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The Impact of Augmented Reality Technology in Packaging on Consumer Behavior, Based on the Stimulus-Organism-Response Framework

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ABSTRACT

Background: Recent advances in information technology help users to experience reality. Augmented reality (AR) and virtual reality tools are considered among the most destructive novel technologies in marketing and advertising. AR marketing, as a type of mobile marketing, can shape and improve customers' experiences. Because of progressing consumer experience expectations and the growing complexity of the product, traditional packaging methods have become insufficient in the packaging industry. AR packaging can save the day and bring about numerous advantages for companies. **Purpose:** This research aims to investigating the impact of AR packaging on consumer behavior, based on the S-O-R framework. **Method:** The hypotheses of this research were analyzed using structural equation modeling (SEM) and Smart-PLS3 software. **Results:** The findings revealed the positive impact of authentic experience on cognitive and affective responses, positive impact of cognitive and affective responses on the intention to continue AR, intent to continue to recommend AR and, purchase intention. **Conclusion:** using AR in packaging can change the customer's experience with the product. This research provides practical insights for marketing managers expecting to find innovative strategies to engage consumers emotionally and who desire empirical evidence to support their decision to invest in such emerging technologies.

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1. Introduction

The adoption of new technologies is always considered in marketing. As studies show, those firms that invest in new technologies can enjoy a stronger competitive advantage (Hoffman et al., 2022). Current progresses in information technology (IT), like excessive-speed mobile nets, artificial intelligence (AI) and, appearance with high resolution, help users to experience reality (Rauschnabel et al., 2022). According to predictions proposed in scientific studies, AR will be a significant technology with some dominant contributions in main functional fields, such as marketing (Wagner & Cozmiuc, 2022).

In recent years, a multitude of reality-enhancing technologies have emerged, capturing the attention of both customers and companies. Among these technologies, augmented reality (AR) and virtual reality (VR) have garnered significant recognition (Hilken et al., 2022b). A distinct type of VR is augmented reality, in which digital devices are used to overlay supplementary sensory information (sounds, objects, avatars, graphics, labels, etc.) on the real world. This provides contextual information that enhances appearance, usability, and enjoyment, and delivers an enhanced interactive experience. The distinction between VR and AR is that VR creates a perception of reality completely based on virtual information, while AR enhances the perception of the real world with additional computer-generated information. Mixed reality (MR) merges both VR and AR (Wedel et al., 2020).

In marketing, there has been a notable integration of various AR technologies aimed at elevating consumer engagement and enriching their overall experience. This emerging trend is called Augmented Reality Marketing (ARM). To achieve this, marketers have employed various AR tools, such as smart glasses, virtual try-ons, and interactive advertisements, that are accessible through QR codes or dedicated applications (Uribe et al., 2022). According to Sung (2021), augmented reality and virtual reality have emerged as highly transformative technologies within the realms of marketing and advertising. In the case of AR, virtual elements integrate into the physical environment through screens or projectors (Wu & Kim, 2022).

As Wagner and Cozmiuc (2022) stated, AR marketing that is known as a form of mobile marketing can shapes customers' experiences. The AR market, characterized by the incorporating of digitally generated media into an existing physical atmosphere, is anticipated to witness substantial growth. It is projected to expand from approximately 5.91 billion in 2018 to a staggering 198 billion by 2025 (Pozharliev et al., 2022). Brands are actively striving to generate novel and captivating content by using this cutting-edge technology (Ibáñez-Sánchez et al., 2022). AR advertising has the capacity to enhance various facets of consumers' emotional reaction (Pozharliev et al., 2022). Managers have shown a strong inclination toward incorporating AR into their marketing endeavors (Gatter et al., 2022). Numerous companies have embraced AR as a means to develop interactive games, design captivating advertisements, and elevate the overall consumer experience (Zhu & Wang, 2022). AR advertising has become increasingly popular across multiple sectors (Li et al., 2021).

Packaging is a fundamental component of any product, crucial in its overall composition and presentation. The packaging is the last tool that can influence the purchasing decision in the decision-making process (Konopelko, 2019). Unlike traditional packaging, limits on the amount of information that can be printed, QR codes offer the opportunity to incorporate an extensive array of brand- and product-related details. By integrating QR codes into packaging, companies can seamlessly deliver copious amounts of information alongside their products (Irawen, 2022). In the contemporary landscape, marketers have adopted the practice of incorporating QR codes into product packaging to guide their target audience into the realm of digital experiences. This strategic approach not only facilitates customer engagement but also unlocks a plethora of additional prospects for brand interaction (Fedeko, 2022).

Augmented reality offers numerous advantages in packaging, ranging from cost reduction to increased sales, ultimately enabling brands to improve customer engagement. This concept presents a mutually beneficial scenario for brands, ensuring optimal outcomes. Furthermore, in the event of a marketing campaign going viral, the brand may experience a surge in demand for its products, potentially resulting in depleted warehouse stocks. With the escalating number of mobile phone users daily, reaching customers has become more convenient, as they can effortlessly scan QR codes and partake in an enchanting experience. As Irwen (2022) has mentioned, although only a mere 1% of retailers currently incorporate AR into their branding strategies, 71% of customers assert that they are inclined to make more purchases if brands utilize AR. This stark contrast between customer and brand

sentiment can be effectively bridged through the implementation of AR in packaging, thereby facilitating a harmonious relationship between the two parties (Irwen, 2022).

A review of AR literature demonstrated some findings in this context as follows: the process of augmented reality development on the packaging (Mat Nasir & Mohammed Ali, 2022), AR impact on the negative perception of consumers (Gu et al., 2023), how AR can be effective to increase the attractiveness of the product in food and beverage industry (Konopelko, 2019), the usage of AR for the needs of food traceability (Todorović et al., 2019), factors affecting the experimental value of AR aesthetic features (Vongurai, 2021), the importance of AR for personal care post-COVID-19 (Mangtani et al., 2020), AR as a powerful tool for e-commerce from the aspect of interactivity and vividness (Yim et al., 2017), using the technology acceptance model to state the impacts of perceived AR on customers' perceptions (Oyman et al., 2022), the effect of perceived interactivity of AR on customer responses from an intellectual imagery facet (Park & Yoo, 2020), and the effect of AR on retail sales (Tan et al., 2022).

Despite the keen interest in AR, there has been limited research demonstrating its impact in packaging on consumer behavior. Having a more clear understanding of how AR affects consumer behaviors, would help marketing managers incorporate this immersive technology into their marketing strategies. It is worth mentioning that, to the best of the authors' knowledge, no previous research investigated AR technology in packaging using the S-O-R framework. In this regard, this research seeks to pave the way for more research in this context. Empirically, this study replicates research by applying the Stimulus-Organism-Response Paradigm, on which the present study's model is based.

Different marketing stimuli and cognitive factors can be explained by this framework. The flexibility and the possibility of investigating different internal and external stimuli and experiential and non-experiential organisms are the main advantages of S–O-R model (Sultan et al., 2021). This model is highly flexible and can be used to investigate both internal and external phenomena, tangible and intangible entities, as well as living things and those that do not exist in real life. It is used to understand how individuals behave in virtual worlds, as more individuals use the internet (Seçilmiş et al., 2022). The model is primarily based on the assumption that environmental cues impact human beings' cognitive or emotional responses, which eventually affect their consumption behaviors (Ric & Benazić, 2022).

Customer behavior is the key to success in dynamic marketing. As companies navigate this landscape, marketing's deep understanding of consumer behavior will be a compass to guide strategic decisions. By aligning marketing, communications, and strategies with consumer behavior issues, companies can build lasting relationships, improve brand loyalty, and ensure longevity and prosperity in a constantly changing market. Therefore, this research aims to investigate the impact of using AR technology in product packaging on consumer behaviors, regarding the S-O-R framework. This paper proposes authentic experience as the stimulus, cognitive and affective responses as the organism, and continuance intention toward AR, intention to recommend AR, and purchase intention as the responses. Therefore, the purposes of this study are: (1) to examine the impact of authentic experience on cognitive and affective responses to AR experiences through the SOR framework; (2) to investigate the effect of cognitive and affective responses on intention to continue AR, intention to recommend AR, and purchase intention, respectively.

2. Literature Review

2-1. Augmented Reality

Augmented reality is an innovative technology that seamlessly merges the real world with virtual information (Liu & Nhung, 2022). By overlaying digital content onto our physical environment, AR enhances our perception and interaction with the surroundings. This cutting-edge technology allows for the projection of virtual objects into real-world settings, creating a more immersive and lifelike experience. Through integrating virtual elements with our environment, AR offers individuals a heightened level of engagement and realism (Wagner & Cozmiuc, 2022).

Although the origins of AR can be traced back to the 1950s, it was not until 1990 that Tom Caudell and David Mizell coined the term itself (Rauschnabel et al., 2022). AR service automation is characterized by its visually captivating and contextually relevant information, creating a sense of

immersion and seamless interaction. Consequently, this generates value through repeated service usage and positive word-of-mouth (Wu & Kim, 2022).

Recent research on AR indicate that the fusion of virtual and real worlds, as a particular feature of AR, can create inimitable sensory experiences. Augmented reality advertising, contrary to traditional 2D advertising, helps the audience have a more interactive and realistic experience, which enhances proceeding expressiveness and may activate positive attitudes and behavioral responses (Pozharliev et al., 2022). The information in virtual environment may improve the elements in the real world and enhance the users' perceptions of the real atmosphere (Zhu & Wang, 2022). Thanks to the integration of AR into mobile applications, brands may offer customers comprehensive information related to products. This action can influence customer attitudes and perceptions. Smartphones and tablets are some tools that host AR applications. Among others are cameras and sensors that insert information into the systems of augmented reality (Wagner & Cozmiuc, 2022).

2-2. AR Marketing

AR marketing is "a strategic concept that integrates digital information or objects into the subject's perception of the physical world, often in combination with other media, to expose, articulate, or demonstrate consumer benefits to achieve organizational goals" (Wagner & Cozmiuc, 2022, p. 5). AR virtual experience marketing merges the needs of consumers for real experience, enhances their cognition of products from trial wearing and some different manners, provides consumers with precise information, and strengthens the authenticity and credibility of marketing content (Zhu & Wang, 2022).

Unlike VR, the AR user is not secluded from the real space; they see their physical environment, but the technology augments this real world with some virtual information (Gatter et al., 2022). The AR marketing landscape is developing promptly. The integration of augmented reality into marketing strategies caters to consumers' desire for genuine experiences while also enhancing their understanding of products through various means, such as virtual try-ons. This approach not only provides consumers with comprehensive information but also reinforces the credibility and authenticity of marketing content (Zhu & Wang, 2022). Over the past decade, the market has witnessed the rise of AR as a disruptive technology thanks to the advancements in both hardware and software (Ibáñez-Sánchez et al., 2022). Augmented marketing can potentially expand traditional marketing methods, encompassing everything from advertising to content marketing and storytelling. Particularly, during highly competitive holiday seasons, AR marketing tools can foster a shared sense of holiday spirit, enabling campaigns to stand out (Li et al., 2021). By enhancing sensory stimulation and facilitating engagement and interaction, AR experience marketing influences users' psychology and emotions, leading to improved psychological well-being, value recognition, brand impression, and a stronger connection with consumers (Zhu & Wang, 2022). Augmented reality is an ideal platform for providing consumers with an authentic and immersive assessment of products or services (Hilken et al., 2022a).

2-3. Smart Packaging

The concept of smart or intelligent packaging involves using technology to monitor the quality of products, whether this monitoring occurs in real time or not. This technology can also be extended to the supply chain and distribution logistics. By implementing smart packaging, customers and distributors can have access to relevant information about the quality and safety of the product. Smart packaging is more efficient than conventional packaging, as it reduces losses along the supply chain (Fernandez et al., 2023). It is projected that the global market for smart packaging will reach $26.7 billion by 2024. Smart packaging means systems that incorporate sensor technology and are used in various industries such as food and pharmaceuticals (Schaefer & Cheung, 2018). Although smart packaging is still in its early phases of progress, its potential applications and benefits are significant. Consumers can benefit from increased access to product and company information, while businesses can address inefficiencies and reach a deeper insight of a product's journey and usage (impacX, 2023).

Schaefer and Cheung (2018) declare that, due to burgeoning customer expectations and the escalating complexity of products, traditional packaging has become insufficient within the packaging industry. The integration of smart packaging, in conjunction with AR technology, offers a novel approach in real time, wherein enhancements are achieved by incorporating of computer-generated

data. The utilization of AR within packaging can revolutionize the customer's encounter with the product by imparting objective details such as pricing, country of origin, composition, nutritional value, authenticity, and potential discounts. Furthermore, this consumer experience can encompass subjective elements, including comments, attitudes, reviews, and suggestions (Fernandez et al., 2023).

2-4. Advantages of Using Augmented Reality in Product Packaging

Marketers employ AR packaging as the most innovative strategy to captivate their target audience, making it a popular choice among brand owners. Beyond its ability to leave a lasting impression and enhance brand significance, AR packaging offers numerous additional advantages and benefits. Fedeko (2022) has outlined several key advantages associated with the utilization of AR in product packaging:

- *Sales Increase*: By integrating AR into their merchandise, brands can significantly increase sales by providing users convenient access to comprehensive product information via an interactive website.
- *Competitive Advantage*: Marketers constantly strive to outperform their rivals and improve their offerings. Augmented reality in packaging leverages a competitive advantage that sets brands apart in the eyes of their target audience.
- *Enhanced Brand Loyalty*: Creating an opportunity for customers to engage with AR packaging demonstrates a genuine concern for their satisfaction, fostering a sense of loyalty towards the brand.
- *Unique Shopping Experience*: While products may be forgotten, the interactive experience facilitated by AR packaging remains etched in customers' memories, influencing their purchasing decisions.
- *Increased Customer Engagement*: AR packaging catches the attention of onlookers, provides extensive product information, and encourages active engagement, facilitating the purchasing decision-making process.
- *Millennial Appeal*: Engaging younger generations in physical product purchases is more complex than the older demographics. Utilizing augmented reality in packaging enables brands to impress and resonate with the younger audience, showcasing a shared affinity and a forward-looking approach.
- *Cost-Effectiveness*: Implementing AR packaging is a relatively affordable endeavor. With existing package designs, companies need to incorporate a QR code to trigger AR content, minimizing expenses.
- *Flexibility and Content Variety*: With AR, marketers can easily update content, messaging, and promotions associated with the product. Digital presence provides unparalleled flexibility in making diverse choices and delivering timely content updates.
- *Viral Marketing Potential*: AR packaging serves as a powerful tool that not only prompts users to share their experiences through social media platforms but also encourages real life word-of-mouth promotion.

2-5. Stimulus- Organism- Response Framework

At the beginning of the 20th century, the first models of shopping behavior were formulated (Ric & Benazić, 2022). The Stimulus-Organism-Response (S-O-R) framework was initially introduced by Mehrabian and Russell in 1974 within environmental psychology. According to this model, it is believed that the emotional state of the individual is affected by the stimuli. This internal processing includes cognitive and emotional responses, which are then expressed through behaviors. S-O-R suggests that environmental cues can elicit specific behaviors by influencing emotional and cognitive states. This model is widely recognized and utilized in consumer behavior research as a significant psychological theory (Chen et al., 2019).

The S-O-R theory originated in psychology and later found application in communication science due to the shared focus on human beings and their components, such as attitudes, opinions, perceptions, emotions, and behaviors (Armawan & Sudarmiatin, 2022). Widely employed in psychology, consumer behavior, and marketing research (Mim et al., 2022), the S-O-R model posits

that various environmental factors act as stimuli, influencing the cognitive and emotional states of individuals/organisms and prompting behavioral reactions. Stimulus refers to an external object in the environment that can impact an organism's cognitive and emotional conditions (Sohaib et al., 2022). The underlying assumption of this model is that changes in behavior are contingent upon the quality of the stimulus that interacts with the organism. Furthermore, the model elucidates how different environmental stimuli can shape an individual's internal experience, leading to observable responses (Armawan & Sudarmiatin, 2022). Kim et al (2020) believed that the S-O-R theory is a valuable model for exploring factors related to disruptive technologies such as VR and AR. It has been employed to investigate the connections among inputs (stimulus), processes (organism), and outputs (response).

Stimulus (S) is perceived by the human senses, and it can also be described as an impact on the individual's internal state (Min & Tan, 2022). The organism (O) represents an individual's cognitive and emotional state, typically manifested through perception and feelings. The response (R) presents the ultimate behavioral response to the stimulus (Vidyanata, 2022). This concept stems from the consumer behavior approach, which focuses on understanding how individuals behave as consumers (Min & Tan, 2022). The S-O-R framework has been studied in different consumer behavior background.

Conceptual Model and Hypotheses Development

2-6. Authentic Experience, Cognitive Response, Affective Response

Authenticity is a "new consumer sensibility that involves perceptions of the extent to which novel, real, original, exceptional, and unique experiences, services, or products are genuine" (Kim et al., 2020, p. 72). Authenticity pertains to the quality of being genuine rather than fake or counterfeit, particularly when considering physical objects. The S-O-R framework operates under the premise that environmental cues influence an individual's cognitive and emotional responses, which subsequently impact their consumption behavior (Ric & Benazić, 2022).

AR features are so entertaining, motivational, and helpful for users who express positive app evaluations, purchase intentions, more willingness to pay and, higher brand perceptions (Zanger et al., 2022). In the digital age, individuals prefer to be more active users. Indeed, when customers' senses are more actively engaged, they get memorable experiences. Consumers make purchasing decisions based on their perception of authenticity. In addition, consumers seek immersive experiences beyond mere education and entertainment, allowing them to become fully engaged (Kim et al., 2020). Given the impactful nature of authentic AR marketing, it offers the capacity for more immersive experiences with brands for customers. AR marketing represents a novel approach interacting with products and services, providing opportunities for companies to enhance brand awareness, highlight product features, and stimulate market demand (Sung, 2021).

Previous studies have demonstrated that augmented reality may improve customers' affective responses such as satisfaction and attitude toward products, services, and brands (Pozharliev et al., 2022). AR features do a positive task in e-commerce regarding the hedonic motivations and purchase intention (Jayawardena et al., 2023). Mental imagery influences attitudinal judgments. In advertising research, consumers who conjured vivid mental images had a more positive attitude toward an advertisement than others (Park & Yoo, 2020). Individuals' attitude is a leading predictor of behavioral intentions. How individuals respond to any action is affected by different external cues and relies on how they interpret and process these cues. Cues encompass any information about products that serve as indicators of quality. Customers rely on direct and indirect cues to assess the quality of a product (Sultan et al., 2021). The quality of smart technologies is widely recognized in e-commerce to impact customer psychological processes. Customers evaluate augmentation quality by the practical value it serves (utilitarian benefit) and the enjoyment (hedonic benefit) that derives from the experience. A 3D AR shopping experience that closely matches real shopping experience allows customers to verify a product's attributes and quality before purchase, demonstrating its practical usefulness (utilitarian benefit) (Nikhashemi et al., 2021).

In virtual contexts, a more authentic environment in 3D virtual settings may leads to a higher level of immersion and entertainment value. Authentic contexts contribute to a better immersive experience, as perceived authenticity is a significant driver of perceived value (Kim et al., 2020). Vividness and novelty, which are considered to be among the highly salient attributes of AR, may stimulate

customer-brand-related responses. Vividness in AR refers to the richness of the mediated environment generated through a shopping AR app, in terms of both aesthetic appeal and the quality of the product presentation. Vividness positively influences media usefulness (utilitarian benefits) and enjoyment (hedonic benefits), which then drives attitudinal and behavioral constructs (Nikhashemi et al., 2021).

Additionally, a study conducted in the tourism industry, has demonstrated that authentic experiences play an important role in predicting tourists' behavioral intentions and their subsequent online reviews after visiting (Kim et al., 2020). Through packaging, brands can use AR to deliver tailored marketing messages, promotions, and personalized content to consumers. This participatory approach fosters a stronger bond between the brand and the consumer, resulting in enhanced brand awareness and increased customer loyalty. By displaying product information about virtual content, AR apps can support customers in understanding the specific characteristics of a product and in making their product decisions. Relevant and useful information helps consumers to increase their clarity regarding the product and feel satisfied with their selection (e.g., utilitarian value). On the other hand, the higher playful presentation of informative features provided by AR apps comes along with greater hedonic value (Hsu et al., 2021). According to Tabaeeian et al. (2024), the characteristics of AR packaging which include interactivity, informativeness, enjoyment, and usefulness have a positive effect on the dimensions of the perceived, hedonic, and utilitarian value. AR packaging could be used for providing more information, emotional value, and supporting attributes in the shopping process, such as a superlative experience and exclusivity. There is a direct influence between food choice and emotions. The emotions help us to gain deeper insights into consumer product interactions. It has also been stated that consumer choices exist below the level of consciousness; therefore, the emotional and hedonic responses are processed at an unconscious level by the brain and cannot be verbally shown even though they play a major role in product selection (Bhavadharini et al., 2023).

Therefore, based on background mentioned above, we hypothesize that:

Hypothesis 1: Authentic experience has a positive and significant effect on cognitive Response.
Hypothesis 2: Authentic experience has a positive and significant effect on Affective Response.

2-7. Cognitive Response, Intention to Continue AR, Intention to Recommend AR, Purchase Intention

Consumers' usage intention refers to their tendency to test offerings and the probability of continuing to use them based on their positive usage experience (Chen et al., 2019). In virtual contexts, cognitive, social, and hedonic profits impact consumer engagement intentions. Perceived benefits positively relate to behavioral engagement intention toward applications (Molinillo et al., 2021). AS Zanger et al. (2022) have mentioned, consumers with a more positive attitude toward the product presentation format represent higher degrees of purchase intentions and reuse intentions.

Even though the purchase decision is the last step in the intricate consumer decision-making process, service providers must give attention to each phase of the customer journey by providing appropriate marketing exposure. This is because there is a complex process before reaching the final stage of purchase decision (Vidyanata, 2022). Cognitive response plays a significant role in influencing decisions at this stage, and based on the S-O-R theory, cognitive factors can lead to either approach or avoidance behavior (Seçilmiş et al., 2022). The S-O-R theory has been widely used to predict user behavior in the context of information and communication technologies (Kim et al., 2020). The cognition of technologies is influenced by factors such as information content, visual display, and interactive factors that engage consumers (Ying et al., 2022).

Cognitive responses may impact consumer's purchase intentions. When consumers have a positive inclination toward a brand, they are more likely to exhibit eagerness to purchase offerings related to that brand and more inclined to recommend it to others (Zanger et al., 2022). In virtual-world environments, consumer experiences (e.g., usefulness and enjoyment) play a positive role in consumer attitudes (Baker et al., 2019). Prior research has suggested a link between experiential value and continued usage intention in a mobile environment. Customers are willing to revisit an app and use it more frequently when they are satisfied with the experience. As such, an AR beauty app could provide practical, relevant, and trustworthy makeup knowledge and information to satisfy customers' utilitarian motivations and needs, thereby encouraging them to continue using the app. Conversely,

customers could experience a high degree of playfulness and enjoyment when an AR beauty app provides features or functions of sensory stimulation, fantasy, fun, and amusement. In light of this fact, customers will tend to continue using AR apps when they experience positive emotions or feelings (Hsu et al., 2021). AR applications, in particular, have been shown to increase perceptions of immersion for individuals and, when situated in the context of purchase-related behavior, to enable greater levels of engagement with products of interest. Immersion positively affects purchase intention. The assumption with AR-based apps is that they enable consumers to engage with content and products in a way that is not possible with other forms of online shopping. Hence, AR apps confer a level of usefulness that facilitates greater levels of purchase intention from consumers (Söderström et al, 2024).

Intention to use is more progressive than the actual use as a dependent variable, which is more static and retrospective. Behavioral intention is a customer's decision to show a particular behavior in the future. When the strength of a behavioral intention to conduct an act is greater, it is more likely that such an act will be performed in the future (Darzian Azizi et al., 2021). According to the cognitive consistency theory, consumers desire to seek consistency between their attitudes and behaviors. If consumers have a favorable attitude toward a product, their intentions to purchase and recommend the product will increase. If consumers have a favorable attitude toward a product, their behavioral intention to utilize that product is likely to be positive (Park & Yoo, 2020).

Based on the background mentioned above, we hypothesize that:

Hypothesis 3: Cognitive Response has a positive and significant effect on Intention to Continue AR.
Hypothesis 4: Cognitive Response has a positive and significant effect on Intention to Recommend AR.
Hypothesis 5: Cognitive Response has a positive and significant effect on Purchase Intention.

2-8. Affective Response, Intention to Continue AR, Intention to Recommend AR, Purchase Intention

The affective response is characterized as a reaction that involves feelings and emotions, while emotion encompasses the overall affective reaction that includes various feeling states (Weinlich & Semerádová., 2022). Affection represents individuals' attitudes, preferences, and experiential hedonic reactions based on emotions. According to the affect infusion theory, affection can serve as the information upon which a customer bases their purchase decision (Ying et al., 2022). In marketing communications, consumers' affective responses to advertisements can influence different aspects of their behavior, including their attitude toward the advertisement or purchase intention (Cho & Yamanaka, 2012).

In a research focused on the influence of authentic experience on visit intention using VR as a marketing tool, Kim et al. (2020) investigated the mediating effect of cognitive and affective responses. Another study conducted within the VR context employed the S-O-R model to examine the effect of sensory perception and information quality on satisfaction and visit intention (Seçilmiş et al., 2022). Consumers' evaluations of new products are dependent on the emotions and involvement drawn by the offer. Emotional responses compose predictable decision-making drivers with regularity in the mechanisms through which they impact product valuation (Bettiga et al., 2020). Increased levels of pleasure and enjoyment have a positive effect on various aspects, including the attitude toward the specific product presentation design, the willingness to use the design, the perceived usefulness of the format, changes in brand attitude, and the anticipated satisfaction with the consumer's choice (Zanger et al., 2022).

Szymkowiak et al. (2021) examined how thematic compatibility of content shared by influencers influences purchase intention in the hotel context by creating arousal. Affective reactions to product presentations may drive behavioral results. The positive emotions that online buyers encounter during their interaction with a product presentation can impact their actual behavior (Zanger et al., 2022). If consumers have positive intentions, they will likely engage in positive WOM and recommend products to others. Conversely, if they have negative intentions, they may switch products or decrease the frequency of their purchases. When it comes to the consumer's willingness to use a technology information system in the future, the behavioral intention is reflected in their usage intention (Chen et

al., 2019). Consumers who enjoy from the entertaining aspect of the shopping experience are more inclined to share their shopping experiences with others. Enjoyment impacts purchase intentions and word of mouth. A consumer's enjoyment of product presentations can indirectly influence their purchase intentions via an amplified attitude concerning the presentation (Zanger et al., 2022).

Based on the background mentioned above, we hypothesize that:

Hypothesis 6: Affective Response has a positive and significant effect on Intention to Continue AR.

Hypothesis 7: Affective Response has a positive and significant effect on Intention to Recommend AR.

Hypothesis 8: Affective Response has a positive and significant effect on Purchase Intention.

Based on the research theoretical background, above-mentioned literature review, and research hypotheses, the research model is presented as follows.

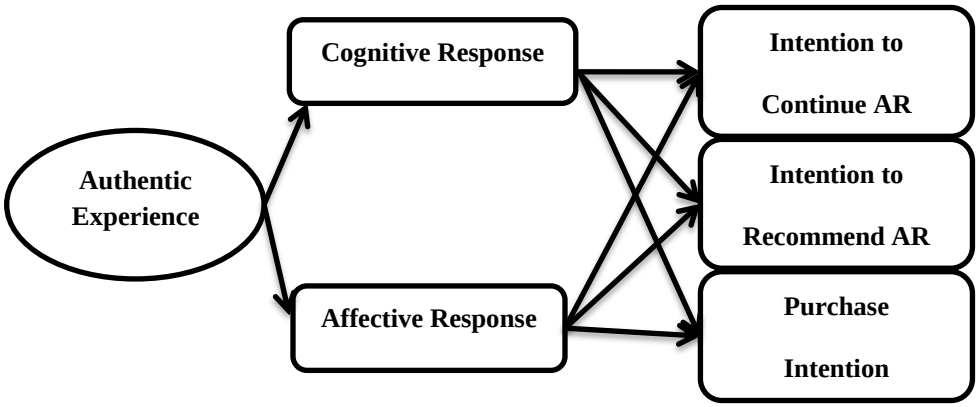

Fig. 1. Conceptual Model

3. Research Method

This survey was conducted as an applied and descriptive one. The data were collected through a questionnaire using a convenience sampling method. Convenience sampling is a non-probability sampling method where units are selected for inclusion in the sample because they are the easiest for the researcher to access. This can be due to geographical proximity, availability at a given time, or willingness to participate in the research. The questionnaire consisted of two parts: the first section dedicated to demographic information of the participants, while the second section included six research constructs with a total of 21 items.

We applied the questionnaire of Kim et al. (2018) for measuring authentic experience, cognitive response, and affective response; Lee et al.'s (2020) questionnaire for intention to continue, Talukder et al.'s (2020) questionnaire for intention to recommend, Kim and park's (2019) questionnaire for perceived value, and Sung's (2021) questionnaire for purchase.

The participants' perceptions of the items in the measurement model were assessed using a 5-point Likert scale. The research hypotheses were analyzed using structural equation modeling (SEM) by Smart-PLS3 software.

SEM is especially appreciated for its ability to evaluate complex relationships involving many dependent and independent variables within a unified analytical framework. This capability makes it an ideal tool for testing theoretical models that propose causal paths and interdependencies between variables. SEM works in two basic ways:

Measurement model: This part of SEM describes how the observed variables relate to their latent constructs, which essentially describes the operationalization of theoretical concepts.

Structural model: This method describes measurable relationships between the constructs themselves and provides a conceptual map of how different constructs influence one another. An important feature of PLS-SEM is that model estimates depend on the model under study to remove or adding specific indicators or configurations that affect model estimates for different parts of the model (Lubis & Handayani, 2022).

SmartPLS is a graphical user interface program for variance-based structural equation modeling using least squares path modeling (PLS-SEM). Smart-PLS offers advanced analysis capabilities. This allows researchers to examine moderating and mediating effects and better understand the underlying processes and relationships between terms in their models.

4. Analysis and Results

4-1. Demographic Characteristics of Participants

Due to the unlimitedness of the statistical population in this study, the number of samples based on Morgan's table consisted of 384 individuals, with a total of 215 questionnaires finally accepted. The population being examined in this study comprised university students who had experienced AR technology in packaging. For this purpose, an AR video about a beverage can from a well-known brand was provided to the participants and they were asked to watch it carefully. After experiencing the video and being engaged, the questionnaire was provided to them and they were asked to answer the questions based on their AR packaging experience. The demographic attributes of the participants are presented in Table 1.

Table 1. Demographic Attributes of Participants

Demographic Variable		Valid Percent
Gender	Male	37%
	Female	63%
Age	30 & below	33.6
	31-40	42.2
	41-50	13.3
	51 & above	10.9
Education	Associate and below	9.5
	BA	38.6
	MA and higher	51.9

4-2. Normality

Data normality test is a method to determine whether the distribution of the collected data is normal or not. In inferential statistics, the main condition for all types of parametric and non-parametric statistics tests depends on the data distribution. If the data distribution is normal, then parametric methods are used, and if it is not normal, parametric methods should not be used. Before conducting any test with the assumption of data normality, a normality test should be done. There are several methods for this purpose. The normality of the research data was assessed using the Kolmogorov-Smirnov test. Based on the results presented in Table 2, it is concluded that the research data is not normally distributed, as indicated by the significance value (sig < 0.05).

Table 2. Normality

Variable	K.S Coefficient	Sig.
AE	0.267	0.000
CR	0.270	0.000
AR	0.300	0.000
IC	0.300	0.000
IR	0.280	0.000
PI	0.392	0.000

4-3. Reliability and Validity

To evaluate the internal consistency of constructs, Cronbach's alpha (α) and composite reliability (CR) were employed. Internal consistency describes the degree to which all test items measure or contradict the same concept and is related to the relationship between items within a test. Internal consistency must be determined before using a test for research or testing purposes to ensure its validity. In addition, reliability statistics show the amount of measurement error in a test.

Cronbach's alpha is a method of assessing reliability by comparing the number of differences. The idea is that for an instrument to be reliable, the variance within items should be greater than the variance between items. Composite reliability is another way for researchers to assess the value of

their measures. It is recommended that composite reliability be at least 0.70 to be considered acceptable. The high reliability of the composition is a good indicator that all your measurements have the same configuration at all times.

Convergent validity was assessed using the average variance extracted (AVE). Convergent validity refers to how closely a test is related to other tests that measure the same (or similar) constructs. Average value extraction (AVE) is a measure of the amount of variance accounted for by a construct relative to the amount of variance due to measurement error. Generally, an AVE value of at least 0.50 is recommended to achieve good convergence. However, an AVE value of less than 0.50 means that the items explain more than the error in the variance of the constructs. For each measurement model, the AVE for each construct should be calculated as at least 0.50.

The findings presented in Table 3 indicate that α and CR exceeded the threshold of 0.7, while AVE surpasses the cutoff point of 0.5, thereby establishing the convergent validity of the scales (Fornell & Larcker, 1981). Discriminant validity was examined using the Fornell-Larcker test. As observed in the results, the square roots of AVE for all latent variables are more significant than the correlations between the corresponding variable and any other variables, confirming discriminant validity. The outcomes of the discriminant validity analysis are presented in Table 4.

Table 3. Reliability and Convergent Validity

Variable	Cronbach's alpha	CR	AVE
AE	0.88	0.90	0.71
CR	0.82	0.77	0.57
AR	0.72	0.70	0.50
IC	0.87	0.76	0.55
IR	0.72	0.81	0.66
PI	0.99	0.99	0.99

(**AE**: Authentic Experience, **CR**: Cognitive Response, **AR**: Affective Response, **IC**: Intention to Continue AR, **IR**: Intention to Recommend AR, **PI**: Purchase Intention)

Table 4. Discriminant Validity

	AE	CR	AR	IC	IR	PI
AE	0.87					
CR	0.65	0.85				
AR	0.58	0.82	0.78			
IC	0.76	0.79	0.51	0.82		
IR	0.48	0.63	0.75	0.67	0.99	
PI	0.71	0.54	0.63	0.71	0.69	0.76

4-4. Analysis of the Fitness of the Research Model

In this paper, several indices (such as R square, construct cross-validated redundancy, and construct cross-validated communality) were used to evaluate the quality of the research model. Cross-validated redundancy is used to obtain the Q^2 value based on the prediction of the omitted data points by means of the underlying structural model and measurement model, whearas cross-validated communality is used to obtain the Q^2 value based on the prediction of the omitted data points by means of the underlying measurement model alone (smartpls.com).

R square describes how much variance a factor can have in relation to another related factor, while cross-validated redundancy was used for the indirect prediction of omitted data points for latent variable indices dependent on components that predict latent variables (Lubis & Handayani, 2022). A high R square value suggests that a significant portion (more than 60%) of the variation in variables can be explained by the changes in authentic experience. The amount of CVR and CVC are also positive and acceptable. The Goodness-of-fit (GFI) index was employed to examine the overall fit of the model. The goodness-of-fit index (GFI) value is between 0 and 1, with values of 0.10 (small), 0.25 (medium), and 0.36 (large), indicating the global validity of the path model. Likewise, the Goodness of Fit Index (GFI) score is less than or equal to three to define a fit model, and between 2.0 and 5.0 is considered as an acceptable fit model (Ng et al., 2023). The GFI value (0.54), presented in Table 5, demonstrate that the structural model reasonably fits the data, thereby confirming the quality and fitness of the research model.

Table 5. Model Fitness Indices

	CVC	CVR	R^2	GOF
AE	0.485	-	-	
CR	0.242	0.355	0.75	
AR	0.125	0.208	0.67	0.62
IC	0.238	0.393	0.72	
IR	0.430	0.586	0.95	
PI	0.701	0.912	0.94	

5. Hypotheses Testing and Discussion

Figures 2 and 3 are the standard and T-value models. The figures are utilized to test the research hypotheses, and subsequently, analyze and discuss the results.

The positive impact of authentic experience on cognitive response demonstrates a high level of significance (β = 0.87, CR = 10.85, P<00.10) and the positive impact of authentic experience on affective response is a high level (β = 0.82, CR = 30.98, P<00.10). According to Alimamy and Al-Imamy (2022), perceived authenticity increases experience quality and, in turn, influences attitude. Kim et al. (2020) have stated that consumers purchase products according to their recognition of authenticity. AR features have a positive role in creating consumer motivations and purchase intention (Jayawardena et al., 2023). Pozharliev et al. (2021) demonstrated that AR advertising creates higher affect intensity.

The positive impact of cognitive response on intention to continue demonstrates a high level of significance (β = 0.12, CR = 3.89, P<00.10); the positive effect of cognitive response on intention to recommend (β = 0.81, CR = 7.05, P<00.10) and the positive impact of cognitive response on purchase intention (β = 0.84, CR = 9.81, P<00.10) are both at a high level. Cognitive response can influence consumers' purchase intention. As Zenger et al. (2022) stated, consumers who have a positive attitude toward a brand are more likely to purchase related products and recommend them to others. The positive impact of affective response on intention to continue demonstrates a high level of significance (β = 0.74, CR = 6.76, P<00.10). The positive effect of affective response on intention to recommend (β = 0.18, CR = 3.41, P<00.10) and the positive effect of affective response on purchase intention (β = 0.14, CR = 4.39, P<00.10) are both at a high level. It aligns with Zanger et al. (2022) that affective responses increase purchase intention. The positive impact of AR on purchase intention was also supported in the study of Hilken et al. (2022). As Zanger et al. (2022) mentioned, affective reactions to product presentation arouses behavioral results.

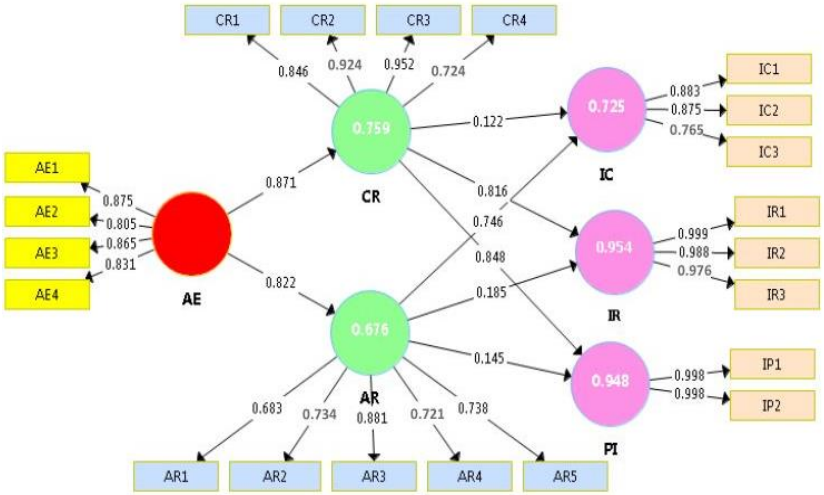

Fig. 2. Standard Model

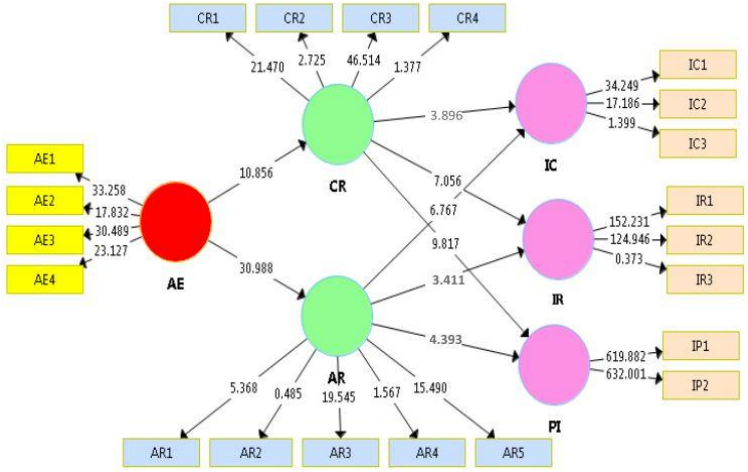

Fig. 3. T-value Model

Table 6. Results of Hypotheses

Path	Hypothesis	Path Coefficient	T-statistic	Result
AE-CR	1	0.871	10.856	Confirmed
AE-AR	2	0.822	30.988	Confirmed
CR-IC	3	0.122	3.896	Confirmed
CR-IR	4	0.816	7.056	Confirmed
CR-PI	5	0.848	9.817	Confirmed
AR-IC	6	0.746	6.767	Confirmed
AR-IR	7	0.185	3.411	Confirmed
AR-PI	8	0.145	4.393	Confirmed

6. Conclusion and Maneagerial Implications

In recent decades, it is said that facets of human life have been affected by the rapid development of technology. The manner of organizations' interactions and customer relationships has been changed because of the widespread technological disruption (Vidyanata, 2022). In recent years, the SOR approach has been implied chiefly in the study of consumer behavior (Guo et al., 2022). This framework serves as a theoretical foundation, suggesting that marketing stimuli impact customers' internal conditions, thereby eliciting a specific response from them (Vidyanata, 2022). In the SOR theory, S is conceptualized as a factor influencing the consumer's internal organs. O represents the individual's internal condition concerned with cognitive and emotional systems. The organismic process can be understood as an individual's reaction to various forms of stimuli, whether conscious or unconscious, internal or external. The outcome of this reaction manifests as consumer behavior (Jayadi & Murwani, 2022).

In this study, the authentic experience has been proposed as the stimuli that will cause cognitive response, affective response, and perceived value (organisms), which results in intention to continue AR, intention to recommend AR, and purchase intention. The primary indicator in considering the IT usage is the behavioral intention, which is regarded as consumers' beliefs in what they decide to do in certain situations in the future (Chen et al., 2019). AR experience marketing, while optimizing the consumer's decision-making process, helps them compare traditional marketing advertisements and e-commerce platforms, make purchase decisions, and buy suitable products (Zhu & Wang, 2022).

This study contributes to the literature by shedding light on the impact of augmented reality technology in packaging on consumer behavior. We bring the S-O-R theory to the AR marketing research. This study adds important evidence on the impact of AR technology on cognitive and affective response as well as the impact of cognitive and affective response on behavioral intention. Authentic experience through AR packaging can lead to eliciting affective and cognitive responses.

Consumers who have immersive experiences with AR technology show higher levels of behavioral intentions. They have more intention to continue and recommend AR and more intention to purchase. According to the results in this paper, AR authentic experience can positively influence organisms (cognitive and affective response). This is in line with Kim et al. (2020) and Pozharliev et al. (2022).

Moreover, organisms can positively impact responses (intention to continue AR, intention to recommend it, and finally, consumer purchase intention). Some other researches such as Zanger et al. (2022), Darzian Azizi et al. (2021), Chen et al. (2019), and Kim et al. (2020) have approved these results.

These findings have practical implications for marketing managers expecting to detect new approaches to engage consumers emotionally and are willing to have empirical evidence encouraging their decision to invest in such emerging technologies. AR technology can build interactive and immersive experiences for users. Through packaging, brands can use AR to deliver tailored marketing messages, promotions, and personalized content to consumers. This participatory approach fosters a stronger bond between the brand and the consumer, resulting in enhanced brand awareness and increased customer loyalty. By leveraging AR technology, packaging can become a platform for storytelling, product demonstrations, and interactive games, increasing consumer engagement and driving brand loyalty. This unique experience can create connections between the brand and customers. By applying AR technology in packaging, marketing managers can differentiate their products or services and create a competitive advantage for their brands. Moreover, through providing useful information related to the product, the managers can create an attractive and memorable shopping experience for buyers.

Brands should try to move their customers to the virtual world that can tell the whole story of the brand and make them more familiar with. Storytelling can also enhance customer's engagement and inclination. The information provided to the consumers through the packaging should be useful and attractive for them, so that it can help them make a better decision while attracting their attention. Another aspect that marketing managers should consider is the use of gamification. For some products, using AR in packaging can be designed as a form of an interactive game that provides users with more enhanced immersion and excitement. This is especially attractive for products related to millennials. AR games can also create social connection and networking and are mostly liked by younger generations. In order to reap the benefits of viral marketing, brands should encourage users to share their augmented reality experience on social media. Through 360 video stories, brands can show the history of products creation. Using celebrities and influencers in AR videos can increase their appeal to consumers. Hearing the brand message from a popular or famous individual will usually be more persuasive.

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