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RESEARCH ARTICLE

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It's all part of the customer journey: The impact of augmented reality, chatbots, and social media on the body image and self-esteem of Generation Z female consumers

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Abstract

Research is needed to identify novel ways to influence Generation Z female consumers' behavior when they interact with various technologies. This study investigates how experiences of using augmented reality, artificial intelligence-enabled chatbots, and social media when interacting with beauty brands affect body image, self-esteem, and purchase behavior among female consumers in Generation Z. Through three studies, we propose and test a model drawing on social comparison theory. In Study 1, a survey was completed by Generation Z women (n = 1118). In Study 2 and Study 3, two laboratory experiments were conducted with Generation Z women in Malaysia (n = 250 and n = 200). We show that (1) Generation Z women's perceived augmentation positively affects their body image, self-esteem, and actual purchase behavior; (2) although trust in social media celebrities positively affects Generation Z women's body image and self-esteem, the addictive use of social media does not have significant effects; (3) the chatbot support type (assistant vs. friend) has a significant impact on these women's experience; and (4) brand attachment, reputation, and awareness do not have significant effects. This article provides important implications for theory and practice on the behavior of Generation Z females when interacting with various technologies.

KEYWORDS
artificial intelligence, augmented reality, chatbot, Generation Z, self-esteem, social media

1 | INTRODUCTION

Generation Z refers to individuals who were born from 1997 onwards (Dimock, 2019). This generation comprises 40% of all the world's consumers (Chamberlain, 2018). As a "tech native" generation, Generation Z is highly active on social media and open to interacting with technologies such as chatbots and augmented reality (Ameen et al., 2021; Yu et al., 2019). This generation had a spending power of $143 billion in 2020, and retailers are competing to appeal to consumers who belong to it (Davis, 2020). In addition, Generation Z consumers have been named the biggest cohort of beauty spenders, with female Generation Z consumers spending approximately $368 annually on beauty products (In-Cosmetics, 2020).

Previous research has indicated that Generation Z has certain characteristics that differentiate it from other generations; for example, its expectations for purchasing behavior are different from

those of previous generations because its members' digitally literate consumption makes them highly informed, more pragmatic, and more capable of making analytical decisions than representatives of previous generations are (Grigoreva et al., 2021). In addition, Generation Z has been associated with low confidence and low self-esteem (Writer, 2017). Low self-esteem is a particular issue for young women: it affects their risk of developing depression, anxiety, self-harming behaviors, and other mental health problems (Kramer, 2021).

Of all the generations alive today, Generation Z is one of the most concerned with physical and mental well-being, and its members like to monitor their health via a variety of methods (Egolf, 2018). Accordingly, this generation is more willing to spend on health-related products and cosmetics than previous generations are (Moussavi & Mander, 2019). Prior studies have identified a link between women's use of cosmetics and beauty products and their self-esteem (Dickman, 2010). In the context of Generation Z, women in this section of the population are active customers of beauty brands; they consider these brands to be part of their self-identity and link beauty products to their self-esteem (In-Cosmetics, 2020).

Beauty brands such as Mac, Sephora, and L'Oréal have developed software applications that allow consumers to try on make-up virtually; these are referred to as virtual make-up try-on applications. A virtual make-up try-on application provides consumers with integrated, augmented reality-enabled, virtual make-up try-on services. Many beauty brands have started to invest in and use artificial intelligence-enabled chatbots to reach consumers more efficiently and effectively. The customer journey offered by these brands no longer relies on a single technology but integrates multiple cutting-edge technologies to ease consumers' decision making (i.e., purchase behavior) (Ameen et al., 2021). Hence, it is important to study Generation Z's interactions with beauty brands and the services offered by these brands through various technologies and to determine how these interactions affect body image, purchase behavior, and self-esteem among this consumer group.

The creative use of advanced technologies and high engagement with sharing on social media are the norm for digital natives (Ameen et al., 2021). However, despite their importance, there is a lack of research focusing on digital natives' interaction with new-age technologies and the developmental psychology aspects of this process (Kesharwani, 2020). Specifically, there is a gap in research on how services that are offered by beauty brands and enabled through the integration of artificial intelligence, augmented reality, and social media influence Generation Z women's body image, self-esteem, and purchase behavior.

Building on previous studies on Generation Z's interactions with technologies as part of the shopping journey (e.g., Ameen et al., 2021; Ng et al., 2019), we advance the knowledge of female Generation Z consumers' buying behavior and self-esteem by exploring how these factors are influenced by a range of technologies that are integrated into the customer journey. Specifically, we argue that the augmentation enabled by augmented reality, the type of chatbot (friend vs. assistant), and social media (specifically trust in social media celebrities and addictive use of social media) can affect these women's body image, purchase behavior, and self-esteem. Furthermore, we analyze the influence of brand-related factors in this context. The research develops a theoretical model that draws on social comparison theory (Festinger, 1954). This theory has been used to investigate how consumers compare themselves to others (Hendrickse et al., 2017).

We focus on services offered by beauty brands because beauty products are often linked with body image and self-esteem (de Lenne et al., 2021). In addition, beauty brands are more innovative than other brands in terms of integrating the latest technologies into the services that they offer to customers, and Generation Z women often relate to beauty and cosmetics products and are these brands' biggest buyers (Knit, 2022). Furthermore, more than 66% of Generation Z consumers are spending more on beauty since the COVID-19 pandemic (Knit, 2022).

In addition to the practical implications of employing various technologies in the customer journey for the purchase behavior and self-esteem of women in Generation Z, this study provides three theoretical contributions. First, our research contributes to the literature on body image, buying behavior, and self-esteem (e.g., Djafarova & Rushworth, 2017; Gulas & McKeage, 2000; Kurt, 2022; Townsend & Sood, 2012; Yim & Park, 2019) by considering how these can be enhanced during interactions with cutting-edge technologies as part of the customer journey. In particular, although past research has explored the effects of different types of technologies on Generation Z consumers (e.g., Ameen & Anand, 2020; Ameen et al., 2021), it remains unclear how the integration of augmented reality, chatbots, and social media into the customer journey can affect the buying behavior and psychological well-being of female Generation Z consumers.

Second, we contribute to the literature on the use of chatbots in marketing services to facilitate various processes related to customer service (e.g., Ciechanowski et al., 2019; Mariani et al., 2022; Roy & Naidoo, 2021) by exploring the impact of the chatbot support type on female Generation Z consumers' perception of the augmentation of services, their body image, their purchase behavior, and their self-esteem.

Third, we address the gap in the existing literature on how brand-related factors affect the impact of the various technologies with which Generation Z women interact as part of their shopping journey. We contribute to the literature on the impact of brand-related factors on the customer journey (e.g., Thomson et al., 2005; Veloutsou & Moutinho, 2009; Yoo & Donthu, 2001; Yoo et al., 2000) by exploring the impact of brand attachment, reputation, and awareness as control variables in the context of our research.

The article is organized as follows. First, the relevant literature on social comparison among Generation Z consumers, the influence of social media, augmented reality, and chatbots in the customer journey is discussed to develop a theoretical backbone for the proposed model and hypotheses. Then, the results from the three studies conducted to test the research hypotheses are presented. In the final section, the theoretical and practical implications are discussed.

2 | LITERATURE REVIEW

2.1 | Social comparison and Generation Z women

Social comparison theory is the most extensively used theory in the existing studies. This theory was first developed by Festinger (1954), and it has been used in later research to examine the relationship between media and body image (e.g., Hendrickse et al., 2017). According to the theory, individuals compare themselves with others around them (e.g., on social media), and this comparison can be either an upward social comparison or a downward social comparison (Hendrickse et al., 2017). Individuals have a drive to compare their own attributes and abilities with those of others (Festinger, 1954). For example, when women compare themselves with a better look (i.e., thinner) or an ideal look, the difference between their body size and the target's body size becomes salient, which leads to an undesirable evaluation of their own body image (Hendrickse et al., 2017). Generation Z has been classified as the least confident generation in comparison with previous generations, causing its members anxiety and leading them to experience increasing pressure due to the rise of social media, which can make problems like bullying or body image issues more intense than they were in the past (Chappet, 2019). For younger and older women alike, body image is strongly linked to self-esteem, self-concept, and mental health (Cameron et al., 2019). However, Generation Z women have less self-confidence and are more risk averse in their attitude and behavior than earlier generations (Khamis & Zaatarti, 2019). Furthermore, low self-esteem in young women has been linked to the use of social media in ways that do not reflect a true social life and may reduce their confidence further (NYU Dispatch, 2019).

2.2 | The influence of social media on the customer journey

Previous research has studied interactions on social media and the impact of these interactions on their users (e.g., Hawi & Samaha, 2017; Pozharliev et al., 2022). For example, social media celebrities have been found to influence these platform users' behavior (e.g., Lo & Peng, 2022). The relationship between celebrity endorsements and self-esteem has also been studied, with the findings showing that, when consumers believe in a product endorsed by a celebrity, they feel better about buying it and doing so increases their self-esteem (Djafarova & Rushworth, 2017). These consumers seek the opinions of others before making the decision to buy as they are less confident in their own decision-making capabilities. Previous studies in this area have focused on the effect of social media on individuals' self-esteem or on the role of self-esteem in individuals' perceptions of social media interactions and celebrity recommendations (e.g., Djafarova & Trofimenko, 2019).

Furthermore, the addictive use of social media has been found to have a negative effect on young people's self-esteem but a positive association with life satisfaction (Hawi & Samaha, 2017). Interestingly, there is more addiction to social media among young women than among young men (Hawi & Samaha, 2017). Young women are active on social media platforms; for example, female users constitute 51% of Instagram users worldwide (Statista, 2020) and 61% of users of Tik Tok, which is mainly a platform for young individuals (Cyca, 2022).

2.3 | Augmented reality and chatbots in the customer journey

Augmented reality is defined as a "medium in which digital information is overlaid on the physical world that is in both spatial and temporal registration with the physical world and that is interactive in time" (Craig, 2013; p. 20). From a marketing perspective, two of the main benefits of chatbots enabled by artificial intelligence are powerful personalization and the option to automate services offered to customers (Ameen et al., 2022; Chandra et al., 2022; Liu-Thompkins et al., 2022; Mariani et al., 2022). Chatbots have been defined as "an e-service agent that represents a technological evolution of the traditional service agent involved in direct firm–customer exchanges" (Murtarelli et al., 2020; p. 2).

Previous studies have tended to focus on customers' experience of using one single type of technology as part of their shopping experience, for example by investigating either artificial intelligence or augmented reality as a sole technology used in retail (e.g., Flavián et al., 2019; Gatter et al., 2022). However, in reality, the customer journey no longer relies on one technology alone but instead involves a combination of smart technologies. Specifically, beauty brands have integrated artificial intelligence and augmented reality technologies into their applications to provide a more efficient customer experience. Both chatbots and augmented reality have recently become more widely used in a range of industries, including cosmetics and beauty, to offer services enabled by these technologies. They have been integrated into mobile applications or made accessible through social media platforms, such as Facebook, Instagram, or WeChat, which include Virtual Artist Apps, Modiface, Virtual Catwalks, and digital mirrors.

Augmented reality has been described as digital and real-time content that is superimposed on users' actual surroundings (Flavián et al., 2019). Consumers' evaluations of products available through augmented reality (AR)-based virtual try-on product applications have been found to be linked to perceptions of their body image, whether those perceptions are either positive or negative (Yim & Park, 2019). An AR-enriched user experience can be more entertaining, and it enables potential customers to have limitless interactions with virtual information. Augmented reality allows customers to become more familiar with a product, and this makes them feel more comfortable about making a decision to purchase (Hilken et al., 2017). Although augmentation is a core aspect of AR-enabled experiences, the impact of augmentation on Generation Z women's body image, self-esteem, and actual purchase behavior and the impact of the type of chatbot support and brand-related factors are notions that have

not been fully investigated in the marketing context and theory (i.e., social comparison theory) (Javornik, 2016).

3 | RESEARCH OVERVIEW

Since the customer journey often entails interactions with different technologies that can affect the customer experience, we opt for a multistudy approach based on three studies using multiple methods to understand the impact of each of these technologies. Study 1 analyses the impact of the perceived augmentation of reality on Generation Z women's body image, which, in turn, affects the actual purchase behavior and self-esteem of this generation of consumers. In addition, Study 1 analyses the moderating effects of external factors related to Generation Z women's use of social media, namely trust in social media celebrities and addictive use of social media. In Study 2, we extend the model further by analyzing the moderating effects of the type of chatbot support (friend vs. assistant) on the relationships in the model proposed in Study 1. In Study 3, we re-examine the proposed hypotheses of Study 1 and Study 2 with the inclusion of control variables, namely brand attachment, brand reputation, and brand awareness. Figure 1 depicts the overall model.

4 | STUDY 1

Study 1 sets the basis of this study by analyzing the impact of perceived augmentation on Generation Z women's body image, which, in turn, affects their actual purchase behavior and self-esteem (Figure 1). In addition, this study analyses the moderating effects of external factors related to Generation Z women's use of social media, namely trust in social media celebrities and addictive use of social media. As AR-enabled try-on virtual make-up applications tend to be built around self-service technologies (Ameen et al., 2021), the quality of the service offered by these applications is likely to differ significantly from that provided by conventional interpersonal services. However, to the best of our knowledge, there is a lack of research on how these services can affect body image, self-esteem, and purchase behavior among Generation Z women. Furthermore, no research exists on the role of external factors related to social media in this process.

4.1 | Theoretical model and hypothesis development

Social comparison theory (Festinger, 1954) has increasingly been used to understand the processes through which societal messages about appearance influence body image among adolescents (Krayer et al., 2008). Previous research on body image has shown that they emerge most prominently among women whose traits rank higher in social comparisons (Betz et al., 2019). Self-esteem and body image have been identified in previous research on individuals' behavior as important components of this theory (e.g. Tylka & Sabik, 2010). Rosenberg (1965a, p. 15) defined self-esteem as "a favorable or unfavorable attitude toward the self." For young women, self-esteem is an important factor that influences their well-being, learning, and employability (Potgieter, 2012). From a marketing perspective, recent studies have identified the role of self-esteem in shaping consumer behavior toward brands and when buying products and services. Tan et al. (2017) found that self-esteem strongly influences customer citizenship behavior towards brands through its effects on four main mediators: attachment, commitment, involvement, and beliefs.

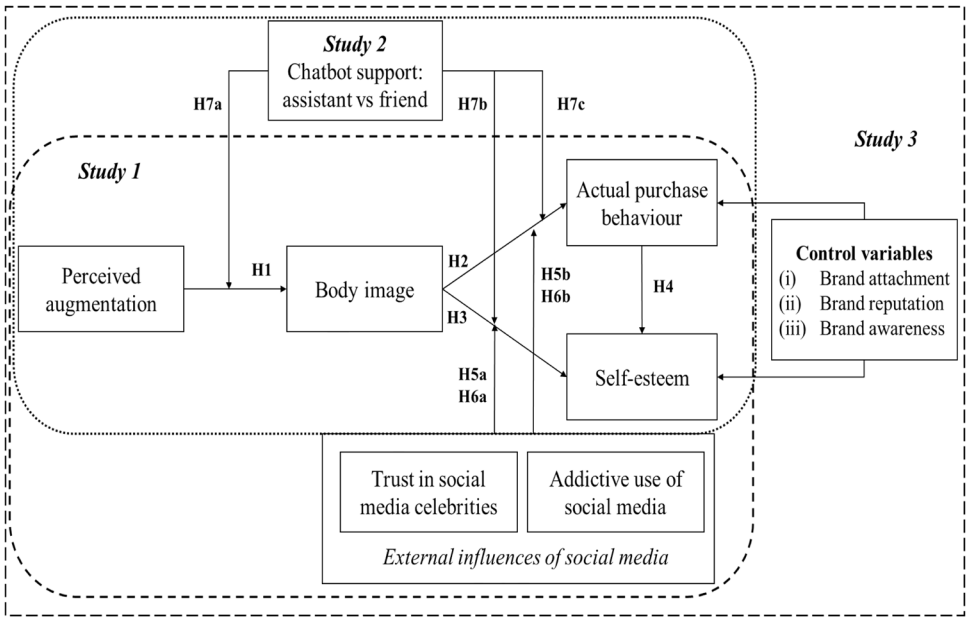

FIGURE 1 Overall research model (Study 1 to Study 3)

Body image is defined as an individual's subjectively perceived physical self, embedded in a mental construct (P. N. Myers & Biocca, 1992). As women are very frequently judged on their appearance, they often compare their bodies with those of other women (Stice et al., 2001). Previous research has found that even women with high self-esteem may engage in social comparison processes at the individual level (i.e., with daughters or peers) as well as at the group level (with other women in society) because both types of comparison should enable them to redefine and improve their feminine image (Gentina et al., 2018).

Previous studies have adopted social comparison theory (Festinger, 1954) to focus on the relationship between women's self-esteem, their body image, and the use of various technologies (such as social media and virtual reality [VR]). The authors found that women are more likely than men to engage in appearance comparisons, body image concerns, and a drive for thinness on social media. Hendrickse et al. (2017) investigated the role of appearance-related comparisons and intrasexual comparisons among male and female consumers using social comparison theory. They classified social comparison as follows: upward comparison (i.e., when individuals compare themselves with those whom they consider to be superior to them) and downward comparison (i.e., when individuals compare themselves with those whom they consider to have attributes and abilities that are inferior to their own). Women who are exposed and connected to more women on Instagram are more likely to engage in downward comparison (Hendrickse et al., 2017). Some studies have focused on the relationships between VR-enabled experiences that examine body image and enable social comparison.

Based on these aforementioned issues, the model proposed in this study draws on social comparison theory (Festinger, 1954), which focuses on body image and self-esteem. It offers a novel approach to understanding how the integration of AR-enabled services into virtual make-up try-on applications can improve Generation Z women's body image, self-esteem, and purchase behavior. The model integrates factors that are relevant to the phenomenon of Generation Z women's interaction with AR-enabled services. It hypothesizes the effects of perceived augmentation on Generation Z women's body image, which, in turn, is hypothesized to affect self-esteem and purchase behavior (see Figure 1, Study 1).

4.1.1 | Perceived augmentation

Figure 2 Previous research in the area of human–computer interaction has explained that AR's capability of enhancing physical reality is referred to as augmentation (Preece et al., 2015). It can overlay virtual elements onto people, products, or the surrounding space. Augmentation refers to an enrichment of the environment in which the virtual elements are not separated from the physical ones and computer-generated elements coexist with the physical environment due to the technological ability to augment real objects with virtual annotations (Javornik, 2016). Augmentation is the main

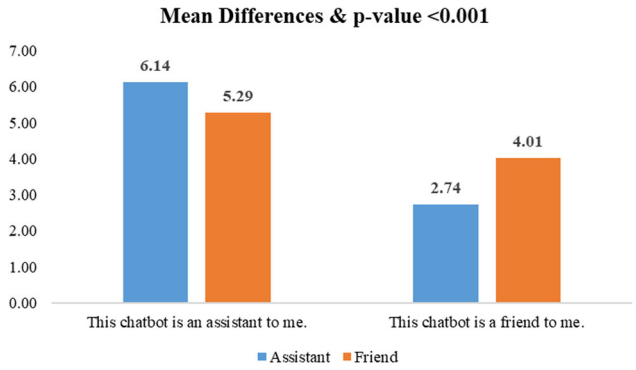

FIGURE 2 Differences between the virtual assistant and the virtual friend for Study 2

characteristic that differentiates augmented reality from other technologies (Javornik, 2016). There has been a significant increase in the integration of augmented reality into the beauty industry in recent years; for example, in the use of magic mirrors and smart virtual applications (Javornik, Rogers, et al., 2016). Despite this, previous studies have highlighted that research is needed to aid our understanding of customers' perceived augmentation when using beauty services (Javornik, 2016; Javornik, Rogers, et al., 2016).

In addition, augmented reality applications allow the augmentation of a product—usually by scanning an item with a smart device that can then create an enhanced view. Such applications help female customers to see how products fit them personally, or how they look in their own environment, while maintaining the convenience of online purchasing. AR-based service augmentation improves not only the product offering but also the interaction between customers and the business frontline. From the perspective of customers (Hilken et al., 2017), augmented reality can offer a more context-sensitive interface with richer information (Yaoyuneyong et al., 2016) and a more distinct process of interaction than other smart technologies (Javornik, 2016). Previous studies have also suggested that the use of augmented reality enhances customers' perceptions of interface, information, and interaction in the holistic shopping experience in a retail context (e.g., Hilken et al., 2017). Augmentation has a more significant effect on female consumers than male ones because socially and culturally driven body ideals have led to women generally developing a more negative attitude towards their bodies than men (Yim & Park, 2019). Thus, this study proposes that perceived augmentation may have a significant positive effect on body image among Generation Z women. Hence, the following hypothesis is proposed:

H1: *Perceived augmentation has a significant positive effect on body image.*

4.1.2 | Body image

Body image is commonly defined as an individual's subjectively perceived physical self, embedded in a mental construct (P. N. Myers

& Biocca, 1992; Yim & Park, 2019). In addition, social comparisons with idealized body images can have a negative impact on self-esteem and individuals' evaluations of their body image (Gulas & McKeage, 2000). Body image has been found to have a stronger effect on the use of augmented reality than traditional web-based media (Yim & Park, 2019). In addition, a relationship has been identified between body image and cosmetics consumption among young women, who tend to use cosmetics for compensation and concealing when they felt dissatisfied with areas of their face (Dickman, 2010). However, women are interested in improving or maintaining their looks even when they have a positive body image, and this affects the depth and breadth of the beauty products that they purchase. Thus, the following hypothesis is proposed:

H2: *Body image has a significant positive effect on purchase behavior.*

In addition, previous studies have identified the significant direct effects of body image on self-esteem among women (e.g., Yim & Park, 2019). The concepts of both "body image" and "self-esteem" come from social comparison theory (Krayer et al., 2008). As stated by T. A. Myers et al. (2012, p. 342), "Social comparison theory (Festinger, 1954) provides a foundation for understanding women's body image disturbance. This theory proposes that people have a drive to determine their progress and standing in life, and they often do so by searching out standards to which they can compare themselves." Scholars have explained that people with a negative body image tend to worry about how others view them and tend to avoid public places where their bodies are exposed, which negatively affects their self-esteem (Thompson & Chad, 2002). Previous research on advanced technologies (such as virtual reality) has explained their significance in improving body image and self-esteem (Yim & Park, 2019). This suggests that artificial intelligence and augmented reality-enabled services can improve body image, which may have a significant positive impact on self-esteem among women. Thus, the following hypothesis is proposed:

H3: *Body image has a significant positive effect on self-esteem.*

4.1.3 | Purchase behavior

In their qualitative study, Djafarova and Rushworth (2017) found that consumers believe that buying products online boosts their self-esteem and that they make purchases as a way of rewarding themselves. The authors also found that women's self-esteem is enhanced when buying a product or service that has been recommended by a celebrity on social media. In addition, women with low self-esteem can develop a beauty obsession in an attempt to increase their self-esteem (Britton, 2012). Existing studies in the area of retail therapy have shown that consumers are keen to buy new products when they feel less confident and less powerful than others; hence, they anticipate that buying these products will boost their positive mood, confidence, and power (e.g., Townsend & Sood, 2012). Similarly, buying beauty products can make young women feel good about themselves and boost their self-esteem: a pertinent finding given that low self-esteem is an issue for Generation Z women (Gillan, 2019). Hence, the following hypothesis is proposed.

H4: *Purchase behavior has a significant positive effect on self-esteem.*

4.1.4 | The moderating effects of trust in social media celebrities and addictive use of social media

Individuals who are part of Generation Z do not simply use smartphones; they live their lives on them. This behavior is one step ahead of tech savviness, a skill possessed by many millennials. However, for women, exposure to idealized images of the human body, which their own bodies differ from, creates pressure to achieve what can sometimes be classified as "unrealistic ideals of attractiveness" (West, 2018). The rise of influencer marketing, particularly targeting younger demographics, proves that word of mouth on social media plays a significant part in shaping the preferences of these young consumers.

Social media celebrities and influencers are perceived to be more genuine than brand advertisers because they have built up loyal audiences and the content that they produce tends to outperform the content that most brands create internally (Patel, 2017). They are role models, movement leaders, and even educators. It is common for people in Generation Z to turn to YouTube when they want to learn something or when faced with a decision about whether to buy a product (Patel, 2017). However, recent research has highlighted that building trust in content generated by social media celebrities remains a challenge (Lou & Yuan, 2019). Buying a product or service that has been recommended by a trusted celebrity on social media can enhance self-esteem among women (Djafarova & Rushworth, 2017), and when women trust a celebrity to recommend products that will improve the way they look, they tend to buy these products more often. It follows that a high level of trust in social media celebrities can strengthen the relationship between body image and self-esteem.

The majority of the existing studies on self-esteem and celebrity endorsement on social media have focused on the effect of self-esteem on interactions between individuals and with celebrities on social media and the role of social comparison in this process (e.g., Djafarova & Rushworth, 2017). Consumers perceive celebrity advertisements or endorsements as trustworthy when parasocial relationships are formed. Individuals who follow digital celebrities are more likely to experience feelings of friendship for them than for traditional celebrities owing to similarities and familiarity with parasocial relationships (Hwang & Zhang, 2018). When women trust the recommendations made by social media celebrities, in spite of the effects of social comparison, they start to believe in the improvement that the recommended products would make to their facial appearance, which increases their self-esteem. Hence, the following hypothesis is proposed:

H5a, b: *Trust in social media celebrities moderates the relationships between (a) purchase behavior and (b) Generation Z women's*

self-esteem and body image such that these relationships are stronger among women with a higher level of trust.

Social media addiction occurs more often among women than among men (Boyle et al., 2016). In addition, some studies have linked Generation Z's addiction to social media to some of the main problems associated with this generation—low self-esteem and anxiety—due to the negative stories and views that individuals express and share on these platforms (Chappet, 2019). A young woman with a positive body image can still have low self-esteem if she is addicted to social media because these can have a negative impact on her perception of herself. In addition, high levels of social media addiction can interrupt the relationship between body image and purchase behavior. Social media use has been found to predict stronger baseline dissatisfaction with one's body and to be associated with a higher risk of eating disorders (Cohen & Blaszczynski, 2015). Women who are highly addicted to social media may be more influenced by the opinions of individuals on these platforms than by their own perceptions of their body. Hence, the addictive use of social media may moderate the effect of body image on purchase behavior. Thus, the following hypothesis is proposed:

H6a, b: *Addictive use of social media moderates the relationships between (a) purchase behavior and (b) Generation Z women's self-esteem and body image such that these relationships are stronger among women with a lower level of addiction*.

4.2 | Method

4.2.1 | Sampling and data collection

The target participants for this study were young female customers who had used a virtual make-up try-on application that integrated augmented reality and was offered by a leading European beauty brand. The brand specialized in personal care and beauty products, and the target participants for this study were already its customers. Beauty brands are increasingly using AR-enabled virtual artist applications to enhance the customer experience. A virtual artist application includes a color (shade)-matching tool that analyses an image of the user's face to estimate the shade of any product and then shows a picture of how the product will look on the user's skin. In addition, the beauty application used for this study offered an AR-enabled customer experience by integrating a virtual make-up try-on facility, a color (shade)-matching tool, and a chatbot service. The augmented reality virtual make-up try-on feature helps shoppers to see how they would look when wearing different types of make-up, and the color (shade)-matching tool helps them to identify the most suitable foundation for their skin tone. These tools allowed a reasonable level of customer interaction with AR, and using this application provided greater access to the target participants.

A purposive sampling strategy was used in the data collection. This sampling method has been used in previous studies on specific issues related to consumers (e.g., Cuny & Opaswongkarn, 2017). Purposive sampling allows researchers to target individuals who may hold various and important views and therefore to answer the research question. In addition, the main objective of a purposive strategy is to produce a sample that can logically be assumed to represent the population, which was the case in this study. Following Malhotra and Galletta (1999), the criteria for sampling were that participants: (1) must be female consumers; (2) must be between 18 and 23 years old; and (3) must have used the AR-enabled application selected for this study. The average time taken to complete the survey was 10 min. The participants were recruited through social media platforms (i.e., Facebook and Instagram). In particular, we collected data through various beauty groups on these two platforms, on which young women who are interested in beauty products are often active.

We started the survey with qualifying questions based on the criteria set for our purposive sampling, and only those who met all three criteria completed the survey. An online survey was distributed in 2020, and a total of 1118 unique responses were collected. An ethics review application was submitted to the author's university and approved before the data collection stage. All ethical approval procedures and guidelines set by the university were followed with regard to the data collection. Accordingly, each questionnaire was accompanied by a participant information sheet that explained the purpose of the research and how participants' data would be used and informed participants that no personal information would be collected or used at any time and that they could withdraw from the study at any time without giving a reason. In addition, the questionnaire was accompanied by a participant consent form, which each participant had to complete before answering the questionnaire. All the participants were aged 18 or over, and no sensitive data were collected.

Supporting Information: Table D (Supporting Information Appendix) shows the profile of the respondents. All the participants had used the brand's artificial intelligence- and augmented reality-enabled virtual artist application, and they all followed the brand on social media. All the participants indicated that they had used the virtual artist application for less than 5 years, and they had all shopped with the brand for less than 5 years. With regard to relationships, 74% of the participants were single and 26% were married. In terms of professional status, 51% of them were employed, 21% were unemployed, and 28% were studying.

4.2.2 | Measurement items

The measurement items for perceived augmentation were adopted from Javornik, Rogers, et al.'s (2016) study, those for self-esteem were from Rosenberg's (1965b) study, and those for purchase behavior were from Adjei et al.'s (2010) study (in which it was measured based on the depth of purchase and breadth of purchase). A 7-point Likert scale with anchors ranging from "strongly disagree" to "strongly agree" was used. For body image, two questions were adopted from Chan and Grossman's (1988) study, with answers given on a 7-point scale ranging from "not at all satisfied" to "extremely

satisfied" for the first question and from "nothing" to "as much as possible" for the second question. Regarding purchase behavior, the 7-point scale for depth of purchase was based on the total number of products purchased (1 to more than 20); in relation to the breadth of purchase, the scale was related to the number of product categories purchased by the participant, following the study conducted by Adjei et al. (2010). The measurement scale for addictive use of social media was adopted from Andreassen et al. (2012) study, with answers on a 7-point scale ranging from "never" to "always." The measurement items for trust in social media celebrities were adopted from Ohanian's (1990) study. To ensure the validity and reliability of the measurement items included in this study, the items were adopted from existing scales that had been used and empirically tested in relevant previous studies. The inclusion of a 7-point Likert scale was justified given that it had been used extensively in previous related studies (e.g., Javornik, Rogers, et al., 2016). Supporting Information: Table E (Supporting Information Appendix) shows the measurement items for all the factors that were integrated into the model proposed in this study.

4.3 | Analysis and results

The collected data were first analyzed using the Statistical Package for the Social Sciences software for the descriptive statistics. Subsequently, partial least squares structural equation modeling (PLS-SEM) analysis (Hair et al., 2017)—using SmartPLS3 software—was used to assessed both the measurement model and the structural model. In addition, multigroup analysis was also adopted to test the moderating effects of trust in social media celebrities and addictive use of social media in the proposed model.

To minimize the potential for common method variance (CMV) bias, the survey design and administration adhered to the guidelines created by Podsakoff et al. (2003). Harman's single-factor test was used to assess CMV, in which the factor analysis result showed that the first factor accounted for 8% of the variance in the sample. Subsequently, CMV was assessed and the values of the inner variance inflation factor were below the threshold value of 3.3 (Petter et al., 2007). Hence, no issues were identified.

4.3.1 | Measurement model

When assessing the measurement model, the criteria of loading, convergent validity, reliability, and discriminant validity were evaluated. Most of the measurement items had loadings that were higher than 0.7 (Hair et al., 2017), and those with low loadings were deleted. In addition, as shown in the Supporting Information: Table E (Supporting Information Appendix), all the factors had an average variance extracted of 0.5 or higher (Hair et al., 2017). Hence, convergent validity was established. In addition, all the Cronbach's alpha (CA) and composite reliability (CR) values were higher than the threshold value of 0.7 (Hair et al., 2017). Supporting Information: Table A (Supporting Information Appendix) shows the results of the assessment of loading, reliability, convergent validity, and discriminant validity. Hence, the measurement model met the reliability requirements. Finally, discriminant validity was examined using the heterotrait–monotrait (HTMT) values. The result showed that each value was below 0.85 (Henseler et al., 2015); thus, no issues were identified.

4.3.2 | Structural model

The structural model was evaluated using the standardized path coefficients (β-value), significance level (t value), and R^2 estimates. The result showed that all the hypothesized relationships were supported (see Table 1; H1 to H4).

4.3.3 | Structural model based on multigroup analysis

H6a and H6b predicted the moderating effects of trust in social media celebrities and addictive use of social media on the relationships between body image and each of the purchase behavior and self-esteem factors. Before conducting the multigroup analysis, the sample was first separated into two subgroups according to the median score for each of the factors trust in social media celebrities and addictive use of social media.[1] For trust in social media celebrities, the first group contained 425 women with a low trust level (below or equal to the median) and the second group contained 693 women with a high trust level (above the median). For addictive use of social media, the first group contained 474 women with a low level of addictive use (below or equal to the median) and the second group contained 644 women with a high level of addictive use (above the median). Next, the measurement invariance of composite models (MICOM) procedure was employed to assess the configural and compositional invariance and the equality of the values and variances across the two groups for each factor (Henseler et al., 2016). The results of the MICOM procedure supported full measurement invariance (see Supporting Information: Table F, Supporting Information Appendix); see Study 2(i) and Study 2(ii)). Subsequently, we compared the path coefficients between the two groups in each factor using Henseler's PLS-MGA approach (Hair et al., 2017). This approach assesses the observed distribution of the bootstrap outcomes instead of making any distributional assumptions (Henseler, 2012). As shown in Table 2, H5a and H5b were supported as trust in recommendations made by social media celebrities moderated the relationship between body image and purchase behavior (t value = 1.997**) as well as the relationship between body

[1]Cheah et al. (2021) and Sarstedt et al. (2020) highlighted that the use of PROCESS is not advisable because it does not account for the measurement error inherent in multi-item measurements as well preventing researchers from simultaneously analyzing complex inter-relationships between observed and latent variables.

TABLE 1 Assessment of the structural model

	Hypothesis	Standard β	t value	Supported?	R^2
H1	Perceived augmentation ≥ body image	0.06	2.095**	Yes	0.1
H2	Body image ≥purchase behavior	0.41	12.364***	Yes	0.2
H3	Body image ≥ self-esteem	0.68	34.577***	Yes	0.6
H4	Purchase behavior ≥ self-esteem	0.15	4.887**	Yes	

Note: ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$.

TABLE 2 Multigroup analysis

Hypothesis	Moderator	Relationship	t Value (group differences)	Standard β (group one: lower level)	Standard β (group two: higher level)	Results
H5a	Trust in social media celebrities	Body image ≥ purchase behavior	1.997**	−0.060	0.463***	Supported
H5b	Trust in social media celebrities	Body image ≥ self-esteem	5.141***	0.201***	0.321***	Supported
H6a	Addictive use of social media	Body image ≥ purchase behavior	4.167***	0.201***	0.413***	Supported
H6b	Addictive use of social media	Body image ≥ self-esteem	1.145	0.331***	0.332***	Not supported

Note: ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$.

image and self-esteem (*t* value = 5.141***). However, H6a was only partially supported as the addictive use of social media moderated the relationship between body image and purchase behavior (*t* value = 4.167***) but did not moderate the relationship between body image and self-esteem (*t* value = 1.145). Nevertheless, the effect of body image on self-esteem was significant among both the high-addiction and the low-addiction group.

4.4 | Discussion

The research findings supported the proposed model, which drew on social comparison theory (Festinger, 1954). They revealed that augmented reality can affect body image, self-esteem, and purchase behavior positively. This study found that perceived augmentation had a significant effect on body image. In other words, the quality of the virtual make-up try-on application and the way in which the virtual make-up is placed on the face in real-time affect Generation Z women's satisfaction with how they look. This finding bridges the gap in research by improving our understanding of the effects of customers' perceived augmentation (Javornik, 2016; Javornik, Rogers, et al., 2016). The findings of this study show that body image has a significant effect on both self-esteem and purchase behavior. Furthermore, they show how body image is affected by factors related to the use of augmented reality and how the body image created by AR-enabled experiences can build self-esteem among Generation Z women. In addition, the findings reveal that the depth and breadth of the purchase of cosmetics products has a significant impact on Generation Z women's self-esteem.

Moreover, this study examined the role of social media-related factors in the relationship between Generation Z women's body image and their self-esteem as well as the relationship between their body image and their actual purchase behavior. The findings indicate that trust in social media celebrities moderates the effects of body image on purchase behavior as well as self-esteem. In particular, the more trust recommendations made by celebrities that Generation Z women see on social media, the more confident they are about the products that they are buying and the higher their self-esteem becomes. However, trust in content generated by social media celebrities is difficult to achieve, as has been highlighted in recent studies (Lou & Yuan, 2019).

A surprising finding was the absence of the moderating effects of addictive use of social media on self-esteem among young women. This may indicate that, although addiction to social media leads to Generation Z individuals becoming less sociable or more withdrawn (Chappet, 2019), it does not necessarily result in a weaker relationship between body image and self-esteem. In other words, whether or not Generation Z women are highly addicted to social media has no effect on the significance of the relationship between body image and self-esteem. The findings also reveal that the effect of body image on self-esteem is significant among Generation Z women, regardless of how addicted they are to social media. A possible explanation for this lack of the moderating effects of addictive use of social media in our study is the type of social media content that these young women have been exposed to while using

social media. It is possible that they have mainly been exposed to positive posts on beauty-related topics due to their interest in this area. Therefore, the level of addiction to social media use has not affected the impact of body image on their self-esteem.

5 | STUDY 2

In Study 2, we extend the model from Study 1 by analyzing the moderating effects of the type of chatbot support (friend vs. assistant) (see Figure 1). Chatbots can simulate human language with the aid of a text-based dialog system (Youn & Jin, 2021). Previous studies have examined the impact of the two types of chatbot support (friend vs. assistant) (e.g., Dautenhahn, 2007; Youn & Jin, 2021). This study extends the findings of these studies by showing the impact of the chatbot support type on Generation Z female consumers' perceived augmentation, body image, self-esteem, and purchase behavior.

5.1 | The moderating effects of the chatbot support type

Chatbot systems not only mimic human conversation but also utilize well-trained chatbots widely to interact with users in business, education, or information retrieval (Ciechanowski et al., 2019). In addition, chatbots' language style and name can influence perceptions of their social presence as well as mindful and mindless anthropomorphism (Mariani et al., 2022). Chatbots are increasingly used in marketing services to facilitate various processes related to customer service and personalization. Recent research has shown that anthropomorphic assistants and the increasing perceived humanness of chatbots result in more effective conversations (Roy & Naidoo, 2021). Sundar et al. (2017, p. 89) reported that "the label of assistant and the label of companion can both trigger heuristics (or mental shortcuts) that elicit positive evaluations from the user," such that the label of "assistant" triggers the "helper" heuristic while the label of "companion" triggers the "social presence" or "copresence" heuristic. Thus, a chatbot's assistantship and friendship could be both (1) the intrinsic properties of the chatbot and (2) the mental representations ascribed to each consumer's approach (Youn & Jin, 2021).

The "assistant" type of interactive technology identifies and responds to humans' needs primarily in the sense of assisting in certain tasks, thus making the "competence" dimension more relevant and salient (Dautenhahn, 2007). However, the role of a "companion" type of interactive technology is to provide users with emotional support, thus making the "sincerity" dimension more relevant and salient (Dautenhahn, 2007). Youn and Jin (2021) found that the type of customer–chatbot relationship affects customers' perception of the brand personality and parasocial interactions. Consumers who interact with a friendlier chatbot will experience stronger parasocial interactions with it. However, when chatbots are used in the context of digital beauty experiences, the customer–chatbot relationship may affect customers' perception of the experience, body image, self-esteem, and actual purchase behavior. Previous studies have found that digital devices with friend-like characteristics encourage stronger feelings of warmth than those with engineer-like characteristics that can relate to brand attachment (Schweitzer et al., 2019). For Generation Z consumers, it is possible that a chatbot has the anthropomorphic attribution with friend-like characteristics, that is, "female, tall, sassy, perky, humorous, abrupt, shy, helpful, nice, friendly, unassertive, intelligent, factual, organized, and serious" (Schweitzer et al., 2019; p. 702). It is possible that a chatbot with friend-like characteristics can improve young women's perceptions of their bodies and increase their self-esteem and actual purchase behavior since previous research has highlighted that positive social interactions and social influence improve young women's perceptions of their beauty and self-esteem (Coughlin, 2009). We propose that Generation Z women who receive chatbot support in friend-like conversations would have a more positive perception of their body image, self-esteem, and actual purchase behavior than women who receive chatbot support in assistant like conversations that are aimed at improving functionality. Hence, we propose:

H7: *The type of chatbot support (assistant vs. friend) moderates the effects of Generation Z customers' (7a) perceived augmentation on body image; (7b) body image on self-esteem; and (7c) body image on actual purchase behavior such that those who interact with a chatbot as a virtual friend will perceive these relationships to be stronger.*

5.2 | Method, sampling, data collection, and manipulation check

In Study 2, the authors employed a one-way experimental design in which female participants from Generation Z in Malaysia were asked to evaluate chatbot support via a virtual assistant versus virtual friend condition. Following the between-subject design method, participants were first assigned randomly to one of the conditions. In particular, respondents were instructed to read a chatbot scenario regarding seeking information about a make-up product. In this manipulation procedure, respondents were randomly exposed to one of two conditions: (1) a chatbot as a virtual assistant, in which participants were exposed to communication that was *intelligent*, *factual*, *organized*, and *serious*; or (2) a chatbot as a virtual friend, in which respondents were exposed to communication that was *helpful*, *nice*, and *friendly* (see Supporting Information: Table G, Supporting Information Appendix, C, Panel A and Panel B). In addition, the communications in the two chatbot scenarios were identical (i.e., chatbot communications from two different well-known international beauty brands), that is, seeking information on a make-up product (i.e., lipstick).

Consent agreement (e.g., assurance of anonymity) was given to the participants before their participation. First, the participants were instructed to imagine that they were looking for information on lipstick and presented with the paragraph that introduced a chatbot given by each of the two beauty brands. They were also informed that they would encounter a mobile phone screen depicting a conversation

between the brand's chatbot and a consumer. Second, the participants were presented with an explanation that described the chatbot as either a virtual assistant or a virtual friend. We employed forced exposure by displaying the paragraph for 30 s to ensure that the participants were able to read the message completely. They were then asked to answer a number of questions about perceived augmentation, body image, actual purchase behavior, and self-esteem (see Study 1 for the measurement items' details). The scenario was adapted from Youn and Jin (2021) and ensured that no one realized the specific research hypotheses during the study, demonstrating that the concern about demand characteristics was nonexistent.

In 2021, a sample of 300 consumers, among attendees at a research lab in Malaysia, was invited to participate by the researcher via email. They volunteered to participate in the study after we discussed the goal of our investigation during a meeting at the research lab. Following that, the instructions for the online experiment at the lab were presented to the participants. Fifteen participants were excluded because they did not answer correctly the following attention check question: What does the virtual chatbot communication look like? The respondents had to choose a binary answer: either the communication was an assistant or it was friendly. In addition, 35 responses were discarded due to being incomplete, leaving 250 usable responses ($n = 118$ for the assistant data set; $n = 132$ for the friend data set) from Generation Z female participants (mean age = 22 and standard deviation = 0.597) with student status. Importantly, these participants have used the brand's virtual artist application for more than a year (between 1 and 5 years). In addition, they have shopped with the cosmetic brand before through mobile commerce and social commerce (many times a week) with the help of the chatbot service. Supporting Information: Table H (Supporting Information Appendix) (see Study 2) contains the demographic information of the participants in this study.

For the appraisal of manipulation success, the participants were asked about the extent to which they perceived the chatbot to be an assistant or a friend. The two specific statements were: (1) This chatbot is an assistant to me; and (2) This chatbot is a friend to me. A 7-point Likert scale, ranging from 1 "strongly disagree" to 7 "strongly agree," was used. An independent sample t test analysis reported a statistically significant difference between assistant and friend chatbot conditions ($t = 5.432$, $df = 248$, $p < 0.001$, the mean values of the assistant chatbot condition versus the friend chatbot condition for the first question being 6.14 and 5.29, respectively; while $t = -4.230$, $df = 248$, $p < 0.001$, the mean values of the assistant chatbot condition versus the friend chatbot condition for the second question being 2.74 and 4.01, respectively). Thus, these findings showed that the participants were more likely to identify the relationship type assigned to them correctly.

5.3 | Analysis and results

In Study 2, we continued to use the PLS-SEM technique to assess the measurement model and structural model.

5.3.1 | Measurement model

Following the standard evaluation of the measurement model, this study first examined the result of the loading, convergent validity, internal reliability, and discriminant validity (see Supporting Information: Table B, Supporting Information Appendix). After cleaning the low loading values, all the items for the subgroup data sets (i.e., the assistant data set and friend data set) achieved outer loadings above the threshold value of 0.70. In addition, convergent validity was established because all the factors across the data sets had an average variance extracted (AVE) of 0.5 or higher. In addition, both CA and CR values for both subgroup data sets were above the threshold value of 0.7 (Hair et al., 2017); hence, the measurement model met the reliability requirements. Finally, there were no discriminant validity issues in the HTMT assessment because both data sets showed that all the values were below 0.85 (Henseler et al., 2015).

5.3.2 | Structural model based on multigroup analysis

H7a to H7c predicted the moderating effects of chatbot support (assistant vs. friend) on the relationships between perceived augmentation and body image as well as body image and both factors of purchase behavior and self-esteem. Similar to Study 1, our study first assessed the measurement invariance using MICOM. Partial measurement invariance was thus established for the assistant and friend groups (see Supporting Information: Appendix B, Study 2) because not all factors have significant differences in terms of the composite mean values and variance ratio (i.e., not all the results of both composite mean and variance ratio values fall outside the upper and lower bounds of the 95% confidence interval). Subsequently, we compared the path coefficients between the two groups in each factor using Henseler's PLS-MGA approach (Hair et al., 2017). As shown in Table 3, H7a, H7b, and H7c were supported as the chatbot support type moderated the relationships between perceived augmentation and body image (t value = 4.155**) and between body image and purchase behavior (t value = 3.065**) as well as the relationship between body image and self-esteem (t value = 3.993***). Nevertheless, the virtual friend type of chatbot support showed a stronger path coefficient effect than the virtual assistant type.

5.4 | Discussion

This study examined the role of the chatbot support type (friend vs. assistant) in the body image, self-esteem, and purchase behavior of Generation Z female customers who use beauty brands' virtual applications. Our findings show that, for Generation Z women, receiving support from a chatbot in a form of a virtual friend, with the characteristics of being *helpful*, *nice*, and *friendly*, can have a more

TABLE 3 Multigroup analysis for Study 2

Hypothesis	Moderator	Relationship	*t* Value (group differences)	Standard β (group one: assistant)	Standard β (group two: friend)	Results
H7a	Chatbot support	Perceived augmentation ≥ body image	4.155***	0.166***	0.509***	Supported
H7b	Chatbot support	Body image ≥ purchase behavior	3.065***	0.331***	0.564***	Supported
H7c	Chatbot support	Body image ≥ self-esteem	3.993***	0.263***	0.568***	Supported

Note: ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$.

positive outcome for perceptions in terms of body image and self-esteem and improved purchase buying behavior when using beauty brands' virtual applications (which integrate augmented reality). Hence, our findings show that, when the chatbot support is in the form of friendship, it can have a positive effect on how female customers perceive themselves and how they evaluate the impact of services enabled by other technologies (i.e., services enabled by augmented reality) on their body image. This is particularly important for young women who tend to use cosmetics for compensation and concealing purposes when they feel dissatisfied with areas of their face (Dickman, 2010). This extends the findings of previous studies on chatbots, which have found that assistant versus friendship chatbot support can influence customers' perception of brands (Youn & Jin, 2021) and feeling of warmth (Schweitzer et al., 2019). While the "assistant" type of chatbot support (i.e., *intelligent*, *factual*, and *organized*) can offer responses to different customer enquiries, it can be extended to offer benefits to both the customer and the brand.

6 | STUDY 3

Study 3 re-examines the overall proposed hypotheses of Study 1 and Study 2 with the inclusion of control variables, namely brand attachment, brand reputation, and brand awareness (see Figure 1). These three brand concepts have long been regarded as important factors in influencing product evaluations, preferences, and purchase intentions (Thomson et al., 2005; Veloutsou & Moutinho, 2009; Yoo & Donthu, 2001; Yoo et al., 2000). However, there is a gap in research concerning how brand-related factors affect Generation Z female customers when using various technologies in their shopping journey. Hence, this study enriches our understanding of the impact of such factors in the context of this study by building on the findings of Study 1 and Study 2.

6.1 | The impact of brand attachment, reputation, and awareness

Previous studies have emphasized the impact of various brand-related factors on consumers' preferences and choices (Yoo & Donthu, 2001; Yoo et al., 2000). In particular, brand attachment, reputation, and awareness have been found to be significant factors in shopping contexts (Shahid et al., 2022; Thomson et al., 2005; Yoo et al., 2000). Brand attachment is conceptualized as "an emotion-laden target-specific bond between a person and a specific object" (Thomson et al., 2005; p. 77). This factor is related to consumers' emotions regarding a brand, and it comprises affection for, connection to, and passion about a brand (Thomson et al., 2005). Brand reputation occurs primarily through the signals that producers send to the market and the degree to which the organizational tactics support the marketing signals to establish it (Veloutsou & Moutinho, 2009). It refers to whether consumers find the brand to be trustworthy, to be reliable, and to make honest claims (McLean et al., 2022). Brand awareness is the "ability for a buyer to recognize or recall that a brand is a member of a certain product category" (Aaker, 1991; p. 61).

In the context of the involvement of chatbots in brand management, previous studies have examined the attributes of chatbots facilitating positive beliefs about and behavior towards a brand (e.g., Roy & Naidoo, 2021). Brand-related factors have mainly been examined as outcome variables in previous studies (e.g., Cheng & Jiang, 2020; Trivedi, 2019). Despite the existing literature agreeing that brand-related factors affect consumers' choices, there is a lack of research on how such factors affect consumers' preference for the type of chatbot to interact with during their shopping experience. In addition, consumers' preferences for a chatbot type (friend vs. assistant) can be influenced by brand attachment, reputation, and awareness. For example, when consumers are emotionally attached to a brand, they develop strong feelings and become more emotionally engaged in their experience. Therefore, it is possible that they prefer the chatbot to act as a friend that they can bond with and become more emotionally attached to as it encourages stronger feelings of warmth than one with engineer-like characteristics linked to brand attachment (Schweitzer et al., 2019). As brand reputation covers functional aspects related to the brand, including being trustworthy, being reliable, and making honest claims (McLean et al., 2022), it is possible that consumers who interact with a brand that they perceive to have a positive reputation may prefer a chatbot to act as an assistant that is functional and reliable. Similarly, brand awareness may change consumers' preferences.

In addition, when empirically examining purchase intention and self-esteem effects, it is desirable to control for potential exogenous influences of the brand attachment, reputation, and awareness concepts to ensure that a causal explanation can be achieved from our inferential test (Nguyen et al., 2018). Furthermore, Generation Z customers' perceptions of a brand may affect the extent to which they are influenced by social media interactions (Mahmoud et al., 2021). Therefore, we empirically analyzed the impact of these brand-related factors of the relationships in our proposed model as control variables.

6.2 | Method, sampling, data collection, and manipulation check

Study 3 (in 2022) employed a similar experimental design to the one that we used in Study 2, in which female participants from Generation Z in Malaysia were randomly asked to evaluate the type of chatbot support (virtual assistant vs. virtual friend) in the scenario (a make-up cosmetic product) that we employed. In addition, the participants responded to questions related to the moderating effect of the external influences of social media (i.e., trust in social media celebrities and addictive use of social media).

A new sample of 200 female volunteers from Generation Z, from attendees at our research lab, were invited randomly via email by the researcher. Specifically, 100 participants were exposed to the scenario of a virtual assistant and the remaining 100 participants were exposed to the scenario of a virtual friend. A paragraph was displayed for 30 s to both groups of participants to ensure that they were able to read the complete message. Subsequently, the participants were asked to respond to similar measurements to those used in Study 1 and Study 2. In addition, new control variables were included for which the measurement items were adapted from previous studies: brand attachment (Thomson et al., 2005), brand reputation (Veloutsou & Moutinho), and brand awareness (Yoo et al., 2000).

From the data collection, the majority of the participants—regardless of the type of chatbot support—were students aged 22 with standard deviation of 0.773. Importantly, these participants have used the brand's virtual artist application for more than a year (between 1 and 5 years). In addition, they have shopped with the cosmetic brand before through mobile commerce and social commerce (many times a week) with the help of the chatbot service. In terms of the attention check, the respondents were able to choose the right answer regarding whether the communication was being an assistant or a friend.

To ensure the effectiveness of the manipulation check, similar manipulation questions to those in Study 2 were used. The independent-sample test results showed significant differences between the assistant and the friend chatbot conditions ($t = 4.451$, $df = 98$, $p < 0.001$, the mean values of the assistant chatbot condition vs. the friend chatbot condition for the first question being 5.85 and 4.51, respectively; while $t = -3.545$, $df = 98$, $p < 0.001$, the mean values of the assistant chatbot condition vs. the friend chatbot condition for the second question being 3.24 and 5.41, respectively). Thus, these findings also showed a similar outcome to Study 2 in that the participants were able to identify the relationship type assigned to them correctly Figure 3.

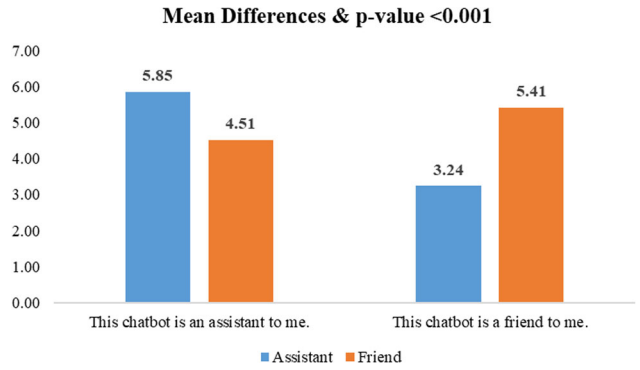

FIGURE 3 Differences between the virtual assistant and the virtual friend in Study 3

6.3 | Analysis and result

Subsequently, we continued to use the PLS-SEM technique to assess the measurement model and structural model in Study 3.

6.3.1 | Measurement model

All the items for the subgroup data sets (i.e., the assistant data set and friend data set) achieved outer loadings above the threshold value of 0.70, especially after removing indicators that have low loading values. Consequently, the CA, CR, AVE, and HTMT values for both subgroup data sets met the satisfactory threshold values suggested by Hair et al. (2017) (see Supporting Information: Table C in Supporting Information Appendix).

6.3.2 | Structural model based on multigroup analysis

The results are generally consistent with the findings of Study 1 (Table 4), in which all the proposed hypothesized relationships were supported (H1 to H4), after controlling for the effects of brand attachment, brand reputation, and band awareness. However, the findings also show that the control variables of both brand awareness and brand reputation have significant effects on Generation Z women's purchase behavior.

Study 3 used a similar assessment procedure to Study 1 and Study 2 when assessing the proposed moderating effect of H5a to H7c while controlling for the three brand-related factors. Partial measurement invariance was established for factors such as trust in

TABLE 4 Assessment of the structural model

Hypothesis		Standard β	t Value	Supported?	R^2
H1	Perceived augmentation ≥ body image	0.804	43.314**	Yes	0.6
H2	Body image ≥ purchase behavior	0.174	3.276***	Yes	0.7
H3	Body image ≥ self-esteem	0.107	2.831***	Yes	0.6
H4	Purchase behavior ≥ self-esteem	0.140	2.967**	Yes	
	Control variables				
	Brand attachment ≥ purchase behavior	0.067	1.212		
	Brand attachment ≥ self-esteem	0.076	1.583		
	Brand awareness ≥ purchase behavior	0.135	1.766*		
	Brand awareness ≥ self-esteem	0.056	1.139		
	Brand reputation ≥ purchase behavior	0.119	1.698		
	Brand reputation ≥ self-esteem	0.014	0.602		

Note: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

social media celebrities and addictive use of social media. The invariance also occurred for both assistant and friend groups (see Supporting Information: Appendix B, Study 3i to Study 3iii). Subsequently, we compared the path coefficients between the moderating variables using Henseler's PLS-MGA approach (Hair et al., 2017). As shown in Table 5, both H5a and H5b were supported as trust in the recommendations made by social media celebrities moderated the relationship between body image and purchase behavior (t value = 2.334**) as well as the relationship between body image and self-esteem (t value = 2.615**). In addition, H6a was supported as the addictive use of social media moderated the relationship between body image and purchase behavior (t value = 2.412**) but did not moderate the relationship between body image and self-esteem (t value = 0.945). Nevertheless, the effect of body image on self-esteem was significant in both the low social media addiction and the high social media addiction group. Furthermore, H7a, H7b, and H7c were supported (see Table 5). Similar to Study 2, there were also significant differences between virtual assistant and virtual friend chatbot support for perceived augmentation and body image (t value = 5.521**), body image and purchase behavior (t value = 4.210**), and body image and self-esteem (t value = 4.523**). Importantly, the type of virtual friend also showed a stronger path coefficient effect than the virtual assistant type. Overall, when examining the impact of brand attachment, reputation, and image, the results remained consistent with those of Study 2.

6.4 | Discussion

Overall, the findings of Study 3 supported the robustness of our earlier findings in Study 1 and Study 2 when controlling for brand attachment, brand reputation, and brand awareness. While the existing literature has highlighted the significance of brand-related factors for various aspects of the customer journey (Shahid et al., 2022; Thomson et al., 2005; Yoo et al., 2000), our findings show that the inclusion of these factors does not influence Generation Z women's perceptions of the technologies that they interact with as part of their journey. This is possibly due to the nature of Generation Z consumers' perceptions of brands as they were found to be less attached and loyal to brands than other consumer cohorts and they trust user-generated content on social media more than the brands themselves (Djafarova & Bowes, 2021). In addition, Generation Z consumers are mostly well educated about brands and the realities behind them (Francis & Hoefel, 2018). Furthermore, it is conceivable that Generation Z women are tech natives; hence, they are less influenced by brand-related factors. However, our findings show that these control variables have significant effects on Generation Z women's purchase behavior. This is consistent with previous studies emphasizing the impact of brand-related factors on customer purchase behavior (e.g., Shahid et al., 2022; Thomson et al., 2005).

7 | GENERAL DISCUSSION

Prior research has emphasized that low self-esteem, confidence, and body image are major issues for young female consumers (Chappet, 2019; Khamis & Zaatarti, 2019). In addition, previous studies on consumers' interactions with technologies have demonstrated the potential of these technologies to improve their shopping experience (e.g., Ameen et al., 2021; Ng et al., 2019). In this study, we study the integration of multiple technologies as part of Generation Z women's customer journey. We argue that the augmentation enabled by augmented reality, the type of chatbot (friend vs. assistant), and social media (specifically trust in social media celebrities and addictive use of social media) can affect Generation Z female consumers' body image, purchase behavior, and self-esteem. Evidence for our hypotheses was provided by a survey and two experimental studies

TABLE 5 Multigroup analysis for Study 3

Hypothesis	Moderator	Relationship	*t* Value (group differences)	Standard β (group one: lower level)	Standard β (group two: higher level)	Results
H5a	Trust in social media celebrities	Body image ≥ purchase behavior	2.334**	0.178**	0.268***	Supported
H5b	Trust in social media celebrities	Body image ≥ self-esteem	2.615**	0.201***	0.321***	Supported
H6a	Addictive use of social media	Body image ≥ purchase behavior	2.412**	0.222***	0.334***	Supported
H6b	Addictive use of social media	Body image ≥ self-esteem	0.945	0.181**	0.195**	Not supported
		Control variables				
		Brand attachmen ≥ purchase behavior	0.054	0.068	0.060	Not significant
		Brand attachment ≥ self-esteem	0.534	0.076	0.064	Not significant
		Brand awareness ≥ purchase behavior	0.584	0.168*	0.158*	Not significant
		Brand awareness ≥ self-esteem	0.873	0.067	0.073	Not significant
		Brand reputation ≥ purchase behavior	1.486	0.121*	0.143*	Not significant
		Brand reputation ≥ self-esteem	1.324	0.062	0.069	Not significant
Hypothesis	**Moderator**	**Relationship**	***t* Value (group differences)**	**Standard β (group one: assistant)**	**Standard β (group two: friend)**	**Results**
H7a	Chatbot support	Perceived augmentation ≥ body image	5.521***	0.376***	0.612***	Supported
H7b	Chatbot support	Body image ≥ purchase behavior	4.210***	0.137***	0.316***	Supported
H7c	Chatbot support	Body image ≥ self-esteem	4.523***	0.163***	0.368***	Supported
		Control variables				
		Brand attachment ≥ purchase behavior	0.054	0.060	0.058	Not significant
		Brand attachment ≥ self-esteem	0.534	0.081	0.074	Not significant
		Brand awareness ≥ purchase behavior	0.584	0.178*	0.172*	Not significant
		Brand awareness ≥ self-esteem	0.873	0.057	0.011	Not significant
		Brand reputation ≥ purchase behavior	1.486	0.153*	0.193*	Not significant
		Brand reputation ≥ self-esteem	1.324	0.047	0.065	Not significant

Note: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

showing that the integration of augmented reality and a "friend" type of chatbot support in services offered by beauty brands and promotion through trusted social media celebrities can improve Generation Z female customers' body image, self-esteem, and purchase behavior. Overall, the findings show that Genertaion Z women are less influenced by brand-related factors when interacting with various technologies as part of their shopping journey.

7.1 | Theoretical contributions

Our research makes important contributions to the literature on Generation Z consumers' behavior by highlighting the conditions under which their self-esteem and purchase behavior can be enhanced with technology-enabled solutions. The literature in this study stream has shown that body image and low self-esteem are major issues among Generation Z consumers, specifically female consumers, and has called for further research to identify ways to enhance their body image and self-esteem (Khamis & Zaatarti, 2019; Rosenbaum, 2018; Thompson & Chad, 2002). While there has been substantial interest in understanding the impact of technology on young consumers (e.g., Ameen & Anand, 2020; Ameen et al., 2021; Yu et al., 2019), no research has investigated how the integration of multiple technologies into the customer journey can influence Generation Z female consumers' body image, self-esteem, and purchase behavior. To the best of our knowledge, our research is the first to consider how the use of various technologies in the services offered to Generation Z female consumers can be beneficial beyond enhancing their purchase behavior, drawing on social comparison theory (Festinger, 1954). This is significant given the central role that self-esteem and body image play in Generation Z female consumers' decision making (Hendrickse et al., 2017).

Moreover, we contribute to the literature on Generation Z consumers' interactions with technology (e.g., Ameen & Anand, 2020; Ameen et al., 2021; Yu et al., 2019) by showing how the integration of augmented reality, chatbots, and social media can improve Generation Z female consumers' body image, self-esteem, and purchase behavior. This study builds on the findings of previous studies (e.g., Javornik, 2016; Javornik, Rogers, et al., 2016) and offers evidence that the perceived augmentation of reality in these experiences has a strong influence on body image and self-esteem and shapes the purchase behavior of Generation Z women. The present study also contributes to a research stream that examines the role of social media, body image, self-esteem, and purchase behavior (e.g., Hawi & Samaha, 2017; West, 2018). Our findings show that, while Generation Z female consumers' trust in social media celebrities' recommendations has a significant moderating effect on the relationship between body image and self-esteem, the addictive use of social media does not have any significant effects in this context.

Adding to the literature on consumer interactions with chatbots (Dautenhahn, 2007; Youn & Jin, 2021), our findings offer a more nuanced understanding of how the chatbot support type, "friend vs assistant," can affect Generation Z female consumers' perceived augmentation, body image, self-esteem, and purchase behavior and the impact of brand-related factors in this context. Previous research has studied the effects of the friend versus assistant type of chatbot and the role of factors such as functionality and anthropomorphism in chatbot support in enhancing purchase behavior or customer–brand relationships (e.g., Roy & Naidoo, 2021; Sundar et al., 2017). Our research extends the findings of these studies by establishing that, when Generation Z female consumers receive support from a chatbot in the form of a virtual friend, they can have a more positive perception of beauty brands' virtual applications (which integrate augmented reality) and their body image and self-esteem and improved purchase behavior. Additionally, in the context of chatbot support, brand-related factors have mainly been examined as outcome variables in previous studies (e.g., Cheng & Jiang, 2020; Trivedi, 2019). However, the majority of previous studies have highlighted the impact of brand-related factors, including brand attachment, brand reputation, and brand awareness, in shopping contexts (Shahid et al., 2022; Thomson et al., 2005; Yoo et al., 2000). Our research adds to this line of literature by showing that, for Generation Z female consumers, brand-related factors affect neither their interactions with the technologies offered by brands as part of their services nor their self-esteem. However, our findings show that brand reputation and brand awareness affect these consumers' purchase behavior. Overall, our research offers a novel way to enhance body image, self-esteem, and purchase behavior among Generation Z female consumers.

7.2 | Managerial implications

Beauty brands are increasingly integrating cutting-edge technologies into the services offered to their customers. Until now, the primary purpose of beauty brands when offering various services enabled by cutting-edge technologies had been to offer more convenient services to customers. Given the significance of the young female consumer segment for these brands, there is a need to identify new ways in which their services can be beneficial to young women in ways that extend beyond influencing their buying decision making. Beauty brands can play an active role in enhancing young female consumers' body image, self-esteem, and purchase behavior through the careful use of augmented reality, chatbots, and social media.

Despite the excitement surrounding the use of advanced technologies in retail, there is still much to be learned about how they can work more effectively. For example, given the significance of augmentation in enhancing Generation Z women's body image and self-esteem, beauty brands should collaborate with IT companies to find ways to improve the augmentation in the services that they offer. Further improvements regarding positioning in real time and precision in showing features are required. In addition to focusing on cutting-edge technologies, beauty brands should carefully develop strategies for integrating social media effectively when communicating with young female consumers. Social media celebrities or key

opinion leaders play a significant role in encouraging young female consumers to use technologically advanced services and enhancing their body image and self-esteem, but it is crucial to ensure that these celebrities are trusted by the target consumers. Hence, beauty brands should collaborate with social media influencers who are considered trustworthy and are appealing to the young female segment of consumers to influence them in ways that reach beyond buying beauty products. Given that social media have a profound impact on Generation Z women, policy makers should collaborate with beauty brands and social media celebrities to find ways to use social media to improve the body image and self-esteem in this cohort. In addition, to offset the potential negative impacts of social media on young women's behavior (e.g., as a result of addictive use of social media), beauty brands should make such services more available on their websites.

Finally, while the beauty industry has witnessed a sharp increase in the use of chatbots since the start of the COVID-19 pandemic, there is a need for a more personalized approach to the conversation style of chatbots when interacting with young female customers (Generation Z) in a "friend" type of support to provide benefits that extend beyond increasing sales and improving the customer–brand relationship. Beauty brands should offer chatbot services in the form of a virtual friend (i.e., characterized as being helpful, nice, and friendly) and carefully design the language style in the text-based dialog system to enhance young women's body image and self-esteem. This is equally important for large beauty brands as our findings show that brand attachment, reputation, and awareness do not particularly affect how Generation Z women interact with cutting-edge technology-enabled services. However, given that brand awareness and brand reputation are important for enhancing Generation Z female consumers' purchase behavior, beauty brands should identify ways to enhance their reputation and awareness among this generation of consumers. This can be achieved in various ways, for example through collaboration with trusted social media influencers.

8 | LIMITATIONS AND FUTURE RESEARCH

Despite the significant contributions made by this study, it has certain limitations that can be addressed in future research. Given that women's perceptions of body image and self-esteem can vary according to cultural and national factors, it would be interesting for future research to collect data from women in two or more countries and compare the results. This will help in advancing knowledge by showing the similarities and differences in Generation Z female consumers behavior in various cultures and settings. Furthermore, future studies can focus on other aspects, such as how applications supported by augmented reality and artificial intelligence can provide the youngest generation of consumers with retail therapy. This is likely to open new avenues for future research in this area.

Our study focused on text-based chatbots. Future studies can focus on voice-based systems too and analyze their impact on Generation Z women's self-esteem, body image, and purchase behavior. Additionally, future studies can analyze the impact of voice-based systems on Generation Z individuals' loneliness and engagement at different stages of the customer journey. This is an important area for future research to investigate due to the growing use of voice-based systems.

Our findings show that addiction to social media use does not moderate the impact of body image on self-esteem. This area is worthy of further investigation in future research, which can use analytics to understand the type of content that Generation Z women can be addicted to on social media. This will enable a better understanding of the reasons behind their addiction and how it changes over time.

In addition, this study has some methodological limitations, including reliance on self-reported data from participants, the use of a controlled lab experiment, and the use of purposive sampling, which has its own limitations. Future studies can collect data using different and more robust methods and offer more generalizable findings. In addition, due to the nature of our study, we collected data from Generation Z women only. Future studies can also collect data from individuals from different generations, for example comparing the model using groups from Generations Z, Y, and X. This will help in obtaining a better understanding of the behavior of different generations of consumers.

9 | CONCLUSION

This study aimed to determine how Generation Z women's body image, self-esteem, and purchase behavior are influenced by various technologies that are part of the customer journey, namely augmented reality, chatbots, and social media, and the impact of brand-related factors in this context. Our findings show the role of augmentation in developing body image and self-esteem among Generation Z women and in shaping their purchase behavior. In addition, the findings show that, when the chatbot support type is classified as "friend," it can provide both intrinsic and extrinsic benefits to young female consumers that extend beyond improving the customer–brand relationship as it relates to their self-esteem. Furthermore, our findings show that brand attachment, awareness, and reputation have a significant impact on Generation Z women's interactions with cutting-edge technologies as part of their shopping experience. However, the findings indicate that brand awareness and brand reputation affect Generation Z women's purchase behavior. The study makes a significant contribution by highlighting the impact of Generation Z female consumers' interactions with various technologies as part of their shopping journey with beauty brands on their shopping behavior and psychological well-being. Future research can build on our findings to enhance our understanding of the impact of various technologies that work together as part of the customer journey and brand-related factors on Generation Z women's psychological well-being in a step towards marketing for a better world.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The research data are not shared.

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REFERENCES

Aaker, D. A. (1991). *Managing brand equity*. The Free Press.

Adjei, M. T., Noble, S. M., & Noble, C. H. (2010). The influence of C2C communications in online brand communities on customer purchase behavior. *Journal of the Academy of Marketing Science*, *38*(5), 634–653.

Ameen, N., & Anand, A. (2020). Generation Z in the United Arab Emirates: A smart-tech-driven igeneration. In E. Gentina, & E. Parry (Eds.), *The new Generation Z in Asia: Dynamics, differences, digitalisation (The changing context of managing people)* (pp. 181–192). Emerald Publishing Limited. https://doi.org/10.1108/978-1-80043-220-820201018

Ameen, N., Sharma, G. D., Tarba, S., Rao, A., & Chopra, R. (2022). Toward advancing theory on creativity in marketing and artificial intelligence. *Psychology & Marketing*. https://doi.org/10.1002/mar.21699

Ameen, N., Tarhini, A., Reppel, A., & Anand, A. (2021). Customer experiences in the age of artificial intelligence. *Computers in Human Behavior*, *114*, 106548. https://doi.org/10.1016/j.chb.2020.106548

Andreassen, C. S., Torsheim, T., Burnborg, G. S., & Pallesen, S. (2012). Development of a facebook addiction scale. *Psychological Reports*, *110*(2), 501–517.

Betz, D. E., Sabik, N. J., & Ramsey, L. R. (2019). Ideal comparisons: Body ideals harm women's body image through social comparison. *Body image*, *29*, 100–109.

Boyle, S. C., LaBrie, J. W., Froidevaux, N. M., & Witkovic, Y. D. (2016). Different digital paths to the keg? How exposure to peers' alcohol-related social media content influences drinking among male and female first-year college students. *Addictive Behaviors*, *57*, 21–29.

Britton, A. M. (2012). *The beauty industry's influence on women in society* [Doctoral thesis, University of New Hampshire].

Cameron, E., Ward, P., Mandville-Anstey, S. A., & Coombs, A. (2019). The female aging body: A systematic review of female perspectives on aging, health, and body image. *Journal of Women & Aging*, *31*(1), 3–17.

Chamberlain, L. (2018). Gen-Z will account for 40 percent of all consumers by 2020. *GeoMarketing*. https://geomarketing.com/gen-z-will-account-for-40-percent-of-all-consumers-by-2020

Chan, C. S., & Grossman, H. Y. (1988). Psychological effects of running loss on consistent runners. *Perceptual and Motor Skills*, *66*(3), 875–883.

Chandra, S., Verma, S., Lim, W. M., Kumar, S., & Donthu, N. (2022). Personalization in personalized marketing: Trends and ways forward. *Psychology & Marketing*. https://doi.org/10.1002/mar.21670

Chappet, M. (2019). We've been more empowered than ever, so why are Gen-Z the least confident generation yet? *Glamour*. https://www.glamourmagazine.co.uk/article/gen-z-least-confident-generation

Cheah, J. H., Nitzl, C., Roldán, J. L., Cepeda-Carrion, G., & Gudergan, S. P. (2021). A primer on the conditional mediation analysis in PLS-SEM. *Advances in Information Systems*, *52*(SI), 43–100.

Cheng, Y., & Jiang, H. (2020). How do AI-driven chatbots impact user experience? Examining gratifications, perceived privacy risk, satisfaction, loyalty, and continued use. *Journal of Broadcasting & Electronic Media*, *64*(4), 592–614.

Ciechanowski, L., Przegalinska, A., Magnuski, M., & Gloor, P. (2019). In the shades of the uncanny valley: An experimental study of human–chatbot interaction. *Future Generation Computer Systems*, *92*, 539–548.

Cohen, R., & Blaszczynski, A. (2015). Comparative effects of Facebook and conventional media on body image dissatisfaction. *Journal of Eating Disorders*, *3*(1), 23–30.

Coughlin, J. W. (2009). *The efficacy of a media literacy program for the prevention and treatment of eating disturbances: Implications for the continuum model of eating disorders* (p. 69). ProQuest Information & Learning. http://libproxy.boisestate.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2009-99040-455&site=ehost-live

Craig, A. B. (2013). *Understanding augmented reality: Concepts and applications*. Elsevier.

Cuny, C., & Opaswongkarn, T. (2017). Why do young Thai women desire White skin? Understanding conscious and nonconscious motivations of young women in Bangkok. *Psychology & Marketing*, *34*(5), 556–568.

Cyca, M. (2022). 24 important TikTok stats marketers need to know in 2022. *Hootsuite*. https://blog.hootsuite.com/tiktok-stats/

Dautenhahn, K. (2007). Socially intelligent robots: Dimensions of human–robot interaction. *Philosophical Transactions of the Royal Society, B: Biological Sciences*, *362*(14), 679–704.

Davis, D. (2020). *Gen Zers have a spending power of over $140 billion, and it's driving the frenzy of retailers and brands trying to win their dollars. Insider*. https://www.businessinsider.com/retail-courts-gen-z-spending-power-over-140-billion-2020-1?r=US&IR=T

de Lenne, O., Vandenbosch, L., Smits, T., & Eggermont, S. (2021). Framing real beauty: A framing approach to the effects of beauty advertisements on body image and advertising effectiveness. *Body image*, *37*, 255–268.

Dickman, C. (2010). *Body image effects on cosmetics consumption among young females in the Greater Helsinki Region*. University of Applied Sciences Arcada. https://www.theseus.fi/bitstream/handle/10024/12465/dickman_christina.pdf;jsessionid=8B007CA9A5AC55D4F8861509D6B787C1?sequence=1

Dimock, M. (2019). *Defining generations: Where Millennials end and Generation Z begins. Pew Research Center*. https://www.pewresearch.org/fact-tank/2019/01/17/where-millennials-end-and-generation-z-begins/

Djafarova, E., & Bowes, T. (2021). 'Instagram made me buy it': Generation Z impulse purchases in fashion industry. *Journal of Retailing and Consumer Services*, *59*. https://doi.org/10.1016/j.jretconser.2020.102345

Djafarova, E., & Rushworth, C. (2017). Exploring the credibility of online celebrities' Instagram profiles in influencing the purchase decisions of young female users. *Computers in Human Behavior*, *68*, 1–7.

Djafarova, E., & Trofimenko, O. (2019). 'Instafamous' – credibility and self-presentation of micro-celebrities on social media. *Information, Communication & Society*, *22*(10), 1432–1446.

Egolf, K. (2018). Z: A generation redefining health and wellness. https://cdn2.hubspot.net/hubfs/4000540/content-reports/reports-pdf-versions/UNiDAYS-Ad-Age-Health-Wellness-2018-Report.pdf

Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, *7*, 117–140. https://doi.org/10.1177/001872675400700202

Flavián, C., Ibáñez-Sánchez, S., & Orús, C. (2019). The impact of virtual, augmented and mixed reality technologies on the customer experience. *Journal of Business Research*, *100*, 547–560.

Francis, T., & Hoefel, F. (2018). *'True Gen': Generation Z and its implications for companies: The influence of Gen Z – the first generation of true digital natives – is expanding*. McKinsey and Company. http://www.drthomaswu.com/uicmpaccsmac/Gen%20Z.pdf

Gatter, S., Hüttl-Maack, V., & Rauschnabel, P. A. (2022). Can augmented reality satisfy consumers' need for touch? *Psychology & Marketing*, *39*(3), 508–523.

Gentina, E., Huarng, K. H., & Sakashita, M. (2018). A social comparison theory approach to mothers' and daughters' clothing co-consumption behaviors: A cross-cultural study in France and Japan. *Journal of Business Research*, *89*, 361–370.

Gillan, T. (2019). Brands that raise self-esteem win over millennials. *IPM Bitesize,*. https://www.promomarketing.info/brands-raise-self-esteem-win-millennials/

Grigoreva, E. A., Garifova, L. F., & Polovkina, E. A. (2021). Consumer behaviour in the information economy: Generation Z. *International Journal of Financial Research*, *12*(2), 164–171.

Gulas, C. S. & McKeage, K. (2000). Extending social comparison: An examination of the unintended consequences of idealized advertising imagery. *Journal of Advertising*, *29*(2), 17–28. https://doi.org/10.1080/00913367.2000.10673606

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). *A primer on partial least squares structural equation modeling* (2nd ed.). Sage.

Hawi, N. S. & Samaha, M. (2017). The relations among social media addiction, self-esteem, and life satisfaction in university students. *Social Science Computer Review*, *35*(5), 576–586.

Hendrickse, J., Arpan, L. M., Clayton, R. B., & Ridgway, J. L. (2017). Instagram and college women's body image: Investigating the roles of appearance-related comparisons and intrasexual competition. *Computers in Human Behavior*, *74*, 92–100.

Henseler, J. (2012). PLS-MGA: A non-parametric approach to partial least squares-based multi-group analysis. In W. A. Gaul, A. Geyer-Schulz, L. Schmidt-Thieme, & J. Kunze (Eds.), *Challenges at the interface of data analysis, computer science, and optimization* (pp. 495–501). Springer.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2016). Testing measurement invariance of composites using partial least squares. *International Marketing Review*, *33*(3), 405–431.

Hilken, T., de Ruyter, K., Chylinski, M., Mahr, D., & Keeling, D. I. (2017). Augmenting the eye of the beholder: Exploring the strategic potential of augmented reality to enhance online service experiences. *Journal of the Academy of Marketing Science*, *45*(6), 884–905.

Hwang, K., & Zhang, Q. (2018). Influence of parasocial relationship between digital celebrities and their followers on followers' purchase and electronic word-of-mouth intentions, and persuasion knowledge. *Computers in Human Behavior*, *87*, 155–173.

In-Cosmetics. (2020). *Gen Z: What do they look for in personal care & beauty products? Road to In-cosmetics Asia. In-Cosmetics Connect*. https://connect.in-cosmetics.com/regions/in-cosmetics-asia/gen-z-what-do-they-look-for-in-personal-care/

Javornik, A. (2016). 'It's an illusion, but it looks real!' consumer affective, cognitive and behavioural responses to augmented reality applications. *Journal of Marketing Management*, *32*(9–10), 987–1011.

Javornik, A., Rogers, Y., Moutinho, A. M., & Freeman, R. (2016). Revealing the shopper experience of using a 'magic mirror' augmented reality make-up application, *Conference on designing interactive systems* (pp. 871–882). Association for Computing Machinery (ACM).

Kesharwani, A. (2020). Do (how) digital natives adopt a new technology differently than digital immigrants? A longitudinal study. *Information & Management*, *57*(2), 103170.

Khamis, J., & Zaatarti, S. (2019). *Listen to what Gen Z says: Future forward. Gulf News asks Gen Zers in UAE about what they believe in and how they view their future. UAE*. https://gulfnews.com/uae/education/gen-z-in-the-uae-future-forward-1.61728309

Knit. (2022). *How Gen Z is growing the beauty industry and pushing its innovation*. https://goknit.com/how-gen-z-is-growing-the-beauty-industry-and-pushing-its-innovation/

Kramer, C. (2021). *Gen z women, self-esteem, & the dark side of TikTok*. https://www.hercampus.com/culture/social-media-self-esteem-women/

Krayer, A., Ingledew, D. K., & Iphofen, R. (2008). Social comparison and body image in adolescence: A grounded theory approach. *Health Education Research*, *23*(5), 892–903.

Kurt, D. (2022). Obesity and compensatory consumption: Evidence from jewellery shopping. *Psychology & Marketing*, *39*(1), 101–110.

Liu-Thompkins, Y., Okazaki, S., & Li, H. (2022). Artificial empathy in marketing interactions: Bridging the human-AI gap in affective and social customer experience. *Journal of the Academy of Marketing Science*. https://doi.org/10.1007/s11747-022-00892-5

Lo, F. Y., & Peng, J. X. (2022). Strategies for successful personal branding of celebrities on social media platforms: Involvement or information sharing? *Psychology & Marketing*, *39*(2), 320–330.

Lou, C., & Yuan, S. (2019). Influencer marketing: How message value and credibility affect consumer trust of branded content on social media. *Journal of Interactive Advertising*, *19*(1), 58–73.

Mahmoud, A. B., Hack-Polay, D., Grigoriou, N., Mohr, I., & Fuxman, L. (2021). A generational investigation and sentiment and emotion analyses of female fashion brand users on Instagram in sub-Saharan Africa. *Journal of Brand Management*, *28*(5), 526–544.

Malhotra, Y., & Galletta, D. F. (1999). Extending the technology acceptance model to account for social influence: Theoretical bases and empirical validation, *In Proceedings of the 32nd Annual Hawaii International Conference on Systems Sciences* (pp. 1–14). IEEE. https://doi.org/10.1109/HICSS.1999.772658

Mariani, M. M., Perez-Vega, R., & Wirtz, J. (2022). AI in marketing, consumer research and psychology: A systematic literature review and research agenda. *Psychology & Marketing*, *39*(4), 755–776.

McLean, G., Al-Nabhani, K., & Marriott, H. (2022). 'Regrettable-escapism' the negative effects of mobile app use: A retail perspective. *Psychology & Marketing*, *39*(1), 150–167.

Moussavi, A., & Mander, J. (2019). *Global trends among gen Z. Globalwebindex*. https://assets.ctfassets.net/inb32lme5009/7wDIuSsLOnSxTUqPmRb081/603b8ffb77757549d39034884a23743c/The_Youth_of_the_Nations__Global_Trends_Among_Gen_Z.pdf

Murtarelli, G., Gregory, A., & Romenti, S. (2020). A conversation-based perspective for shaping ethical human–machine interactions: The particular challenge of chatbots. *Journal of Business Research*, *129*. https://doi.org/10.1016/j.jbusres.2020.09.018

Myers, P. N., & Biocca, F. A. (1992). The elastic body image: The effect of television advertising and programming on body image distortions in young women. *Journal of Communication*, *42*(3), 108–116.

Myers, T. A., Ridolfi, D. R., Crowther, J. H., & Ciesla, J. A. (2012). The impact of appearance-focused social comparisons on body image disturbance in the naturalistic environment: The roles of thin-ideal internalization and feminist beliefs. *Body image*, *9*(3), 342–351.

Ng, S. I., Ho, J. A., Lim, X. J., Chong, K. L., & Latiff, K. (2019). Mirror, mirror on the wall, are we ready for Gen-Z in marketplace? A study of smart retailing technology in Malaysia. *Young Consumers*, *22*(1), 68–89.

Nguyen, H. T., Zhang, Y., & Calantone, R. J. (2018). Brand portfolio coherence: Scale development and empirical demonstration. *International Journal of Research in Marketing*, *35*(1), 60–80.

NYU Dispatch. (2019, 9 April). Marketing to Gengen Z amid social media panic. *NYU Dispatch*, https://wp.nyu.edu/dispatch/2019/04/09/marketing-to-gen-z-amid-social-media-panic/

Ohanian, R. (1990). Construction and validation of a scale to measure celebrity endorsers' perceived expertise, trustworthiness, and attractiveness. *Journal of Advertising*, *19*, 39–52.

Patel, D. (2017). 5 differences between marketing to millennials vs. Generation Z. *Forbes*. https://rb.gy/by2fxg

Petter, S., Straub, D., & Rai, A. (2007). Specifying formative constructs in information systems research. *MIS Quarterly*, *31*(4), 623–656.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879–903.

Potgieter, I. (2012). The relationship between the self-esteem and employability attributes of postgraduate business management students. *SA Journal of Human Resource Management*, *10*(2), 1–15.

Pozharliev, R., Rossi, D., & De Angelis, M. (2022). A picture says more than a thousand words: Using consumer neuroscience to study instagram users' responses to influencer advertising. *Psychology & Marketing*. https://doi.org/10.1002/mar.21659

Preece, J., Sharp, H., & Rogers, Y. (2015). *Interaction design—Beyond human–computer interaction*. John Wiley & Sons.

Rosenberg, M. (1965a). *Society and adultism self-image*. Princeton University Press.

Rosenberg, M. (1965b). Society and the adolescent self-image. *American Journal of Orthopsychiatry*, *36*, 560–562.

Roy, R., & Naidoo, V. (2021). Enhancing chatbot effectiveness: The role of anthropomorphic conversational styles and time orientation. *Journal of Business Research*, *126*, 23–34.

Sarstedt, M., Hair, J. F., Jr., Nitzl, C., Ringle, C. M., & Howard, M. C. (2020). Beyond a tandem analysis of SEM and PROCESS: Use of PLS-SEM for mediation analyses! *International Journal of Market Research*, *62*(3), 288–299.

Schweitzer, F., Belk, R., Jordan, W., & Ortner, M. (2019). Servant, friend or master? The relationships users build with voice-controlled smart devices. *Journal of Marketing Management*, *35*(8), 693–715.

Shahid, S., Paul, J., Gilal, F. G., & Ansari, S. (2022). The role of sensory marketing and brand experience in building emotional attachment and brand loyalty in luxury retail stores. *Psychology & Marketing*. https://doi.org/10.1002/mar.21661

Statista. (2020). *Instagram: Distribution of global audiences 2020, by gender*. https://www.statista.com/statistics/802776/distribution-of-users-on-instagram-worldwide-gender/

Stice, E., Spangler, D., & Agras, W. S. (2001). Exposure to media-portrayed thin-ideal images adversely affects vulnerable girls: A longitudinal experiment. *Journal of Social and Clinical Psychology*, *20*(3), 270–288.

Sundar, S. S., Jung, E. H., Waddell, T. F., & Kim, K. J. (2017). Cheery companions or serious assistants? Role and demeanor congruity as predictors of robot attraction and use intentions among senior citizens. *International Journal of Human–Computer Studies*, *97*, 88–97.

Tan, V., Quoquab, F., Ahmad, F. S., & Mohammad, J. (2017). Mediating effects of students' social bonds between self-esteem and customer citizenship behaviour in the context of international university branch campuses. *Asia Pacific Journal of Marketing and Logistics*, *29*(2), 305–329.

Thompson, A. M., & Chad, K. E. (2002). The relationship of social physique anxiety to risk for developing an eating disorder in young females. *Journal of Adolescent Health*, *31*(2), 183–189.

Thomson, M., MacInnis, D. J., & Park, C. W. (2005). The ties that bind: Measuring the strength of consumers' emotional attachments to brands. *Journal of Consumer Psychology*, *15*, 77–91.

Townsend, C., & Sood, S. (2012). Self-affirmation through the choice of highly aesthetic products. *Journal of Consumer Research*, *39*(2), 415–428.

Trivedi, J. (2019). Examining the customer experience of using banking chatbots and its impact on brand love: The moderating role of perceived risk. *Journal of Internet Commerce*, *18*(1), 91–111. https://doi.org/10.1080/15332861.2019.1567188

Tylka, T. L., & Sabik, N. J. (2010). Integrating social comparison theory and self-esteem within objectification theory to predict women's disordered eating. *Sex Roles*, *63*(1–2), 18–31.

Veloutsou, C., & Moutinho, L. (2009). Brand relationships through brand reputation and brand tribalism. *Journal of Business Research*, *62*, 314–322.

West, K. (2018). Naked and unashamed: Investigations and applications of the effects of naturist activities on body image, self-esteem, and life satisfaction. *Journal of happiness studies*, *19*(3), 677–697.

Writer, S. (2017). *34% of Gen Z feel they lack the confidence to lead. Human Resources Online.net*. https://www.humanresourcesonline.net/34-of-gen-z-feel-they-lack-the-confidence-to-lead

Yaoyuneyong, G., Foster, J., Johnson, E., & Johnson, D. (2016). Augmented reality marketing: Consumer preferences and attitudes toward hypermedia print ads. *Journal of Interactive Advertising*, *16*(1), 16–30.

Yim, M. Y. C., & Park, S. Y. (2019). 'I am not satisfied with my body, so I like augmented reality (AR)': Consumer responses to AR-based product presentations. *Journal of Business Research*, *100*, 581–589.

Yoo, B., & Donthu, N. (2001). Developing and validating a multi-dimensional consumer-based brand equity scale. *Journal of Business Research*, *52*(1), 1–14.

Yoo, B., Donthu, N., & Lee, S. (2000). An examination of selected marketing mix elements and brand equity. *Journal of the Academy of Marketing Science*, *28*(2), 195–211.

Youn, S., & Jin, S. V. (2021). In AI we trust?" The effects of parasocial interaction and technopian versus luddite ideological views on chatbot-based customer relationship management in the emerging "feeling economy. *Computers in Human Behavior*, *119*, 106721. https://doi.org/10.1016/j.chb.2021.106721

Yu, Q., Foroudi, P., & Gupta, S. (2019). Far apart yet close by: Social media and acculturation among international students in the UK. *Technological Forecasting and Social Change*, *145*, 493–502.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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