L'Oréal try-on function. This section of the survey is of high importance, as only the responses of participants who truthfully followed the instructions can be considered in the final evaluation.

The third and main part of the questionnaire contains questions with the purpose to test the causal relationships between the five variables of this thesis: imagination, uncertainty, anticipated emotions, attitude toward buying online, and online purchase intention. The exact items and scales within the constructs will be discussed in more depth in the next subsection.

The questionnaire concludes with general questions about the respondents' (online) shopping behaviors about beauty products, their attitude toward the L'Oréal brand, their knowledge and experience with AR, and their privacy concerns about virtual try-on. At the very end, participants

are asked to provide information about their demographics, such as gender, age, and level of education.

3.2.2   Measurement

In order to test the proposed conceptual framework of this thesis properly, the measurement items (statements) used in this questionnaire and the scales on which they are evaluated are adapted from existing literature. As has been mentioned in the previous subchapter, the main part of the questionnaire is dedicated to measuring five constructs: imagination, uncertainty reduction, anticipated emotions, attitude toward buying online, and online purchase intention. Imagination is measured with an item adapted from Órus et al. (2017) on a 7-point Likert scale. The construct of uncertainty reduction was adapted from Sun et al. (2022) and is measured with eight items on a 7-point Likert scale. Furthermore, the anticipated emotions "joy," "pleasure," "excitement," "happiness," and "satisfaction" identified by Bagozzi and Pieter (1998) are adapted and the emotion "curiosity" is added due to the innovative nature of AR. All items are measured on a 7-point Likert scale. In addition, also the attitude toward buying online is measured on a 7-point Likert scale with two items adapted from Hasan (2010). Finally, the construct of online purchase intention is adopted from Yim et al. (2017) and measured on four items within a 7-level Semantic scale. An overview of the measurement scales used to measure the variables of this thesis is provided in Table 1.

Construct	Scale	Adaption from
Imagination		
It is easy for me to imagine how the product would perform. It is easy for me to picture myself using the product. It is easy for me to fantasize about using the product . It is easy for me to picture myself enjoying the product.	7-Point Likert	Órus et al. (2017)
Uncertainty reduction		
I am no longer uncertain about the descriptions of this product.	7-Point Likert	Sun et al. (2022)

I am no longer un- certain about the future performance of this product. My uncertainty about the actual quality of this product is eliminated. I could no longer doubt that the product will match my requirements. I could no longer doubt that the product will match my tastes. I could no longer doubt the product will fit my preference.		
Anticipated emotions		
Excitement Enjoyment Happiness Satisfaction Surprise Curiosity Delight	7-Point Likert	(Bagozzi & Pieters, 1998)
Online shopping attitude		
I like to shop online. Online shopping is an effective way to shop.	7-Point Likert	Hasan (2010)
Purchase Intention		

I intend to buy from L'Oréal online in the future… Uncertain - Certain Unlikely - Likely Improbable - Probable Impossible – Possible	7-Level Semantic	Yim et al. (2017)

TABLE 1: MEASUREMENT SCALES

3.2.3 Pre-Test

Before the distribution, a pre-test was conducted to identify issues that could jeopardize the effectiveness of obtaining valid and reliable results. The pre-test was specifically used to assure that the questions and instructions are straightforward and understandable for respondents. A total of 15 volunteers were provided with a draft version of the experiment. After the completion, volunteers were asked to comment on their experience. Based on the collected information no major alterations had to be made, as the respondents only highlighted minor errors that concerned for example the questionnaire's format in the smartphone application and typos.

3.2.4 Sampling method

Before actual data collection, the target population must be defined, i.e., a subset of individuals with common characteristics who have sufficient information to conclude the research (Saunders et al., 2016). Since this study investigates the impact of AR-controlled magic mirrors in the beauty industry, consumers of cosmetics and makeup products, who are over 18 years old and have access to a device with a camera to be able to try the AR function, constitute the element as well as the sampling unit of the target population. In terms of scope, which corresponds to geographic boundaries, the study is confined to those living in Austria. Furthermore, the period under consideration refers to a one-week survey period that takes place in May 2023.

Furthermore, various indicators can be used to estimate the appropriate sample size for this research. To ensure validity, it is critical that both the experimental and control groups are equally weighted. While there is no universal rule on how large a sample needs to be, several researchers have suggested practical guidelines. For example, Schoenfelder et al. (2007)

recommended that each group should include at least 30 respondents. This assumption can also be supported by Field (2002). Therefore, in the case of this thesis, consisting of two groups, a minimum number of 60 respondents should be achieved. Nevertheless, in other research with similar objectives, the number of participants was significantly higher than the recommended sample size. The majority of studies with experimental designs with two groups counted between 100 and 250 respondents. Therefore, a sample size of 150 participants is deemed appropriate for the scope of this work.

The sampling method used in this study involves the use of panel data funded by the Merit Scholarship of Modul University Vienna. The grant provided funding of €900, which, at a cost per interview (CPI) of €4, allowed the predefined sample size of 150 respondents to be achieved. Panel samples offer several advantages to researchers. Participants in panel samples are typically compensated for their participation in the study. As a result, they are likely to have a greater incentive to contribute to data collection actively and meaningfully (Nerlove, 2007). This increased motivation often leads to a higher completion rate, allowing researchers to reach their desired sample size more quickly and efficiently (Nerlove, 2007). In addition, previous research with panel data has shown that respondents tend to complete the questionnaire with greater conscientiousness (Blossfeld et al., 2009). This increased awareness and attention leads to better response quality compared to alternative sampling methods such as convenience sampling (Blossfeld et al., 2009). The use of panel sampling facilitates more focused and deliberate participant engagement, which increases the overall reliability and validity of the collected data (Blossfeld et al., 2009). Additionally, panel sampling allows researchers to pre-define their target population (Hsiao, 2007). By working with data providers and conducting more rigorous screening procedures, only relevant and qualified individuals are considered for participation in the study, which helps to collect a sample that is representative of the target population in terms of gender, age, and education (Hsiao, 2007). This selective approach ensures that the sample closely matches the intended research objectives, thereby increasing the overall representativeness and generalizability of the results (Hsiao, 2007).

3.3 Analysis and results

This section of the thesis describes the process of preparing the gathered data for the consequent analysis. Furthermore, the data analysis approach for the various steps in the data analysis procedure is clearly described.

3.3.1 Data preparation

Despite the collection of high-quality data through panel sampling, a data cleaning process was required after importing the data file into the SPSS statistical software to ensure that only high-quality data are used for the data analysis. The experimental design included various manipulation and attention checks to ensure that respondents deliberately filled in the survey. Therefore, along with the exclusion of participants who did not fully complete the questionnaire, individuals who provided inaccurate responses in these controls were also removed from the data set. In addition, both groups of respondents were asked to describe their actions verbally after clicking on the provided link to the L'Oréal online store. Through careful review of these open-ended responses, additional erroneous records were identified and subsequently filtered out so that they would not be included in the primary analysis. Thereby, all participants that indicated that they had incorrectly utilized the stimuli were removed from the sample in order to increase the reliability of the findings. Thus, a total of 144 out of 151 complete responses were deemed suitable for further investigation and consideration. Before starting with the preliminary analysis, composite scores, combining all items within each variable, have been created to facilitate data evaluation and reporting.

3.3.2 Data analysis

Within the preliminary analysis of the data, a reliability assessment of the measurement scales has been conducted. In this regard, the internal consistency of the scales has been measured through the calculation of the constructs' Cronbach Alphas. In the next step, the manipulation check has been assessed using a multivariate analysis of variance (MANOVA), with the groups serving as the factor variable and the manipulation scale as the dependent variable.

The primary analysis of this thesis consisted of various statistical tests to identify the viability of the proposed hypotheses. The first underlying hypothesis of this thesis was tested using an analysis of variance (ANOVA), where the groups were treated as the factor variable and the composite score of imagination was considered the dependent variable. Furthermore, for the second and third hypotheses, regression analyses were performed with imagination as the independent variable and the composite scores of uncertainty (H2) and anticipated emotions (H3) as the dependent variables. Next, a multiple regression analysis was estimated to examine the fourth and fifth hypotheses. In this analysis, the constructs of uncertainty and anticipated emotions were used as independent variables and the composite score of attitudes toward

buying online was used as the dependent variable. Finally, the sixth and last hypothesis of this paper was tested with another regression analysis, with attitude toward online purchasing as the independent variable and the composite score of online purchase intention as the dependent variable.

3.3.3 Sample characteristics

To establish an overall better understanding of the findings, this chapter entails additional insights into the collected data. Therefore, the following sections describe the characteristics of the sample, in terms of demographics and discuss the respondents' shopping habits. Furthermore, also the participants' previous experiences with and current attitudes toward AR are disclosed.

A total sample of 144 participants validly completed the questionnaire and are therefore considered in this statistic. Given the possibility to pre-screen the participants before data collection sufficient individuals meeting the prerequisite could be reached. Concerning this, the sample consists solely of female respondents who are residing in Austria and use cosmetic products regularly. The most relevant additional sociodemographic characteristics of the respondents are presented in Table 7. The mean age of the sample is 47.7 years. Furthermore, with the youngest participants being 18 years old and the oldest being 83 years, the sample's age range is relatively dispersed. In terms of education, 13.9% of the respondents indicated possessing a university degree and 19.4% stated having completed high school. The largest proportions reported vocational school (30.6%) and apprenticeship (31.9%) to be their highest completed level of education. The smallest fraction (4.2%) finished compulsory school. Due to the differences in sample characteristics, the findings of this research can be generalized to a broader range of Austrian women, which significantly contributes to the representativeness of this study.

Sample Characteristics	N = 144
Age	
Minimum	18
Maximum	83
Mean	48
Education	%
University	13.9
High School	19.4

Vocational School	30.6
Apprenticeship	31.9
Compulsory School	4.2

TABLE 2: SAMPLE CHARACTERISTICS

Participants were randomly assigned to their respective groups. This method ensures that the treatment and control groups are expected to have similar characteristics, given an appropriate sample size. To verify this assumption, Table 8 provides an overview of the age distribution within the split sample. Most participants reported being above the age of 59 in both the treatment (30.3%) and the control group (36.4%). The second-highest concentration was observed in the age group 50 – 59 with 22.5% for the treatment group and in the age group 40 – 49 with 20% for the control group. The age group 40-49 was least represented in the group treated with AR (12.4%). In contrast, individuals aged 30-39 years were least represented in the control group, accounting for 10.9% of the sample. Despite these minor differences in age distribution, the two groups have similar characteristics. Consequently, meaningful conclusions can be drawn from the data.

		Condition	
		Presence of AR	**Absence of AR**
Age	18 - 29	18.0%	16.4%
	30 - 39	16.9%	10.9%
	40 - 49	12.4%	20.0%
	50 - 59	22.5%	16.4%
	> 59	30.3%	36.4%

TABLE 3: AGE DISTRIBUTION PER GROUP

Furthermore, since this thesis focuses to reveal how the online shopping experience can be enhanced by AR, the respondents were asked to provide additional information about their shopping habits in the questionnaire. In this regard, this chapter discloses the participant's frequency of buying cosmetic products, their preferred mode of shopping, as well as their familiarity with the L'Oréal brand. The corresponding results have been summarized in Table 9.

Participants' cosmetic shopping habits	
Frequency of purchasing cosmetics	**%**
At least once a week	1.4
At least once a month	15.3
At least once every three months	22.9
At least once every six months	27.1
At least once a year	19.4
Less often	13.9
Preferred mode of purchasing cosmetics	**%**
Online only	4.9
Mainly online	7.6
Both stationary and online (equally)	10.4
Mainly stationary	38.2
Stationary only	38.9
L'Oréal familiarity	**%**
Purchased from L'Oréal in the past five years	55.6
Already visited L'Oréal online	21.5
> Visits resulted in purchases	7.7

TABLE 4: SHOPPING HABITS

Regarding purchasing frequency (see illustrated in Figure 14), a significant proportion (27%) of the 144 considered respondents reported buying beauty products at least once every six

months. The second highest concentration of respondents (23%) indicated buying beauty products at least once every three months. This was followed by 19% of respondents who reported shopping at least once a year. In contrast, the least common shopping frequency, with a substantial 13% difference from the second lowest response category, was weekly purchases, which accounted for only 1% of respondents.
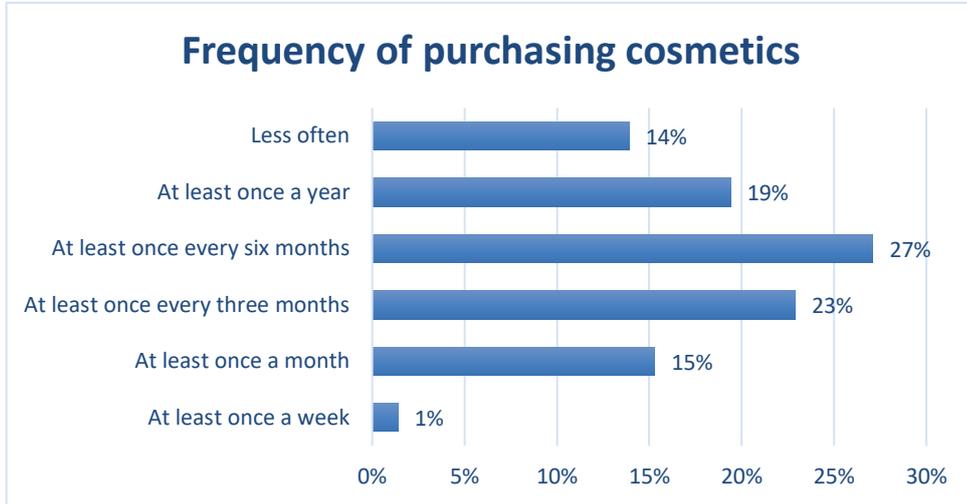

FIGURE 11: FREQUENCY OF PURCHASING COSMETICS

As demonstrated in Figure 15, a clear trend among the participants could be identified, in terms of the preferred mode of shopping for beauty products. Nearly 80% of the sample expressed a preference for purchasing cosmetic products in physical stores. Within this group, 39% exclusively purchase stationarily while 38% predominantly opt for physical shopping experiences. In contrast, only a minority (13%) of all participants reported shopping for beauty products online, with 8% buying their cosmetics primarily online and 5% buying exclusively online.

FIGURE 12: PREFERRED MODE OF SHOPPING

Furthermore, although the majority (56%) of the sample stated to have purchased a product from L'Oréal in the last 5 years, only a proportion of less than 2% of the participants have ever made an online purchase from L'Oréal. Overall, 22% of the 144 respondents claimed to have already visited the L'Oréal online shop. Out of this fraction, only 8% ended up completing an online purchase.

Moreover, for the purpose of this study, it is deemed valuable to obtain additional insights into participants' past experiences with AR. The resulting key findings have been outlined in Table 10. Overall, based on the means of the responses, the participants exhibit a moderate level of familiarity, experience, and knowledge regarding AR. In the context of beauty, a significant fraction of the respondents (78%) reported that they had not yet utilized AR. Respectively, only 22% already experimented with a virtual try-on function.

Experience with AR	
Overall experience with AR	**Mean (SD)**
Perceived familiarity	3.72 (2.01)
Perceived experience	3.42 (1.94)
Perceived knowledge	3.73 (1.92)
Experience with magic mirrors	**%**
Yes	21.5
No	74.5

TABLE 5: EXPERIENCE WITH AR

4 RESULTS AND DISCUSSION

The present chapter is devoted to the outcomes of the statistical tests that were conducted based on the primary data collection. Considering this, the chapter is divided into three subchapters. First, the scale reliabilities as well as the manipulation checks are examined. Second, the findings resulting from the examination of the viability of the hypotheses are presented and interpreted. For a better understanding, the selected statistical tests, which have already been introduced in the previous chapter, are summarized and illustrated in the context of the underlying conceptual framework of this thesis in Figure 11.
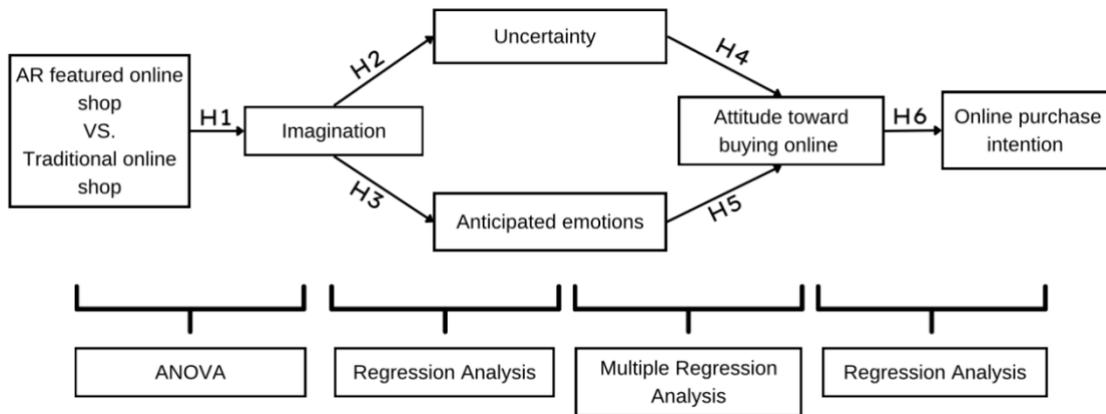

FIGURE 13: STAGES OF HYPOTHESES TESTING

The third and final section of this chapter provides additional insights into the collected data, including the presentation of descriptive data of the participants. Furthermore, the section aims to reveal the respondents' AR usage and shopping behaviors.

4.1 Scale reliabilities and manipulation check

To ensure consistency between the measured items the scale reliabilities must be assessed. Therefore, reliability analyses for all constructs were conducted. The results of these tests have been summarized in Table 2.

Construct & items measuring the construct	Cronbach's Alpha if item deleted	Cronbach's Alpha
Imagination		**0.897**

After having seen the online product presentation of L'Oréal,…		
…it is easy for me to imagine how the product would perform.	0.883	
…it is easy for me to picture myself using the product.	0.861	
…it is easy for me to fantasize about using the product.	0.877	
…it is easy for me to picture myself enjoying the product.	0.843	
Uncertainty		**0.940**
After having seen the online product presentation of L'Oréal,…		
…I am no longer uncertain about the descriptions of this product.	0.934	
…I am no longer uncertain about the future performance of this product.	0.932	
…my uncertainty about the actual quality of this product is eliminated.	0.941	
…I could no longer doubt that the product will match my requirements.	0.919	
…I could no longer doubt that the product will match my tastes.	0.926	
…I could no longer doubt the product will fit my preference.	0.919	
Anticipated emotions		**0.923**
Excitement	0.916	
Enjoyment	0.902	

Happiness	0.900	
Satisfaction	0.916	
Curiosity	0.916	
Delight	0.900	
Online shopping attitude		**0.878**
I like to shop online.	-	
Online shopping is an effective way to shop.	-	
Purchase Intention		**0.919**
I intend to buy from L'Oréal online in the future… Uncertain/Certain	0.892	
Unlikely /Likely	0.854	
Impossible/Possible	0.901	

TABLE 6: RELIABILITY ANALYSIS

As shown in the right column of the table, the results of the analysis indicate that all constructs have high reliability. The Cronbach's alphas for all six variables exceed the threshold of 0.8, indicating the high reliability of the scales. In addition to the basic Cronbach's Alphas, the results of "Cronbach's Alpha if item deleted" were assessed to determine the integration of each item into the construct and to identify items that should potentially be deleted. In order to be considered reliable and relevant for the construct, items' values of "Cronbach's Alpha if item deleted" should be lower than the overall Cronbach's Alpha of the respective construct. Comparing the values in the middle column with those in the right column, only one item from the construct Uncertainty ("...my uncertainty about the actual quality of this product has been eliminated") shows a slightly higher value than the associated Cronbach's alpha (0.941 > 0.940). However, given the overall high reliability of the construct and the insignificant impact on reliability, if the item were eliminated, it was decided not to make any alterations.

In the next step, the effectiveness of the manipulation of the experiment was assessed. In this study, the experiment group was asked to visit the L'Oréal website to review the lip products with the requirement to apply the virtual try-on function. In contrast, participants of the control group were requested to refrain from using the AR-powered try-on function but instead, only examine the two-dimensional product presentation. To verify that the participants proceeded following the given instructions, both groups were asked to rate the following statements on a seven-point Likert scale:

- I was able to see how the makeup would look on my face through the "virtual testing" feature.
- I was able to try different makeup products virtually (i.e. on my face using augmented reality).

A significant difference in responses between the two groups must be observed to confirm the success of the manipulation check. If the respondents followed the instructions accurately, the experimental group is expected to agree with the statements, resulting in relatively high ratings. Conversely, the control group should express disagreement with the statements. To examine whether this assumption is true, a MANOVA has been conducted. The results of the test demonstrated a significant difference between both groups as Pillai's trace = 0.647, $F_{(2, 129)}$ = 129.195, $p < 0.001$. Furthermore, the Partial Eta Squared ($\eta2 = 0.647$) indicates a large size effect. This could further be supported by the descriptive analysis, as the mean values of the experiment groups are higher than the ones of the control group ($M_{MAN1=EX}$ = 5.88, $SD_{MAN1=EX}$ = 1.70 vs $M_{MAN1=CO}$ = 1.96, $SD_{MAN1=CO}$ = 1.54 & $M_{MAN2=EX}$ = 6.06, $SD_{MAN2=EX}$ = 1.63 vs $M_{MAN2=CO}$ = 1.96, $SD_{MAN2=CO}$ = 1.60).

The results of the MANOVA analysis show that the manipulation check was successful. Furthermore, also the reliability of the scales used in the study was confirmed. Consequently, the study can continue with the next stage, which is hypotheses testing.

4.2 Hypotheses testing

The present study employed a one-factor, between-subject design, with product presentation (with AR vs. without AR) being the manipulated variable. Concerning this, to test the statistical significance of the first hypothesis, proposing that AR has a positive impact on imagination, a one-way analysis of variance (ANOVA) was conducted. In the first step, the homogeneity of variances has been assessed using Levene's Test. The statistic demonstrated that there is no significant effect ($p=0.257$). Therefore, the homogeneity of variances can be assumed. Furthermore, the results of the one-way ANOVA revealed a significant impact of AR in online product presentations on imagination $F_{(1, 142)}$ = 4.986, $p = 0.027$. However, the partial eta squared in this analysis shows a medium size effect ($\eta2 = 0.034$). Ultimately, also the results of

the descriptive analysis confirm this effect ($M_{IM=EX}$ = 5.22, $SD_{IM=EX}$ = 1.5 vs $M_{IM=CO}$ = 4.62, $SD_{IM=CO}$ = 1.68). All aspects of this analysis, such as those highlighted in Table 3, imply that the presence of AR has a small but significant effect on imagination. Consequently, **H1** (AR has a positive impact on imagination) can be retained.

ANOVA	Presence of AR		Absence of AR		F	p-value
	MEAN	SD	MEAN	SD		
Imagination	5.22	1.50	4.62	1.68	4.99	0.027

TABLE 7: ANOVA HYPOTHESIS 1

To test the second hypothesis, stating that imagination reduces uncertainty, a simple linear regression analysis was performed. The analysis demonstrated an overall significant effect between the dependent (uncertainty) and independent variable (imagination). The ANOVA analysis yielded a significant regression equation: $F (1, 142) = 168.046$, $p < 0.001$. Furthermore, the strength of the effect has been captured with the adjusted R Square (R^2=0.54). With respect to this value, it can be inferred that 54% of the level of uncertainty can be reduced by imagination, thereby demonstrating a large effect. Moreover, the unstandardized coefficient B, representing "the change in the outcome associated with a unit change in the predictor" (Field, 2009, p. 208), indicated that for every 1-point increase in imagination, uncertainty is reduced by 0.707. Given the results of the regression analysis (summarized in Table 4), **H2** (Imagination reduces uncertainty) can be accepted.

To test hypothesis 3, declaring that imagination increases anticipated emotions, another simple linear regression analysis was estimated, which demonstrated an overall significant effect between the two variables ($F (1, 142) = 97.171$, $p < 0.001$). Furthermore, the adjusted R Square revealed a large effect size (R^2 = 0.40), inferring that 40% of anticipated emotions can be enhanced by imagination. The anticipation of emotions increases by 0.563 for every 1-point increase in imagination. Therefore, it can be said that imagination has a stronger effect on uncertainty than on anticipated emotions (see Table 4). Nevertheless, the results of the regression analysis imply that **H3** (Imagination increases anticipated emotions) can be confirmed.

Linear Regression Model			
Uncertainty			
	B	**SE B**	**β**	**p-value**
Constant	2.107	0.299		< 0.001
Imagination	0.707	0.055	.736	< 0.001
Anticipated Emotions			
	B	**SE B**	**β**	**p-value**
Constant	2.107	0.299		< 0.001
Imagination	0.563	0.057	.637	< 0.001
Model Summary			
Uncertainty			
	R	**R Square**	**Adjusted R Square**	**St. Error of the estimate**
	0.736	0.542	0.539	1.038
Anticipated Emotions			
	R	**R Square**	**Adjusted R Square**	**St. Error of the estimate**
	0.637	0.406	0.402	1.087

TABLE 8: REGRESSION ANALYSIS HYPOTHESES 2 & 3

Furthermore, a multiple regression model was performed to test both the effect of uncertainty (H4) and of anticipated emotions (H5) on attitude towards buying online. The adjusted R Square ($R^2 = 0.17$) demonstrates a significant ($p < 0.001$) effect size. According to this value, uncertainty and anticipated emotions account for 17% of the attitude toward buying online. Furthermore, the ANOVA indicates an overall significant model effect: ($F_{(2, 141)} = 15.402$, $p < 0.001$). However, an inspection of the coefficient demonstrates deviating results between the two variables (see Table 5). The unstandardized coefficient B implies that attitude toward buying online increases by 0.485 if anticipated emotions increase by one unit ($p < 0.01$). In contrast, no significant effect on attitude toward buying online was observed for uncertainty ($p = 0.627$).

Therefore, **H4** (Uncertainty decreases attitude toward buying online) must be rejected. On the opposite, **H5** (Anticipated emotions increase attitude toward buying online) can be accepted.

Linear Regression Model				
	B	**SE B**	**β**	**p-value**
Constant	3.153	0.474		< 0.001
Uncertainty	- 0.043	0.088	- 0.042	0.627
Anticipated Emotions	0.485	0.095	0.442	< 0.001
Model Summary				
	R	**R Square**	**Adjusted R Square**	**St. Error of the estimate**
	0.423	0.179	0.168	1.409

TABLE 9: MULTIPLE REGRESSION ANALYSIS HYPOTHESES 4 & 5

The final analysis, claiming that attitude toward buying online increases online purchase intention has also been assessed with a simple linear regression model, demonstrating an overall significant effect between the dependent and independent variable: $F_{(1, 142)} = 26.121$, $p < 0.001$. Additionally, based on the adjusted R Square ($R^2 = 0.16$), inferring that 16% of the level of purchase intention is affected by attitude toward buying online, a large effect size could be identified. In comparison, the unstandardized coefficient B, reveals that online purchase intention is increased by 0.413 given a unit change of attitude toward buying online. Consequently, according to the results of the regression model, as summarized in Table 6, **H6** (Attitude toward buying online increases online purchase intention) can be maintained with a small size effect.

Linear Regression Model				
	B	**SE B**	**β**	**p-value**
Constant	2.067	0.448		< 0.001
Attitude	0.413	0.081	.394	< 0.001

Model Summary			
	R	R Square	Adjusted R Square	St. Error of the estimate
	0.394	0.155	0.149	0.149

TABLE 10: REGRESSION ANALYSIS HYPOTHESIS 6

4.3 Discussion

The results of the analytical part of this study largely align with the proposed hypotheses and therefore confirm the developed research framework. Several statistical tests were performed in the previous chapter leading to the acceptance of five out of six hypotheses. Table 11 summarizes the statistical tests performed for each hypothesis and the corresponding results.

	Hypotheses	Testing Method	Result
H1	AR has a positive impact on imagination.	one-way ANOVA	Significant → H1 maintained
H2	Imagination reduces uncertainty.	Regression Analysis	Significant → H2 maintained
H3	Imagination increases anticipated emotions.	Regression Analysis	Significant → H3 maintained
H4	Uncertainty decreases attitude toward buying online.	Multiple Regression Analysis	Not significant → H4 rejected
H5	Anticipated emotions increase attitude toward buying online.		Significant → H5 maintained
H6	Attitude toward buying online increases online purchase intention.	Regression Analysis	Significant → H6 maintained

TABLE 11: RESULTS OF HYPOTHESES TESTING

5 CONCLUSION

The progressive growth of e-commerce underscores the importance of overcoming the challenge of effectively positioning experience products within the intangible environment of online retail. Amid these evolving trends, marketers of beauty products are forced to adjust their marketing strategies and adapt innovative solutions. Specifically, the adoption of new technologies that can fill the gap between reality and virtuality should be considered in the selection of point-of-sale techniques. Regarding this, AR has emerged as a new form of product demonstration, providing immersive experiences that offer both utilitarian and hedonic value to customers. In the context of retail, various researchers examined AR within the dimensions of the technology acceptance model to determine customers' willingness and motivation to adopt the innovation. However, only limited research studied the technology's effect on the customer journey. Therefore, this thesis aimed to identify how AR can enhance the online shopping experience and to what extent it impacts customers' online purchase intentions. Furthermore, within the scope of this research, special attention has been given to the constructs of imagination, uncertainty, anticipated emotions, as well as attitude toward buying online.

To address the research questions and test the six underlying hypotheses that resulted from the theoretical part of this study, a quantitative research method with an explanatory design was selected. More specifically, a one-factor between-subject online experiment was employed within a sample that is representative of the Austrian population. Within the experiment, both the treatment and the control group answered questions based on hands-on experience made with the L'Oréal online shop. However, only the treatment group was able to access the AR-powered try-on function whereas the control group was restricted to reviewing the two-dimensional product presentation.

To identify potential differences between online product presentations with and without AR, it has been investigated with causal research design if AR has a significant positive impact on customers' imagination capabilities (H1). The results of the conducted one-way ANOVA implied a statistically significant effect. These findings are consistent with extant literature suggesting that AR's ability to provide realistic, interactive, and vivid product representations, promotes the formation of mental images. This, in turn, facilitates information processing and stimulates imagination (Gatter et al., 2021; Heller et al., 2019; Lavoye et al., 2021; Park & Yoo, 2020). Thus, the present study supports the above literature and confirms the positive effects of AR on improving consumer experiences.

Subsequently, the next two hypotheses investigated the impact of imagination on uncertainty (H2) and anticipated emotions (H3). Simple linear regression models were used to examine these potential causal relationships. Both tests yielded statistically significant results with p-

values below 0.001, which is consistent with previous research findings. The utilitarian aspects of AR allow customers to receive additional information which contributes to true-to-detail imagination (Park & Yoo, 2020). Thus, customers are more likely to envision the consequences of their purchase decisions leading to increased confidence in the product's attributes. Additionally, AR enables a more precise prediction of the alignment between customers' preferences and expectations and the actual product performance, thereby diminishing product uncertainties (Heller et al., 2019; Sun et al., 2022). With the acceptance of hypothesis two, stating that imagination reduces product uncertainty, the pre-established findings from the literature can be validated. Furthermore, multiple scholars proposed that emotional responses are attributable to the hedonic benefits of AR (Steinman et al., 2014). Aside from the frequently studied momentaneous responses during the use of the technology, such as perceived enjoyment, AR appears in the context of forward-looking affective responses (Yoo & Kim, 2014). The phenomenon could be explained by mental images, such as those created through AR representations, being richer in sensorial information. Consequently, being able to imagine the consumption experience with more sensory details encourages the anticipation of emotions (Holmes & Mathews, 2005; Kotabe et al., 2019; Yoo & Kim, 2014). This finding could be confirmed through the acceptance of hypothesis three, which posits that imagination increases anticipated emotions.

Moreover, hypotheses four and five, investigating the effect of uncertainty (H4) and anticipated emotions (H5) on attitude toward buying online, were tested with a multiple linear regression model. Attitude is the result of a learning process that is shaped by expertise and experiences (Bagozzi et al., 2003; Fishbein & Azjen, 1995; Hasan, 2009). Uncertainty, on the opposite, is the result of lacking valuable knowledge (Al-Adwan et al., 2022; Chatterjee, 2008). Although extant literature points to the assumption that uncertainty reduces the attitude toward buying online, this relationship could not be validated in the current research. In contrast, hypothesis five, which posits that anticipated emotions increase the attitude toward buying online, could be accepted. This finding validates various studies highlighting the impact of emotions and anticipated emotions on consumer behavior (Bettiga & Lamberti, 2018; Hasan, 2009; Kotabe et al., 2019). More specifically, according to their orientation, emotions shape the opinion of customers (Hasan, 2009). Thus, the causal relation between anticipated emotions and attitude can be confirmed. Surprisingly, in the context of magic mirrors, anticipated emotions appear to be a stronger predictor of attitude toward buying online as compared to uncertainty. Hence, it seems that individuals put more emphasis on emotional evaluation rather than rational thoughts. This highlights the importance of understanding and leveraging emotional factors to enhance the online shopping experience and increase customer engagement in the beauty industry.

Regarding the final postulated hypothesis of this thesis, claiming that attitude toward buying online positively affects online purchase intention (H6), another single linear regression model

revealed a statistically significant effect. This result aligns with the extant research, indicating that formed attitudes are associated with higher (purchase) decision comfort which stimulates (purchase) intentions (Hansen et al., 2004; Hasan, 2009; Heller et al., 2019).

Concerning the purpose and the underlying research questions of this thesis, it can be concluded that the integration of AR into the online product presentation of beauty products, particularly makeup products, enhances the customer journey. Specifically, both, the review of extant literature as well as the results of the experiment highlighted the importance of AR in encouraging imagination and anticipated emotions, which contribute to making the purchase experience more immersive and adding to the provision of relevant information, thereby facilitating purchase decision-making. In addition, the implementation of AR helps reduce uncertainty around product performance, quality, and suitability. Although the impact of uncertainty on customer attitudes was not significant, the use of AR has the potential to improve the overall customer journey in other aspects. Customers who have a clear understanding of the product and its features are more likely to have realistic expectations of the product experience (Chatterjee & Datta, 2008; Hong & Pavlou, 2014). It can, therefore, be speculated that the reduction of uncertainty positively impacts other dependent variables relevant to the evaluation of the shopping experience during the post-purchase phase, such as purchase dissonance, brand attitude and reputation, as well as repeat purchases, which provides an avenue for future research. Furthermore, by contributing to customers' confidence regarding the future consumption experience, AR not only increases the attitude toward buying makeup products online but also stimulates the intention of purchasing them. AR-powered virtual try-on functions enable customers to obtain sensory representations of the post-purchase product presentation, through which anticipated emotions are generated, contributing to a greater desire of possessing the specific product.

5.1 Theoretical implications

The findings of this research contribute to the existing body of knowledge by providing a comprehensive understanding of how AR impacts the customer experience in the cosmetic industry. Within its scope, the study was drawing on a variety of long-established theories, ranging from the expectation-confirmation theory to the media richness theory, and connects them with the novel technology of AR. Furthermore, it examined the underlying mechanisms through which imagination, uncertainty, and anticipated emotions impact customers' attitudes and purchase intentions regarding beauty online shopping.

Due to its novelty, AR has received considerable attention in the area of technology acceptance. Various scholars have extensively investigated the usability of AR by examining the key concepts of the technology acceptance model: perceived usefulness and perceived ease of use. Therefore, to further enrich the existing literature, this study aimed to expand the understanding of AR by

examining the utilitarian and hedonic benefits and their impact on different stages of customer decision-making. Specifically, this study focused on the role of AR in the pre-purchase phase, especially the awareness and consideration stages, and its influence on the final purchase decision. The pre-purchase phase is a critical period within the shopping journey in which customers engage in a learning process, shaping their attitudes and developing potential intentions. In this study, AR's ability to facilitate the anticipation of emotions has been identified as particularly influential in the formation of attitudes and intentions. Positive anticipated emotions, such as those tested in this study (excitement, joy, happiness, curiosity, delight, and satisfaction), tend to create a sense of desire and aspiration for a product (Kotabe et al., 2019). Therefore, these future-oriented emotions can function as motivational forces that encourage customers during purchase decision-making (Kotabe et al., 2019). Based on this finding, the current study highlights the importance of anticipated emotions during the pre-purchase stage and emphasizes the influential role of AR in forming customer perceptions and intentions.

In addition, this study contributed to the theoretical field of beauty e-commerce by combining various constructs that have been studied separately in the past, resulting in a synthesis of new knowledge. In particular, the study of uncertainty and anticipated emotions provided new perspectives relevant to stakeholders. Although both constructs have been discussed in the literature in the context of AR, they have rarely been examined together. However, this study directly contrasted these two concepts and offered new insights into the role of AR in improving the customer journey. Despite receiving similar attention in the literature, significant differences in the importance of the two constructs were found in this study. The results of the current experiment not only highlight the relevance of implementing cues that facilitate the anticipation of emotions during the pre-purchase stage but also show a superior effect of anticipated emotions on attitude and purchase intention compared to uncertainty. This suggests that focusing on the emotional aspects of the customer journey may have a greater impact on online sales than reducing uncertainty. Although extensive research supports the claim that uncertainty negatively affects customers' attitudes toward online purchasing, the primary data in this study did not confirm this finding. Consequently, the results of this study suggest the existence of confounding variables that might need to be taken into consideration. Several possible explanations exist for the insignificant relationship between uncertainty and attitude that should be studied more thoroughly in future research. For one, uncertainty is strongly connected to personal risk perceptions, which are formed by the interaction of various factors (Holt & Laury, 2002). In this regard, one crucial determinant might be the product category (González-Benito et al., 2015; Hong & Pavlou, 2014; Song & Kim, 2012). In this study, the relationship between uncertainty and attitude was investigated by analyzing the online product presentation of a cosmetics brand. The market for beauty products covers a wide price spectrum, ranging from low-priced to high-priced/luxury items. However, due to their classification as consumer goods, make-up products, especially those available in drugstores, such as products from L'Oréal, typically belong to the low-involvement products (Stephen et al.,

2013). Therefore, given the relatively low price, it can be postulated that customers perceive diminished levels of risk when purchasing beauty products in comparison to high-involvement goods, thereby reducing uncertainties. Furthermore, beauty products can be categorized as experience goods, meaning that they only fully develop their properties during consumption (Hong & Pavlou, 2014; Song & Kim, 2012). In this context, it is assumed that the use of experiential products stimulates the physical senses, which evokes emotional reactions (Song & Kim, 2012). This might explain the finding that attitudes toward the purchase of beauty products are formed by emotional evaluations rather than rational thoughts (i.e. uncertainty). Moreover, increasingly more online stores offer a free return policy that allows customers to return their purchased products within a certain period of time. In some instances, buyers do not even have to pay before this period expires. Given this option, one might surmise that customers view their purchase as a preliminary step rather than a final decision, which is associated with less risk and reduced uncertainty.

Unlike many existing studies in the field of AR, which are based on passive experiences with the technology (e.g., demonstration videos), the results of the present study rely on first-hand experience. In this experiment, participants were asked to use the virtual try-on feature provided by L'Oréal, thereby enhancing the representativeness of the obtained results. Active engagement with the technology is essential for individuals to receive a genuine understanding of the abilities, advantages, and disadvantages of AR, which in turn enables accurate evaluations of the user experience. Furthermore, compared to the literature, this study specifically examined the impact of AR on the Austrian market. The sample included is, therefore, representative of the Austrian population, which increases the external validity of the results and enables a high degree of generalizability.

While the previous chapter focused on the study's theoretical contributions, the subsequent chapter emphasizes the resultant practical implications and provides relevant recommendations to stakeholders.

5.2   Practical implications

One of the main reasons for this research was to investigate a potential method of how beauty marketers can overcome the challenges of e-commerce. As demonstrated by the additional insights of this research, customers still show scepticism towards online shopping of makeup products. This highlights the need for online product presentation techniques that narrow the gap between virtual and physical experiences.

The results of the primary research indicated that online shops that provide three-dimensional product presentations in the form of AR-powered virtual try-on functions have a significantly higher effect on customers' imagination abilities than conventional two-dimensional representations. Imagination, in turn, has a profound impact on various other aspects

influencing the customer journey. As suggested by the discussion of extant literature presented in this study, mental images provide rich and qualitative information, which is of utmost relevance in addressing knowledge gaps and facilitating cognitive processes (Heller et al., 2019). Furthermore, mental images are perceived as more dynamic, which not only adds to perceived hedonic value but also encourages the creation of emotions (Smink et al., 2019). The relevance of mental imagery in intangible retail scenarios could be reinforced by the findings of the experiment conducted within the present research framework, demonstrating significant causal relationships between imagination and uncertainty as well as anticipated emotions. According to this, this study provides evidence that AR positively affects multiple aspects of the customer journey and therefore emphasizes the importance for marketers to reinvest in the technology. It is recommended to continuously investigate innovative ways that optimize the usability of AR, to fully exploit its potential.

Another valuable outcome with practical implications is the superior effect of anticipated emotions on purchase decision-making. In contrast to uncertainty, future-oriented emotions play a significant role in the learning process and therefore impact the attitude formation of customers. Accordingly, in case of doubt, beauty markers are advised to prioritize the hedonic aspects of AR product presentation. Therefore, when designing content, it is beneficial to incorporate sensory cues that allow customers to not only imagine the useful features of the product, but more importantly, enable them to anticipate their affective state during the consumption experience. Marketers are, therefore, advised to pay particular attention to the simulation of emotions in the online shopping experience.

Although the present experiment did not show a statistically significant effect of uncertainty on customer attitudes, the extant literature suggests the importance of uncertainty in shaping the customer experience. Several possible confounding variables, including the study context and the geographic location of the target audience, may have influenced the results. In addition, informational gaps, causing uncertainty, prevent customers from forming realistic expectations about the product. Considering this, uncertainty may affect post-purchase outcomes, such as dissonance, regret, or dissatisfaction, rather than impacting the pre-purchase stage. These factors have the potential to negatively influence the final evaluation of the overall experience, which affects brand reputation, and reduces the likelihood of future repurchases. Thus, despite the results of this experiment, marketers should not disregard the importance of addressing uncertainty reduction. Instead, it is advisable to invest in further research regarding this construct.

Overall, the results of this study show that customers have weak attitudes and low intentions when it comes to shopping for beauty products online. Furthermore, it has also been revealed that a large fraction of customers (78%) considers itself as inexperienced with AR in the context of beauty. This research highlighted the potential of AR to counteract the aversion to online shopping. If marketers would like to increase online sales, the benefits of magic mirrors must

become more apparent to customers. In this regard, marketers are advised to incorporate additional point-of-sale and call-to-action materials that promote the application to increase the adoption rate and make customers more familiar with the novel shopping mode.

5.3   Limitations & future research

Although this study makes a valuable contribution to the existing literature on e-commerce and the implementation of AR in the beauty industry, several limitations were identified that should be considered. First, it is important to recognize that any research method, including online experiments, has advantages and limitations that may present potential problems in data collection. Unlike laboratory experiments where participants can be closely observed, online experiments lack direct observation, leading to participant error that cannot be completely avoided even with manipulation and attention controls. Panelists may exhibit disinterest and an associated desire to complete the questionnaire quickly, which can lead to inaccurate responses that negatively affect the validity of the data. In addition, the use of several Likert scales, the primary measurement scale in this experiment, is prone to errors due to respondent inattention. Especially, extreme responses, where participants tend to choose the highest or lowest response option without thinking about it, are a common threat to validity. Another common limitation is response bias due to respondents not answering questions truthfully. In some cases, participants intend to respond appropriately to research objectives. Nevertheless, the implementation of various attention checks in the current research minimizes the risk of low-quality data.

In addition, since it was not possible to completely prevent participants in the control group from using the L'Oréal virtual try-on feature, they were only verbally instructed not to use it. However, this could have led to reactance, which is the tendency of individuals to react against the attempts that restrict their behavioral freedom. To address these limitations, it is recommended that a similar experiment is repeated in a closely monitored laboratory setting to improve data quality and control for potential confounding factors.

In addition, participants were asked to imagine themselves in a hypothetical retail situation during the study. Despite the pre-selection of individuals with an interest in using cosmetic products, some participants were potentially, situationally, not truly interested in purchasing makeup products because the scenario presented was artificial. In contrast, field experiments would create more realistic environments; thus, allowing for better observation of the natural decision-making process. In future studies in this area, it would be useful to consider conducting field experiments to study actual purchase decisions rather than intentions, which would allow researchers to gain more accurate insights into consumer behavior.

Moreover, also the sampling method used in this work is subject to certain limitations that may affect the representativeness of the results. The use of panel data limited the participant

population to only active members of the Institute "Talk Online", thus potentially leaving out other individuals who would also match the criteria for this study. In addition, the research findings are specific to the Austrian population, which limits their generalizability to the Austrian cosmetics market. Therefore, brands operating in territories outside of Austria should only carefully apply the implications derived from this study. For future research, it is recommended that the scope is expanded to a larger and more diverse group of individuals to increase the external validity of the results.

Finally, also the used stimulus is subject to limitations. L'Oréal, as the brand on which the assumptions of this thesis are tested, is the global market leader in terms of beauty products. Due to the company's notoriety and its associated reputation, participants may likely have already formed pre-existing attitudes toward L'Oréal before taking part in the experiment, which possibly caused response bias. Other scholars conducting similar research in the future might therefore test the effect on multiple and/or less recognizable brands. Furthermore, this study only contained L'Oréal's lip product assortment. However, since not everyone who uses makeup products automatically uses lip products, considering other categories could increase the generalizability of the findings. In this regard, also potential differences between different makeup product categories could be detected, enabling scholars to identify the effectiveness of AR per assortment.

Besides the recommendations given about the limitations of the current research, it is suggested to consider a qualitative research approach in the future, as it allows for more detailed responses and in-depth evaluations. In such a way, respondents could disclose insightful information on i.e., their preferences or concerns, enabling the author to provide deeper explanations for the results.

In addition, the results of this study open avenues for further research into the impact of uncertainty on the customer journey. To gain a better understanding of how uncertainty affects the post-purchase phase, particular attention should be paid to the constructs of satisfaction, brand reputation, and repeat purchases.

6 BIBLIOGRAPHY

Al-Adwan, A. S., Alrousan, M. K., Yaseen, H., Alkufahy, A. M., & Alsoud, M. (2022). Boosting online purchase intention in high-uncertainty-avoidance societies: A signaling theory approach. *Journal of Open Innovation: Technology, Market, and Complexity*, *8*(3), 136. https://doi.org/10.3390/joitmc8030136

Akerlof, G. A. (1970). The market for "Lemons": Quality uncertainty and the market mechanism. *Quarterly Journal of Economics*, *84*(3), 488. https://doi.org/10.2307/1879431

Algharabat, R. S. (2018). The role of telepresence and user engagement in co-creation value and purchase intention: Online retail context. *Journal of Internet Commerce*, *17*(1), 1–25. https://doi.org/10.1080/15332861.2017.1422667

Alshaddadi, R. (2021). Applying e-commerce on small medium enterprise a case study for Saudi perfumes cosmetics retailer in KSA. *International Journal of Recent Technology and Engineering (IJRTE)*, *10*(1), 73–90. https://doi.org/10.35940/ijrte.a5725.0510121

Babenko, V., Kulczyk, Z., Perevosova, I., Syniavska, O., & Davydova, O. (2019). Factors of the development of international e-commerce under the conditions of globalization. *SHS Web of Conferences*, *65*, 04016. https://doi.org/10.1051/shsconf/20196504016

Babin, L. A., Burns, A. C., & Biswas, A. (1992). A framework providing direction for research on communications effects of mental imagery-evoking advertising strategies. *Advances in Consumer Research*, *19*, 621. https://aquila.usm.edu/fac_pubs/6811/

Bagozzi, R. P., Dholakia, U. M., & Basuroy, S. (2003). How effortful decisions get enacted: the motivating role of decision processes, desires, and anticipated emotions. *Journal of Behavioral Decision Making*, *16*(4), 273–295. https://doi.org/10.1002/bdm.446

Baluch, A. (2023, February 8). 38 E-Commerce statistics of 2023. *Forbes Advisor*. https://www.forbes.com/advisor/business/ecommerce-statistics/

Barhorst, J. B., McLean, G., Shah, E. D., & Mack, R. W. (2021). Blending the real world and the virtual world: Exploring the role of flow in augmented reality experiences. *Journal of Business Research*, *122*, 423–436. https://doi.org/10.1016/j.jbusres.2020.08.041

Beck, M., & Crié, D. (2018). I virtually try it . . . I want it ! Virtual fitting room: A tool to increase online and off-line exploratory behavior, patronage and purchase intentions. *Journal of Retailing and Consumer Services*, *40*, 279–286. https://doi.org/10.1016/j.jretconser.2016.08.006

Berger, J. (2014). Word of mouth and interpersonal communication: A review and directions for future research. *Journal of Consumer Psychology*, *24*(4), 586–607. https://doi.org/10.1016/j.jcps.2014.05.002

Berryman, D. R., & Hoy, M. (2012). Augmented reality: A review. *Medical Reference Services Quarterly*, *31*(2), 212–218. https://doi.org/10.1080/02763869.2012.670604

Bettiga, D., & Lamberti, L. (2018). Exploring the role of anticipated emotions in product adoption and usage. Journal of Consumer Marketing, 35(3), 300–316. https///doi.org/10.1108/jcm-06-2016-1860

Bhattacherjee, A. (2012). Social science research: Principles, methods, and practices.

Blossfeld, H., Schneider, T., & Doll, J. (2009). Methodological advantages of panel studies: Designing the new national educational panel study (NEPS) in Germany. *Journal for Educational Research Online*, *1*(1), 10–32. https://doi.org/10.25656/01:4554

Bonetti, F., Warnaby, G., & Quinn, L. (2018). Augmented reality and virtual reality in physical and online retailing: A review, synthesis and research agenda. *Springer EBooks*, 119–132. https://doi.org/10.1007/978-3-319-64027-3_9

Buda, R., & Zhang, Y. (2000). Consumer product evaluation: the interactive effect of message framing, presentation order, and source credibility. *Journal of Product & Brand Management*, *9*(4), 229–242. https://doi.org/10.1108/10610420010344022

Castellanos, S. (2019, December 19). L'oreal expands virtual try-on service. *WSJ*. https://www.wsj.com/articles/loreal-expands-virtual-try-on-service-11576776586

Chatterjee, S., & Datta, P. (2008). Examining inefficiencies and consumer uncertainty in e-commerce. *Communications of the Association for Information Systems*. https://doi.org/10.17705/1cais.02229

Chen-Yu, H. J., & Kincade, D. H. (2001). Effects of product image at three stages of the consumer decision process for apparel products: alternative evaluation, purchase and post-purchase. *Journal of Fashion Marketing and Management*, *5*(1), 29–43. https://doi.org/10.1108/eum0000000007277

Cheng, Z., Shao, B., & Zhang, Y. (2022). Effect of product presentation videos on consumers' purchase intention: the role of perceived diagnosticity, mental imagery, and product rating. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.812579

Chi Lin, C. (2003). A critical appraisal of customer satisfaction and e-commerce. *Managerial Auditing Journal*, *18*(3), 202–212. https://doi.org/10.1108/02686900310469952

Chisvert, A. S. a. A. (2018). Analysis of cosmetic products. *Elsevier ebooks*. https://doi.org/10.1016/c2014-0-00920-3

Creswell, J.W. (2014). Research design: Qualitative, quantitative, and mixed methods approaches (4th ed.), Thousand Oaks, CA: Sage Publications.

De Amorim, I. P., Guerreiro, J., Eloy, S., & Loureiro, S. M. C. (2022). How augmented reality media richness influences consumer behaviour. *International Journal of Consumer Studies*, *46*(6), 2351–2366. https://doi.org/10.1111/ijcs.12790

Denscombe, M. (2001). *The good research guide: For small-scale social research projects*. Open University Press.

Doh, S. J., & Hwang, J. S. (2009). How consumers evaluate ewom (electronic word-of-mouth) messages. *CyberPsychology &Amp; Behavior*, *12*(2), 193–197. https://doi.org/10.1089/cpb.2008.0109

Egeln, L., & Joseph, J. (1998). Shopping cart abandonment in online shopping. *Atlantic Marketing Journal*, *1*(1).

Elliot, A. J., & Maier, M. A. (2014). Color psychology: effects of perceiving color on psychological functioning in humans. *Annual Review of Psychology*, *65*(1), 95–120. https://doi.org/10.1146/annurev-psych-010213-115035

Field, A. (2009). Discovering statistics using SPSS. 3rd Edition, Sage Publications Ltd., London.

Flavián, C., Gurrea, R., & Orús, C. (2017). The influence of online product presentation videos on persuasion and purchase channel preference: The role of imagery fluency and need for touch. *Telematics and Informatics*, *34*(8), 1544–1556. https://doi.org/10.1016/j.tele.2017.07.002

Gatter, S., Hüttl-Maack, V., & Rauschnabel, P. A. (2021). Can augmented reality satisfy consumers' need for touch? *Psychology & Marketing*, *39*(3), 508–523. https://doi.org/10.1002/mar.21618

Gerstell, E., Marchessou, S., Schmidt, J., & Spagnuolo, E. (2020). How COVID-19 is changing the world of beauty. *McKinsey & Company*. https://www.mckinsey.com/industries/consumer-packaged-goods/our-insights/how-covid-19-is-changing-the-world-of-beauty

Gleicher, F., Boninger, D. S., Strathman, A., Armor, D., Hetts, J., & Ahn, M. (1995). With an eye toward the future: The impact of counterfactual thinking on affect, attitudes, and behavior. In N. J. Roese & J. M. Olson (Eds.), *What might have been: The social psychology of counterfactual thinking* (pp. 283–304). Lawrence Erlbaum Associates, Inc.

González-Benito, Ó., Martos-Partal, M., & Martín, S. S. (2015). Brands as substitutes for the need for touch in online shopping. *Journal of Retailing and Consumer Services*, *27*, 121–125. https://doi.org/10.1016/j.jretconser.2015.07.015

Goossens, C. F. (2000). Tourism information and pleasure motivation. Annals of Tourism Research, 27(2), 301e321.

Grohmann, B., Spangenberg, E.R. and Sprott, D.E. (2007). The influence of tactile input on the evaluation of retail product offerings, Journal of Retailing, Vol. 83 No. 2, pp. 237-245.

Gune, S., & Sur, S. (2021). To analyze impact of beauty product advertisements v/s beauty bloggers' reviews of same product, on purchase decision of consumer. *A Global Journal of Interdisciplinary Studies*, *4*(3).

Hansen, T., Jensen, J. S., & Solgaard, H. S. (2004). Predicting online grocery buying intention: A comparison of the theory of reasoned action and the theory of planned behavior. *International Journal of Information Management*, *24*(6), 539–550. https://doi.org/10.1016/j.ijinfomgt.2004.08.004

Halzack, S. (2015). The Sephora effect: How the cosmetics retailer transformed the beauty industry. *Washington Post*. Retrieved March 5, 2023, from https://www.washingtonpost.com/news/business/wp/2015/03/09/the-sephora-effect-how-the-cosmetics-retailer-transformed-the-beauty-industry/

Hartmann, J., Heitmann, M., Schamp, C., & Netzer, O. (2021). The power of brand selfies. *Journal of Marketing Research*, *58*(6), 1159–1177. https://doi.org/10.1177/00222437211037258

Heller, J., Chylinski, M., De Ruyter, K., Mahr, D., & Keeling, D. I. (2019). Let me imagine that for you: transforming the retail frontline through augmenting customer mental imagery ability. *Journal of Retailing*, *95*(2), 94–114. https://doi.org/10.1016/j.jretai.2019.03.005

Hockey, G. R. J., John Maule, A., Clough, P. J., & Bdzola, L. (2010). Effects of negative mood states on risk in everyday decision making. *Cognition and Emotion*, *14*(6), 823–855. https://doi.org/10.1080/02699930050156654

Holmes, E. A., & Mathews, A. (2005). Mental imagery and emotion: a special relationship? *Emotion*, *5*(4), 489–497. https://doi.org/10.1037/1528-3542.5.4.489

Holt, C., & Laury, S. (2002). Risk aversion and incentive effects. *American Economic Review*, *92*(5). https://doi.org/10.1257/000282802762024700

Holton, E. F., & Burnett, M. F. (2005). The basics of quantitative research. In R. A. Swanson & E. F. Holton (Eds.), *Research in organizations: Foundations and methods of inquiry* (1st ed, pp. 29–44). Berrett-Koehler Publishers.

Hong, Y., & Pavlou, P. A. (2014b). Product fit uncertainty in online markets: Nature, effects, and antecedents. *Information Systems Research*, *25*(2), 328–344. https://doi.org/10.1287/isre.2014.0520

Hsiao, C. (2007). Panel data analysis—advantages and challenges. *Test*, *16*(1), 1–22. https://doi.org/10.1007/s11749-007-0046-x

Hsu, C., Chang, C., & Yansritakul, C. (2017). Exploring purchase intention of green skincare products using the theory of planned behavior: Testing the moderating effects of country of origin and price sensitivity. *Journal of Retailing and Consumer Services*, *34*, 145–152. https://doi.org/10.1016/j.jretconser.2016.10.006

Hsu, S. H., Tsou, H., & Chen, J. (2021). "Yes, we do. Why not use augmented reality?" customer responses to experiential presentations of AR-based applications. *Journal of Retailing and Consumer Services*, *62*, 102649. https://doi.org/10.1016/j.jretconser.2021.102649

Hung, S. W., Chang, C., & Chen, Y. (2021). A new reality: Exploring continuance intention to use mobile augmented reality for entertainment purposes. *Technology in Society*, *67*, 101757. https://doi.org/10.1016/j.techsoc.2021.101757

Ishii, K., Lyons, M. M., & Carr, S. A. (2019). Revisiting media richness theory for today and future. *Human Behavior and Emerging Technologies*, *1*(2), 124–131. https://doi.org/10.1002/hbe2.138

Jang, S., Prasad, A., & Ratchford, B. T. (2012). How consumers use product reviews in the purchase decision process. *Marketing Letters*, *23*(3), 825–838. https://doi.org/10.1007/s11002-012-9191-4

Jaswal, R. (2021). Augmented reality's effect on online cosmetics consumer purchasing patterns: a study on virtual artists at sephora. *Turkish Journal of Computer and Mathematics*

Education *(TURCOMAT)*, *12*(12), 730–737. https://www.turcomat.org/index.php/turkbilmat/article/view/7458

Javornik, A. (2016). Augmented reality: Research agenda for studying the impact of its media characteristics on consumer behaviour. *Journal of Retailing and Consumer Services*, *30*, 252–261. https://doi.org/10.1016/j.jretconser.2016.02.004

Javornik, A., Rogers, Y., Moutinho, A. M., & Freeman, R. (2016). Revealing the shopper experience of using a "magic mirror" augmented reality make-up application. *Designing Interactive Systems*. https://doi.org/10.1145/2901790.2901881

Jha, M., Kemper, J., & Brettel, M. (2019). Product uncertainty in online markets: the influence of situational factors and individual characteristics on purchase decision reversal. *Proceedings of the Annual Hawaii International Conference on System Sciences*. https://doi.org/10.24251/hicss.2019.771

Jiang, & Benbasat. (2007). The effects of presentation formats and task complexity on online consumers' product understanding. *MIS Quarterly*, *31*(3), 475. https://doi.org/10.2307/25148804

Jovic, M., Milutinovic, D., Kos, A., and Tomazic, S. (2012). Product presentation strategy for online customers. *J. Universal Comput. Sci*. 18, 1323–1342. doi: 10.5506/APhysPolBSupp.5.181

Kanuganti, S. (2019). Augmented reality benefits us all. *Forbes*. Retrieved May 13, 2023, from https://www.forbes.com/sites/forbestechcouncil/2019/08/16/augmented-reality-benefits-us-all/

Katiyar, A., Kalra, K., & Garg, C. (2015). Marker based augmented reality. Advances in Computer Science and Information Technology (ACSIT), 2(5), 441-445.

Kim, J., Forsythe, S., 2008. Sensory enabling technology acceptance model (SE-TAM): a multiple-group structural model comparison. Psychol. Mark. 25, 901–922. https://doi.org/10.1002/mar.20245.

Kim, J., Kim, M., & Lennon, S. J. (2009). Effects of web site atmospherics on consumer responses: music and product presentation. *Direct Marketing: An International Journal*, *3*(1), 4–19. https://doi.org/10.1108/17505930910945705

Knight, F. H. (1985). Risk, uncertainty, and profit. University of Chicago Press, Chicago.

Knowles, K. (2018). L'Oréal snaps up startups: AR beauty is just the beginning says cdo. *Forbes*. https://www.forbes.com/sites/kittyknowles/2018/06/04/loreal-buys-silicon-valley-startup-but-ar-beauty-is-just-the-beginning-says-cdo/?sh=b9a0e1119820

Kopot, C., & Reed, J. (2022). Shopping for beauty: The influence of the pandemic on body appreciation, conceptions of beauty, and online shopping behaviour. *Journal of Global Fashion Marketing*, *14*(1), 20–34. https://doi.org/10.1080/20932685.2022.2085602

Kotabe, H. P., Righetti, F., & Hofmann, W. (2019). How anticipated emotions guide self-control judgments. Frontiers in Psychology, 10. https///doi.org/10.3389/fpsyg.2019.01614

Kotler, P. (1974), "Atmospherics as a marketing tool", Journal of Retailing, Vol. 49, pp. 48-64

Kumar, A., and Tan, Y. L. (2015). The demand effects of joint product advertising in online videos. *Manag. Sci*. 61, 1921–1937. doi: 10.1287/mnsc.2014.2086

Kuo, Y., Wu, C., & Deng, W. (2009). The relationships among service quality, perceived value, customer satisfaction, and post-purchase intention in mobile value-added services. *Computers in Human Behavior*, *25*(4), 887–896. https://doi.org/10.1016/j.chb.2009.03.003

Lavoye, V., Mero, J., & Tarkiainen, A. (2021). Consumer behavior with augmented reality in retail: a review and research agenda. *The International Review of Retail, Distribution and Consumer Research*, *31*(3), 299–329. https://doi.org/10.1080/09593969.2021.1901765

Lee, D. H. (2015). An alternative explanation of consumer product returns from the postpurchase dissonance and ecological marketing perspectives. *Psychology & Marketing*, *32*(1), 49–64. https://doi.org/10.1002/mar.20757

Lee, W., & Gretzel, U. (2012). Designing persuasive destination websites: A mental imagery processing perspective. *Tourism Management*, *33*(5), 1270–1280. https://doi.org/10.1016/j.tourman.2011.10.012

Levine, David N., Joshua Warach and Martha Farah (1985). Two visual systems in mental imagery dissociation of "what" and "where" in imagery disorders due to bilateral posterior cerebral lesions. *Neurology,* 35 (7), 1010-10.

Li, H., Daugherty, T., & Biocca, F. (2003). The role of virtual experience in consumer learning. *Journal of Consumer Psychology*, *13*(4), 395–407. https://doi.org/10.1207/s15327663jcp1304_07

Libby, L. K., & Eibach, R. P. (2011). Chapter four - visual perspective in mental imagery: A representational tool that functions in judgment, emotion, and self-insight. *Advances in Experimental Social Psychology*, *44*, 185–245. https://doi.org/10.1016/b978-0-12-385522-0.00004-4

Lodén, M., Buraczewska, I., & Halvarsson, K. (2007). Facial anti-wrinkle cream: influence of product presentation on effectiveness: a randomized and controlled study. *Skin Research and Technology*, *13*(2), 189–194. https://doi.org/10.1111/j.1600-0846.2007.00220.x

L'Oreal. (2022). Annual growth of the global cosmetics market from 2004 to 2021 [Graph]. In *Statista.*Retrieved February 17, 2023, from https://www.statista.com/statistics/297070/growth-rate-of-the-global-cosmetics-market/

MacInnis, Deborah J. and Linda L. Price (1987). The role of imagery in information processing: review and extensions. *Journal of Consumer Research,* 13 (4), 473–91

Maity, M., & Dass, M. (2014). Consumer decision-making across modern and traditional channels: E-commerce, m-commerce, in-store. *Decision Support Systems*, *61*, 34–46. https://doi.org/10.1016/j.dss.2014.01.008

Maslowska, E., Smit, E. G., & Van Den Putte, B. (2016). It is all in the name: a study of consumers' responses to personalized communication. *Journal of Interactive Advertising*, *16*(1), 74–85. https://doi.org/10.1080/15252019.2016.1161568

McLean, G., & Wilson, A. A. (2019). Shopping in the digital world: examining customer engagement through augmented reality mobile applications. *Computers in Human Behavior*, *101*, 210–224. https://doi.org/10.1016/j.chb.2019.07.002

Mitchell, V., & Boustani, P. (1994). A preliminary investigation into pre- and post-purchase risk perception and reduction. *European Journal of Marketing*, *28*(1), 56–71. https://doi.org/10.1108/03090569410049181

Mustika, D. V., & Wahyudi, L. (2022). Does the quality of beauty e-commerce impact online purchase intention? The role of perceived enjoyment and perceived trust. *International Journal of Economics, Business and Management Research*, *06*(04), 199–218. https://doi.org/10.51505/ijebmr.2022.6415

Nayyar, A., Mahapatra, B., Le, D., & Suseendran, G. (2018). Virtual reality (VR) & Augmented reality (AR) technologies for tourism and hospitality industry. *International Journal of Engineering & Technology*, *7*(2.21), 156. https://doi.org/10.14419/ijet.v7i2.21.11858

Nerlove, M. (2007). Comments on: Panel data analysis—advantages and challenges. *Test*, *16*(1), 42–46. https://doi.org/10.1007/s11749-007-0052-z

Neuman, W. (2014). Social research methods: qualitative and quantitative approaches. Harlow: Pearson New International Edition.

Nguyen, T. T. N. (2020). Developing and validating five-construct model of customer satisfaction in beauty and cosmetic E-commerce. *Heliyon*, *6*(9), e04887. https://doi.org/10.1016/j.heliyon.2020.e04887

Niven-Phillips, L. (2019). In the flesh: how beauty is luring customers back to the high street. *The Guardian*. Retrieved May 12, 2023, from https://www.theguardian.com/fashion/2019/aug/22/in-the-flesh-how-beauty-is-luring-customers-back-to-the-high-street

Oliver, R. P. (1977). Effect of expectation and disconfirmation on postexposure product evaluations: An alternative interpretation. *Journal of Applied Psychology*, *62*(4), 480–486. https://doi.org/10.1037/0021-9010.62.4.480

Orús, C., Gurrea, R., and Flavián, C. (2017). Facilitating imaginations through online product presentation videos: effects on imagery fluency, product attitude and purchase intention. *Electron. Commer. Res*. 17, 661–700. doi: 10.1007/s10660-016-9250-7

Overby, J. W., & Lee, E. (2006). The effects of utilitarian and hedonic online shopping value on consumer preference and intentions. *Journal of Business Research*, *59*(10–11), 1160–1166. https://doi.org/10.1016/j.jbusres.2006.03.008

Oyman, M., Bal, D., & Ozer, S. (2022). Extending the technology acceptance model to explain how perceived augmented reality affects consumers' perceptions. *Computers in Human Behavior*, *128*, 107127. https://doi.org/10.1016/j.chb.2021.107127

Pancer, E., McShane, L., & Noseworthy, T. J. (2015). Isolated environmental cues and product efficacy penalties: the color green and eco-labels. *Journal of Business Ethics*, *143*(1), 159–177. https://doi.org/10.1007/s10551-015-2764-4

Park, S., & Lee, K. (2021). Examining the impact of e-commerce growth on the spatial distribution of fashion and beauty stores in Seoul. *Sustainability*, *13*(9), 5185. https://doi.org/10.3390/su13095185

Park, J., Lennon, S. J., & Stoel, L. (2005). On-line product presentation: Effects on mood, perceived risk, and purchase intention. *Psychology and Marketing*, *22*(9), 695–719. https://doi.org/10.1002/mar.20080

Park, J., Stoel, L., & Lennon, S. J. (2008). Cognitive, affective and conative responses to visual simulation: the effects of rotation in online product presentation. *Journal of Consumer Behaviour*, *7*(1), 72–87. https://doi.org/10.1002/cb.237

Park, M., & Yoo, J. (2020). Effects of perceived interactivity of augmented reality on consumer responses: A mental imagery perspective. *Journal of Retailing and Consumer Services*, *52*, 101912. https://doi.org/10.1016/j.jretconser.2019.101912

Paivio, A. (1971). Imagery and verbal processes. New York: Holt, Rinehart & Winston.

Pearson, D.G., C. Deeprose, S.M. Wallace-Hadrill, S. Burnett Heyes and E.A. Holmes (2013), "Assessing Mental Imagery in Clinical Psychology: A Review of Imagery Measures and a Guiding Framework," *Clinical Psychology Review,* 33 (1), 1–23.

Pelet, J. R., & Papadopoulou, P. (2012). The effect of colors of e-commerce websites on consumer mood, memorization and buying intention. *European Journal of Information Systems*, *21*(4), 438–467. https://doi.org/10.1057/ejis.2012.17

Perannagari, K. T., & Chakrabarti, S. (2019). Factors influencing acceptance of augmented reality in retail: insights from thematic analysis. *International Journal of Retail & Distribution Management*, *48*(1), 18–34. https://doi.org/10.1108/ijrdm-02-2019-0063

Percy, L., & Rossiter, J. R. (1983). Effects of picture size and color on brand attitude responses in print advertising. *ACR North American Advances*. https://www.acrwebsite.org/search/view-conference-proceedings.aspx?Id=6071

Petrova, P. K., & Cialdini, R. B. (2008). Evoking the imagination as a strategy of influence. In C. P. Haugtvedt, P. M. Herr, & F. R. Kardes (Eds.), *Handbook of consumer psychology* (pp. 505–523). Taylor & Francis Group/Lawrence Erlbaum Associates.

Pindyck, R., & Rubinfeld, D. (2012). Uncertainty and consumer Behavior. In *Microeconomics* (8th ed., pp. 159–199). Pearson

Qin, H., Osatuyi, B., & Xu, L. (2021). How mobile augmented reality applications affect continuous use and purchase intentions: A cognition-affect-conation perspective. *Journal of Retailing and Consumer Services*, *63*, 102680. https://doi.org/10.1016/j.jretconser.2021.102680

Rathee, R., & Rajain, P. (2019). Online shopping environments and consumer's need for touch. *Journal of Advances in Management Research*, *16*(5), 814–826. https://doi.org/10.1108/jamr-12-2018-0116

Riar, M., Korbel, J. J., Xi, N., Zarnekow, R., & Hamari, J. (2021). The use of augmented reality in retail: a review of literature. *Proceedings of the Annual Hawaii International Conference on System Sciences*. https://doi.org/10.24251/hicss.2021.078

Richardson, J. T. E. (1999). Imagery. Hove, UK: Psychology Press.

Richardson A. (1969). Mental imagery, London: Routledge & Kegan Paul.

Roberts, J. D., & Nedungadi, P. (1995). Studying consideration in the consumer decision process: Progress and challenges. *International Journal of Research in Marketing*, *12*(1), 3–7. https://doi.org/10.1016/0167-8116(95)00008-p

Safa, N. S., & Von Solms, R. (2016). Customers repurchase intention formation in e-commerce. *SA Journal of Information Management*, *18*(1). https://doi.org/10.4102/sajim.v18i1.712

Saunders, M., Lewis, P., & Thornhill, A. (2016). Research methods for business students. Edinburgh: Pearson Education Limited.

Schoenfelder, E., Olson, R., Bell, M., & Tom, K. (2007). Stop and smell the roses: an activity for teaching the central limit theorem. *Psychology Learning &Amp; Teaching*, *6*(2), 80–84. https://doi.org/10.2304/plat.2007.6.2.80

Sarkar, R., & Das, S. (2017). Online shopping vs offline shopping : a comparative study. *International Journal of Scientific Research in Science and Technology*, *3*(1), 424–431. https://doi.org/10.32628/ijsrst173184

Scott, L. M. (1994). Images in advertising: the need for a theory of visual rhetoric. *Journal of Consumer Research*, *21*(2), 252. https://doi.org/10.1086/209396

Scholz, J., & Smith, A. (2016). Augmented reality: Designing immersive experiences that maximize consumer engagement. *Business Horizons*, *59*(2), 149–161. https://doi.org/10.1016/j.bushor.2015.10.003

Silva, S., Rocha, T. V., De Cicco, R., Galhanone, R. F., & Mattos, L. S. M. (2021). Need for touch and haptic imagery: An investigation in online fashion shopping. *Journal of Retailing and Consumer Services*, *59*, 102378. https://doi.org/10.1016/j.jretconser.2020.102378

Smink, A. R., Frowijn, S., Van Reijmersdal, E. A., Van Noort, G., & Neijens, P. (2019). Try online before you buy: How does shopping with augmented reality affect brand responses and personal data disclosure. *Electronic Commerce Research and Applications*, *35*, 100854. https://doi.org/10.1016/j.elerap.2019.100854

Song, S., & Kim, M. (2012). Does more mean better? An examination of visual product presentation in e-retailing. *Journal of Electronic Commerce Research*, *13*(4), 345. http://www.jecr.org/sites/default/files/13_04_p5.pdf

Souiden, N., Ladhari, R., & Chiadmi, N. E. (2019). New trends in retailing and services. *Journal of Retailing and Consumer Services*, *50*, 286–288. https://doi.org/10.1016/j.jretconser.2018.07.023

Statista. (2021). Beauty & personal care report 2021. In *Statista Consumer Market Insights* (did-55499-1). Retrieved February 17, 2023, from https://www.statista.com/study/55499/cosmetics-and-personal-care/?locale=en

Statista. (2022a). *Global retail e-commerce sales 2026 | Statista*. Retrieved May 11, 2023, from https://www.statista.com/statistics/379046/worldwide-retail-e-commerce-sales/

Statista. (2022b). *E-commerce revenue worldwide 2017-2027, by segment*. https://www.statista.com/forecasts/1223973/e-commerce-revenue-worldwide-by-segment

Statista. (2022c). *Number of monthly active Instagram users 2013-2021*. https://www.statista.com/statistics/253577/number-of-monthly-active-instagram-users/

Statista. (2022d). *Global online shopping cart abandonment rate 2006-2021*. https://www.statista.com/statistics/477804/online-shopping-cart-abandonment-rate-worldwide/

Statista. (2023). *Annual growth rate of the cosmetics market worldwide 2022 | Statista*. Retrieved May 12, 2023, from https://www.statista.com/statistics/297070/growth-rate-of-the-global-cosmetics-market/

Steinmann, S., Kilian, T., & Brylla, D. (2014). Experiencing products virtually: the role of vividness and interactivity in influencing mental imagery and user reactions. *International Conference on Information Systems*. https://aisel.aisnet.org/cgi/viewcontent.cgi?article=1402&context=icis2014

Stephen, A. T., Yakov, B., & Sarvary, M. (2013). Making mobile ads that work. *Harvard Business Review.*

Sun, C., Fang, Y., Kong, M., Chen, X., & Liu, Y. (2022). Influence of augmented reality product display on consumers' product attitudes: A product uncertainty reduction perspective. *Journal of Retailing and Consumer Services*, *64*. https://doi.org/10.1016/j.jretconser.2021.102828

Taher, G. (2021). E-commerce: advantages and limitations. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, *11*(1). https://doi.org/10.6007/ijarafms/v11-i1/8987

Tang, J., & Zhang, P. (2020). The impact of atmospheric cues on consumers' approach and avoidance behavioral intentions in social commerce websites. *Computers in Human Behavior*, *108*, 105729. https://doi.org/10.1016/j.chb.2018.09.038

Team, T. (2016). *Why is l'oréal increasing its focus on augmented reality?* Forbes. Retrieved April 5, 2023, from https://www.forbes.com/sites/greatspeculations/2016/03/15/why-is-loreal-increasing-its-focus-on-augmented-reality/?sh=17cb1f2d2ce5

Terlep, S. (2022). The beauty industry is defying inflation. *WSJ*. Retrieved May 5, 2023, from https://www.wsj.com/articles/the-beauty-industry-is-defying-inflation-11667878910

Theopilus, Y., Yogasara, T., Theresia, C., & Ardine, D. (2021). Customer experience analysis of cosmetics retail store on millennial women. *Engineering Management in Production and Services, 13*(2), 29-45. doi: 10.2478/emj-2021-0010

Tokunaga, R. S. (2013). Engagement with novel virtual environments: The role of perceived novelty and flow in the development of the deficient self-regulation of internet use and media habits. *Human Communication Research*, *39*(3), 365–393. https://doi.org/10.1111/hcre.12008

Van Noort, G., Voorveld, H. a. M., & Van Reijmersdal, E. A. (2012). Interactivity in brand web sites: cognitive, affective, and behavioral responses explained by consumers' online flow experience. *Journal of Interactive Marketing*, *26*(4), 223–234. https://doi.org/10.1016/j.intmar.2011.11.002

Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. Information systems research, 11(4), 342-365.

Vieira, V. A., Rafael, D. N., & Agnihotri, R. (2022). Augmented reality generalizations: A meta-analytical review on consumer-related outcomes and the mediating role of hedonic and utilitarian values. *Journal of Business Research*, *151*, 170–184. https://doi.org/10.1016/j.jbusres.2022.06.030

Walters, G., Sparks, B., & Herington, C. A. (2007). The effectiveness of print advertising stimuli in evoking elaborate consumption visions for potential travelers. *Journal of Travel Research*, *46*(1), 24–34. https://doi.org/10.1177/0047287507302376

Wang, Y., Ko, E., & Wang, H. (2021). Augmented reality (AR) app use in the beauty product industry and consumer purchase intention. *Asia Pacific Journal of Marketing and Logistics*, *34*(1), 110–131. https://doi.org/10.1108/apjml-11-2019-0684

Wang, Y. S., Yeh, C. H., Wang, Y. M., Tseng, T. H., Lin, H. H., Lin, S., & Xie, M. Q. (2019). Investigating online consumers' responses to product presentation modes. *Internet Research*, *29*(6), 1233–1255. https://doi.org/10.1108/intr-07-2017-0258

Watson, A., Alexander, B., & Salavati, L. (2018). The impact of experiential augmented reality applications on fashion purchase intention. *International Journal of Retail & Distribution Management*, *48*(5), 433–451. https://doi.org/10.1108/ijrdm-06-2017-0117

Whang, J. B., Song, J. H., Choi, B., & Lee, J. (2021). The effect of Augmented Reality on purchase intention of beauty products: The roles of consumers' control. *Journal of Business Research*, *133*, 275–284. https://doi.org/10.1016/j.jbusres.2021.04.057

Williams, L. and Ackerman, J. (2011), "Please touch the merchandise", Harvard Business Review, available at: https://hbr.org/2011/12/please-touch-the-merchandise

Won Jeong, S., Fiore, A. M., Niehm, L. S., & Lorenz, F. O. (2009). The role of experiential value in online shopping. *Internet Research*, *19*(1), 105–124. https://doi.org/10.1108/10662240910927858

Wu, J., Wu, Y., Sun, J., & Yang, Z. (2013). User reviews and uncertainty assessment: A two stage model of consumers' willingness-to-pay in online markets. *Decision Support Systems*, *55*(1), 175–185. https://doi.org/10.1016/j.dss.2013.01.017

Yan, G., He, W., Shen, J., & Tang, C. (2014). A bilingual approach for conducting Chinese and English social media sentiment analysis. *Computer Networks*, *75*, 491–503. https://doi.org/10.1016/j.comnet.2014.08.021

Yan, Q., Wu, S., Wang, L., Wu, P., Chen, H., & Wei, G. (2016). E-WOM from e-commerce websites and social media: Which will consumers adopt? *Electronic Commerce Research and Applications*, *17*, 62–73. https://doi.org/10.1016/j.elerap.2016.03.004

Yoo, J., & Kim, M. (2012). Online product presentation: the effect of product coordination and a model's face. *Journal of Research in Interactive Marketing*, *6*(1), 59–72. https://doi.org/10.1108/17505931211241378

Yue, L. Q., Liu, Y. M., and Wei, X. H. (2017). Influence of online product presentation on consumers' trust in organic food: a mediated moderation model. *Br. Food J*. 119, 2724–2739. doi: 10.1108/BFJ-09-20 16-0421

Yuen, S. C., Yaoyuneyong, G., & Johnson, E. A. (2011). Augmented reality: An overview and five directions for ar in education. *Journal of Educational Technology Development and Exchange*, *4*(1). https://doi.org/10.18785/jetde.0401.10

Zeelenberg, M., Nelissen, R. M. A., Breugelmans, S. M., & Pieters, R. (2008). On emotion specificity in decision making: Why feeling is for doing. *Judgment and Decision Making*, *3*(1), 18–27. https://doi.org/10.1017/s1930297500000139

Zhou, L., Wang, W., Xu, J., Liu, T., & Gu, J. (2018). Perceived information transparency in B2C e-commerce: An empirical investigation. *Information & Management*, *55*(7), 912–927. https://doi.org/10.1016/j.im.2018.04.005

APPENDICES

Appendix 1: Online experiment (treatment group)

Liebe Teilnehmerin, lieber Teilnehmer,

in dieser Studie geht es um die Evaluierung verschiedener Methoden zur Online-Präsentation von Kosmetikartikeln.
Bitte nehmen Sie daher nur an dieser Studie teil, wenn Sie Kosmetikprodukte verwenden.

Bitte beachten Sie, dass Sie **EINE KAMERA** und einen **GUT BELEUCHTEN RAUM** benötigen, um diese Studie durchzuführen. **SIE MÜSSEN KEIN FOTO VON SICH HOCHLADEN**; aber eventuell werden Sie gebeten, ein Produkt virtuell zu testen.

In dem Sie den "Weiter" Button drücken, bestätigen Sie die oben genannten Informationen gelesen zu haben und erklären sich einverstanden freiwillig an der Umfrage teilzunehmen. Sie stimmen außerdem zu Ihre Kamera für die Zwecke der Studie zu verwenden. Die Daten sind anonym und werden ausschließlich für wissenschaftliche Zwecke verwendet.

1. Haben Sie eine Kamera zur Verfügung?

○ Ja
○ Nein

2. Verwenden Sie Kosmetikprodukte?

○ Ja
○ Nein

3. Sind Sie damit einverstanden, dass sie auf eine externe Seite (L'Oreal) während dieser Umfrage weitergeleitet werden?

○ Ja
○ Nein

Weiter

Stellen Sie sich vor, Sie möchten einen neuen Lippenstift bzw. Lipgloss kaufen. Bei Ihrer Recherche stoßen Sie auf den L'Oréal Onlineshop. Bitte folgen Sie nun den unten angeführten Link, um dann durch das Lippenstift/Lippgloss Sortiment zu stöbern.

Bitte schauen Sie sich dabei mindestens ein Produkt genauer an und wenden Sie auch die **"VIRTUELL TESTEN"** Funktion an. Klicken Sie bitte dafür auf ein Produkt. Direkt auf dem Produktbild (Desktop-Anwendung) oder am Bildschirm links unten (Smartphone-Anwendung) finden Sie nun einen Button "VIRTUELL TESTEN" - klicken Sie diesen bitte ebenso an. Bitte entscheiden Sie sich anschließend für "LIVE AUFTRAGEN" um danach unterschiedliche Farben ausprobieren zu können.

Sie können die nachfolgenden Fragen nur beantworten wenn Sie die Produkte auch wirklich <u>virtuell</u> anprobiert haben.

Danach kehren Sie bitte wieder zu dieser Umfrage zurück, um anschließend darauf basierende Fragen zu beantworten. Beachten Sie bitte außerdem, dass der "Weiter" Button erst in 90 Sekunden erscheint und Sie daher erst dann die Möglichkeit haben auf der nächsten Seite fortzufahren.

Hier geht's zu:

L'Oreal Lippen Make-up

4. Haben Sie die „virtuell Testen" Funktion verwendet?

Das heißt haben Sie auf Ihrem eigenen Gesicht die unterschiedlichen Lippenstifte ausprobiert?

○ Ja
○ Nein

Weiter

5. Bitte bewerten Sie die folgenden Aussagen.

	stimme gar nicht zu						stimme voll zu
	1	2	3	4	5	6	7
Ich konnte durch die „virtuelle Testen"-Funktion sehen, wie das Make-up auf meinem Gesicht aussieht.	○	○	○	○	○	○	○
Ich konnte verschiedene Make-up-Produkte virtuell (dh. auf meinem Gesicht mittels Augmented Reality) ausprobieren.	○	○	○	○	○	○	○

6. Bitte beschreiben Sie in 2-3 Sätzen, wie Sie nachdem Sie auf den Link gedrückt haben, vorgegangen sind.

Weiter

7. Welche Schaltfläche mussten Sie betätigen um die virtuelle Anprobe-Funktion zu starten?

Weiter

8. Bitte geben Sie an, inwieweit Sie den folgenden Aussagen zustimmen.

Nachdem ich die Online-Produktpräsentation von L'Oréal gesehen habe,

	stimme gar nicht zu						stimme voll zu
	1	2	3	4	5	6	7
kann ich mir gut vorstellen, was dieses Produkt leisten würde.	○	○	○	○	○	○	○
fällt es mir leicht, mir vorzustellen, wie ich das Produkt verwende.	○	○	○	○	○	○	○
fällt es mir leicht, über die Verwendung des Produkts zu fantasieren.	○	○	○	○	○	○	○
fällt es mir leicht, mir vorzustellen, wie ich das Produkt genieße.	○	○	○	○	○	○	○

Weiter

9. Bitte geben Sie an, inwieweit Sie den folgenden Aussagen zustimmen.

Nachdem ich die Online-Produktpräsentation von L'Oréal gesehen habe,

	stimme gar nicht zu						stimme voll zu
	1	2	3	4	5	6	7
bin ich nicht mehr unsicher, was die Beschreibungen dieses Produkts angeht.	○	○	○	○	○	○	○
bin ich nicht mehr unsicher, was die zukünftige Leistung dieses Produkts angeht.	○	○	○	○	○	○	○
ist meine Unsicherheit über die tatsächliche Qualität dieses Produkts beseitigt.	○	○	○	○	○	○	○
zweifle ich nicht mehr daran, dass das Produkt meinen Anforderungen entsprechen würde.	○	○	○	○	○	○	○
zweifle ich nicht mehr daran, dass das Produkt meinem Geschmack entspricht.	○	○	○	○	○	○	○
zweifle ich nicht mehr daran, dass das Produkt meinen Vorstellungen entspricht.	○	○	○	○	○	○	○

Weiter

10. Bitte kreuzen Sie das Feld in der Mitte an.

○	○	○	○	○
1	2	3	4	5

Weiter

Welche Emotionen erwarten Sie, wenn Sie daran denken, eines der im Online-Shop vorgestellten Produkte zu verwenden?

	stimme gar nicht zu						stimme voll zu
	1	2	3	4	5	6	7
Freude	○	○	○	○	○	○	○
Vergnügen	○	○	○	○	○	○	○
Aufregung	○	○	○	○	○	○	○
Fröhlichkeit	○	○	○	○	○	○	○
Zufriedenstellung	○	○	○	○	○	○	○
Neugierde	○	○	○	○	○	○	○

Weiter

11. Bitte geben Sie an, inwieweit Sie den folgenden Aussagen zustimmen.

	stimme gar nicht zu						stimme voll zu
	1	2	3	4	5	6	7
Ich kaufe gerne online ein.	○	○	○	○	○	○	○
Online-Shopping ist ein effektiver Weg zum Einkaufen.	○	○	○	○	○	○	○

Weiter

12. Bitte geben Sie an, inwieweit Sie den folgenden Aussagen zustimmen.

Ich beabsichtige, in Zukunft Make-up von diesem Online-Shop zu kaufen.

	-3	-2	-1	0	1	2	3	
Unsicher	○	○	○	○	○	○	○	Sicher
Unmöglich	○	○	○	○	○	○	○	Möglich
Unwahrscheinlich	○	○	○	○	○	○	○	Wahrscheinlich

Weiter

13. Wie oft kaufen Sie Make-up?

○ Mindestens einmal alle sechs Monate
○ Mindestens einmal im Jahr
○ Weniger häufig
○ Mindestens einmal alle drei Monate
○ Mindestens einmal pro Woche
○ Mindestens einmal im Monat

14. Wo kaufen Sie Ihr Make-up?

○ Nur in stationären Geschäften
○ Nur online
○ Sowohl stationär als auch online, aber hauptsächlich stationär
○ Sowohl stationär als auch online, aber hauptsächlich online
○ Sowohl stationär als auch online (gleichmäßig verteilt)

15. Haben Sie in den letzten fünf Jahren bei L'Oréal eingekauft?

○ Ja
○ Nein

16. Haben Sie schon einmal den L'Oréal-Onlineshop besucht?

○ Ja
○ Nein

17. Wenn ja, haben Sie schon einmal ein Produkt über die Website gekauft?

○ Ja
○ Nein

Weiter

18. Haben Sie schon einmal eine virtuelle Anprobefunktion verwendet?

○ Ja

○ Nein

19. Bitte bewerten Sie die folgenden Aussagen.

In Bezug auf Augmented Reality (AR) betrachte ich mich als

	-3	-2	-1	0	1	2	3	
Nicht vertraut	○	○	○	○	○	○	○	Vertraut
Unerfahren	○	○	○	○	○	○	○	Erfahren
Unwissend	○	○	○	○	○	○	○	Wissend

20. Bitte geben Sie an, inwieweit Sie den folgenden Aussagen zustimmen.

	stimme gar nicht zu						stimme voll zu
	1	2	3	4	5	6	7
Ich bin besorgt über die Weitergabe meiner persönlichen Informationen in diesem Online-Shop, weil ich befürchte, dass andere damit etwas anfangen könnten.	○	○	○	○	○	○	○
Ich bin besorgt über die Weitergabe meiner persönlichen Informationen in diesem Online-Shop, weil sie auf eine Weise verwendet werden könnten, die ich nicht vorausgesehen habe	○	○	○	○	○	○	○
Ich glaube, dass ich in der Lage bin, meine persönlichen Daten im Internet zu schützen.	○	○	○	○	○	○	○
Es ist einfach für mich, die Privatsphäre im Internet durch die Aktivierung von Funktionen zu wahren.	○	○	○	○	○	○	○

Weiter

Alter

[   ]

21. Höchste abgeschlossene Ausbildung

[Bitte auswählen] ⬍

22. Geschlecht

[Bitte auswählen] ⬍

Weiter

Vielen Dank für Ihre Teilnahme!

Wir möchten uns ganz herzlich für Ihre Mithilfe bedanken.

Ihre Antworten wurden gespeichert, Sie können das Browser-Fenster nun schließen.

Appendix 2: Online experiment (control group)

Liebe Teilnehmerin, lieber Teilnehmer,

in dieser Studie geht es um die Evaluierung verschiedener Methoden zur Online-Präsentation von Kosmetikartikeln.

Bitte nehmen Sie daher nur an dieser Studie teil, wenn Sie Kosmetikprodukte verwenden.

In dem Sie den "Weiter" Button drücken, bestätigen Sie die oben genannte Informationen gelesen zu haben und erklären sich einverstanden freiwillig an der Umfrage teilzunehmen. Die Daten sind anonym und werden ausschließlich für wissenschaftliche Zwecke verwendet.

Weiter

1. Sind Sie damit einverstanden, dass sie auf eine externe Seite (L'Oreal) während dieser Umfrage weitergeleitet werden?

○ Ja
○ Nein

2. Verwenden Sie Kosmetikprodukte?

○ Ja
○ Nein

Weiter

Stellen Sie sich vor, Sie möchten einen neuen Lippenstift bzw. Lipgloss kaufen. Bei Ihrer Recherche stoßen Sie auf den L'Oréal Onlineshop. Bitte folgen Sie nun den unten angeführten Link, um dann durch das Lippenstift/Lippgloss Sortiment zu stöbern.

Bitte schauen Sie sich mindestens ein Produkt genauer an und **VERZICHTEN** Sie dabei auf die **"VIRTUELL TESTEN"** Funktion.

Sie können die nachfolgenden Fragen nur beantworten wenn Sie die Webseite auch wirklich besucht haben.

Danach kehren Sie bitte wieder zu dieser Umfrage zurück, um anschließend darauf basierende Fragen zu beantworten. Beachten Sie bitte außerdem, dass der "Weiter" Button erst in 45 Sekunden erscheint und Sie daher erst dann die Möglichkeit haben auf der nächsten Seite fortzufahren.

Hier geht's zu:

L'Oreal Lippen Make-up

3. Haben Sie die „virtuelle Testen" Funktion verwendet?
Das heißt haben Sie auf Ihrem eigenen Gesicht die unterschiedlichen Lippenstifte ausprobiert?

○ Ja
○ Nein

Weiter

4. Bitte bewerten Sie die folgenden Aussagen.

	stimme gar nicht zu					stimme voll zu	
	1	2	3	4	5	6	7
Ich konnte durch die „virtuelle Testen"-Funktion sehen, wie das Make-up auf meinem Gesicht aussieht.	○	○	○	○	○	○	○
Ich konnte verschiedene Make-up-Produkte virtuell (dh. auf meinem Gesicht mittels Augmented Reality) ausprobieren.	○	○	○	○	○	○	○

5. Bitte beschreiben Sie in 2-3 Sätzen, wie Sie nachdem Sie auf den Link gedrückt haben, vorgegangen sind.

[ ]

Weiter

6. Bitte geben Sie an, inwieweit Sie den folgenden Aussagen zustimmen.

Nachdem ich die Online-Produktpräsentation von L'Oréal gesehen habe,

	stimme gar nicht zu					stimme voll zu	
	1	2	3	4	5	6	7
kann ich mir gut vorstellen, was dieses Produkt leisten würde.	○	○	○	○	○	○	○
fällt es mir leicht, mir vorzustellen, wie ich das Produkt verwende.	○	○	○	○	○	○	○
fällt es mir leicht, über die Verwendung des Produkts zu fantasieren.	○	○	○	○	○	○	○
fällt es mir leicht, mir vorzustellen, wie ich das Produkt genieße.	○	○	○	○	○	○	○

Weiter

7. Bitte geben Sie an, inwieweit Sie den folgenden Aussagen zustimmen.

Nachdem ich die Online-Produktpräsentation von L'Oréal gesehen habe,

	stimme gar nicht zu					stimme voll zu	
	1	2	3	4	5	6	7
bin ich nicht mehr unsicher, was die Beschreibungen dieses Produkts angeht.	○	○	○	○	○	○	○
bin ich nicht mehr unsicher, was die zukünftige Leistung dieses Produkts angeht.	○	○	○	○	○	○	○
ist meine Unsicherheit über die tatsächliche Qualität dieses Produkts beseitigt.	○	○	○	○	○	○	○
zweifle ich nicht mehr daran, dass das Produkt meinen Anforderungen entsprechen würde.	○	○	○	○	○	○	○
zweifle ich nicht mehr daran, dass das Produkt meinem Geschmack entspricht.	○	○	○	○	○	○	○
zweifle ich nicht mehr daran, dass das Produkt meinen Vorstellungen entspricht.	○	○	○	○	○	○	○

Weiter

8. Bitte kreuzen Sie das Feld in der Mitte an.

1	2	3	4	5
○	○	○	○	○

Weiter

Welche Emotionen erwarten Sie, wenn Sie daran denken, eines der im Online-Shop vorgestellten Produkte zu verwenden?

	stimme gar nicht zu						stimme voll zu
	1	2	3	4	5	6	7
Freude	○	○	○	○	○	○	○
Vergnügen	○	○	○	○	○	○	○
Aufregung	○	○	○	○	○	○	○
Fröhlichkeit	○	○	○	○	○	○	○
Zufriedenstellung	○	○	○	○	○	○	○
Neugierde	○	○	○	○	○	○	○

Weiter

9. Bitte geben Sie an, inwieweit Sie den folgenden Aussagen zustimmen.

	stimme gar nicht zu						stimme voll zu
	1	2	3	4	5	6	7
Ich kaufe gerne online ein.	○	○	○	○	○	○	○
Online-Shopping ist ein effektiver Weg zum Einkaufen.	○	○	○	○	○	○	○

Weiter

10. Bitte geben Sie an, inwieweit Sie den folgenden Aussagen zustimmen.
Ich beabsichtige, in Zukunft Make-up von diesem Online-Shop zu kaufen.

	-3	-2	-1	0	1	2	3	
Unwahrscheinlich	○	○	○	○	○	○	○	Wahrscheinlich
Unmöglich	○	○	○	○	○	○	○	Möglich
Unsicher	○	○	○	○	○	○	○	Sicher

Weiter

11. Wie oft kaufen Sie Make-up?

○ Weniger häufig

○ Mindestens einmal im Monat

○ Mindestens einmal alle sechs Monate

○ Mindestens einmal pro Woche

○ Mindestens einmal alle drei Monate

○ Mindestens einmal im Jahr

12. Wo kaufen Sie Ihr Make-up?

○ Nur in stationären Geschäften

○ Nur online

○ Sowohl stationär als auch online, aber hauptsächlich stationär

○ Sowohl stationär als auch online, aber hauptsächlich online

○ Sowohl stationär als auch online (gleichmäßig verteilt)

13. Haben Sie in den letzten fünf Jahren bei L'Oréal eingekauft?

○ Ja

○ Nein

14. Haben Sie schon einmal den L'Oréal-Onlineshop besucht?

○ Ja

○ Nein

15. Wenn ja, haben Sie schon einmal ein Produkt über die Website gekauft?

○ Ja

○ Nein

Weiter

16. Haben Sie schon einmal eine virtuelle Anprobefunktion verwendet?

○ Ja
○ Nein

17. Bitte bewerten Sie die folgenden Aussagen.

In Bezug auf Augmented Reality (AR) betrachte ich mich als

	-3	-2	-1	0	1	2	3	
Nicht vertraut	○	○	○	○	○	○	○	Vertraut
Unerfahren	○	○	○	○	○	○	○	Erfahren
Unwissend	○	○	○	○	○	○	○	Wissend

18. Bitte geben Sie an, inwieweit Sie den folgenden Aussagen zustimmen.

	stimme gar nicht zu						stimme voll zu
	1	2	3	4	5	6	7
Ich bin besorgt über die Weitergabe meiner persönlichen Informationen in diesem Online-Shop, weil ich befürchte, dass andere damit etwas anfangen könnten.	○	○	○	○	○	○	○
Ich bin besorgt über die Weitergabe meiner persönlichen Informationen in diesem Online-Shop, weil sie auf eine Weise verwendet werden könnten, die ich nicht vorausgesehen habe	○	○	○	○	○	○	○
Ich glaube, dass ich in der Lage bin, meine persönlichen Daten im Internet zu schützen.	○	○	○	○	○	○	○
Es ist einfach für mich, die Privatsphäre im Internet durch die Aktivierung von Funktionen zu wahren.	○	○	○	○	○	○	○

Weiter

Alter

[   ]

19. Höchste abgeschlossene Ausbildung

[Bitte auswählen] ⬍

20. Geschlecht

[Bitte auswählen] ⬍

Weiter

Vielen Dank für Ihre Teilnahme!

Wir möchten uns ganz herzlich für Ihre Mithilfe bedanken.

Ihre Antworten wurden gespeichert, Sie können das Browser-Fenster nun schließen.