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Reality vs Digital image - A virtual makeover

A study on how customers experience AR in the makeup & beauty industry

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Title

Reality vs Digital image - A virtual makeover: A study on how customers experience AR in the makeup & beauty industry

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Abstract

Augmented Reality (AR) technology is steadily gaining presence in the online retail environment. The technology makes it possible to create a visual representation of a product in a customer's device to experience the product in real life. To study the customer's affective response to the experience, the research is conducted in the makeup and beauty industry, where retailers are trying to recreate visual stimuli in the try-on sphere of different products. Previous research has identified elements of AR experience which are, *Interactivity, Augmentation, Vividness, Aesthetics,* and *Playfulness*. This study combines the elements of the previously studied Flow stage model to analyse the affective responses in correlation to a psychological theory. A qualitative study approach through online focus groups was made to examine the respondents' experience with AR try-on. Findings show that users experience the visual stimuli differently depending on the elements. Although the visual stimuli were often perceived as unrealistic, the users still felt satisfaction surrounding the projection of the product and reached the Flow stage of concentration throughout the try-one. One element that emerged was *playfulness* which distinguished the experience compared to the real-life shopping experience. The results of the thesis contributed to an insight into how customers experience element aspects of AR in retail.

Keywords

Augmented reality (AR) experience, Virtual try-on, Makeup and beauty industry, AR five elements, Flow psychological concept, Customer experience

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1 Introduction

Imagine that Amelia is sitting at home and watching a YouTube tutorial about new makeup. After Amelia finished watching the video, she became eager to test the new products. The problem is that the products are only sold via the website and Amelia has no store near where she lives that sells these specific products. She wanted to order but hesitated because she was uncertain how the makeup would look on her or what colors and shades to choose. Amelia has received a tip from a friend that some websites that sell makeup and beauty products use a technology that makes it possible to test products virtually. The technology projects an image on the user's face to help determine which product suits the buyer. Amelia has after a few clicks been able to test the products on herself with the help of her phone and then ordered what she considered suitable for her. This is an example of a customer journey based on *Augmented Reality*, also known as *AR*. Unknowingly the technology, has become a part of our everyday life, from the use of filters via various apps to get an image on your screen that is built up of your reality. AR is still in the technological development and improvement phase and so is the number of growing users (Madeira et al., 2022).

The retail environment is always developing innovative experiences that can overcome the physical barrier between the product and customer in product presentation. Technological advancement in recent years has enabled retailers to create new ways for customers to experience shopping more vividly, with AR as a frontrunner in making these experiences possible (Kowalczuk et al., 2020). The technology behind AR creates a link between a virtual object that is visualized in the real world by implementing computer-generated images in a real-life scenario. With the help of AR, customers can experience a similar visual sensation of a product as offered when shopping in a physical store (Mclean, 2019).

A person's appearance is considered important in today’s modern times, as it is a big part of people's everyday life. The makeup and beauty industry has built up a culture, where new trends are constantly evolving (Dambrin & Lambert, 2017). Being attractive has for long been associated with happiness, success, and positivity. During various psychological studies that have studied people's appearance and attractiveness, the results have repeatedly shown that a

positive image is created around an attractive person (Rajanala et al., 2020). Trends are in a constant phase of change as the taste for different styles changes. Technological advancements have made it easier for the production of new makeup and beauty products. Now manufacturers can offer their customers a larger range of makeup with different shades in a significantly shorter production time. As the population is also in a growing phase, large industries such as makeup and the beauty industry need to keep up with the right products for each segment (Kumar, 2005).

AR technology in retail lets customers interact with a product using gestures, and the possibility to adapt the product to whatever preferences the customer wants. The ability of product interaction with AR has previously been limited to the web experience most people are used to (Song et al., 2019). Technology has allowed retailers to experiment with AR technology to convert typical activities such as try-on for customer convenience (Mclean, 2019).

1.2. Problematization

The number of worldwide AR users has increased considerably in recent years and is currently predicted to be surpassing a billion active users in the year 2022. Future predictions show that the number of AR users is an estimated 1.7 billion people (Statista, 2022). With advancements in technology, AR is considered to be a solution for an improved shopping experience compared to the current web shopping experience. Additionally, online shopping is facing certain issues attributed to a poor product presentation lacking sensory attributes compared to a physical store environment (Smink et al., 2019). AR is also associated with high development costs for retailers with relatively small amounts of research surrounding the topic. Even though a few retailers have started to experiment with AR in the try-on sphere online, their purpose and underlying customer experiences of the technology research are demanding (Kowalczuk et al., 2021).

In the visual spectrum of how a product is visualized with the use of AR, research mentions that customers' perception of vividness and aesthetics is relevant for the customer in terms of visualization (Wang et al., 2021). Furthermore, Kowalczuk et al. (2021), state that findings show that elements of AR interaction such as *interactivity* contributes to the usefulness of AR and the increase of positive opinion towards the product. Along with the elements mentioned augmentation of the product which is not only the quality but the perception of the customer

towards a product, is part of the AR experience according to AR research by Kowalczuk et al. (2021). The last element studied in previous research mentions that AR creates playfulness which might encourage influence on the behaviour of perceived experience (Wang et al., 2021). Interestingly, the element of playfulness is different from the normal online shopping experience where it can create a temporary escape from what the customer is doing by creating a simulated experience (Huang & Liao, 2014). In addition, it has been concluded that experiences in AR can be explored through the Flow model, which started of as a psychological theory of the mental state (Gao et al., 2015). Previous research mentioned how the model has been implemented in relation to how customers react to an experience (Javornik, 2016).

Previous studies have either focused on AR from a marketing perspective, where companies have been in focus, or from the perspective of e-customer purchase behaviour. Chylinski et al. (2020) have researched the customer experience through an AR marketing perspective, to determine customers' marketing preferences in the AR segment from a corporal view. They found that the usage of AR in marketing could lead to a more pleasing purchasing experience for the customer. The reason behind this is how customers experience the generated image on a physical surface as a reality. This study was conducted with a quantitative approach. Similarly, a quantitative approach from Song et al. (2019) explores retail shopping changes and digital tools that facilitate the current purchasing process for customers. The AR purchase experiences and the impact it has on customers have not been well researched according to the authors' Song et al. (2019).

Brands need to keep in mind the challenges AR might bring. However, what they often fail to mention is the experiences the customers have when using AR. Additionally, there has not been any study made with a correlation between AR and the try-on experiences of customers in the makeup and beauty segment. According to previous research, the online shopping experience has its weaknesses compared to physical shopping, with the solution being the elimination of the physical barrier (Kowalczuk et al., 2020).

Therefore, it is relevant to study the effect AR can have on the customer experience while testing products in the online retail environment. Considering that previous studies have been conducted on the effects of AR as a technological tool, creates questions about what customers experience when using AR. Furthermore, this study will contribute to possible values that the

technology can bring to retailers and information regarding the use of AR in the makeup and beauty industry.

1.3. Purpose

The purpose of this study is to explore how customers experience AR try-on in the makeup and beauty industry. This study will contribute meaningful information surrounding research experiences connected to the makeup and beauty industry regarding how the usage of AR is reflected from a customer perspective. AR as a technological tool has multiple implementations with this study referring to both the users and customers depending on where AR is applicable, to study the AR experience.

1.4. Research question

- How does AR affect the customer experience in the makeup and beauty industry, underlining the AR construction and psychological experience reaction during the AR try-on?

2 Theoretical Background

As the aim of the present thesis is to analyze how customers experience AR elements in the makeup & beauty industry, in this chapter we will present a review of the five important elements regarding AR perception and the psychological theory of Flow. Additionally, the correlation between the two models will be reviewed. These aspects are relevant to study in the field of AR customer experience.

2.1 Affective responses of AR Elements

According to Wang et al. (2021), AR is a computer-generated experience that allows customers to virtually try-on a product. Costumers associate AR with various experiences, which can be conceptualized into five elements. Firstly, *Interactivity* defines how the interaction is adapted to suit customers' preferences and expectations of a smooth system (Wang et al., 2021). Secondly, *Augmentation* is the core defining element of virtual image projection (Wang et al., 2021). Thirdly, *Vividness* distinguishes the richness of sensory product experience (Yim et al., 2017). Fourthly, *Playfulness* is linked to positive reactions to the experience and the degree of enjoyment is determined by cognitive aspects (Huang & Liao, 2014). Lastly, *Aesthetics* relates to how the visualization can fulfil the experience compared to what is offered in-store, in terms of stimuli such as *smell*, *feeling*, and *perception* (Wang et al., 2021).

In this research, we have chosen to organize these into sub-titles that will present the five AR elements connected to the customer experience. Furthermore, the AR environment and its visualization will be presented. Additionally, the customer perception and the affective response towards the elements will be discussed.

2.1.1 Interactivity

Interactivity in the AR sphere can be defined from two perspectives, the effectiveness of AR from a technological perspective, and how users approach the concept. The effectiveness of the technology defines how each user can interact with the content which is projected by AR. Interactivity is built on the subcomponent's speed, mapping, and range. Firstly, speed determines how fast users can switch between the content projected in the environment. Secondly, mapping refers to how effective the similarity in controlling the environment is

compared to the real world. Lastly, range examines how far the content in the AR environment can be used (Yim et al., 2017).

User interactivity is subjected to how an individual's traits are activated when interacting with AR. If an individual is unmotivated in terms of interaction, it will result in a lack of Interactivity between a system and an individual. The need for motivation is important for the experience to be utilized which is affected by the technological aspect of AR (Yim et al., 2017).

The aspect of Interactivity in previous research has studied the offline environment in connection to a customer and a retailer. Finding a connection and being able to identify with brands and products is something that is considered an important part of customers' experience. From a customer perspective, interactivity refers to brands' willingness to communicate and interact with their customers, which should be done with a sense of authenticity. Interaction in terms of customer preferences is easier to achieve in a physical environment. From a customer's perspective, brand engagement increases when they can identify with brand values. Interactivity takes place at a stage where the customer gets a sense of understanding and interest from the companies, this can be a challenging stage as buyers usually have high demands on brands (Wang et al., 2021).

In recent years Interactivity has been developed to be identified in an online environment that is related to AR usage. The Interactivity in AR can be found in customer interaction with the products visualized on the screen. In terms of the ability for the customer to seemingly explore what is offered by the retailer (Wang et al., 2021).

The difference between Interactivity in a physical environment differs in comparison to the digital experience that a person experiences on a website. In a physical store, the contact between seller and buyer is an important component for creating an interaction. When it comes to creating the same conditions through a digital sale, AR comes in handy when the customer gets an opportunity to design the digital image into their reality. This results in the buyer ending up in a psychological stage where some form of behavioural reaction is conveyed to form a positive reaction to the experience (Gligor & Bozkurt, 2021). The importance of a good web design goes hand in hand with interaction, as a well-designed website where the information is available to customers usually results in a recurring visit. To have a better digital experience,

customers can, through Interactivity, screen out and filter out the information that is necessary for the specific need (Tang, 2020).

To determine how customers experience Interactivity when integrating with AR in the makeup and beauty sector certain attributes need to be fulfilled. These attributes include *speed*, *mapping*, and *range* of AR's technological possibility of image visualization need to be fulfilled. Additionally, the effectiveness of technology affects customer motivation to continue the process of AR image visualization. This can be achieved with a proper web interface that correlates with how customers experience Interactivity (Tang, 2020). Depending on the outcome the motivation has a direct effect on the experience of interactivity in customers. Therefore, Interactivity is a core attribute of the customer AR experience (Yim et al., 2017).

2.1.2 Augmentation

A defining AR technology characteristic is a projection of a virtual image to create a sensory environment for the user with the help of a device in the form of a phone or tablet.
Augmentation is an affective response that projects virtual images in a real environment for the user to experience, which is a different approach compared to the traditional two-dimensional content users are used to. The aspect of augmentation is therefore relevant to how AR is presenting the virtual approach in terms of quality (Wang et al., 2021).

Augmentation makes it possible to transform a virtual object and make it feel as if it was realistic, simultaneously giving the user a better sense of the item as a reality. This creates an opportunity to break the wall between human and machine boundaries. Therefore, Augmentation has a connection with the cognition of how users experience a certain task (Wang, 2021). The quality of Augmentation is important to create a realistic portrayal of a visual image. Augmentation that has a higher quality is considered better than a similar object presented two-dimensionally on a website (Kowalczuk et al., 2021).

An effective response can be seen through how Augmentation is perceived from the customer's perspective. For example, comparing how natural the projection of an augmented image is experienced by the user to the perception of how a real product would look. AR in a retail context is supposed to give customers a realistic portrayal of a product. The perception of an authentic image reduces the void between reality and virtual visualization. Correlation between

how a user can fluently process, navigate and identify features of augmentation reflects how the experience is perceived from a user perspective. Lower quality of a perceived product Augmentation creates an unrealistic experience (Rauschnabel et al., 2019).

2.1.3 Vividness

The aspect of Vividness determines how AR technology can produce an environment for the user experience, in terms of which visual senses are activated upon trying on products. For instance, the visual boundary between AR and a realistic image defines how Vividness is perceived (Wang, 2021). A realistic product portrayal in the hand of the user contributes to a vivid perception of the experience a customer would have in the store which makes shopping more effortless. Vividness has to be present to capture the product graphic presentation, such as the *sharpness*, *detail*, and *clarity* in terms of colours. These aspects need to be qualified to create usefulness in relation to technology and for the end-user in AR (Kowalczuk et al., 2021).

Vividness can be described as a colour-rich sensory environment. In the AR aspect Vividness is a combination of the sensory experience of vivid presentation of a physical product combined with the illusion of an experience that a non-sensory object is being projected correctly. A vivid presentation stimulates the cognitive processes of a customer that interacts with a given product. Additionally, a well-defined vivid AR presentation produces a mental image that helps customers create positive connections to a product and willingness to further interact with the technology (Yim et al., 2017).

Vividness can be identified as where depth and breadth are added. In this aspect, depth refers to how the quality of provided information is viewed by the users and breadth incrementally defines the number of sensory aspects that are interpreted. A clearer image of higher quality creates a higher perception of Vividness (Yim et al., 2017). As a result, the Vividness factor is relevant to research on how customers experience the colour sensory environment (Kowalczuk et al., 2021).

Vividness has a central role in AR's affective response to the experience. The visual aspect is the first thing the customer responds to on a website, hence the products presented and visualized through AR should be created similar to how a real-life product would be portrayed. A realistic image that consists of high-quality pictures is a necessity to be able to interpret the

AR experience. To determine what is considered high-quality, the product needs to fulfill details, color sharpness, and quality. If Vividness is perceived as unappealing and visually unpleasant the experience of AR will result in an unfavorable experience for the customer. This means Vividness in AR correlates with the experience outcome (Yim et al., 2017).

2.1.4 Playfulness

Playfulness is an effective response in AR that contributes to creating a valuable experience to stimulate the customer expectation of a product (Grzegorczyk et al., 2019). AR in an online environment can emerge from a shopping experience into a form of enjoyment that differs from traditional practice. Enjoyment creates a temporary playful sphere for the customer incited using AR (Huang & Liao, 2014). It allows the customer to create their playful sphere where they are no longer observers and rather become respondents in the experience (Mathwick et al., 2001).

Playfulness experience can emerge when a customer interacts with the presented image provided on the screen with the help of AR (Moon et al., 2001). In the aspect of the retail shopping experience, Playfulness can create a temporary positive illusion of departure from the typical shopping experience. The background surrounding Playfulness is established as an escape from usual demands in activities that appear outside the online environment (Mathwick et al., 2001). Creating enjoyment can indirectly target customers, and affective responses of playfulness are set in motion. The reason for indirect targeting is that Playfulness is a value that relates to a form of pleasure. Compared to the aspect of Vividness, Playfulness is only related to the task the user is immersed in and does not affect the visual aspect of the Augmentation (Wang et al., 2021). The subjective nature of value creation is a result based on Playfulness and usually is more important than finishing the process. Additionally, Playfulness indirectly affects attitude toward other responses that a customer experience (Mathwick et al., 2001).

Playfulness can be found in emotions emitted from the user when interacting with a projected image through AR. Furthermore, the ease of use can distract and affect enjoyment resulting in a less playful experience for the customer (Wang et al., 2021). Interactions that feedback response in a playful demeanor affected customers' ability to self-control even in unknown environments. The state of Playfulness also affects the perception of interaction which influences how the user experiences Interactivity. (Moon et al., 2001).

2.1.5 Aesthetics

Aesthetic, which is the fifth element of AR perception, can be expressed as a symbol of a dynamic culture that is encompassed by human beings' views on taste, design, and art. This is categorized within the dynamic individual culture as the preferences change at a rapid pace, hence its development must also be constantly satisfactory to customers (Vazquez et al., 2020).

Wang et al. (2021) emphasize that visual appearance is an important factor in being able to attract customers to a good purchase experience. With the help of AR, users can get a feeling that is very similar to the real shopping environment found in a physical store. The Aesthetic element has a value that can lead the customer satisfied through visualization, which in turn can lead to amusement.

The senses are an important part of Aesthetics, but it also has a great significance for the users' experience. The senses that are significant in Aesthetics are the feelings around the product, design, and symbol that represents art. The significant role of Aesthetics is based on the factor of people's attraction toward the senses. However, the view of Aesthetics in an online web shop differs from the visual image that arises in a physical store, this is connected to the senses being seen and felt in a different area. Aesthetic perception in AR contributes to a deeper relationship between the customer and the brand. The biggest difference between Aesthetics in a physical store compared to an online web shop is that the emotions that a customer builds up through senses are not traceable in the same way. Senses such as *smell*, *feeling*, and *perception* cannot be fulfilled in an online environment. AR is helpful in replacing the missing senses and at the same time. To build a relationship, AR has been helpful to strengthen customers' senses while at the same time being able to visualize products on their screen (Vazquez et al., 2020).

Table 1
Augmented Reality Elements

AR Elements	Effects	References
Interactivity	-Engagement between customers and a firm	(Gligor & Bozkurt, 2021),
	- Form of reaction is conveyed	(Tang, 2020)
	- Good web design available for customers	(Wang et al., 2021)
		(Yim et al., 2017)
Augmentation	-Projection of a virtual image to create a sensory experience	(Kowalczuk et al, 2021)
	-Wall between humans and machine	(Rauschnabel et al., 2019)
	-Higher quality of augmentation creates realistic portrayal	(Wang, 2021)
Vividness	-Environment for user experience of sensory perceptions	(Kowalczuk et al, 2021)
	-Graphically realistic portrayal creates a vivid image	(Wang, 2021)
	-Sharpness, detail and quality need to be fulfilled	(Yim et al, 2017)
Playfulness	-Temporary positive illusion of enjoyment usually found in shopping experience	(Grzegorczyk et al., 2019)
	-Targets customers indirectly, a hedonic value that relates to pleasure	(Huang & Liao, 2014)
	- Affectes customers' ability to self-control	(Mathwick et al., 2001)
		(Moon et al., 2001)
		(Wang, 2021)
Aesthetics	- Symbol of views on taste, design, and art	(Vazquez et al., 2020)
	- Similar experience to a shopping environment	(Wang, 2021)
	- Important to strengthen senses of smell, feeling and perception	

2.2 The Flow experience, a psychological concept

To understand the customers' AR experience in virtual makeup and beauty products try-on, Flow psychological model will be used. The model provides a deeper understanding of the mindset the user experiences during the interaction of a specified task. In this case, the task presented is connected to the usage of AR on a website. In this research, three Flow components, *concentration, enjoyment, and control*, will be used as a foundation for understanding the customer experience state of mind (Gao et al., 2015).

Flow is a psychological concept that is about an examination of how a person's concentration is played out in different activities (Wang et al., 2021). Gao et al. (2015) found that Flow has in previous research examined people's activity involvement and awareness absorption in activities. However, newer research presents Flow in both an online environment and in a physical environment. In the online environment Flow stage can be measured through a subconscious experience of the environment. There are three relevant stages measured within Flow assigned to the online environment. These are, the ability to concentrate, what control the individual has to be able to perform a given task, and the level of enjoyment (Gao et al., 2015).

The Flow model can be described as a balance between a person's scepticism, and their knowledge while completing a task. The balance is an important part of this model, for example, if the user's understanding is much wider compared to the resistance encountered, it can lead to a feeling of boredom. If symmetry is found between the user’s knowledge and the difficulties they encounter along the way, there is balance, which ultimately leads to the Flow experience. The Flow model consists of several components, but the convenient ones are, *perceived control, perceived enjoyment*, and *concentration*. Recently, a new part of the Flow concept has been developed and it is specially built for digital purchases. Users who are to order an item online must possess technological knowledge to complete the task. Some obstacles, for instance, sharing of personal information, bad web design, and insufficient network can create a negative impact on the digital experience (Gao et al., 2015).

Vazquez et al. (2020) accentuate that a customer experiencing the stages of Flow has a significant role in recurring purchases. When a customer reaches the Flow stage a higher level of engagement with the brand can be found. Gao et al. (2015) also emphasize that the Flow stage can be seen as a motivating factor among customers. For Flow to be achieved, the

importance of offering valuable and high-quality information is essential. Jung et al. (2009) highlights the results that the Flow state of mind can have on customers viewed from a long-term perspective. The outcome when Flow is fulfilled is a more flourishing and powerful attitude of mind around people.

To understand the Flow model's involvement with the AR experience, the three stages of components are, *concentration, enjoyment,* and *control.* All three components are in need to interact with each other for the customer to reach a Flow stage. *Concentration* is the view of attention given to a specified task, whether the customer experiences any obstacles during the visualization of AR on the screen. If the obstacle exceeds customers' technological competence in handling the process results in an imbalance between the Flow stage. The imbalance of knowledge and the visual obstacle has a direct effect on the second component which is the *control* the user has over the technology. In other words, the *control* component determines if the customer experiences persuasive intention to operate with AR. Furthermore, the lack of *control* contributes to an experience where *enjoyment* cannot be reached. The *enjoyment* stage is the third component which stands for the experience of satisfaction. Enjoyment can only be reached by the customer if the two other components mentioned above are in balance. Additionally, the physiological stage of the Flow experience will be completed when all of the three components in the online environment are fulfilled. In the context of AR, the knowledge of technology and the balance of difficulties that are connected to the given task are fundamental to succession to the three components. Therefore, it is crucial for a customer to have some background knowledge of the AR technology for Flow accomplishment (Barhorst et al., 2021; Kowalczuk et al., 2020).

2.3 Interaction of the Five elements and Flow in AR

To explore how customers experience AR in the makeup and beauty industry, the following experiences of *Interactivity, Augmentation, Vividness, Aesthetics,* and *Playfulness* are based on literature reviewing AR application and studying customer stimuli experiences (Gligor & Bozkurt, 2021; Huang & Liao, 2014; Kowalczuk et al., 2021; Tang, 2020; Wang et al., 2021).

Flow's physiological concept has a strong connection to the technological part of AR as well as to the task needed to be completed by the customer such as trying on the products in the virtual try room. Flow can be described as a stage where the customer can by interacting with the five

elements mentioned above reach the mental stage of concentration. The five elements of AR *Interactivity, Augmentation, Vividness, Aesthetics,* and *Playfulness* can be described as the fundament required for the possibility of achieving the mental stage of Flow. These parts go hand in hand to be able to contribute to an experience where the customer puts their skills and abilities into play to meet the given task.

Findings related to Interactivity are connected to Flow in terms of the technological interactive aspect of website usage. A high level of Interactivity means the customer feels a strong connection to brand engagement and ease of use which meditates the Flow stage satisfaction. The reason is that Interactivity extracts engaging values surrounding the ease of use which affects whether a stage of Flow is reached (Kowalczuk et al., 2021).

The element augmentation in AR is according to previous research also strongly related to the mediation phase of Flow. The projection of an augmented image relates to how customers can reach Flow if the customer experiences a high-quality visualization of the product increases the chance of a Flow state (Rauschnabel et al., 2019).

Vividness in relation to the psychological model of Flow is associated with the sensory stimuli of the visual quality sharpness and clarity of the projection. With the sensory aspects of Vividness affecting Flow, in a way that the projected visual stimuli prevail, ignoring other senses such as touch and smell. This also translates to previous AR experiences where people that have more experience are less reluctant to Flow through the element of Vividness (Yim et al., 2017)

Previous research around Playfulness in the technology sphere focuses on how an individual is mediated by the experience of the interaction in terms of Flow. The usefulness of the playful experience has been crucial in the examination of users' interaction with a web-based technology tool such as AR (Moon et al., 2001). The Flow stage of playfulness can be achieved when a user's skill and the emerging challenge are at a similar level, and when there is a playful environment surrounding the interaction. When these two characteristics are achieved, a Flow stage is reached by Playfulness (Woszczynski et al., 2002).

Aesthetics, according to Vazquez et al. (2020) is a driver in terms of experiences and impact on the Flow stage. The visual sensory representation of Aesthetics is what customers experience when interacting with AR and the initial sensory factors of views of the products stimulate similar experiences customers have in-store (Vazquez et al., 2020).

3 Method

The following chapter will present our chosen method will be described and well-argued. A further explanation of our research approach, design, and strategy as well as data collection will be discussed. Furthermore, we will define the choice of theory and why it is relevant to our thesis. Additionally, a discussion surrounding the selection of respondents, focus group guide and data analysis will be presented. At last, this chapter will include a presentation of the research paper's trustworthiness and the limitations will be discussed.

3.1 Research philosophy

According to Bryman & Bell (2011), the epistemological theory is a description of the validity of what an acceptable stance of knowledge is. The three epistemological theories described are *interpretivism, realism, and positivism*, in which each of them has a direct effect on the chosen research method and strategy.

The theory of *interpretivism* is based on the philosophy of critical utilization of scientific theories to research a subject in qualitative research studies. What distinguishes *interpretivism* from the two other approaches is the research approach against what is considered natural. Through *interpretivism*, researchers need to research why people act in a certain way. When the researcher grasps the background behind the human action, a relevant conclusion can be made (Bryman & Bell, 2011).

Realism philosophy applies commitment to using the same approach surrounding the collection of research data and discussion of the findings. Furthermore, another concept of realism is the belief that there always is a different reality, which refers to a two-sided view of a research question. These approaches are also shared by *positivism*. The philosophy of positivism differs from realism in the approach to study method and the research question in relation to reality and future implications. The importance of collecting relevant data is of great importance in positivism, as the understanding of the social world increases (Bryman & Bell, 2011).

For our thesis *interpretivism* is the relevant choice of research philosophy, as the purpose of this study is how customers experience AR virtual try-on. To understand why the respondents,

react in a certain way when it comes to the AR experience, interpretivism studies the outcomes of theories in this research. Moreover, the AR experience circles around the interaction between the customer and the projected image on the screen, which also argues the applicability of the philosophical theory of interpretivism (Bryman & Bell, 2011).

3.2 Research approach

When writing a research paper, the method plays a central role as the empirical data is based on the approach presented in the methodology. Lind (2019) describes the importance of data collection, and that the choice of method reflects the researchers' approach. There are three different approaches a researcher can work from, those are, *Deductive, Inductive, and Abductive.* This study will be based on a *deductive* approach since this research frequently will have a starting point based on theories from the previous research. Lind (2019) mentions the importance of a theoretical framework in the *deductive* approach, as they stand as a basis for a variation that is supposed to be significant and characterize the study. The theoretic framework is also relevant in this study as the researcher must be able to interpret and analyze the results from the experiment. Bryman & Bell (2011) believes that the *deductive* approach is the most common, concerning the relationship between researchers and the chosen theory. Additionally, Lind (2019) describes the deductive analysis strategy, has an equal weight in both the initial work and the result of the research.

The current study intended to explore how customers experience AR in the makeup and beauty industry, especially in connection to the five AR elements and the psychological model called Flow, a broad theoretical framework was, therefore, a necessity. Considering that there was a sample of research in the category of AR and the customer experience, we wanted to construct and form our research in connection to the current theories as well as earlier research. With this study, the intention was not to present new theories, instead, the purpose was to utilize the current theories to study the research question surrounding AR experiences. The theories were later on implemented through our empirical study. The above-mentioned arguments strengthen the intention behind the choice of the *deductive* approach.

3.3 Choice of Theory

Lind (2019) clarifies the reasons behind why researchers use theories, which is to investigate, understand and explain different phenomena of research questions. The use of theories in scientific writing is a component that stands as a foundation for being able to interpret and analyze the collected empirical data and answer the research question. The theory can be described as a guide for relevant research work and it is important to be able to specify chosen theories. Theories that are out of context can affect the outcome and will not answer the research question correctly.

Previous research has focused on AR either from a marketing perspective or from a purchase behavior perspective. For instance, the effect AR has on the purchase stages in customers' decision-making process, and what experiences customers experience when they interact with AR. The discussed themes in previous research were valuable and convenient for the research about how customers experience the AR elements not only limited to the makeup and beauty industry. We consider the choice of the five elements relevant as they can give an in-depth analysis from five different perspectives of the experience.

The elements in previous research initially presented various elements connected to AR.
Each study focused more on some parts of the elements that were relevant for their thesis, but over the recent years the five elements, *Interactivity, Augmentation, Vividness, Aesthetics,* and *Playfulness* have been in focus. It is therefore relevant to use these five elements due to technological development to accommodate AR research.

Additionally, to be able to analyze an experience through a psychological perspective the Flow theory has been used. The Flow theory came into use to measure the satisfaction of the AR experience. In the field of previous research, Flow has been used together with the five elements to determine whether the experience meditates into a Flow stage. The technological aspect of Flow has been researched in AR, therefore we consider the theory to be an important element in our study. With the help of these two theories and empirical data gathered through focus groups, a complete analysis could be carried out.

3.4 Research design and strategy

Business research strategy, according to Bryman & Bell (2011), is often shaped by two different aspects, which are, the current business world and different social traditions tied to business research. It is crucial to choose a design that goes hand in hand with the chosen research philosophy, which in this study is interpretivism. The philosophy of interpretivism stands for the knowledge behind a human's actions, rather than studying the reasons behind the actions. Since this study's purpose is to investigate an area that has not been fully developed in previous studies, the study, therefore, takes a lead in an exploratory design. Furthermore, this study is based on qualitative data collection, this approach is according to Lind (2019) connected to the theory of interpretivism. There are two leading research strategies, which are either quantitative or qualitative, the chosen strategy is a central part of research to be further developed. Bryman and Bell (2011), mention the fundamental difference between these two approaches is that quantitative research is used to test a theory and qualitative should generate theories. However, this is not completely right as a qualitative approach can also be used to test theories. The research paper was planned to be a combination of a qualitative and quantitative study. According to Brymann and Bell (2011), a mixed-method approach that combines the two different research methods makes it possible to make a clearer picture in a study. Additionally, the complexity of the study is increased. However, after careful consideration of previous research outcomes of such studies, and possible research strategies, the choice landed on a qualitative study approach. The qualitative approach is relevant for the purpose of this study due to previous research mainly using a quantitative approach. Our purpose is to examine the AR try-on experience which would not be possible while using a quantitative strategy, as the collection of the empirical data is often based on surveys.

3.5 Data collection

For the choice of method to have a clear connection to the purpose of our study and the research question, we have chosen to use research groups to be able to collect relevant data that can provide useful information to us researchers. Denscombe (2012) describes *Focus groups* as semi-structured group interviews where all the respondents have relatively similar knowledge of the theme that was discussed. The valuable information that researchers can get out of focus groups is an insight into the respondents' perceptions, attitudes, ideas, and general thoughts about the chosen research area. The usability of focus groups is at its best when researchers in a new research area want to be assigned answers that are based on emotion and perception. The

data collected through a focus group distributes the researchers with useful information that can show differences between perceptions about the chosen topic, another interesting material that you as a researcher also have access to is the underlying factors within the respondents' views.

The focus groups were held on Zoom Online which made it easier for respondents to join from any desired location. The advantage of conducting focus groups online compared to in person is the ability for moderators to collect respondents in one space without having them travel to a specific location. Therefore, respondents from different locations can join and discuss their experiences. Any need to book a space and preparation of recording equipment excluding a computer. This results in a minimalistic burden for both the moderators and respondents (Bryman and Bell, 2011). Tools provided by the application lets moderators easily record and control the online environment. The challenges however lie within the trust that all respondents can join the online conversation and not experience any technical difficulties. It can not be taken for granted that everyone has a certain technological proficiency, computer, webcam access, or stable internet connection. Topic-related limitations for focus groups online also need to be taken into consideration. In this case, however, an online approach is appropriate to determine experiences of AR due to the technology being present on any computer or smartphone. Respondents can therefore join from any location and be actively subjected to the discussion. Focus groups online currently offer similar experiences to on-site focus groups with benefits for both moderators and respondents with the exemption that technological challenges are not an obstacle. Unfortunately, this cannot be foreseen with the challenge being mainly added for the moderators to make sure that the focus groups will be successful and well prepared (Tuttas, 2014).

The Focus groups were divided into three sessions consisting of 14 respondents in total through Zoom Online. According to Bryman and Bell (2011), focus groups can offer the respondents a challenge of their opinions. The respondents can discuss them to explore their views from different perspectives. This argumentation might change their opinion resulting in a more vivid expression of their views.

Using computer-aided interview methods that are considered to be widely available in terms of owned equipment and software created ease of use for both the respondents and moderators (Bryman & Bell, 2011). The number of respondents ranged from four to five per focus group.

Focus groups should usually involve between 6-10 respondents according to Bryman & Bell (2011). However larger groups tend to be more difficult to moderate. Especially if the group is discussing the same question in a common space. Smaller groups have the advantage that they are often more dynamic as every respondent has more pressure to engage in the discussions. Smaller groups are often the difficulty ensuring attendance for all respondents and the logistics behind making everyone available (Bryman & Bell, 2011). In order to ensure attendance, the groups were planned to at least accommodate four people. One instance required one respondent to join a different group which is the reason for the uneven sorting.

The focus groups were recorded using the Zoom built-in recorder. In one instance after a software update, the meeting was also recorded on a phone to prevent technical difficulties. In the first focus group, the recording had to be split into two parts due to limitations in the software that allowed 40-minute long calls each time. Bryman and Bell (2011), mention that recording the audio in focus groups and transcribing them sequentially allows for a seeming less activity without moderators having to take notes and disrupt conversation. Each focus group session took around 60 to 70 minutes including a short introduction to the thesis. Some unplanned obstacles such as connection errors or waiting times affected the time. What follows is a table presenting an overview of the focus groups, where a presentation of the date, duration, and the number of participants of each group.

Table 2
Summary of focus groups

Group	Date	Time	Participants
1	2022-04-23	16:30 -17:35	4
2	2022-04-29	16:30- 17:40	5
3	2022-05-05	18:00-19:20	5

3.5.1 Respondent selection

This study aimed to explore how customers' feelings are perceived during the AR usage experience while trying on makeup and beauty products. Primarily, a *subjective respondent selection* was made. A subjective selection means that the researcher chooses respondents that are relevant to the aim of the study. Every respondent is handpicked, due to their interest and

personal qualities as well as their relevance to the research purpose. Another reason behind the choice of subjective selection is the advantages. The researcher can with the chosen selection conduct a closer view of people and phenomena, it is also more informative (Denscombe, 2018).

Based on the subjective selection, 17 females were contacted through different social media accounts such as Facebook and *Instagram.* A requirement for being able to participate in focus groups was that the women should be between 18-30 in terms of age and have a genuine interest in makeup and its use. The age criterion was limited as people from 18-30 years of age are active in e-commerce, but also usually have an interest in makeup and beauty products. A total of 14 respondents chose to participate in the study, the remaining three respondents chose not to participate due to lack of time. Lastly, three focus groups were assembled, the first group contained four females, and the second group consisted of five respondents. The last focus group was based on five female respondents.

Denscombe (2018) emphasizes the importance of trust within focus groups, with the help of trust a successful focus group is built. From this, the groups were constructed with respondents who had relationship with each other, this means that we as moderators would provide a secure basis for their discussions. The 14 female respondents from the three focus groups are summarized in *table 3* beneath.

Table 3

Focus Groups respondents' presentation

Group	Age	Occupation	Participant
1	27	Working	Anna
	24	Working	Beatrice
	26	Working	Clara
	24	Student	Daniella
2	21	Student	Elise
	27	Working	Fanny
	24	Working	Gigi
	23	Student	Hanna
	28	Student	Isa
3	18	Student, Working	Johnna
	27	Student	Kristina
	23	Student	Lisa
	26	Student	Maja
	24	Student	Nina

3.5.2 Focus group guide

The three focus groups were structured after a semi-structured interview guide, which also included some follow-up questions that were adjusted to the respondent's discussions (Appendix A and B). Before the respondents could start the discussion, a brief introduction to the thesis was presented. Then a fictional story linked to the AR experience was carried through the testing of makeup and beauty products online. This in turn would give the respondents a slightly deeper understanding of the AR context linked to makeup. The next step for the respondents was to test three different makeup and beauty products online with the help of AR, the link was sent out by us moderators who pre-selected three different products to broaden the perspective of the whole experience. Each respondent had to test the products to collect thoughts and feelings that came up during this experience. After a presentation of the meaning of the study, a small warm-up, and testing of the AR function online, the discussion could be started. The discussion in the focus groups was based solely on the experiences around AR, which the respondents were informed about in advance.

The respondents could freely discuss the questions connected to the experience with input from moderators if we felt that the conversation was not relevant to the experience or when the respondents were ready with their discussion.

After the first part of the focus group was completed a series of 16 questions were asked to the respondents to discuss their experiences. Some questions included one or two sub-questions to make it easier for the respondents to understand the main questions. Additionally, if they would deviate from discussing the experience of AR, the sub-questions would steer them in the right direction. With AR in the retail context, we understood that it is difficult to not only focus on the experience but on factors that might be connected to purchase which is not the intention of the study. The questions were based on the five elements of AR experience and Flow. Each element was additionally divided into two or three questions for each element for the respondents to discuss the AR experience.

Before the focus group ended, all participants would describe their AR experience in three positive and negative words. This is to be able to effectively connect their feelings after the discussion around the whole experience. When all the respondents finished describing the experience in three positive and negative words, we moderators thanked all the respondents for an interesting discussion and for taking the time to join the focus group.

3.6 Data analysis

In order to record an audio and video file during the three focus groups, all 14 participants had to sign a consent form. When the focus groups were organized via Zoom, a sound and file recording could be done directly via the communication platform. When all the data had been collected, the empirical material needed to be transcribed, this was done by us having to listen through all the individual focus groups separately in order to then be able to transcribe the material. The transcription took a few days to complete as the discussions within the focus group were detailed, and we did not use any aids to transcribe, which took a long time. When the transcription of all three focus groups was completed, the transcribed empirical data consisted of a total of 72 pages of text. Due to some interruptions and short answers, the number of pages in transcription was greater. Focus groups were held in Swedish, hence the transcription was also in Swedish. The collected and transcribed material then needed to be

coded to underline the most important parts. Prior to the coding, parts of the transcribed material needed to be translated into English in order to present the quotations in chapter four.
To quantify the qualitative data, the approach of *Thematic Analysis* was used. According to Bryman & Bell, (2011) it is one of the most common approaches to analyzing qualitative data and focuses on finding similar data in the empirical collection which are related to the research topic. Transcription can be difficult to understand due to participants sometimes speaking over themselves or only commenting with a certain word in agreement or disagreement. Although our approach towards transcription still included some incomplete sentences, some words or phrases that were unclear due to audio quality or distribution from other participants were removed. Additionally, to make the transcription easier to understand some sentences that include repeated wording by respondents were transformed.

The transcribed data was then coded into labels to identify the AR affective response elements and Flow. Labels included *Flow, Interactivity, Vividness, Augmentation, Playfulness, and Aesthetics*. The reasons for this labeling in this order are based on the questionnaire (Appendix A and B). With the use of labels, it was easier to identify which questions and answers correlated to which element and theory. Some transcribed data which clearly represent a statement towards the element was underlined. The purpose of this was to get a clear definition of each element, only sentences with a motivator were therefore chosen. Even though the transcribed data labeling was based on the questionnaire which had purposefully made questions towards each element. Some deviations occurred where a respondent would describe a different element. Therefore, in some parts labels of additional elements that could be identified were added. Furthermore, to make the transcription easier to understand some brackets were added to phrases to accompany what was said by the respondents.

Lastly, a *Thematic Inductive Analysis* in data coding was used. The purpose of the chosen approach is according to Nowell et al. (2017) coding empirical data to suit the already existing coding for further analytics. The already identified elements were divided into groups that specified which experience a user described. This was especially important in the Flow stage to identify the three essential components of the Flow stage which were labeled *concentration, enjoyment,* and *control*.

3.7 Trustworthiness

According to Bryman & Bell (2011), *trustworthiness* can be divided into four criteria to determine how well qualitative research is shaped. The criteria are *confirmability*, *credibility*, *dependability*, and *transferability*. Firstly, confirmability revolves around the authors ensuring objective perception throughout the research. Even though it is impossible to be objective in every aspect, personal perception should never affect the outcome to derive the results. Establishing this criterion is therefore a crucial part for auditors to establish. In the case of this study, confirmability was present throughout the whole research, due to the empirical data being based on other respondents' experiences, with a neutral mindset from our side. Secondly, credibility needs to be established throughout the research. Credibility can be established in the literature review by not only using similar theories but also being able to understand the context of the authors' arguments and opinions surrounding the topic. This has been implemented in this study by researching previous peer-reviewed articles surrounding the topic related to the thesis. We analyzed data from different authors to ensure a credible approach to the research. Thirdly, dependability entrusts the records of all the empirical material used in the research paper. To validate the facts presented, dependability provides a form of a database for validators to confirm what has been transcribed. The empirical data collected in all the parts of the research is stored online in the cloud and offline on the computer for easy accessibility at any time. Lastly, transferability explains how the findings presented by the authors can be put into different contexts. The findings presented need to be able to be transferred between different environments by being descriptive to the readers (Bryman & Bell, 2011).

To ensure the dependability of the study, a clear and detailed explanation of the method, results and conclusion is presented throughout the research.

3.8 Limitations

The choice of method for this research has a number of limitations, which in turn can affect the credibility of the study. A *Subjective Respondent Selection* was used to find respondents that could participate in the focus groups. Limitations of the approach are that the respondents were hand-picked, and a different approach would yield a different possible result outside our criteria. The selection was mainly based on age and gender with the selection of respondents can be described as homogenous, since all 14 respondents were females. Also, in terms of age, the difference between the respondents was not spread as they were between 18-30 years old.

The choice of only female respondents where the age range was limited contributes to the study not showing a variation in the population. The greatest impact will be on the collection of varying perspectives where age and gender can have an impact on the result.

4 Findings and Analysis

In this following chapter, the empirical results based on the three focus group interviews will be presented and analyzed. The purpose of this study was to research how customers feel about the AR experience in the makeup and beauty industry. The empirical data will be used as a basis for the discussion. Firstly, a presentation on the findings around the five AR elements will be presented. Secondly, the Flow model will be discussed based on the empirical results that have emerged. Thirdly, the findings that are related to the AR element in relation to the Flow theory will be analyzed and discussed.

4.1 AR elements experience findings

During the focus group interviews, the respondents tried the AR function by testing three different makeup products at one of the world's largest makeup companies. After testing the products, the discussion between the respondents about the AR experience began based on their thoughts, feelings, and perspectives. The discussion about the respondents' experience is based on the three different makeup and beauty products that they tested before starting the group discussion. In this section, findings will be presented with the five AR elements discussed in the theory review in Chapter 2. The five AR elements are, *Interactivity, Augmentation, Vividness, Aesthetics, and Playfulness*, these elements had an impact on the thoughts and feelings around the experience (Huang & Liao, 2014; Wang et al., 2021; Yim et al., 2017).

4.1.1 Interactivity experience

In the theoretical framework, Interactivity has been described by Yim et al. (2017) as the user approach to the concept, meaning that a customer using AR needs to interact with the visualized product. Findings revealed that Interactivity can be defined from two different perspectives, such as the user *effectiveness* and the user *approach* toward AR. This element in the online environment focuses on how motivated the user feels while interacting (Yim et al., 2017).

The respondents in the three focus groups had different experiences of interaction with AR on the website while testing out the beauty products. Affective responses regarding, efficiency, ease of use, mapping, brand engagements and range were present in respondents experience of interactivity, (Table 4). Mentioned by respondents, the experience in change of shades from

light to dark on the website did not affect their attention. Respondents in groups 1 and 2 mentioned that the scrolling between shades was fast and simple and the shade did not change until the user tapped on their chosen color. Respondent Daniella mentioned that the change between shades was slow, however a faster automatic change while scrolling, would cause a distraction, which would have a negative effect on the experience. However, respondent Fanny in group 2 mentioned that her interaction between the different shades was interrupted due to a delay in the scroll animation which disrupted the interaction between products. The interaction was received differently by group 3, which mentioned difficulties in navigating the AR function. The main concern was the misleading name on the button which would lead the user to the AR try-on function. Respondent Lisa pointed out that it was difficult to determine why the AR function was called "Beauty Service", and that there was no clear definition of the function. In this case, respondent Nina mentioned that it was only reasonable because they were told that such a feature exists, otherwise she would not have clicked there.

Most of the participants experienced difficulties in the interaction of AR between different shades. As specified by respondent Fanny, the animation of scrolling between different shades was delayed. According to Kowalczuk et al. (2021) interactivity has an effect on Flow when the interactive functionality is achieved by the user. The respondent was not able to reach a steady Flow stage due to interference between her and AR interaction. On the contrary, respondent Daniella experienced the interaction differently whereas the slow changes of effects were pleasing. The result is an apparent meditation toward the Flow stage in interaction (Kowalczuk et a., 2021).

The respondents had two different approaches to the AR experience when it comes to Interactivity. Interactivity can according to Wang et al. (2021) identify a customer interaction with the visualization of products. Similarly, Jim et al. (2017) proposed two different perspectives, one of them being the effectiveness of technological interaction. When it comes to the technological interaction, respondent Daniella undertoned that the scrolling between shades manually without automatic input from the system was an effective way to experience the products. As Yim et al. (2017) mention the effectiveness of the three subcomponents, *speed, mapping,* and *range* while interacting, are relevant to a satisfactory interaction experience. Respondent Daniella stated that the subcomponent of speed was insufficient, she did not experience it as an obstacle. Instead, a slower but user-controlled speed contributed to a task-

oriented experience for the user. From a different perspective, respondent Fanny concluded that the speed was disrupted multiple times due to delays in the animation perceived on the screen. This affected her experience negatively of the speed subcomponent which implies that respondents' diverse response was possibly provoked by their internet connection or device. Additionally, the second subcomponent mapping can be connected to the perspective of similarities between how users control the environment on the screen to the real-world environment. In this case respondent, Elise indicated that the try-on of makeup is not similar to what someone would experience in a physical store. The main difference according to her was the confusion that played out before the possibility of trying out a product that would not be evident in a physical store.

The three subcomponents regarding the technological aspects of AR have a strong connection to Tang's (2020) theory about the motivational factor's connection to the experience. If the technological process is uncomplicated and does not affect the users' focus, this will contribute to the user wanting to complete the process with an AR try-on. The users' will therefore be focused on the visualization instead of the disturbing moments that may occur within the technological aspect.

The respondents' experience of different stimuli in terms of speed and interaction, affected their motivational factors of task orientation. This indicated that users perceived the three subcomponents differently to suit their personal preferences. The feelings towards brand interactive engagement were mixed in groups 1 and 2. The impressions were diverse when it came to the perception of both positive and negative feelings towards brand engagement. According to respondent Gigi, the reception towards the brand did not change in any way because the experience she had in a physical store is different compared to the AR try-on. Respondent Isa, agreed, however, she highlighted that it is fun that brands develop a way for customers to try products online. Meanwhile, group 3 only had a positive response towards AR in brand interaction. For example, Nina mentioned that customers can experience a different hair color themselves which makes the experience up to date compared to different trends online. This contributes to the subcomponent of *range* in interactivity. Moreover, brand engagement affects the Flow stage (Kowalczuk et al., 2021) which is apparent in contrasting opinions between respondents Gigi and Isa. The brand engagement did not change towards the brand because her perception of experience in-store is different which did not mediate Flow.

However, Isa stated that brand engagement can be viewed positively due to new ways of trying on products online. The stage in which Flow was reached was, therefore, more evident in participant Isa.

Table 4

Interactivity

Experience	**Affective Response**	**Quote**
Interactivity	Efficiency, speed	*"And that makes it faster, if it had changed color while I scroll all the time, it will be I think a lot tougher experience because it takes a long time, but I actually like it. It does not change until you click on what you want"*- Respondent Daniella (Group 1)
		"It hacked for me by switching to another shade and then many of them were not available, so it was broken all the time. There was a message that it is (shades) not available." "- Respondent Fanny (Group 2)
	Ease of use	*"Because it says like beauty service where of course you might be able to connect in some way. But maybe you do not think about it first. You click on buy online instead, why should you click on it?" "*- Respondent Lisa (Group 3)
		"I kind of think that now that I knew we would look for it was clear, but it might have to be (the button) a little bigger" - Respondent Nina (Group 3)
	Mapping	*"I personally do not trust what it looks like online, so I think it would have been a different thing if I had tested in a physical store."* - Respondent Elise (Group 2)
	Brand interactive engagement	*"For me, it has not changed at all, because I know that maybe if I had tried it in the store, it would also have looked different than they did on the website, so it has not changed at all for me."* - Respondent Gigi (Group 2)
	Range	*"At the same time I think it's fun that they try to develop and come up with new ways to get customers to try the product" -* Respondent Nina (Group 3)

4.1.2 Augmentation experience

Augmentation is the characteristic of AR that projects the virtual image of the users' experience. The virtual object that is projected should break the boundary between humans and machines to create a realistic product experience (Wang, 2021). A realistic portrayal is what customers perceive the augmentation compared to how a product would look like in reality. The lower quality of the Augmentation contributes to a worse experience for the customers (Rauschnabel, et al, 2019).

The Augmentation was perceived differently among the respondents, with the affective responses of augmentation perception, previous experience and augmentation perception were present throughout the experience (Table 5). The returning answer from participants was that they mostly agreed that the experience felt natural. Respondent Johanna compared the experience to Snapchat filters and mentioned that the experience was natural and usual. However, respondent Clara in group 1 described that the Augmentation needs to be further developed to be perceived as natural. Additionally, she pointed out that the Augmentation made her look older and unnatural.

Regarding the view of Augmentation, the opinions were divided into groups. Most of the respondents agreed that the try-on experience was natural, which was a result of their previous usage of AR. According to Rauschnabel et al. (2019), to create a response from users the Augmentation needs to have a natural projection of a visual image. During the focus group session, most of the participants shared that the Augmentation felt natural which resulted in a closure between reality and augmentation. Although, in group 1, respondent Clara displayed the feeling toward the Augmentation as unnatural compared to the rest. The reason behind the respondents feeling towards the experience being unnatural is the image visualization of the face. According to Wang et al. (2021), a realistic portrayal of the product hands the user with a higher sense of reality. This resulted in respondent Clara not being able to reach the expectation of a realistic portrayal.

The Flow stage can also be reached from the augmentation if a user experiences a high-quality projection (Kowalczuk et al. (2021). Reflection of respondents Clara's perception of the Augmentation as unnatural refers to a decreased chance for her to reach the Flow stage. Compared to respondent Johanna who was used to Augmentation from previous experience

showed opposing views towards Augmentation. In contrast to Clara's Augmentation perception, Johanna had it easier to reach the Flow stage due to the natural impression of the augmentation she experiences.

When it comes to previous experience with AR, some respondents had previous knowledge of AR. Although, respondent Clara said that she never tried AR and it was something new to her. Respondent Hanna mentioned that she had some previous experience with AR and that she had higher expectations for the technology in terms of companies using it for customers. She compared the experience of how these kinds of "filters" are already used in social media, however, they still felt undeveloped in the retail sphere.

In terms of the respondent's views on the portrayal of Augmentation, the respondents agreed that the portrayal was not realistic and could need some improvements. According to respondent Isa, the Augmentation was as realistic as the technology lets it be in the current times. With future development, Augmentation would be more realistic. In a different group, respondent Lisa mentions that the Augmentation was worse compared to previous experiences with "filters" on other platforms. The need to adjust the lighting to get a better Augmentation was mentioned by all the groups, with respondent Isa feeling that it was misleading. This goes in line with what Kowlaczuk et al. (2021) mentioned about the crucial aspect of creating a realistic portrayal of the augmented image. However, in this example, the respondents were not convinced about the projected quality of what the product would be like in real life. This is evident in what respondent Lisa mentions that the Augmentation was worse compared to previous experiences with "filters" on other platforms. Mentioned by all the groups that there was a need to adjust the lighting to get a better augmentation, with respondent Isa feeling that the augmentation quality could be misleading at some times. This results in the affective response of Augmentation missing from the customers' perspective which affects how Augmentation of a product is perceived according to Rauschnabel et al. (2019).

Table 5

Augmentation

Experience	Affective Response	Quote
Augmentation	Augmentation perception	*"No, exactly. I would say that it feels pretty neutral, because it almost feels like you are in Snapchat and testing different filters in some way. It felt quite natural and ordinary"* - Respondent Johanna (Group 3)
		"Yes, it was realistic that way, but they could have worked with it a little extra so that it becomes even more realistic" - Respondent Clara (Group 1)
		"I thought that I looked a little older than what I do in reality (Augmentation)" - Respondent Clara (Group 1)
	Previous Experience	*"Yes so, I had a little higher for hopes or expectations of just AR is on their own website for. But there are filters like this on Instagram that can change your hair color"* - Respondent Hanna (Group 2)
		"Yes, for example, I have never tried it, so this was the first time for me" - Respondent Clara (Group 1)
		"So, I do not think it looks very realistic, but I think it is as close as possible to realistic as technology allows it right now" - Respondent Isa (Group 2)
	Augmentation perception	*"But this with adjusting the light and that's what it feels a little misleading and a little hard"* - Respondent Lisa (Group 3)

4.1.3 Vividness experience

The AR element of Vividness refers to the details given in the visualized product. The way a product is presented determines whether the customer experiences a positive connection with the product. The relevant aspects that affect the feelings connected to the experience are the graphical portrayal of the product. Sharpness, detail, and quality are three main categories that are significant to be able to determine the grade of satisfaction with the experience (Wang et al., 2021; Yim et al, 2017).

The visual representation of the product presented by AR was disused in the focus groups. Respondents were agreeing that there was a difference between the aspect of Vividness in the three tests of products with differences in experience between graphics, detail, the vividness quality (Table 6). Some products were seen as more vivid compared to others and the opinions

differed from product to product. For instance, respondent Clara was contended with how the presentation of hair color was projected on her hair. The blonde hair color had an orange undertone on her real black hair, which according to her was a realistic image of how her hair would look if she were to color her hair. Additionally, she mentioned that the orange undertone was sharp, and she was satisfied. As earlier mentioned by Yim et al. (2017) is that a clear picture of contrast and colors gives the user a deeper thought about the vividness perspective, which in turn leads to a positive product connection. The respondents could in this case relate to Yim et al. (2017) since the contrast of colors projected was represented suitable to their expectations of the visual aspect. As a result of the visual representation not being fulfilled, in respondent Clara, the Flow stage could not be reached. An explanation for this result by Yim et al. (2017), is that the visual representation in AR can be linked to the previous experience of AR which the respondent did not have.

On the contrary, Nina who was a respondent in group 3 said that the graphical portrayal of the black hair color was not clear enough on her blonde hair. The detail and quality were not decent enough to project an accurate color. Similarly, respondent Kristina in group 3 emphasized that the colors were not sharp enough. According to Yim et al. (2017), if the users experience Vividness as unappealing, the results will be an unfavorable experience. In turn, this translates to a negative perception of the product. In this case, the experience of accurate color representation was different based on respondents' expectations of how their hair color would look compared to their natural hair color. For example, respondent Clara expected an orange undertone if she would color her hair in real life. However, respondent Nina felt that the color projection did not represent her expectations of what her hair would look like. The differences between the respondents Clara and Nina were based on the opposite color spectrum of white compared to black, which could affect the final result.

In line with what Kowalczuk et al. (2021) presented, a vivid perception in AR experience needs to have the fundamentals of *sharpness, detail, quality visualization*, and *clarity.* The reception to the lipstick product tested was different in terms of how Vividness was perceived. Respondent Johnna considered that the lipstick colors projected were more vivid than how they would look in real life, which made her feel confused. Respondents Matilda and Lisa who took part in focus group 3, had a shared opinion on the quality and sharpness of the intense lipstick colors. This indicated the feeling of usefulness being fulfilled, as mentioned

before by Kowalczuk et al. (2021). On the contrary, not all respondents felt the AR usefulness was fulfilled. Respondent of focus group 3, Johanna, described the experience as graphically undermining because the lipstick color did not cover her whole lips, this resulted in the color not being clear. In connection to Wang et al. (2021) the user experience of Vividness was not comparable with how a lipstick color would be projected in a real-life scenario.

Lastly, on the foundation test, it was mentioned by respondent Johanna, who said that she could not see any difference between different shades of the foundation, however, the quality of the image was projected in a good way. Similarly, the other respondents from the focus groups shared opinions with Johanna, regarding the details of the foundation color. One exception was made, as respondent Kristina that participated in the focus group, 3 was satisfied with the detailing in the colors projected in the foundation. Yim et al. 2017 state that a high-quality image creates a higher vivid perception for the user. This is evident in how respondent Johanna experienced AR projection of foundation, even though she was not satisfied by the color representation of different shades. Her perception of Vividness, however, was fulfilled by the image quality. This relates to how Johanna reached a Flow stage. Yim et al. (2021), acknowledge that the characteristics of the Flow stage in Vividness, where the stimuli surrounding visual projection, cancel out other senses.

Table 6

Vividness

Experience	Affective Response	Quote
Vividness	Graphics	*"I have black hair so I went over to blonde who turned it like orange and that's exactly what it will be if I bleached, my hair or dyed it in reality, so I thought it was good"* - Respondent Clara (Group 1)
		"Difficult with the colors of the hair. I am blonde, so when I saw black it became kind of gray it. But it does not turn black. So, my blonde synthesis is going through a bit" - Respondent Nina (Group 3)
	Graphically details/ vividness quality	*" It was not sharp enough" (projection of hair color)* - Respondent Kristina (Group 3)
		"Then lipstick popped much more than they would had done, perhaps in reality" - Respondent Johanna (Group 3)
		"Is this exact test the lipsticks it was a bit that it was difficult to get like the real shape of the lips, so it came a little outside a little inside" - Respondent Johanna (Group 3)
		"And Foundations. That said, it was pretty hard to tell the difference between the one and other"- Respondent Johanna (Group 3)
		"I tested a few shades it felt like most of them somehow fit in on me"- Respondent Kristina (Group 3)

4.1.4 Playfulness experience

The fourth AR element is characterized by the momentary positive illusion of enjoyment during the experience. This element has a strong connection to the shopping experience since the customer creates a playful sphere that only lasts temporarily. The ease of use is relevant to determining whether the customer experiences a playful sphere, due to difficulties of usage that can cause a distraction which will result in a less playful sphere (Mathwick et al., 2001; Moon et al., 2001; Wang et al., 2021).

The Playfulness experience was present in all groups, with many respondents describing AR as a fun experience. The affective responses identified were enjoyment and the obstacles that prevented the playfulness experience to be met (Table 7). As described by respondent Beatrice the experience was very fun and everybody was laughing. The reason being was that the respondents could see themselves in different color shades which they would probably never

try. She continues that it was very smooth to use. Respondent Elise and respondent Fanny from a different focus group emphasized that the experience made it possible to try-on products that she would normally not try without the help of AR. Interestingly, Playfulness in the AR experience can create an atmosphere where the "fun" aspect can take over the task process that participants are in the middle of (Mathwick et al., 2001). For instance, in the focus groups, respondents were influenced by Playfulness which made them further investigate the possibilities of AR by trying different colors. As stated by respondent Anna, the playful part of the experience made her eager to discover different products that could be tried on with the help of AR. In all focus groups, the evident pattern among the respondents was that everyone described the AR try-on experience as fun. Wang et al. (2021) continued that Playfulness emits emotions when users experience AR, this was evidently seen during the tests performed by the respondents. as they were having a good time while interacting.

Although, respondent Beatrice pointed out that some parts of the experience were bothering her, especially her feeling towards the visualization not being realistic. She described the portrayal of the products as 60 % realistic and attributed it to the fact that the technology is still under development. The outcome of Playfulness being disturbed can, according to Huang & Liao, (2014), cause interference in the temporal Playfulness sphere that is incited by AR. This contributes to a limited experience where the user is no longer a responder, instead, the role switches to an observer (Mathwick et al., 2001). This is observable when respondent Anna added that even though the face that she saw projected on the screen looked realistic, the products were not as realistic, this was something she realized when she took a closer look at the visualization. Therefore, instead of being a respondent to the AR experience, she became an observer.

For the Flow to be mediated by Playfulness, there needs to be a correlation between a user's skill and task challenge, and the task needs to be playful (Woszczynski et al., 2002). Additionally, in terms of Flow meditation, Lisa had her playful experience of the task interrupted by the technological task challenge when she accidentally chose not to give access to the camera. Compared to Beatrice who had a playful experience without any obstacles between the task difficulty and her experience which mediated Flow.

Table 7

Playfulness

Experience	Affective Response	Quote
Playfulness	Enjoyment	*"Yes, we laugh because it's so, fun to. See what you had looked like in this. how I had looked in jet black hair as well"* - Respondent Beatrice (Group 1)
		"So, one thing that I thought was when you tested online you could test all colors and as we said before, but you probably would not tried all colors in the store, so it has given the opportunity to do so." - Respondent Elise (Group 2)
		"It was fun and the more you look at different shades of a product the more you want to look at other products just because it's fun I guess" Respondent Fanny (Group 2)
	Obstacle	*"I feel that it may not be 100% realistic, that it may be 60% realistic"* - Respondent Beatrice (Group 1)
		"But the products on the face look a bit fake as you can see it when you look at it" - Respondent Anna (Group 1)
		"Yes, same here. I experienced there were difficulties, when I happen to lick not to allow my camera so I could not change" – Participant Lisa (Group 3)

4.1.5 Aesthetics experience

The last AR element, Aesthetics, describes the importance of the visual presentation of products. Aesthetics can be expressed as a dynamic culture where preferences are in constant change. Since preferences and the popularity of styles changes rapidly, the Aesthetic development of the website or the images must be kept intact with the adaptation. Customers hold a strong value to this element, therefore senses need to be presented attractively and clearly (Vazquez et al., 2020; Wang et al., 2021).

As Vazquez et al. (2020) revealed that AR technology contributes to a solid relationship with the customer since the try-on based on AR provides the user with a stronger connection to the senses. It is essential to visualize products in a way where the sense still can be communicated to the users. Affective responses in the aesthetics experience represented the senses of perception, smell and feeling. Additionally, the satisfaction of how aesthetics was experienced was identified in terms of affective responses (Table 8). Respondents in all the three focus

groups highlighted those senses such as feel, touch, and smell were unreachable through AR. The exact experience of a product was multiple times described as different in comparison to a physical store experience. According to respondent Daniella, it is possible to get a better experience by touching and seeing the product in real life. Additionally, the sense of smell and consistency were also missing through the AR visualization. An undertone of the importance of portrayal of senses, since according to her is a crucial part of the whole experience. Respondent Gigi, who participated in focus group 2 shared her opinion with Anna regarding the importance of the sense of touch and smell which they saw as fundamental. Participant Maja in focus group 3 emphasized that the difference between a physical store and an online environment is the ability to smell the product. Vazquez et al. (2020) refer to the fact that the senses which include *smell*, *feeling,* and *perception* is the biggest difference that the Aesthetics of AR cannot replicate. Therefore, the Aesthetics of visualization is crucial to be fulfilled for users to experience something similar to the real-life environment. However, interestingly respondent Clara brought up that if the consistency of a product is known before, the sensory experience is less definitive. This emphasizes that the senses of *smell*, *feeling*, and *perception* are obsolete if the Aesthetics are definitive to replace a physical environment.

How respondents experienced the Aesthetic satisfaction of a product was contrasting since respondent Lisa mentioned that AR fulfilled her visual expectation to some point. She added that the presented colors of products were aesthetically appealing. Aesthetics in AR awaken different senses in the experiences compared to a physical store which affects emotions a user develops (Vazquez et al., 2020). Comparing the Aesthetic product experience to a real-life shopping environment, for example, Hanna said that depending on the product the Aesthetic result was different due to the AR try-on function. One product that all the 14 respondents agreed upon was the visual Aesthetic presentation of hair colors. Because the possibility to try-on hair colors is not offered in physical stores and the visual presentation is sufficient. This can be explained because the purpose of Aesthetics is to create a similar real-life shopping environment (Wang et al., 2021). However, the ability to try-on hair color is not plausible in a store. Therefore, the respondent Elise who mentioned the possibility of try-on different hair products which are not possible in-store experienced a positive affection towards Aesthetics. Aesthetics in the Flow meditation is based on the differences between in-store and online environments Vazquez et al., (2020). This refers to how respondent Elise was mediated by the Flow stage due to the AR contribution towards an experience that can be perceived better than

one experienced in-store. Although, respondent Hanna did not share the same stage of Flow because of the experience of Aesthetics being different depending on the product.

Table 8

Aesthetics

Experience	Affective Response	Quote
Aesthetics	Senses perception	*"But if you think about the exact experience then of the product, you get a better experience when you can feel it and look at it in reality than you do online"* - Respondent Daniella (Group 1)
	Senses smell	*"Yes, but here you have no idea how it smells to me, the smell of the product plays a huge role. You do not know if it is heavy to carry if it is light"- Respondent* Maja (Group 3)
	Senses feeling	*"Yes, exactly so and say that you do not know if they are sticky, maybe for some lipsticks are very sticky."- Respondent* Clara (Group 1)
		"And then I think if you recognize and the consistency and all this, as well as if you have used a product before and just want to try another shade like this, it is great to use AR" - Respondent Clara (Group 1)
	Satisfaction of Aesthetics	*"Yes, for me it was ok. In other words. I felt a certain satisfaction. It's fulfilling what I'm kind of looking for"* - Respondent Hanna (Group 2)
		"I thought the hair color was a better experience than in a store… But the others I think would have been better to test in a store which is the foundation and lipstick" - Respondent Elise (Group 2)

4.2 The Flow experience

The second theory presented in chapter 2, was the psychological concept of Flow. This model presents an understanding of the user's mindset while experiencing interaction with a given task. There are three essential components for understanding the mindset during the AR experience, which is, *control, enjoyment,* and *concentration.* These three components need to be fulfilled for the user to reach the mindset of Flow. When the Flow stage is researched, the customer feels a high brand engagement which results in a satisfactory experience (Gao et al., 2015; Jung et al., 2009).

The Flow experience is affected by different responses which are obstacle, concentration and control (Table 9). Obstacles that affected the AR experience were different between the groups.

Groups 1 and 2 experienced technological complications. Respondent Anna had issues with her phone where AR was not working at all. She had to use her friend's phone to get AR to work. The concentration was interrupted a few times according to respondent Isa because the AR projection was slow and her face looked unrealistic. However, after trying a few times the experience was better and more useful. According to respondent Fanny, her experience can be described as similar to a "filter" where not only did the product get applied but the surroundings changed as well. This caused her to lose concentration on the task. Instead of looking at the product, she focused on the environment created by AR. While most of the respondents experienced obstacles on the way while interacting with AR, their concentration was affected. Moreover, as Barhorst et al. (2021) emphasize that technological knowledge and function are crucial for the chance for the user to reach the mental state of Flow. Subsequently, this was not possible due to the concentration being disrupted by technological complications. In contrast, respondent Kristina did not experience any difficulties, instead, she was pleased with how efficient the change between products and shades was in the AR try-on. Since participant Kristina did not experience any obstacles while trying on products, she reached the stage of Flow while interacting with the try-on. This refers to how the element of playfulness was evident as an affective response towards the respondent reaching the Flow stage (Table 9).

The controlling aspect, such as the need to change the lighting and position of the phone to get better results was evident according to respondent Hanna. She experienced that it was annoying that she had to adjust her phone to get a better result. However, it also depended on the product, the lipstick looked better the further away it was. After finding the right position, it was easier to use AR. Further, obstacles were recognized by respondent Lisa who had difficulties connecting to the camera. Imbalances between knowledge and visual Augmentation are evident in obstacles that the respondents experienced which affects the control component of AR (Barhorst et al., 2021). For example, the need to adjust the phone refers to obstacles in the visual Augmentation. If the respondents were aware of solutions to these obstacles there would not be an imbalance that would impact the controlling aspect of Flow.

The third stage of the Flow which is enjoyment is reached when concentration and control are in balance (Barhorst, et al., 2021). Enjoyment was present throughout the whole experience, all respondents were united in terms of the playful enjoyment that AR created. Respondent Elise saw the experience as a fun thing to do, but this also put her in a position of focusing more on

the enjoyment part instead of the product. This resulted in respondent Daniella not reaching a complete stage of Flow due to concentration on the task being overcome by Playfulness. From different perspectives, Daniella and Beatrice expressed their enjoyment through laughter, as they mentioned that the AR try-on was fun and innovative. Fanny described her enjoyment around the fact that she was able to try products that she normally would not try in physical stores. As a result, these participants reached the stage of Flow when all three components were fulfilled (Kowalczuk et al., 2021). In contrast where the Flow stage might have been interrupted is when respondent Maja mentions that the experience was fun and easy in the beginning, however, due to obstacles to the perceived realistic appeal of the product the experience was interrupted.

Table 9

Flow

Experience	Affective Response	Quote
Flow	Obstacle	"Yes, it did not want that to work on my mobile at all. So, it's easier when we did on one and the same mobile"- Respondent Johanna (Group 3)
	Concentration	*"It was difficult because it hacked a bit, when you went in there when you were about to get to the side and my face looked a bit strange, so it was a bit difficult to concentrate. I think that in some cases this could be perceived as disturbing"* - Respondent Isa (Group 2)
		"I probably could have compared the image with a filter. But it felt completely different than the real picture of myself, so this made me lose focus" Respondent Fanny (Group 2)
	Playfulness	*"Yes, I thought more about testing well. It was kind of fun. I thought it was a bit more that it was fun to try different stuff"* Respondent Kristina (Group 3)
	Playfulness/ obstacle	*"I would say that it was fun and it was easy ... the only negative thing that I can think of is that I'm not sure if I believe the products are displayed properly. That it is not really realistic."* – Participant Maja (Group 3)
	Control	*"This with different lights affecting what the result looked like. So, I could have said that the different results based on different lights I experienced as a little disturbing."*- Respondent Hanna (Group 2)
		"I experienced difficulties, when I happened to click on not allowing my camera" - Respondent Lisa (Group 3)
	Enjoyment	*"I thought more about testing well. It was kind of fun. I thought it was a bit more that it was fun to try different and stuff, so that was what I thought more and not about the product so."* - Respondent Elise (Group 2)

5 Conclusion and Discussion

In this segment, a summary of the thesis along with a conclusion around the customers' AR experience while trying on makeup and beauty products online will be presented. Furthermore, a discussion based on the aim of this study will be introduced. Lastly, we will initiate the theoretical as well as the practical contributions, and recommendations for future research.

5.1 Summary of the research thesis

This bachelor's thesis explored the customer's feelings about the AR experience when trying on makeup and beauty products online. Based on previous research, two theories were chosen to further analyze the thesis of this study. The two theories are the five AR elements and the Flow model. The AR elements are based on the technological experience where different elements represent affective responses from customers, while Flow examines the mental satisfaction stage achieved when all five AR elements are integrated. A deductive approach was used to gain a deeper understanding of the theories used in the previous research. The study was applied to a qualitative research approach, where the data collection was taken from three focus groups. The use of focus groups contributed to an increased understanding of how customers experience AR try-on from makeup and beauty products.

Findings in this research paper indicate that customers experience different affective responses when using AR in the makeup and beauty industry. After the participants were subjected to the AR experience, it can be ascertained that the elements of *Interactivity*, *Augmentation*, *Vividness*, *Playfulness*, and *Aesthetics* were present. Additionally, the Flow physiological concept provided a correlation of how these elements were mediated in the experience. Although many respondents perceived the experience similarly, significant differences were observed. We found out that the experience varied several times between the try-on of the three different makeup and beauty products. The main cause of the varied experiences of AR was due to previous knowledge, attitudes, and expectations of the technology. Lastly, the effects of the AR experience were perceived both positively and negatively by the respondents regarding the current phase and possible outcomes of AR in online retail.

5.2 Conclusions and discussion

In conclusion, the purpose of this study was to explore how customers experience AR try-on in the makeup and beauty industry. Our study revealed that the AR experience was contrasting depending on how the five AR elements and the Flow were perceived by the respondents. The findings of this research study have resulted in three leading observations, that will be further presented and discussed below.

With the objective of AR being a complementary experience to adhere to the already existing online shopping, it can be concluded that AR can be described as an experience for the customer in the retail online shopping environment. Most evident was the perception of the customers towards AR try-on in terms of the elements of experience that the technology contributed with. According to Wang et al. (2021), the online retail environment suffers from the ability to match the experience in a physical store. Additionally, online retailers want to add the experience of a realistic visualization of products similar to the physical store environment. Our study showed that the users did not experience a fully realistic portrayal of products while interacting with the online try-on. Even though the visualization of makeup and beauty products was not entirely accomplished with AR. Some other parts of the experience such as the fun playful sphere were evident which were different compared to the experience given in a physical store and a non-AR online environment. These findings agree with what Kowalczuk et al. (2021) emphasized in previous research that affective responses in AR product presentations are far more present in comparison to the current online environment. Although the experience of AR try-on was described as fun by the respondents, the technology needs to further be developed. This is in order to provide the users with a product visualization satisfaction that projects a realistic image.

Secondly, it can be concluded that the five AR elements *Interactivity, Augmentation*, *Vividness, Playfulness,* and *Aesthetics* can be connected to the AR try-on experience. In perspective, the elements were noticeable in the identification of how users respond to the experience. The users' effective response towards the elements was differently perceived regarding previous experience, expectations, and attitudes towards AR. Prominently, elements of Interactivity, Augmentation, Vividness, and Aesthetics are mainly connected to the visual representation of a product. These were however perceived as undeveloped and unrealistic in most cases. Some elements were more prominent as an obstacle to the realistic visualization. For instance,

respondents had different opinions regarding the Vividness and quality of the image. Therefore, in the visual aspect of AR, there is still a need for improvement, even though the respondent felt that it was sufficient but not realistic enough. On the other side, the element of Playfulness was the most apparent positive experience the respondents felt toward AR. Respondents felt that AR was a fun experience of product try-on, which would not be possible in a physical store. Reconnecting to what Wang et al. (2021) states that the Playfulness factor creates a positive experience towards AR. Evidently, the fun factor was noticeable in respondents' reactions to AR. Additionally, it can be concluded that the elements had an effect on the psychological stage of Flow in which the respondents entered a stage of temporary concentration on the task.

Lastly, it was evident that there were obstacles that prevented customers from reaching a psychological stage of Flow in which the customers are concentrated on a task. Even if the task concentration was disrupted in each AR element it was not sufficient enough to disrupt the Flow stage in the experience. To clarify, the respondents did not experience the Flow stage through all the five AR elements simultaneously. However, they did reach a mental stage where control, concentration, and enjoyment interacted with the elements. The most prominent behavior that had an impact on whether customers would encounter an obstacle was the evident differences in technical proficiency. This attributes to what Gao et al. (2015) mentioned as the balance between customers' knowledge and the task challenge. Most of the respondents, however, had previous experience with AR in other areas which contributed to a balance between proficiency and challenge. Although it was noted that some respondents experienced difficulties connected to the AR try-on. Another reason behind the difficulties was how the retailer had developed the technology. This supports Kowlaczuk et al. (2021), who mentions in previous research that the retail sector is always trying to develop new ways of shopping experiences for customers. It can therefore be concluded that AR is still a developing technology with its strengths and weaknesses, and it is up to retailers to develop it further.

5.3 Practical contribution and theoretical contribution

The results of the study provides a contribution towards research for the online retail environment, particularly the use of AR technology. With over a billion users in 2022 and prominent growth in the upcoming years (Statista, 2022) it is certain to say that AR is being adopted in many environments to improve usability for people. It is therefore certain to say that the field is in a growing stage with many possibilities for usage. With the help of this study,

retailers will be able to understand how the customers experience AR as a try-on tool. Even though AR technology is currently available, this study contributes to further explanation of the visual and playful experiences customers are a part of. Therefore, retailers will get the opportunity to understand customers and their preferences better. Additionally, they will be able to identify which element of experience in AR needs to be developed to create a positive experience. The reason behind this is that AR is a costly investment, and for the investment to be profitable, our study can be used to explore investment risks and opportunities (Kowlaczuk et al., 2021).

Previous research has used a combination of the elements. From one perspective Interactivity, Augmentation, Vividness, and Aesthetics have been used by Wang et al. (2021), in combination with the psychological concept of Flow. From another perspective, Kowlaczuk et al. (2021), used Augmentation and Vividness in the retrospect of the AR experience. Playfulness in AR has been identified by previous studies, which mention how the experience of AR creates a temporary playful sphere that distracts the customer from other experiences (Mathwick et al., 2001). Additionally, the psychological Flow stage model has for instance been used by Gao et al. (2015), on how a user creates a temporary sphere of engagement that can be affiliated with the interaction of an experience. Our study combines the five elements with Flow in order to research customers' experience with AR in a makeup and beauty environment which has not been used before. The combination of these theories has been useful in the finding surrounding the customer experience. The reason for that is that the models have proved that they can explain and underline how customers perceive interaction with the AR try-on.

5.4 Critical review and future research

Due to the limitations of the technological tool being specified to one website with only three products tested, it is important to understand that AR might differ if tested on a different website and on different products compared to the ones presented in this research. This study was based on five different AR elements, *Interactivity*, *Augmentation*, *Vividness*, *Playfulness*, and *Aesthetics* which have been studied previously in the context of AR experiences. Additionally, the Flow psychological model has been used to explore respondents' psychological state that is part of the interaction. To our knowledge, there have been no previous studies that explored a customer's experience that have used a combination of the five elements of AR experience. For future research, we propose the use of AR elements to exhibit possible customer purchase

processes in the retail online environment. We believe that AR can have an influence on how customers perceive the purchase experience in the pre-purchase stage, purchase stage, and post-purchase stage. This goes together with what Kowalczuk et al. (2021) mention on what is possible with AR. With the limitation of the makeup and beauty industry, we also propose research in other segments where AR experience can be measured. Additionally, the selection of homogeneous participants was suited to the research environment that we choose to study. In future studies, it can be relevant to expand the selection of respondents from other genders, to get a broader perspective. Another recommendation for future research is to study how age can affect the AR experience since this study focuses on users within an age range of 18-30. This can be of interest for other researchers to explore if the age range has a significant difference in results regarding the use of AR try-on. This is also emphasized by Wang et al. (2021), which mention that there can be a difference in how younger and older generations experience technology. Additionally, technology is not only limited to a certain age group or gender, as it is available to a worldwide population (Wang et al., 2021). Therefore, we can conclude that there are many future possibilities for research in this field.

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Appendix A - Focus group interview guide (Swedish)

Formaliteter

- 26 och 29 mars 2022, samt den 5 maj 2022
- Välkommna alla deltagare och tacka för att de ville ställa upp på fokusgruppen.
- Informera deltagarna att hela diksussionen kommer att filmas och spelas in via Zoom, samt att deltagrna kommer att anonymiseras. De insamlade ljud- och videofilerna kommer enbart vara tillgängliga för oss samt våran handledare. All inspelad data kommer att raderas när analysdelen är färdigskriven.
- Förklara för deltagarna om vad en fokusgrupp går ut på, samt att vi enbart kommer att agera som moderatorer. Även betona vikten av att deltagarna skall hålla i dikussionen, samt vara muntligt aktiva.

Bakgrund

- Presentera syftet med kandidatupsatsen, och ge en beskrivning på ämnet.
- Be alla deltagre att ge en kort introduktion om de själva samt berätta lite om sina intressen gällande smink och skönhetsprodukter.
- Förklara för deltagrna att de kommer att få test tre olika prdukter med hjälp av AR. Länkarna kommer progressivt att skickas ut efter uppvärmningen.

Länkar till produkterna

https://www.lorealparis.se/color-riche/plump-and-shine-lipstick/103-litchi

https://www.lorealparis.se/excellence/creme/5-32-solar-brown

https://www.lorealparis.se/infaillible/32h-fresh-wear-foundation/140-golden-beige

Frågor

1. Kände ni att något påverkade er uppmärksamhet när ni använde AR? Var det något som gjorde att det var svårt att använda AR?
2. Hur var den kontrollerande aspekten av AR? Kände du dig tvungen att prova? Eller var användningen naturlig?
3. Kände du att den virtuella produkten gav en solid presentation av hur nyansen skulle se ut? Eller såg det ut motbjudande?
4. Hur var product upplevelsen när det gäller interaktion, hur upplevde du möjligheten att ändra färger på produkten under interaktion?
5. Hur upplevde du interaktionen med produkten, lätt eller svår? Varför känner du så?
6. Förändrades din varumärkesuppfattning mot företaget mot mer efter att nu har provat produkterna med hjälp av AR? Något positivt?
7. Hur upplevde du den visuella presentationen av produkten? Hur var kvaliteten/ färgerna/ bilderna var skarpa eller detaljerade?

8. Hur upplevde du färgerna som av produkterna som projekterades på ditt ansikte när det gäller livlighet och färgglad aspekten
9. Hur upplevde du den digitala bilden i ditt ansikte? Var det en neutral känsla? Skulle du säga att upplevelsen var onaturlig?
10. Kändes upplevelsen realistisk för hur du skulle tänka att produkten ser ut? Fanns det något hinder som gjorde upplevelsen värre?
11. Vad har du för tidigare erfarenhet av AR? Om du har några tidigare erfarenheter tyckte du att de var till hjälp?
12. Vilka känslor skapade upplevelsen när du provade AR? Var det roligt?
13. Upplevde du att det var tröttsamt/irriterande att använda prova på-funktionen?
14. Fick du en känsla av att upplevelsen är väldigt lik den verkliga shopping miljön som finns i en fysisk butik med hjälp av AR på hemsidan när du provar produkter?
15. Hur skulle ni beskriva era känslor angående de sinnen ni har upplevt genom AR när du provat produkter? Saknades något var produkten visuellt tillräcklig, fattades lukt, touch, feel?
16. Kunde du med hjälp av AR nå en nivå av tillfredsställelse genom visualiseringen av AR som gavs genom skärmen? Eller saknar ni något?

Appendix B - Focus group interview guide (English)

Formalities

- March 26th and 29th, 2022, and May 5th, 2022
- Welcome all participants and thank them for wanting to join the focus group.
- Inform the participants that the entire discussion will be filmed and recorded via Zoom and that the participants will be anonymized. The collected audio and video files will only be available to us and our supervisor. All recorded data will be deleted when the analysis part is completed.
- Explain to the participants what a focus group is about and that we will only act as moderators. Also, emphasize the importance of the participants holding on to the discussion, and actively participating in the discussion.

Background

- Present the purpose of the bachelor's thesis, and give a description of the topic.
- Ask all participants to give a brief introduction about themselves and tell a little about their interests in makeup and beauty products.
- Explain to the participants that they will be able to test three different products using AR. The links will be progressively sent out after the warm-up round.

Links to the products try-on

https://www.lorealparis.se/color-riche/plump-and-shine-lipstick/103-litchi

https://www.lorealparis.se/excellence/creme/5-32-solar-brown

https://www.lorealparis.se/infaillible/32h-fresh-wear-foundation/140-golden-beige

Questionnaire

1. Have you felt any obstacles in attention in connection to the AR use?
2. What was the controlling aspect of AR? Did you feel forced to try it on?
3. Do you experience that the virtual product shows you a valid presentation of what the shade would look like? Or does it look unappealing?
4. How was the product experience in terms of interaction, how did you experience the ability to change the colors of the product while interacting?
5. How did you experience the interaction with the product, easy or difficult? Why do you feel so?

6. Did your brand perception change towards more positive after you have tried the products with the help of AR?
7. How did you experience the visual presentation of the product? How was the quality/ colours/ images/ sharp /detailed?
8. How did you experience the colors projected on your face in terms of liveliness and colorfulness?
9. How did you experience the digital-generated image on your face? Was it a neutral feeling? Would you say that the experience was unnatural?
10. Did the experience feel realistic to what you would experience that the product looks like? Was there a boundary that made the experience worse?
11. What kind of previous experience do you have in connection to AR? If you have any previous experience did you find them helpful?
12. What emotions did the experience create when you tried AR? Was it fun?
13. Did you feel that it was tiring/ annoying to use the try-on feature?
14. Did you get a feeling that the experience is very similar to the real shopping environment found in a physical store with the help of AR on the website when trying on products?
15. How would you describe your emotions regarding the senses that you have experienced through AR while trying on products?
16. Could you with the help of AR reach a level of satisfaction through the visualization of AR given through the screen?