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# AUGMENTED REALITY AND PURCHASE INTENTION IN FASHION AND BEAUTY RE-TAIL: A SYSTEMATIC REVIEW ON ACCEPTANCE AND RISK REDUCTION FACTORS

# REALIDADE AUMENTADA E INTENÇÃO DE COMPRA NO VAREJO DE MODA E BELEZA: UMA REVISÃO SISTEMÁTICA SOBRE FATORES DE ACEITAÇÃO E REDUÇÃO DE RISCO

# REALIDAD AUMENTADA E INTENCIÓN DE COMPRA EN EL COMERCIO MINORISTA DE MODA Y BELLEZA: UNA REVISIÓN SISTEMÁTICA SOBRE LOS FACTORES DE ACEPTACIÓN Y REDUCCIÓN DE RIESGOS

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## ABSTRACT

Augmented reality (AR) has transformed the shopping experience in fashion and beauty re-tail, offering immersive and personalized interactions. However, there is a growing need to understand how AR influences consumer behavior and marketing effectiveness in this sector. This study presents a systematic literature review (SLR) following the guidelines of Kitchen-ham (2004) to examine AR acceptance in fashion and beauty retail. The review explores its impact on customer experience, purchase intention, and return rates. The process involved defining research questions, applying a Boolean search across six academic databases, and selecting 24 relevant articles published between 2020 and 2024. The findings indicate that AR enhances hedonic value, increases consumer satisfaction, and reduces perceived risk and return rates. Key factors influencing acceptance include trust, perceived task complexity, and consumer engagement. While AR improves the online shopping experience and promotes con-tinued use, challenges such as privacy concerns and generational differences in technology adaptation remain. This review identifies gaps and suggests that future studies should investi-gate additional variables, including user familiarity, product realism, and brand perceptions, to expand understanding of AR's effectiveness in retail contexts.

**Keywords:** Augmented Reality. Fashion Retail. Consumer Experience. Online Shopping Environment. E-commerce. Risk Reduction.

## RESUMO

A realidade aumentada (RA) transformou a experiência de compra no varejo de moda e beleza, oferecendo interações imersivas e personalizadas. No entanto, há uma necessidade crescente de entender como a RA influencia o comportamento do consumidor e a eficácia do marketing neste setor. Este estudo apresenta uma revisão sistemática da literatura (RSL) seguindo as diretrizes de Kitchen-ham (2004) para examinar a aceitação da RA no varejo de moda e beleza. A revisão explora seu impacto na experiência do cliente, intenção de compra e taxas de retorno. O processo envolveu a definição de perguntas de pesquisa, a aplicação

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de uma busca booleana em seis bases de dados acadêmicas e a seleção de 24 artigos relevantes publicados entre 2020 e 2024. As descobertas indicam que a RA aumenta o valor hedônico, aumenta a satisfação do consumidor e reduz o risco percebido e as taxas de retorno. Os principais fatores que influenciam a aceitação incluem confiança, complexidade percebida da tarefa e engajamento do consumidor. Embora a RA melhore a experiência de compra online e promova o uso contínuo, desafios como preocupações com a privacidade e diferenças geracionais na adaptação tecnológica permanecem. Esta revisão identifica lacunas e sugere que estudos futuros devem investigar variáveis adicionais, incluindo familiaridade do usuário, realismo do produto e percepções da marca, para expandir a compreensão da eficácia da RA em contextos de varejo.

**Palavras-chave:** Realidade Aumentada. Varejo de Moda. Experiência do Consumidor. Ambiente de Compras Online. E-commerce. Redução de Riscos.

**RESUMEN**

La realidad aumentada (RA) ha transformado la experiencia de compra en el comercio minorista de moda y belleza, ofreciendo interacciones inmersivas y personalizadas. Sin embargo, existe una creciente necesidad de comprender cómo la RA influye en el comportamiento del consumidor y la eficacia del marketing en este sector. Este estudio presenta una revisión sistemática de la literatura (SLR) siguiendo las directrices de Kitchenham (2004) para examinar la aceptación de la RA en el comercio minorista de moda y belleza. La revisión explora su impacto en la experiencia del cliente, la intención de compra y las tasas de devolución. El proceso implicó definir preguntas de investigación, aplicar una búsqueda booleana en seis bases de datos académicas y seleccionar 24 artículos relevantes publicados entre 2020 y 2024. Los hallazgos indican que la RA potencia el valor hedónico, aumenta la satisfacción del consumidor y reduce el riesgo percibido y las tasas de devolución. Los factores clave que influyen en la aceptación incluyen la confianza, la complejidad percibida de la tarea y la participación del consumidor. Si bien la RA mejora la experiencia de compra en línea y promueve el uso continuo, persisten desafíos como las preocupaciones sobre la privacidad y las diferencias generacionales en la adaptación tecnológica. Esta revisión identifica lagunas y sugiere que los estudios futuros deberían investigar variables adicionales, incluida la familiaridad del usuario, el realismo del producto y las percepciones de la marca, para ampliar la comprensión de la eficacia de la RA en los contextos minoristas.

**Palabras clave:** Realidad Aumentada. Comercio Minorista de Moda. Experiencia del Consumidor. Entorno de Compras Online. E-commerce. Reducción de Riesgos.

## 1 INTRODUCTION

In recent years, Augmented Reality (AR) technology has played a significant role in the digital transformation of the retail industry, especially in the fashion and beauty segments. The growing adoption of mobile devices, the evolution of 3D technologies, and the development of e-commerce platforms have driven the integration of AR as a powerful tool to enhance the customer experience and increase the efficiency of business operations.

The fashion industry currently represents the largest segment of business-to-consumer e-commerce worldwide; its global market size is anticipated to be USD 768.7 billion in 2023. The market is expected to grow further at 9.4% annually and reach a total market size of USD 1,103.1 billion by the end of 2027 (Statista 2024). However, one of the main impediments to the expansion of this segment is the inability of consumers to see how products look on them (Briedis et al. 2020). This can not only hinder future growth, but also harm the profitability of fashion retailers due to product returns, which in turn implies sustainability issues, a central theme in this context. Furthermore, one report stated that the majority of returned products in e-commerce come from apparel, accounting for 43% of returns, with around 70% of those due to the wrong size or color (Narvar 2017).

AR has the potential to significantly reduce the environmental impact associated with product returns by allowing consumers to make more accurate choices and avoid unnecessary purchases, thus contributing to more conscious and sustainable practices in retail.

According to the Accenture report (2020), which interviewed more than 3,000 consumers, 61% of those interviewed stated that the chances of purchasing a product from a brand that uses immersive technologies are much higher. In addition, projections for the AR market indicate growth from USD 15.3 billion in 2021 to USD 77 billion in 2025, according to Forbes studies (2021).

AR offers consumers the opportunity to try on products virtually, providing an immersive experience that goes beyond the limitations of the physical environment in traditional stores. With the ability to virtually view items such as clothing, accessories, and even makeup before purchase, consumers have more confidence in making decisions, reducing uncertainty and the chances of product returns. In addition, AR increases consumer engagement by providing a more interactive and fun shopping experience, bringing the store experience into their homes (Pantano and Servidio 2012).

Unlike conventional web-based product presentations (i.e., image and text information), which often fail to grab the shopper's attention, AR-based "virtual try-on" technology is being quickly adopted in the fashion industry because it provides rich sensory modalities (e.g., sight and touch) by superimposing the product image on the consumer's own reflection (H. Park and Kim 2023). Nevertheless, Javornik (2016) showed that consumers with AR applications seem to have more hedonic experiences than utilitarian ones.

In this context, this review includes an analysis of consumer acceptance of AR in the fashion and beauty sectors. From the review of the 24 selected articles, we explored the trends, challenges, and opportunities associated with implementing AR in retail. We thus propose some research questions. The research questions are:

1. What are the key behavioral and experiential factors that affect augmented reality (AR) acceptance and consumer purchase intent in fashion and beauty retail?

2. Can implementing AR in fashion and beauty retail help reduce the perceived risk and rate of product returns?

This article is organized into five sections. The first presents the introduction, explaining the context of the research. The second section offers a review of the literature on the application of Augmented Reality in fashion retail, highlighting the differences between VR, AR and MR. The third section details the methodology adopted in the research, while the fourth discusses the results obtained. Finally, the fifth section brings the conclusions.

## 2 CONCEPTUAL FRAMEWORK

### 2.1 AUGMENTED REALITY (AR)

Augmented Reality (AR) is defined as "a technology that overlays virtual objects onto a live view of physical environments, helping users visualize how those objects fit into their physical world" (Tan, Chandukala, and Reddy 2022). Real-time interaction between virtual objects and the real environment with 3D images is a unique feature of AR (Kumar 2022).

Technological advancement, decreased associated costs, increased mobility and portability of AR, and its integration into the existing digital landscape, together with geolocation, global positioning system (GPS), and near-field communication (NFC) applications, have increased both the utility and, consequently, relevance of AR. Today's digital environment enables the deployment of AR technology for marketing purposes at

various touchpoints in the consumer journey, especially in retail, on mobile and online (Javornik 2016).

The use of Augmented Reality (AR) has grown exponentially around the world, as it is an accessible technology; all that is needed is a device with a camera to make use of 3D applications. This tool has been used in the retail and e-commerce sectors to improve the customer experience and achieve better results. Among the possibilities is the virtual try-on of a particular product before purchase, which is what we call "try-on" technology, or VTOs, where consumers can digitally try on clothes, accessories, and makeup. The images of the products are superimposed on the user's figure, providing a realistic and interactive view of the item. This experience not only increases accuracy in consumer choices but also raises the level of customer engagement and satisfaction.

The most relevant media characteristics of Augmented Reality are the following: interactivity, virtuality (presence of virtual reality elements), geolocation/location specificity features, mobility (in terms of portability and wearability), and synchronization of the virtual and physical/real (Javornik 2016).

## 2.2 AUGMENTED REALITY, VIRTUAL REALITY AND MIXED REALITY.

The main immersive technologies include Augmented Reality (AR), Virtual Reality (VR), and Mixed Reality (MR), each with its distinct applications.

**Table 1**

*Differences Between AR, VR, and MR*

| Feature | Augmented Reality (AR) | Virtual Reality (VR) | Mixed Reality (MR) |
|---|---|---|---|
| Definition | Overlay of virtual elements in the real world. | Creation of a fully digital environment. | Combination and interaction of real and virtual elements. |
| Devices | Smartphones, tablets, AR glasses, computers/monitors with camera. | VR glasses (such as oculus Rift, HTC Vive) | MR glasses (such as Microsoft HoloLens) |
| Interaction with the | Loud | No | Loud |

| | | | |
|---|---|---|---|
| Real World. | | | |
| Common Applications | Retail, Education, Entertainment, Industry | Games, simulations, Training. | Collaboration training, design, engineering... |
| Immersion Level | Moderate | High | Variable |

## 3 METHODOLOGY

Currently, the SRL or Systematic review of the literature is the main method for the synthesis of quality scientific studies based on a methodologically rigorous review of investigation results, which makes it possible to aggregate all the existing evidence for a research question (Kitchenham 2004). It is valuable because it allows for new ideas and helps identify gaps that can be evaluated by additional primary studies (Brereton et al. 2007).

To conduct this review, we used the SRL approach, as suggested by Kitchenham (2004), following a process structured in three distinct phases: definition of the research problem, selection of studies and data analysis.

Initially, we identified the central research problem and developed a detailed protocol, including the formulation of research questions, a search strategy based on Boolean operators, as well as inclusion, exclusion, and evaluation criteria for the studies. Subsequently, relevant studies were selected from six academic databases, with selection limited to publications from the last five years (2020-2024). Finally, the studies were analyzed and synthesized, allowing the identification of trends, findings, and gaps in the existing literature.

A. Research Questions:

The research questions have been written in the introduction section of this article.

B. Boolean search and database selection:

Six databases were used for this study: Science Direct, Scopus, Springer, Emerald Insight, IEEE Xplore, and World Wide Science org. Access to some articles was made through the institution Instituto Federal de Santa Catarina.

For almost all databases, the same keywords were used in the literature search. However, for the Scopus database, only one phrase was used, as limitations were found in performing Boolean searches.

**Table 2**

*Keywords*

| Database | Description |
|---|---|
| Science Direct, Springer, Emerald Insight, IEEE Xplore, World Wide Science | "Augmented reality" AND "Fashion retail" AND "Try on" AND "Customer experience" AND "Online shopping environment" AND "e-commerce" |
| Scopus | Augmented reality in fashion retail |

C. Inclusion and Exclusion Criteria

To find the most relevant literature, some inclusion and exclusion criteria were managed. We have limited the articles according to the year and type of publication. The inclusion and exclusion criteria are listed in the Table 3. Initially, the titles and abstracts were evaluated; Then, a complete analysis of the texts was carried out to verify the relevance of the studies. Next, a quality assessment was applied to ensure that the selected studies met the established criteria.

The inclusion criteria covered articles published in English between 2020 and 2024, focusing on the application of AR in fashion retail. Articles that did not mention retail RA, publications that were not scientific reviews, or published outside this period were excluded and are exemplified in Table 3.

**Table 3**

*Methodology Criteria*

| Stage | Inclusion Criteria | Exclusion Criteria |
|---|---|---|
| Between 2020 and 2024 | | Before 2020 |
| Step 2<br>(Title, Abstract and Keyword and Selection) | • Article in English.<br>• Article mentioning AR and or Virtual Fitting room in fashion retail. | • Non-scientific publication.<br>• No article (editorials, prefaces, abstracts, chapters)<br>• Non-AR Articles<br>• Review Articles |

| | | |
|---|---|---|
| Step 3<br>(Full text and selection) | • Article mentioning purchase intention and customer perception with the use of AR. | • Duplicate article<br>• Discussion article<br>• Short article, less than 4 pages.<br>• Article does not mention AR in Fashion and Beauty Retail. |

D. Step 4: Quality Assessment

The quality assessment checklist questions were applied to provide a clear explanation of the implementation of the use of AR in fashion retail. Although the article might not fully answer the questions, it should largely address them. This evaluation was carried out after the selection of the full text. The questions for quality assessment were:

- Does the article clearly present the objectives of the research and the justification for its realization?

- Are the results obtained detailed and adequately explained in relation to the research questions?

- Are the conclusions aligned with the initial objectives and offer significant contributions to the topic under analysis?

E. Data extraction and synthesis

The extraction and synthesis of data represented the final step before the preparation of the report. During the synthesis of the articles, comparisons, critiques and data analysis were carried out, with the aim of obtaining the most relevant answers to the research questions.

## 4 RESULTS AND DISCUSSIONS

### 4.1 ANALYSIS RESULTS

In this systematic literature review article, 24 articles were selected as final results, after the initial stage, abstract, keyword, title selection, full-text selection, and quality assessment. The explanation of the number of articles at each stage is described in Table 4.

**Table 4**

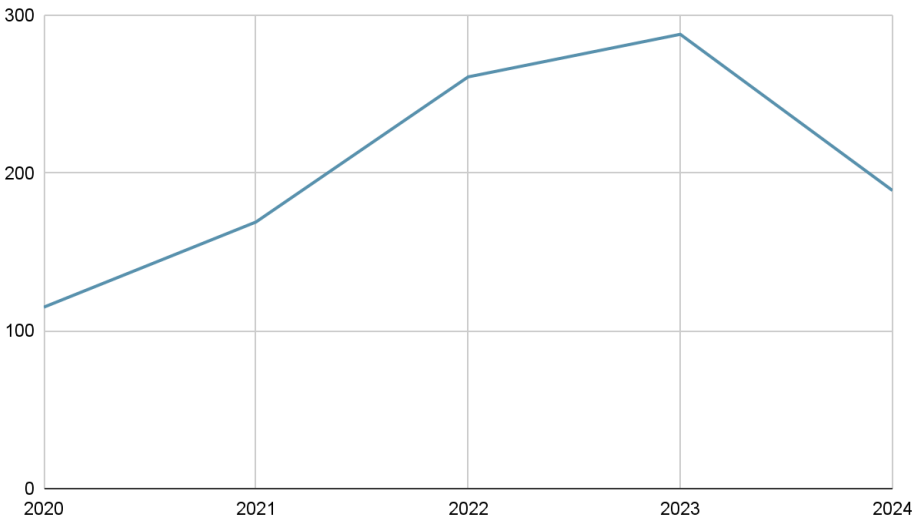
*Number of works in each state*

| Database | Stage 1 Initiation 2020-2024 | Step 2 Title, Abstract and Keyword | Step 3 Full text | Step 4 Quality Rating |
|---|---|---|---|---|
| Science Direct | 222 | 22 | 9 | 7 |
| Scopus | 2 | 1 | 1 | 1 |
| Springer | 207 | 2 | 0 | 0 |
| Emerald Insight | 410 | 32 | 23 | 14 |
| IEEE xplore | 1 | 0 | 0 | 0 |
| World Wide Science org | 166 | 4 | 2 | 2 |
| Total | 1.008 | 62 | 36 | 24 |

From a Boolean survey covering the last 5 years (2020-2024), we note that the survey was carried out in the first half of June 2024. Therefore, we can observe that the number of articles addressing the topic in question has been increasing, and even though we only have data for the first 5 months of 2024, the number of articles for this year already surpasses the numbers from 2021. The explanation of the diagram is given in Figure 1.

**Figure 1**

*Number of articles per year*




4.2 IMPLEMENTATION OF AR IN FASHION AND BEAUTY RETAIL

The advancements of AR technology in fashion and beauty retail are vast, although significant challenges in their implementation still persist. This study focused on retail applications for fashion and beauty products with the aid of AR. The products listed in this study are clothing, footwear, accessories, and makeup. Some of the selected articles examined more than one product, and all are listed in Table 4. The applications of the studies and their objectives are varied, and their details are listed in Table 5.

What differentiates AR technology in relation to different products is that garments work with static images; that is, the clothing is superimposed on the user's image (photograph) through 3D technology (a significant improvement over older 2D applications). Users can experiment with different styles and assemble various looks, where liveliness and image quality are key elements for the acceptance of the technology. On the other hand, the fitting of shoes, accessories, and makeup utilizes AR technology that follows the user's movement. For example, when trying on glasses, the user can move their head and observe the product in real time, as the technology uses visual tracking to detect movements.

Meeting the needs of customers and understanding their desires is not simple. This is why the main objectives of the literature are: (1) customer experience, which consists of flow experience and perceived value; (2) customer response, which consists of interactivity, cognitive and behavioral response; (3) customer purchase intention, which consists of

attitude towards the product and the customer decision process; (4) adoption and acceptance, which refers to the intention to adopt and validate the use; (5) reduction in returns, i.e., how much the use of technology helps with the accuracy of purchases and reduces product returns or exchanges; (6) perceived task complexity, which relates to the difficulty of using the technology; and (7) attitude towards risk/trust, which corresponds to concerns regarding privacy or even the product's compliance.

It is observed that the 24 articles aim to provide answers regarding the use of Augmented Reality across various aspects, but none of the studies answers all the questions. However, all offer contributions that help clarify the questions of this review research.

**Table 5**

*Research Objectives and Theory*

| **Research Objectives** | **Theory or model used** |
|---|---|
| Customer Experience | Mistos Methods (Yoo 2023) (M. Park and Yoo 2020) (Kim, Park, and Kader 2023) (Plotkina, Dinsmore, and Racat 2022) (Tawira and Ivanov 2023) (Wang, Cao, and Ameen 2023) UTAUT+TRI(Qasem 2021) Stimulus-Organism-Response (Hsu, Tsou, and Chen 2021) Theory of Uses and Gratuities (Kang et al. 2023) Method Partial least squares (Ivanov, Head, and Biela 2023) (Chen et al. 2022) Thematic Analysis Method (Caboni and Pizzichini 2022) Structural Equation Modeling (Lee, Xu, and Porterfield 2021) Confirmatory Factor Analysis (Lavoye, Sipilä, et al. 2023) Simple Reconnaissance Poll (Aslam and Davis 2024) |
| Behavioral response | Mistos Methods (Yoo 2023) (Barta, Gurrea, and Flavián 2023) (Plotkina, Dinsmore, and Racat 2022) UTAUT+TRI(Qasem 2021) Stimulus-Organism-Response (Arghashi 2022) (Hsu, Tsou, and Chen 2021) (Baytar, Chung, and Shin 2020a) Flow Theory (Pathak and Prakash 2023) (Kumar and Srivastava 2022a) Technology Acceptance Model (Jiang et al. 2023) Structural Equation Modeling (Dogra et al. 2023) Partial least squares (Ivanov, Head, and Biela 2023) Thematic Analysis Method (Caboni and Pizzichini 2022) Confirmatory Factor Analysis (Lavoye, Sipilä, et al. 2023) Simple Reconnaissance Poll (Aslam and Davis 2024) |
| Purchase intention | Mistos Methods (Yoo 2023) (Barta, Gurrea, and Flavián 2023) (M. |

| Research Objectives | Theory or model used |
|---|---|
| | Park and Yoo 2020) Structural Equation Model (Lavoye, Tarkiainen, et al. 2023) Stimulus Organism Response (Arghashi 2022) (Baytar, Chung, and Shin 2020a) Flow Theory (Pathak and Prakash 2023) Theory of Uses and Gratuities (Kang et al. 2023) Method Partial least squares (Ivanov, Head, and Biela 2023) (Chen et al. 2022) Thematic Analysis Method (Caboni and Pizzichini 2022) |
| Adoption and acceptance | UTAUT+TRI(Qasem 2021) ORESTE (Karadayi-Usta 2024) Stimulus-Organism-Response (Hsu, Tsou, and Chen 2021) Technology Acceptance Model (Jiang et al. 2023) Thematic Analysis Method (Caboni and Pizzichini 2022) Theory of Uses and Gratuities (Kang et al. 2023) Structural Equation Modeling (Lee, Xu, and Porterfield 2021) Confirmatory Factor Analysis (Lavoye, Sipilä, et al. 2023) Method Partial least squares (Chen et al. 2022) |
| Decrease in returns | ORESTE (Karadayi-Usta 2024) Technology Acceptance Model (Jiang et al. 2023) Stimulus Organism Response (Baytar, Chung, and Shin 2020a) |
| Perceived task complexity | Mixed model (Yoo 2023) Technology Acceptance Model (Jiang et al. 2023) Simple Reconnaissance Poll (Aslam and Davis 2024) |
| Attitude towards risk/trust | Theory of Uses and Gratuities (Kang et al. 2023) Structural Equation Modeling (Dogra et al. 2023) Flow Theory (Kumar and Srivastava 2022a) Mistos Methods (Tawira and Ivanov 2023) Simple Reconnaissance Poll (Aslam and Davis 2024) |

**Table 6**

*Articles by Segment*

| AR Application Segment | Articles |
|---|---|
| Clothing | (Plotkina, Dinsmore, and Racat 2022)(Qasem 2021), (Karadayi-Usta 2024), (Kim, Park, and Kader 2023), (Kang et al. 2023), (Kumar and Srivastava 2022a), (Baytar, Chung, and Shin 2020a), (Lee, Xu, and Porterfield 2021), (Tawira and Ivanov 2023), (Wang, Cao, and Ameen 2023), (Aslam and Davis 2024). |

| | |
|---|---|
| Footwear | (Arghashi 2022), (Kang et al. 2023), (Jiang et al. 2023), (Kumar and Srivastava 2022a), (Ivanov, Head, and Biela 2023), (Caboni and Pizzichini 2022), (Chen et al. 2022), (Aslam and Davis 2024). |
| Accessory | (Yoo 2023), (Dogra et al. 2023), (Lavoye, Tarkiainen, et al. 2023), (Pathak and Prakash 2023), (Wang, Cao, and Ameen 2023), (Lavoye, Sipilä, et al. 2023), (Chen et al. 2022). |
| Makeup | (Lavoye, Tarkiainen, et al. 2023), (Hsu, Tsou, and Chen 2021), (Barta, Gurrea, and Flavián 2023), (M. Park and Yoo 2020), (Caboni and Pizzichini 2022), (Wang, Cao, and Ameen 2023), (Lavoye, Sipilä, et al. 2023). |

## 4.3 RESULTS OF RESEARCH OBJECTIVES

**Customer experience:** The analysis of the 24 articles revealed that the experience with AR in fashion and beauty retail occurred at different levels and from different perspectives. In this section, we highlight the main applications observed.

As consumers use AR to virtually experience a product, their ability to control their buying activity increases, allowing them to craft vivid mental images (M. Park and Yoo 2020). Mobile users who engage in AR mobile apps to satisfy their novelty and fashion/status search needs are more likely to rely on AR apps (Kang et al. 2023). Although it cannot take into account tactile attributes such as touch, feel, comfort, and weight, results related to specific visual characteristics (i.e., style, detail, and coordination with other items) were above neutral when using AR, showing that AR visuals were satisfactory in helping participants understand these attributes when shopping online (Baytar, Chung, and Shin 2020b). This is because consumers are motivated to explore their styles in AR-based service contexts, as long as they consider the virtual self to be themselves (i.e., self-presence) (Lavoye, Sipilä, et al. 2023). It was also clear that the quality of the augmentation and the effects of personalization on VTOs are influenced by external body image factors. It seems that users with lower self-esteem are impressed by the new (i.e., enlarged but not imaginary) ways of viewing their bodies, resulting in more satisfaction compared to those who may be used to their relatively "better looking" bodies (Tawira and Ivanov 2023).

It was largely observed that both perceived pleasure and enjoyment fully mediated the impact of the AR app type on the eventual appreciation of the app (Plotkina, Dinsmore, and

Racat 2022), as the level of experience correlates with the high level of satisfaction when using an AR app both to test a product and to check out directly (Caboni and Pizzichini 2022).

Consumers who perceive the richness and interactivity of media experience greater telepresence (Yoo 2023), just as innovation positively impacts performance expectations (Qasem 2021). In addition, the perceived support by the customer is essential for the continuity of use (Hsu, Tsou, and Chen 2021), as well as interactivity and liveliness (Kim, Park, and Kader 2023), and the quality and quantity of information offered improved purchase decision-making (Barta, Gurrea, and Flavián 2023).

The studies underline the superior nature of AR-based VFRs (virtual fitting rooms) in their ability to induce immersive experiences associated with telepresence, and in their perceptions of interactivity, because consumers can understand how interactivity contributes to their utilitarian and hedonic experiences (Lee, Xu, and Porterfield 2021). AR apps made participants feel as if they were still "in person" when trying on products in the apps, even if they had not moved to a physical store. They show how the use of technology can be incorporated to support social practices such as shopping and socializing (Aslam and Davis 2024). Finally, the survey results identify positive relationships between usability, playful value, visual appeal value, and customer satisfaction (Wang, Cao, and Ameen 2023).

**Behavioral response:** Studies demonstrate the customer's response, highlighting how they act and feel towards AR in shopping spaces, which is perceived in a very similar way to in-person physical purchases, allowing product inspections and offering higher utilitarian and hedonic values (Yoo 2023). It is nearly a maxim to say that hedonic value—that is, fun while shopping—is a factor present in all studies. The findings suggest that the experimental features of the AR application exert a more positive effect on hedonic value than on utility value; in turn, only the hedonic value positively influences the intention of continued use (Hsu, Tsou, and Chen 2021). The novelty aspect increases the consumer's inspiration, boosting the motivation for hedonic purchase (Arghashi 2022), and reducing the perception of risk associated with online purchase, leading to impulsive online behavior (Kumar and Srivastava 2022b).

AR reduces the confusion, doubt, and/or anxiety caused by the overabundance of products (Barta, Gurrea, and Flavián 2023). In addition to the solution for shopping without social exposure—recently experienced due to COVID-19—users felt secure and viewed AR technology as fun (Caboni and Pizzichini 2022), which promoted feelings of greater ownership and comfort in decision-making (Pathak and Prakash 2023). However, in some

cases, it has been revealed that technological anxiety significantly influences the attitude towards AR-based e-commerce sites (Dogra et al. 2023).

The relationship with free online apps was more favorable than those available only for in-store use. It was also found that consumers perceive brands as more sincere, exciting, competent, and sophisticated when AR apps allow for virtual try-ons (Plotkina, Dinsmore, and Racat 2022).

In an analysis, it was observed that in relation to satisfaction, well-being, fun, and intention to use AR applications for shopping, Generation X responded more positively than Generation Y, which in turn was more positive than Generation Z (Ivanov, Head, and Biela 2023). In other words, the younger generations are already used to these technologies and do not perceive the tool as a novelty.

The exploration of possible selves allows experimentation during the virtual tests, enabling users to try different styles they might not attempt offline (Lavoye, Sipilä, et al. 2023).

It is evident from the findings that AR fashion apps are useful and the shopping experience is enjoyable to such an extent that users want to share their experiences with friends and family (Aslam and Davis 2024).

**Purchase intent:** The results reveal a positive relationship between attitude toward a product and behavioral intent, with consumers showing a greater willingness to buy it, recommend it to others, and revisit the mobile app in the near future (M. Park and Yoo 2020). Purchase intent was significantly impacted by AR marketing activities, with the explanatory power of purchase intent being 45.3% (Chen et al. 2022).

It has been empirically demonstrated that decision comfort promotes favorable purchase intentions through immersive AR experiences (Pathak and Prakash 2023). The reduction of dissonance experienced during the decision-making process also promotes purchase intentions (Barta, Gurrea, and Flavián 2023). Moreover, consumers find shopping with AR fun, which further increases purchase intention and the likelihood of recommending the mobile app to others (Yoo 2023).

The presence of AR can influence purchase intentions when it provides information that consumers use in their decision-making, which may depend on the symbolic meaning of consumption associated with different levels of body modification (Lavoye, Tarkiainen, et al. 2023). AR has significant potential, improving the degree of psychological and physiological tranquility, contentment, and well-being in decision-making, especially in the context of a purchase decision (Ivanov, Head, and Biela 2023).

It was found that purchase intention is directly linked to telepresence, meaning that participants with higher levels of telepresence had more positive attitudes and higher purchase intentions (Baytar, Chung, and Shin 2020b). Consumer-perceived inspiration also increases hedonic purchase motivation and purchase intent (Arghashi 2022).

**Adoption and acceptance:** The results show a significant relationship between hedonic motivation and the intention to adopt experimentation technology in the context of fashion (Qasem 2021). Experiential value promotes the intention of continued use. The strong effect of the hedonic value on the intention of continued use, as indicated by the path coefficient, suggests that the hedonic value facilitates the adoption and intention of continued use (Hsu, Tsou, and Chen 2021). In addition, the intention of continued use is directly linked to the quality of the system, the perceived ease of use, and the perceived usefulness (Jiang et al. 2023).

Consumers' decision to adopt AR-based VFRs resulted from the combined assessments of cognitive and affective aspects (Lee, Xu, and Porterfield 2021). Specifically, during virtual self-tests, consumers explore their styles and increase the processing of brand information. In turn, this benefits the acceptance of brands offering such services (Lavoye, Sipilä, et al. 2023).

Participants also demonstrated a strong desire to continue using AR technology in a post-COVID world, expressing their great enthusiasm and ability to use it in everyday life (Caboni and Pizzichini 2022). What's more, there is a greater inclination and acceptance to use the phone camera as a tool for body measurements (Karadayi-Usta 2024).

The intention to use and continue AR was significantly impacted by 52.2% of the users of this survey (Chen et al. 2022). Trust in AR apps was a determinant of AR app usage intent and online/offline store sponsorship intent (Kang et al. 2023).

**Decrease in returns:** Although studies are still limited in this regard, it was possible to make some positive observations. In this study, we have the answer that most participants were able to correctly select their sizes and did not need to try on a different size, since when choosing the product through AR technology, the product delivered by mail was suitable for the buyer's body, thus reducing the chances of return (Baytar, Chung, and Shin 2020b).

Using AR is likely to significantly decrease returns and thus emission and waste levels (Karadayi-Usta 2024). The virtual AR shoe fitting function can play a very important role in online shopping and solve many problems, such as improving the shopping experience and reducing return rates (Jiang et al. 2023).

**Perceived task complexity:** The perception that the consumer can control AR technology for a product test is more likely to increase the sense of reality for consumers who perceive low task complexity than for those who perceive high task complexity (Yoo 2023). However, it was observed through the interviews that AR applications can have complications when adapted for certain generations, such as difficulties in use for those with lower technical proficiency, especially regarding the emerging AR technology (Aslam and Davis 2024).

The causal relationship between system quality, perceived utility, and perceived ease of use was verified in the AR relationship model, showing that perceived ease of use can affect multiple constructs simultaneously (Jiang et al. 2023).

**Attitude toward risk/Trust:** Trust in AR apps was a determinant of AR app usage intent and online/offline store sponsorship intent (Kang et al. 2023). Other studies suggest that although trust and the need for touch are fundamental elements for the AR user, they are not the only determinants (Dogra et al. 2023). The virtual test with AR promotes greater certainty of decision and confidence in the choice, which significantly reduces the risk factor (Kumar and Srivastava 2022b). In this study, it was observed that 50% of participants consider the use of avatars in a bank of options to keep their image safe. That is, they perceive privacy risk, and this can be a potential obstacle to the adoption of photorealistic VTO (Tawira and Ivanov 2023). There is a question about the privacy of these apps and how they can shape the consumer's retail journey (Aslam and Davis 2024).

From the data collected, we believe we have answered the questions raised:

1. What are the key behavioral and experiential factors that affect augmented reality (AR) acceptance and consumer purchase intent in fashion and beauty retail?
2. Can implementing AR in fashion and beauty retail help reduce the perceived risk and rate of product returns?

## 4.4 FUTURE RESEARCH DIRECTIONS

Future directions for the study of user behavior include adding variables such as risk and privacy issues to the model due to their significant ability to explain the intent to adopt new technologies (Qasem 2021) (Chen et al. 2022). The individual's level of engagement with the product and the perceived complexity of the task are also important to precisely identify their moderating roles in the relationship between telepresence and perceived values, which can be further explored (Yoo 2023).

Other variables, such as price, the amount of information about the product, and online reviews, are important factors to investigate, as well as the precise use cases that lead to increased space presence. For example, product realism, which is made up of visually appealing features (Hsu, Tsou, and Chen 2021) (Lavoye, Tarkiainen, et al. 2023).

In the future, the study of unknown brands, where consumers lack a particular attitude, may reveal relevant differences (Arghashi 2022). However, studies related to brand and brand loyalty should continue to focus on the impact of the real AR experience and its effect on brand perception and actions (Lavoye, Sipilä, et al. 2023) (Plotkina, Dinsmore, and Racat 2022). Research can also be conducted with other higher-cost products to explore the effect of AR on the shopping experience and examine consumers' willingness to pay more for products (Barta, Gurrea, and Flavián 2023).

Future studies may employ various approaches, such as MCDM (Multicriteria Decision Method) with different elements that influence apparel customers' purchasing choices (Karadayi-Usta 2024). Another suggestion is to use a more heterogeneous mix of users for future testing, in terms of age, culture, and familiarity with new technologies (Tawira and Ivanov 2023; Wang, Cao, and Ameen 2023) (Pathak and Prakash 2023) (Jiang et al. 2023) (Dogra et al. 2023) (Plotkina, Dinsmore, and Racat 2022) (Kumar and Srivastava 2022) (Caboni and Pizzichini 2022) (Lee, Xu, and Porterfield 2021) (Chen et al. 2022) (Aslam and Davis 2024). Additionally, considering the moderating role of consumers' level of familiarity with technology could help ensure different first-time and returning user shopping outcomes (M. Park and Yoo 2020).

It is possible to explore how consumers of different genders perceive AR technology that allows them to try on clothes virtually, and compare the interactions between these consumers and technology (Kim, Park, and Kader 2023) (Jiang et al. 2023) (Lee, Xu, and Porterfield 2021) (Lavoye, Sipilä, et al. 2023).

Scholars could also examine the perceived costs of using a VTO, such as media irritation with the avatar creation phase, as well as privacy concerns resulting from disclosing biometric data (Tawira and Ivanov 2023).

Researching how AR can help explore one's self-concept is an important avenue for future research. Similarly, diving into the self-exploratory experience and collecting additional data to verify findings with self-exploratory engagement as performance can be beneficial, which may involve looking at how many products participants try, how long they use the app, and how creative their experience is (Lavoye, Sipilä, et al. 2023).

As AR technology and consumer preferences evolve, experiences, expectations, and behaviors may change. Additionally, consumer experiences and expectations regarding AR applications may differ across industries, which limits the transferability of findings to non-fashion industries. Future research can explore these dynamics by conducting longitudinal studies or examining AR applications in different industries (Aslam and Davis 2024).

Given the growing influence of Augmented Reality on purchasing decisions, future research should investigate how factors of privacy, perceived cost, and technological familiarity influence consumer adoption and continued use, as well as explore differences in other sectors and their variables, which may mediate the relationship between technological immersion and consumer behaviors.

## 5 CONCLUSION

This study on the application of Augmented Reality (AR) in fashion and beauty retail, based on a systematic analysis of 24 articles selected from six databases over a five-year period, revealed important discoveries into the impact of this technology.

The studies highlight that both perceived pleasure and enjoyment are key mediators of the enjoyment experienced with AR applications, and a high level of satisfaction is correlated with continued use. Innovation as well as the quantity and quality of information are also important determinants of user experience and acceptance of technology.

Consumers' behavioral response to AR is positive, with a significant hedonic value promoting the intention of continued use. In addition, purchase intention is strongly impacted by AR, demonstrating a positive relationship between the attitude towards the product and the desire to acquire it.

The complexity of the task perceived by consumers affects their sense of reality, with the quality of the system and ease of use influencing several aspects simultaneously. Trust and the need for touch are important but not exclusive determinants of AR adoption.

However, there are still challenges to be overcome in the implementation of AR in fashion retail. One of the main ones is the concern for consumer privacy, while another challenge is to meet the expectations of younger generations, for whom immersive technologies no longer offer a strong novelty effect.

These results indicate practical implications where companies in the fashion and beauty sector can increase the adoption of AR by investing in usability improvements and solutions that ensure the privacy of consumer data. Improved personalization and interactivity

can offer a competitive edge, especially as younger consumers seek innovative and fluid experiences during the purchase process.

**Generative AI and AI-assisted technologies statement**

During the preparation of this work, the author(s) used ChatGPT (OpenAI) to improve language clarity and readability. After using this tool, the author(s) reviewed and edited the content as needed and take full responsibility for the content of the publication

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