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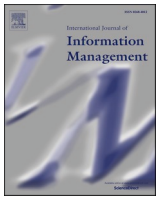

Do cute language style chatbots make consumers more unethical?

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ABSTRACT

With the rapid development of artificial intelligence technologies, offline retailers are increasingly adopting chatbots with a cute language style to enhance customer service experiences. Although such chatbots have shown potential in improving customer satisfaction, their impact on consumer unethical behavior remains underexplored. This research aims to investigate the influence of chatbots with a cute language style on consumer unethical behavior and its underlying mechanisms. Across four experimental studies (N = 436), the results demonstrate that cute language style chatbots can increase consumer unethical behavior by enhancing the consumer's moral self-concept. Furthermore, the findings reveal that avatar type moderates the effect of chatbot language style on moral self-concept. Emotional arousal is also identified as a psychological mechanism underlying the relationship between chatbot language style and unethical behavior. These findings not only advance our understanding of the unintended consequences of deploying chatbots with cute features but also offer practical insights for offline retailers in designing and implementing chatbot services.

1. Introduction

Unethical behavior in consumption contexts—such as customer fraud, deliberate returns, and price arbitrage—is widespread (Rotman et al., 2018) and causes substantial financial losses for the retail industry (Kang & Kirmani, 2024). For instance, fast fashion brand Zara reportedly loses millions of dollars annually due to return fraud,[1] while e-commerce platforms such as Amazon and Walmart also face economic losses stemming from consumer misuse of return policies.[2] Such behavior frequently occurs during interactions between consumers and customer service representatives, particularly in offline retail settings (Leonard & Jones, 2017). With the advancement of artificial intelligence (AI) technologies, offline retailers have increasingly adopted chatbots as customer service agents to enhance personalized consumer experiences (Chen et al., 2021). For example, IKEA has implemented intelligent chatbots in its physical stores to assist customers with locating products, accessing promotional information, and receiving shopping suggestions through natural language interactions,[3] while Walmart employs AI-powered shopping assistant chatbots to improve the efficiency and experience of in-store purchases.[4] According to a study by Juniper Research, chatbot-driven interactions were expected to generate $112 billion in retail sales by 2023.[5] Despite these benefits, the deployment of AI may also lead to an increase in unethical behavior among consumers, thereby negatively impacting business outcomes (Li et al., 2024). For example, Starbucks introduced a virtual assistant named "Barista" that employs a cute language style to offer menu recommendations, order tracking, and payment services, thereby enhancing the overall customer experience.[6] However, subsequent observations revealed instances in which some customers exploited the system by repeatedly redeeming rewards through the misuse of points or coupons for undue benefits[7&8]. Although technological systems can identify and prevent certain forms of fraud, they remain limited in various ways. Automated detection

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systems may produce false positives that deny service to legitimate customers or cause delays that reduce service efficiency and undermine user experience (Boo, 2025; Chen, 2024; Srinivasan and Sarial-Abi, 2021). Furthermore, to ensure smooth and friendly interactions, many AI-based customer service systems are designed to default to trust in consumer statements rather than enforce strict verification procedures (Chaves & Gerosa, 2021). Critically, improving fraud detection capabilities often involves significant development and operational costs, especially for retailers managing both large-scale physical stores and online platforms (Anica-Popa et al., 2021; Stanciu and Rîndaşu, 2021). As a result, in actual operations, retailers are often forced to balance efficiency and security, relying more on consumers' self-restraint to reduce fraudulent behavior rather than exclusively depending on technical solutions to eliminate such misconduct.

Given the human-like qualities exhibited by AI, many retailers have gradually integrated anthropomorphic chatbots into their services, aiming to influence consumer behavior through intelligent service experiences (Xie et al., 2024). Within anthropomorphic language styles, "cute" represents a salient characteristic that describes an individual's charm presented in a pleasant and appealing manner (Hellén & Sääksjärvi, 2013). Chatbots employing a cute language style have demonstrated significant positive effects on post-service failure satisfaction (Hu & Pan, 2024), consumer attachment (Yim et al., 2024), and purchase intention (Yu et al., 2022). For example, the humanoid chatbot Pepper, developed by SoftBank, has been widely applied in retail, banking, and hospitality settings across Japan and other countries. It interacts with customers using a cute language style to provide consultation and product recommendations, alleviating shopping-related stress and enhancing user experience while strengthening brand favorability. However, despite the advantages of cute language style in optimizing user experience, its potential risks should not be overlooked. The "cute" style of chatbots evokes feelings of closeness, safety, and non-threat, which may lower consumers' behavioral vigilance and lead to incomplete moral evaluations, resulting in moral loosening—not because consumers perceive the chatbot as "naive" or "lacking intelligence" and therefore manipulate it strategically. The latter involves a cognitively driven path with deliberate manipulation motives and higher behavioral costs, whereas the influence of the cute style is more affective and immediate, often triggering inappropriate behavior without a clear purpose. Existing research has shown that cute contexts tend to elicit a short-term orientation and a preference for immediate gratification, which can in turn influence moral behavior (Nenkov and Scott, 2014; Septianto et al., 2022; Stavropoulos and Alba, 2018). In practice, some retail stores have reported incidents where customers exploited cute chatbots to repeatedly claim discounts or falsely report returns; even when detection mechanisms were in place, consumers relaxed their guard due to the chatbot's friendly and non-confrontational style and proceeded to test the system's limits. These occurrences suggest that while the cute style can enhance user experience, it may also inadvertently weaken behavioral norms and constitute a noteworthy moral risk. However, existing research has not sufficiently examined the mechanisms through which this language style influences consumers' unethical behavior, and the underlying pathways remain to be further explored.

In recent years, research on AI in the field of consumer behavior has gained increasing attention (Kim & Song, 2023). Existing studies have demonstrated that the framing of information can significantly influence individuals' cognitive and behavioral responses (Kahneman & Tversky, 1979). As AI service tools in retail contexts, chatbots may shape consumers' emotional experiences and behavioral tendencies through their language styles. According to the affect-as-information theory, individuals consider their emotional reactions as important sources of judgment when making decisions (Van den Bos, 2003), and such emotional responses serve as information that influences the evaluation of their moral self-concept. Furthermore, the moral licensing effect reveals a psychological mechanism underlying unethical consumer behavior, whereby previous actions activate an individual's moral self-concept, thus providing "moral permission" for subsequent unethical behavior (Chen et al., 2023). The avatar type of a chatbot, as a form of self-disclosure, conveys identity information to consumers (Luo et al., 2019), and different avatar types may affect consumers' emotional states during interactions, thereby influencing their subsequent behaviors. In addition, traditional psychological or behavioral approaches may have limited capacity to capture emotional information relevant to AI-based interactions (Wang et al., 2023). In contrast, electrodermal activity (EDA), a physiological indicator of emotional arousal, is closely associated with sympathetic nervous system activation and emotional experience (Stuldreher et al., 2020). Therefore, the present study adopts affect-as-information theory and the moral licensing effect as its theoretical framework and employs three behavioral experiments and one electrodermal activity experiment to examine how the language style of chatbots influences consumers' unethical behavior, how avatar type moderates this relationship, and how consumers' emotional experiences manifest in physiological responses during interactions with chatbots using a cute language style.

The main contributions of this study are reflected in several aspects. First, this research innovatively adopts the affect-as-information theory and the moral licensing effect as the theoretical framework to reveal the mechanism through which the language style of chatbots influences consumers' unethical behavior. Specifically, it demonstrates how identical information, when conveyed through different expression styles—such as a cute language style versus a direct language style—can shape consumers' moral self-concept and subsequently affect their tendency to engage in unethical behavior. Second, this study investigates the moderating role of avatar type in the effect of chatbot language style on consumers' moral self-concept, revealing that the use of a robot avatar, as opposed to a human avatar, in combination with a cute language style, more significantly enhances the consumer's moral self-concept. This finding not only extends the understanding of how anthropomorphic features of chatbots influence consumer psychology but also offers new insights for the design of AI-based service interactions. Finally, the study employs electrodermal activity to objectively assess changes in consumers' emotional responses during interactions with chatbots using different language styles, thereby verifying the relationship between chatbot language style and emotional arousal. This approach provides a novel methodological and theoretical basis for understanding how emotional activation during human-chatbot interaction in e-commerce environments may contribute to unethical consumer behavior.

2. Conceptual background and hypotheses development

2.1. Affect-as-information theory and moral licensing effect

Individual behavior is shaped not only by the content of information but also by the way in which that information is presented (Gosling & Moutier, 2019). In consumer behavior research, different modes of information presentation may lead consumers to make markedly different purchase decisions, thereby exerting significant influence on market outcomes and business strategy development (Chang, 2008; Wadhwa et al., 2019). With the rapid advancement of artificial intelligence technologies, chatbots have become an integral part of retail services (Tran et al., 2021). Leveraging their efficiency and real-time responsiveness, chatbots provide consumers with more personalized and convenient shopping experiences (Rese et al., 2020). In the context of chatbot–consumer interactions, the language style used by chatbots may influence consumers' emotions and behaviors (Xie et al., 2024). For instance, chatbots using a cute language style may evoke emotional responses in consumers, thereby prompting different behavioral outcomes (Yan et al., 2025). Such emotion-driven behavioral changes may not only manifest in purchase decisions but also extend to unethical behavior (Bateman et al., 2002).

How information is presented and how communication is framed have become critical issues in consumer behavior research, particularly regarding their influence on individuals' decision-making processes and behavioral outcomes. However, responses to different communication styles are not limited to rational cognitive processing; rather, they involve deeper emotional engagement, which plays a crucial role in the interaction between consumers and their environment (Nabi et al., 2020). Within this context, affect-as-information theory offers a valuable perspective for understanding how emotional states influence information processing and behavioral responses. This theory posits that individuals often rely on their current emotional experiences as a basis for judgment when making behavioral decisions, with different emotional states providing different types of information for action selection (Van den Bos, 2003). Consequently, when individuals encounter information presented in a particular way or through a specific communication style, the emotional cues it elicits can rapidly affect the initial stage of information processing and subsequently shape behavioral decisions (Clore and Huntsinger, 2007; Gray et al., 2022). Prior research indicates that the immediacy and automaticity of emotional responses often allow them to dominate over cognitive evaluations in decision-making processes (Loewenstein et al., 2001), especially in judgments related to unethical behavior (Grappi et al., 2013). Therefore, when information is presented in a specific form—such as a particular language style—the associated emotional responses can further influence how individuals process the information and how they assess their own moral status (Becker, 2021). In human–machine interaction scenarios, for instance, chatbots may influence consumers' tendency toward unethical behavior by eliciting specific emotional responses (Kim et al., 2023). This mechanism suggests that emotional feedback in human–AI interactions may be more influential than cognitive processing, as such feedback not only affects consumers' immediate emotional states but may also shape their perception of their own moral condition based on the emotional information conveyed by the chatbot, thereby altering their propensity for unethical behavior.

Building on affect-as-information theory, the moral licensing effect further elucidates how emotions, when processed as informational cues, influence individuals' propensity to engage in unethical behavior. This theory posits that an individual's moral self-concept—defined as one's perception of consistency between their moral traits and actions—can be activated and reinforced by prior behavior, thereby granting psychological license for subsequent unethical actions (Mullen & Monin, 2016). The moral self-concept is not a stable construct; rather, it is malleable and susceptible to emotional activation in specific contexts (Kouchaki, 2011). Emotions, as diagnostic information, can directly influence individuals' self-evaluation of their moral standing and subsequently lead to adjustments in their moral self-concept (Cameron & Payne, 2012). When individuals experience particular emotional states, they engage in a self-attribution process that allows them to re-evaluate their moral self-concept. This reappraisal, in turn, impacts their likelihood of engaging in unethical behavior (Christner et al., 2022; Wang and Touré-Tillery, 2024). Once the moral self-concept is reinforced, individuals may become more tolerant of their own future unethical actions—a pattern that is especially pronounced in the domain of consumer behavior. Consumer decision-making is often a sequential process, where earlier choices significantly influence later ones (Dhar & Simonson, 1999). In such contexts, once individuals' moral self-concept has been validated or strengthened, they may subsequently relax their moral standards, thereby justifying and permitting relatively unethical behaviors (Chen et al., 2023).

In summary, this study, grounded in affect-as-information theory and the moral licensing effect, investigates how chatbots using different language styles influence consumers' unethical behavior (as illustrated in Fig. 1). Affect-as-information theory highlights the priority of emotional feedback in individual decision-making during human–AI interactions, suggesting that such emotional responses can shape individuals' moral self-concept. The moral licensing effect, in turn, explains that when an individual's moral self-concept is enhanced, they may perceive themselves as having accumulated moral credit, thereby reducing their restraint toward engaging in unethical behavior.

2.2. *The impact of cute/non-cute language style chatbots on consumer unethical behavior*

In consumer behavior research, a central and long-standing question concerns how external information is translated into individual behavior and the underlying psychological mechanisms involved in this transformation. As key carriers of external information, environmental cues are considered effective triggers of emotional responses, which in turn shape behavioral tendencies (Kulesza et al., 2022). Existing studies have shown that the way information is presented not only influences individuals' perceptions of a given context but may also have profound emotional impacts, thereby modulating their judgment and decision-making processes (Gonzalez et al., 2005).

With the rapid development of artificial intelligence technology, chatbots, as a novel form of external information presentation, have become an integral part of online retail services. By providing efficient and personalized services, chatbots create a convenient shopping experience for consumers. During human-computer interactions, chatbots often exhibit humanlike characteristics to enhance user experience and trust (Alsaad, 2023; Yang et al., 2022). These humanlike traits can be expressed through various cues, including both verbal and non-verbal cues (Li & Larivière, 2023). While non-verbal cues (such as appearance,

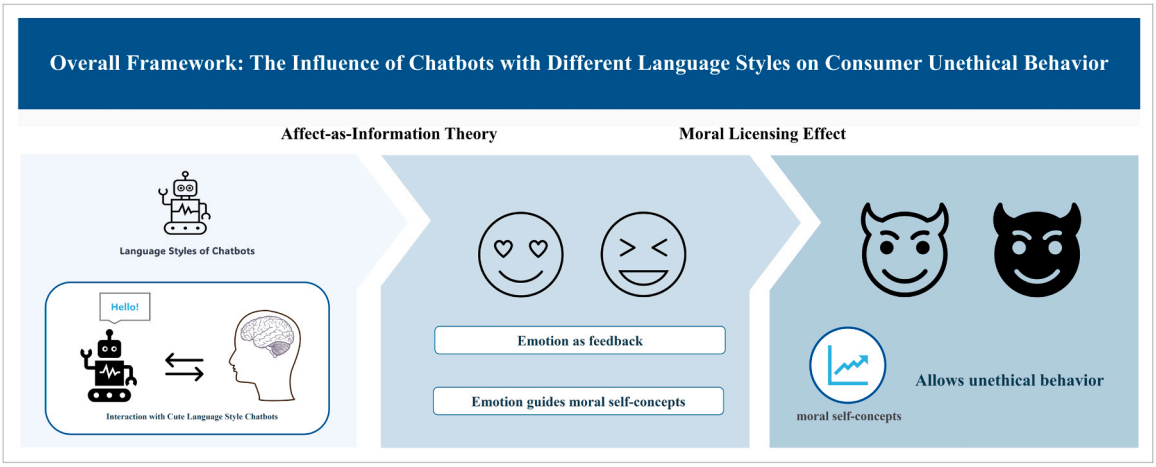

Fig. 1. Diagram of the Relationships Between Theories.

behavior, posture, etc.) have received significant attention in human-computer interaction research (Bakirtas & Baser, 2024), verbal cues, particularly the language style of chatbots, also play a crucial role in shaping consumer perceptions, attitudes, and behavioral intentions. However, this aspect has received relatively less attention (Li & Wang, 2023).

Cute language style, as an important form of anthropomorphism, uses soft, non-threatening, and somewhat dependent phrasing, which subconsciously activates the human instinct for protection and care based on the "Kindchenschema" (baby schema), thereby triggering positive emotions closely related to warmth and affection (Sherman & Haidt, 2011). Simultaneously, its informal and emotionally expressive nature reduces the sense of distance and threat in communication, creating a safe and relaxed interactive atmosphere. This makes it easier for consumers to enter a state of seeking enjoyment, relaxation, and empathy (Fitzsimons et al., 2008; Marquis et al., 2024). According to the affect-as-information theory, individuals use their own emotions as a source of information when making judgments (Van den Bos, 2003). In human-computer interaction contexts, the warmth, care, and pleasure triggered by the cute language style not only enhance the quality of social connections but also strengthen the positive attributes of the interaction (Steinnes et al., 2019). When consumers experience these emotions, they often unconsciously interpret them as positive signals about themselves, leading to a self-attribution process from "a good interaction experience" to "I am the kind person who contributed to this positive interaction," thereby strengthening their moral self-concept—-positive recognition of their own moral qualities (Su et al., 2024; Zhang and Ye, 2023). They perceive warmth, care, and connection as emotional evidence of their own moral traits, such as kindness and friendliness. Furthermore, the cute language style fosters emotional connection and dependence (Fitzsimons et al., 2008; Granot et al., 2014), further enhancing consumers' recognition of their ability to "establish positive relationships," thus boosting their moral self-concept. In contrast, the straightforward language style focuses on functional information delivery and lacks the ability to evoke specific positive emotions, making it difficult to provide the emotional cues needed to enhance the moral self-concept, thereby maintaining a more rational state during the interaction (Shin et al., 2023).

In summary, the cute language style, by triggering positive emotions such as care and warmth, encourages consumers to interpret these emotions as signals of their own good traits, thus significantly enhancing their moral self-concept. However, according to the moral licensing effect theory, as the moral self-concept strengthens, consumers may believe they have accumulated enough moral credit, making them more likely to allow themselves to engage in unethical behavior (Blanken et al., 2015; Kim et al., 2021). In contrast, chatbots with a straightforward language style focus more on rational and accurate information delivery, lacking emotional interactions, and thus fail to trigger similar positive emotions or enhance consumers' moral self-concept, allowing them to maintain a higher level of moral behavior when making decisions. Based on this, we propose the following hypothesis:

H1: Compared to consumers interacting with chatbots using a straightforward language style, consumers interacting with chatbots using a cute language style are more likely to exhibit unethical behavior.

H2: The moral self-concept mediates the impact of cute language style chatbots on consumers' unethical behavior. Specifically, interacting with a chatbot using a cute language style enhances consumers' moral self-concept, thereby increasing their tendency to engage in unethical behavior afterward.

2.3. The moderating role of avatar type

Avatars, as visual representations of chatbots, play a crucial role in conveying emotional and social cues during human-computer interaction, significantly influencing users' emotional responses and behavioral outcomes (Luo et al., 2019). Research has shown that avatars not only enhance the sense of social presence but also improve service satisfaction, foster emotional connections, and promote the adoption of recommendations (Jin & Youn, 2021). The type of avatar, such as a robot avatar versus a human avatar, can affect users' trust and willingness to disclose information (Etemad-Sajadi, 2016; Liu and Siau, 2023). For example, human-like avatars (avatars designed with human features) typically enhance user trust, thereby increasing their willingness to disclose information (Barfield, 2021; Pizzi et al., 2023). However, the impact of human avatars is not fixed and can be influenced by situational factors. For instance, when dealing with personal health issues, users may be more inclined to disclose sensitive information to chatbots that do not appear overly "realistic." This is because human-like chatbots (such as those with human avatars) might make users feel as though they are interacting with an actual human, potentially raising concerns about judgment or privacy breaches (Holthöwer and Van Doorn, 2023; Schuetzler et al., 2018). In contrast, the "non-human" characteristics of a robot avatar can alleviate users' concerns about others' opinions, thus fostering positive emotions such as trust and enjoyment (Becker, 2021). This mechanism, which reduces the pressure of social evaluation, allows users to relax during interactions and enjoy more open emotional exchanges. In contrast, a human avatar may pressure users to maintain their image, making it harder for them to relax and inhibiting the development of positive emotions (Roesler et al., 2021).

Based on the affect-as-information theory, individuals use emotional responses as key informational cues during decision-making, helping them assess the current situation and make behavioral choices (Van den Bos, 2003). In interactions with chatbots, avatar type further moderates user behavior by shaping their emotional experiences. Different types of avatars may influence users' public self-awareness, leading them to become more concerned with others' opinions (Yuan et al., 2025). Specifically, human avatars may enhance users' self-awareness, triggering sensitivity to social norms and evaluations from others, thus inhibiting positive emotions such as pleasure. In contrast, robot avatars, by reducing the pressure of being judged, can make it easier for users to experience positive emotions such as enjoyment and relaxation. These positive emotions not only strengthen users' trust in the chatbot but also help them focus more on the task at hand, rather than excessively worrying about how their behavior is evaluated by others (Kim et al., 2022; Spatola and Wudarczyk, 2021). Moreover, emotions, as informational cues, not only directly influence individuals' emotional responses but also shape their self-evaluations, especially the construction of their moral self-concept (Kouchaki, 2011). Therefore, in the context of interactions with a cute language style chatbot, the robot avatar, due to its "non-human" nature, reduces users' sensitivity to social evaluation, enhancing their openness and promoting the generation of more positive emotions. Specifically, the robot avatar weakens the influence of social evaluation, allowing users to freely enjoy the cute language style of the chatbot without worrying about being judged or misunderstood. This positive emotional feedback enhances users' overall satisfaction and trust, promoting the positive construction of their moral self-concept (Mullen & Monin, 2016). In contrast, human avatars may trigger concerns about social norms and social evaluation (Nowak, 2004; Sharma and Vemuri, 2022). This social evaluation inhibits the generation of positive emotions in users, making it difficult for them to experience enjoyment and relaxation during the interaction. Thus, human avatars may limit users' experience of positive emotions, and the lack of accumulation of positive emotions may hinder the enhancement of their moral self-concept. Based on this, we propose the following hypothesis:

H3: The type of avatar used by a chatbot moderates the effect of the chatbot's language style on consumers' moral self-concept. Specifically, when interacting with a chatbot using a cute language style, consumers are more likely to experience a lower moral self-concept when the chatbot uses a robot avatar (vs. a human avatar).

2.4. The emotional arousal as an underlying mechanism in the impact of cute chatbots on consumer unethical behavior

When exploring consumer experiences, consumers' expectations, motivations, and emotions are core perspectives for understanding their dynamic and subjective nature (Lemon & Verhoef, 2016). Emotions not only affect consumers' memory but also have a profound impact on their behavioral intentions (Poynor, 2010). An individual's emotional response to a specific experience shapes their attitudes and behaviors (Moors et al., 2013). In the domain of AI services, the emotional experiences triggered by consumers' interactions with chatbots not only influence their immediate feelings but may also moderate their subsequent behaviors (Wang et al., 2023).

Emotional arousal refers to the emotional activation state that an individual experiences due to specific stimuli and can regulate their behavioral responses (Harlé et al., 2013). Emotional arousal plays a key role in emotional experiences by influencing an individual's physiological responses, which in turn modulate emotional intensity. It serves as an effective indicator for evaluating the intensity and nature of emotional experiences, as it directly reflects both the physiological and psychological responses to emotions. During interactions with chatbots, the design of the chatbot's appearance, language style, and behavioral features may trigger varying levels of emotional arousal, thereby influencing consumer decisions (Tsai et al., 2021; Zhang et al., 2024). For example, chatbots with a cute language style can enhance consumers' enjoyment through their affability and emotional expressions. This positive emotional feedback not only shapes consumers' subjective experiences but also acts as an informational influence on their self-perception and behavior (Zadra & Clore, 2011). Additionally, avatar type plays a crucial role in this process. Compared to human avatars, robot avatars, with their "non-human" characteristics, reduce users' sensitivity to external evaluations, allowing them to experience less social pressure during interactions, which in turn increases trust and enjoyment (Becker, 2021). Therefore, when interacting with a chatbot with a cute language style, pairing it with a robot avatar may further enhance emotional arousal levels and influence consumers' behavioral tendencies.

Emotional arousal is not only a subjective experience but also involves the activation of the autonomic nervous system, manifested through a range of physiological responses, such as an increased heart rate and enhanced skin conductance response (SCR) (Li et al., 2022). SCR is a widely used physiological measure for assessing emotional arousal levels (Amin & Faghih, 2022), reflecting the intensity of sympathetic nervous system activity (Tronstad et al., 2022). Skin conductance signals are primarily divided into Skin Conductance Level (SCL) and Skin Conductance Response (SCR). SCL is often used to reflect emotional experience over a period of time. Studies have shown that when individuals are in a high emotional arousal state, their skin conductance level significantly increases (Benedek & Kaernbach, 2010). During interactions with a chatbot using a cute language style, consumers may experience stronger emotional arousal, reflected in an increase in SCL. This physiological change not only indicates the level of emotional activation but may also influence their self-concept. An individual's moral self-concept is influenced by their emotional state (Ferguson et al., 2024; Jordan et al., 2011). When consumers are in a highly emotionally aroused state, they are more likely to develop positive self-perceptions (Sachdeva et al., 2009).

Affect-as-information theory posits that individuals rely on their emotional states as sources of information when making decisions (Van den Bos, 2003). During interactions with chatbots using a cute language style, heightened emotional arousal may activate consumers' moral self-concept, leading them to experience stronger positive emotions and perceive themselves as more moral (Effron & Conway, 2015). The moral licensing effect further explains that when consumers' moral self-concept is enhanced, they may believe they have accumulated moral credit, thereby relaxing their constraints on unethical behavior. Thus, in the context of interacting with cute chatbots, increased emotional arousal may elevate consumers' moral self-concept, weakening their moral restraint and increasing their tendency to engage in unethical behavior. In this process, an increase in skin conductance level (SCL) not only reflects physiological emotional arousal but may also serve as a critical indicator for predicting consumers' propensity toward unethical behavior. Based on this reasoning, we propose the following hypothesis:

H4: Consumers exhibit significantly higher skin conductance levels when interacting with chatbots that use a cute language style combined with a robot avatar, compared to interactions with other types of chatbots.

H5: Emotional arousal and moral self-concept exert a serial mediation effect in the relationship between chatbot language style and individuals' unethical behavior. Specifically, interacting with a cute chatbot increases consumers' emotional arousal, which subsequently enhances their moral self-concept, ultimately leading to a greater tendency toward unethical behavior.

Fig. 2 illustrates the conceptual framework of this study and outlines the hypothesized relationships.

3. Study 1: cute chatbots and consumers' unethical behavior

3.1. Method

3.1.1. Participants and design

The aim of study 1 is to validate whether receiving services from a chatbot with a cute language style increases consumers' tendency to engage in unethical behavior in subsequent consumption scenarios. Experiment 1 employs a one-factor, two-level (language style: cute language style vs. straightforward language style) between-subjects design. Participant recruitment was conducted through the Credamo platform (https://www.credamo.com/), and participants completed the online experiment. To enhance participation rates and data quality, a monetary incentive was offered, where eligible participants received a 5 RMB reward after completing the recruitment questionnaire and the subsequent experimental tasks. A total of 124 participants were recruited, with 84 females (67.7 %) and an average age of 24.9 years. In terms of education, 40.3 % of the participants held a bachelor's degree. Regarding income, 38.7 % of the participants had a monthly income between 6000 and 8999 RMB (demographic information for Studies 1–4 can be found in Table S1 of the Supplementary Materials).

3.1.2. Stimulus materials

In this experiment, participants assumed the role of a simulated customer and interacted with a chatbot to resolve service-related issues. To ensure standardized experimental conditions and minimize external variable interference, a carefully tailored conversation script was used to meet the real-time interaction needs of participants with the chatbot. These scripts were derived from an analysis of customer service interactions on major Chinese e-commerce retail platforms (Xie et al., 2024) and consisted of four to five rounds of dialogue, with each response containing approximately 30 words (excluding the opening remarks). The scripts accurately reflected the communication patterns and provided a blueprint for constructing realistic customer service dialogues. The scripts were fine-tuned to ensure that the content, key information, and interaction flow strictly adhered to the experimental design requirements. Adjustments were made to the language style to achieve either a "cute" or "straightforward" effect, while ensuring that information was conveyed accurately, the dialogue remained natural and smooth, and integration with the technical platform was seamless (see Fig. 3).

3.1.3. Procedures and measurements

Participants were explicitly informed that they were taking part in an "offline retail store product information consultation" experiment. All participants were randomly assigned to either the experimental group (receiving product information presented by a chatbot with a cute

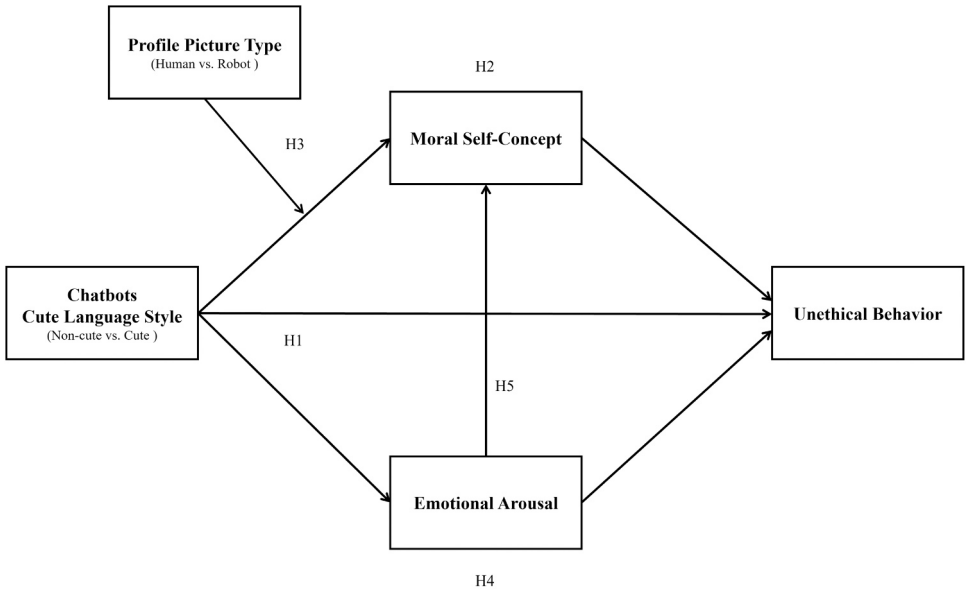

Fig. 2. Theoretical Model.

language style) or the control group (receiving product information presented by a chatbot with a straightforward language style), and a measure of moral judgment was administered (α = 0.943). Moral judgment refers to the process by which individuals evaluate the moral nature of various actions and events, and it reflects participants' baseline moral levels (Gallier et al., 2017). The experimental procedure consisted of three key steps. First, participants were provided with instructions and asked to imagine themselves in an offline retail shopping scenario, where an AI chatbot was offering product information consultation services. They were required to interact in real time with the chatbot to inquire about the details of a newly released hairdryer (the prescribed questions included: 1. The material of the hairdryer; 2. The noise level of the hairdryer), and based on this interaction, they were asked to provide product ratings and evaluations. Second, participants were asked to provide subjective evaluations of the product and assess their purchasing intention, in order to avoid revealing the true purpose of the experiment. Participants rated the chatbot's language style on its cuteness (α = 0.889), the perceived amount of information (α = 0.876), and the perceived quality of the AI chatbot service (α = 0.836). All items were rated on a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). The measurement of cuteness was based on Nenkov & Scott (2014), the perceived amount of information on Kim & Lennon (2000), and the perceived quality of AI chatbot service on Zhang et al. (2022).

Third, participants were asked to rate their tendency to engage in unethical behavior in a consumer context (Nikolova et al., 2018). Specifically, they were instructed to imagine a scenario in which they consulted an AI customer service representative at a retail store for product information and then proceeded to shop in the store. While selecting a product, they accidentally damaged its non-recoverable packaging. They were then asked to rate the likelihood of engaging in a series of behaviors, such as: "I might pretend not to notice this." Responses were recorded on a scale from 1 (extremely unlikely) to 7 (extremely likely), with higher scores indicating a greater tendency toward unethical behavior. At the end of the experiment, participants provided basic demographic information and were asked to guess the purpose of the study. However, none of the participants accurately guessed the true intent of the experiment. Details of the variable measurements for Studies 1 through 4 can be found in Supplementary Materials, Table S2.

3.2. Result

3.2.1. Manipulation checks

This study aims to test the effectiveness of the manipulation of language style types by examining the perceived differences in the cuteness level of the chatbot's language style between the two participant groups. An independent samples t-test was conducted using SPSS 26.0 software. The analysis revealed that the experimental group rated the chatbot's language style as significantly cuter (M_{cute} = 5.734, SD_{cute} = 1.793) than the control group ($M_{non\text{-}cute}$ = 3.875, $SD_{non\text{-}cute}$ = 1.996, $t(122)$ = 5.443, $p < 0.001$). This indicates that the manipulation of the chatbot's language style was effective (see Fig. 4).

To examine whether the perceived amount of information and perceived AI chatbot service quality were effectively controlled between the two chatbot conditions, independent samples t-tests were conducted. The results showed no significant difference in perceived amount of information between the experimental group (M_{cute} = 5.017, SD_{cute} = 1.388) and the control group ($M_{non\text{-}cute}$ = 5.119, $SD_{non\text{-}cute}$ = 0.851), $t(122)$ = 0.497, p = 0.620. Similarly, there was no significant difference in perceived AI chatbot service quality between the experimental group (M_{cute} = 5.181, SD_{cute} = 1.064) and the control group ($M_{non\text{-}cute}$ = 5.160, $SD_{non\text{-}cute}$ = 0.758), $t(122)$ = -0.128, p = 0.899. These results suggest that the manipulations of information amount and service quality were successfully controlled in this study.

To further assess whether participants' baseline moral standards were effectively controlled, an independent samples t-test was conducted on moral judgment scores. The results revealed no significant difference between the experimental group (M_{cute} = 4.180, SD_{cute} = 1.747) and the control group ($M_{non\text{-}cute}$ = 4.188, $SD_{non\text{-}cute}$ = 1.719), $t(122)$ = -0.025, p = 0.898. This indicates that participants in both groups had comparable baseline levels of moral judgment.

3.2.2. Main effect analysis

The present study examined the effect of chatbot language style on consumers' tendency toward unethical behavior by conducting an independent samples t-test, with language style (cute vs. straightforward) as the independent variable and unethical behavioral tendency as the dependent variable. Results indicated that participants who interacted with a chatbot using a cute language style reported significantly higher levels of unethical behavioral tendency (M_{cute} = 4.547, SD_{cute} = 1.877) than those who interacted with a chatbot using a straightforward language style ($M_{non\text{-}cute}$ = 3.781, $SD_{non\text{-}cute}$ = 1.923), $t(122)$ = 2.189,

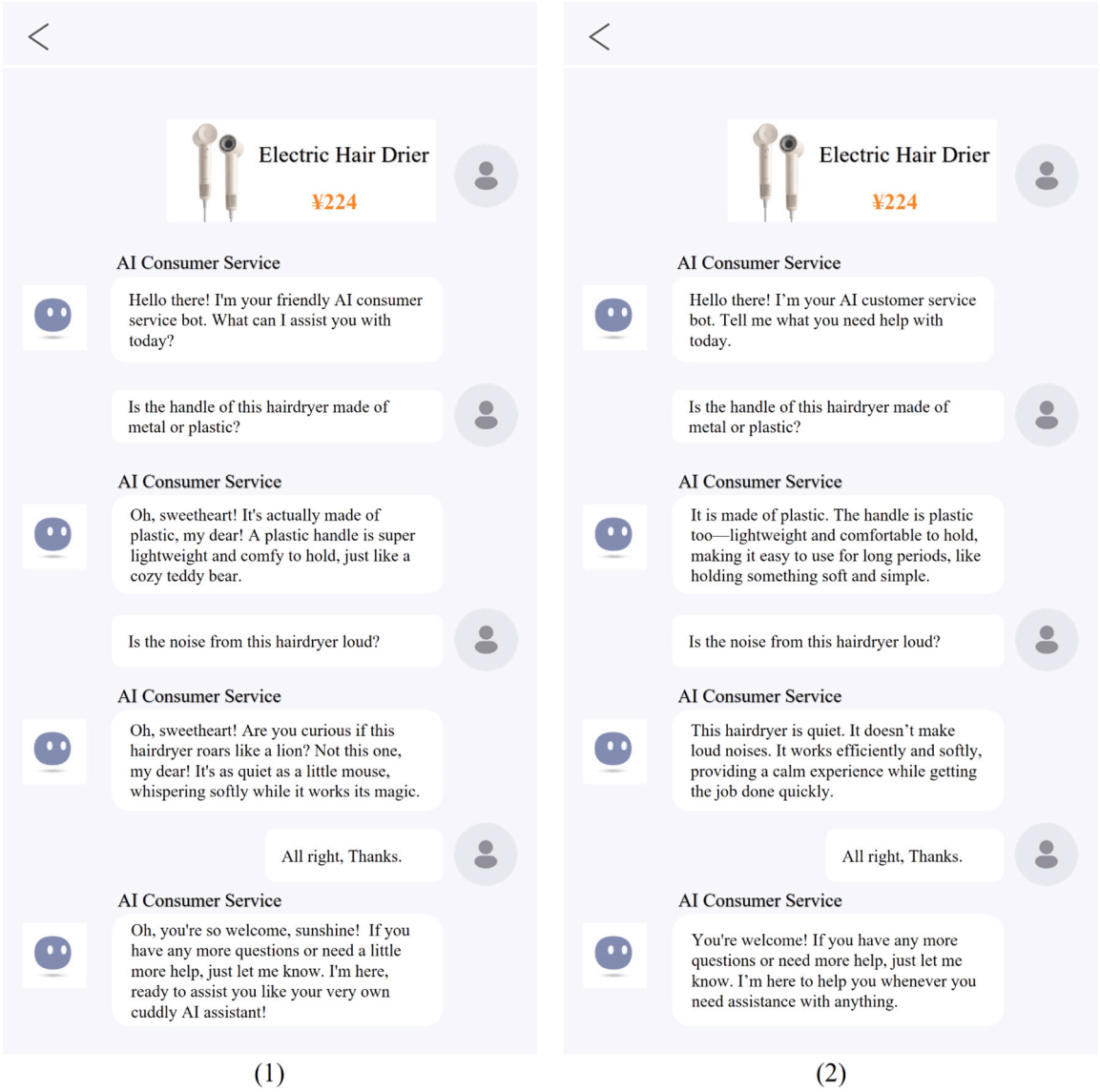

Fig. 3. Stimulus Materials of Study 1. Note: Fig. (1) is the stimulus material for the cute language style chatbot. Fig. (2) is the stimulus material for the straightforward language style chatbot.

$p < 0.05$. These findings suggest that consumers exposed to a cute language style were more likely to engage in unethical behavior compared to those exposed to a straightforward language style (see Fig. 4). Thus, Hypothesis 1 (H1) was supported.

4. Study 2: the mediating role of moral self-concept

4.1. Method

4.1.1. Participants and design

Study 2 aims to examine whether moral self-concept mediates the effect of a chatbot's use of a cute language style on individuals' unethical behavior. This study adopted a one-factor, two-level (language style: cute vs. straightforward) between-subjects design. Participants were recruited via the Credamo platform and completed an online experiment. A total of 92 participants took part in the study, with 48 identifying as female (52.2 %). The average age of participants was 25.5 years. Regarding educational background, 41.3 % held a bachelor's degree. In terms of monthly income, 41.3 % of participants reported earning between 6000 and 8999 RMB.

4.1.2. Procedures and measurements

Participants were explicitly informed that they would be taking part in a "product information inquiry at an offline retail store" experiment. They were randomly assigned to either the experimental group or the control group, followed by the measurement of moral judgment ($\alpha = 0.896$). The experimental procedure consisted of three key stages. First, participants were given instructions for the task. They were asked to interact in real-time with an AI chatbot to inquire about details of a functional beverage product. Specifically, they were instructed to ask two predefined questions: (1) What flavors are available for the functional beverage? and (2) How many milliliters does it contain? Based on this interaction, they were then asked to evaluate and rate the product. Second, participants provided subjective evaluations of the product and rated their purchase intention. This step was designed to mask the true purpose of the experiment. They also rated the chatbot's perceived "cuteness" in language style ($\alpha = 0.709$) and completed a scale measuring moral self-concept ($\alpha = 0.922$). The measure of moral self-concept was adapted from Khan & Dhar (2006), and participants were asked to indicate the extent to which they identified with descriptors such as "compassionate," "warm," "helpful," and "sympathetic." All items were measured using a 7-point Likert scale ranging from 1

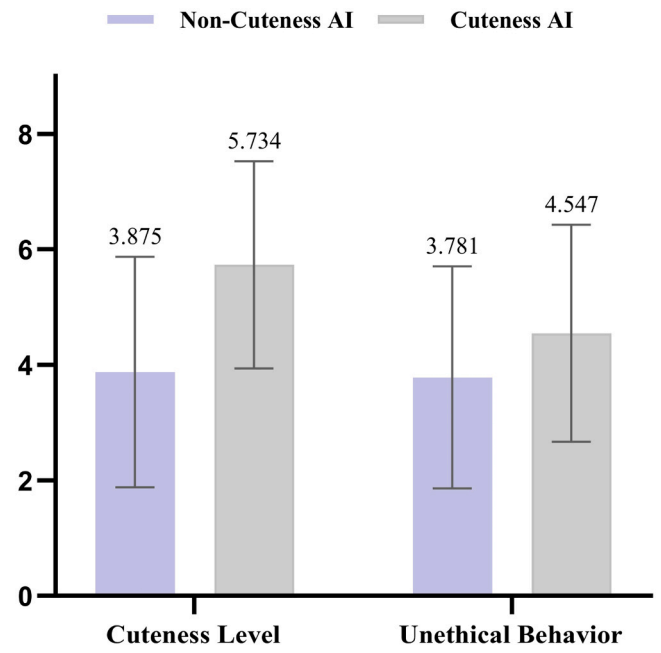

Fig. 4. Results of Study 1: Cuteness Level and Unethical Behavior. Note: The numerical values represent the mean of the variable, and the error bars represent the standard deviation. Both variables were measured using a 7-point Likert scale.

(strongly disagree) to 7 (strongly agree).

Third, participants were asked to assess their tendency to engage in unethical behavior in a consumer context. The scenario was adapted from the passive benefit items of the Consumer Ethics Scale (CES) developed by Vitell & Muncy (1992). Specifically, participants were instructed to imagine a situation in which, after paying for the product shown in the image from the first part of the experiment, they discovered that the retailer had mistakenly undercharged them due to an error in the promotional pricing. Participants were then asked to rate the likelihood of engaging in the following behavior: "I might consider ignoring the issue." Higher scores indicated a greater tendency toward unethical behavior. At the end of the experiment, participants provided basic demographic information and were asked to guess the purpose of the study. None of the participants were able to accurately identify the true objective of the experiment.

4.2. Result

4.2.1. Manipulation checks

This study aimed to examine differences in participants' perceived cuteness of the chatbot across two groups. An independent samples *t*-test was conducted using SPSS 26.0. The results revealed that participants in the experimental group rated the chatbot as significantly cuter (M_{cute} = 4.783, SD_{cute} = 1.747) than those in the control group ($M_{non\text{-}cute}$ = 3.457, $SD_{non\text{-}cute}$ = 1.348), and the difference was statistically significant, $t(90) = 4.075$, $p < 0.001$. These findings confirm that the manipulation of chatbot cuteness in this study was successful (see Fig. 5).

Additionally, to examine whether participants' baseline moral levels were effectively controlled across the two groups, an independent samples *t*-test was conducted on participants' moral judgment scores. The results showed no significant difference between the experimental group ($M_{cute} = 4.206$, $SD_{cute} = 1.194$) and the control group ($M_{non\text{-}cute}$ = 4.082, $SD_{non\text{-}cute} = 1.470$), $t(90) = -0.448$, $p = 0.655$. This indicates that the baseline moral levels of participants in both groups were comparable.

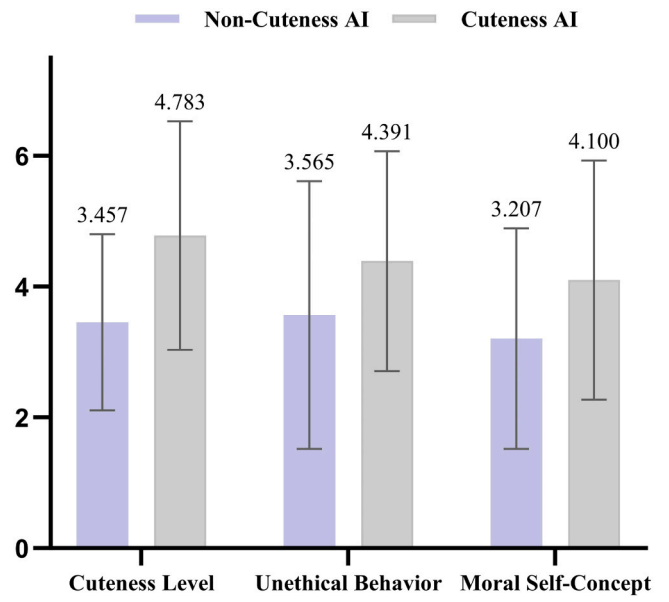

Fig. 5. Results of Study 2. Note: The numerical values represent the mean of the variable, and the error bars represent the standard deviation. Both variables were measured using a 7-point Likert scale.

4.2.2. Main effect analysis

This study treated the chatbot's language style as the independent variable and participants' tendency toward unethical behavior as the dependent variable, aiming to evaluate, via an independent samples *t*-test, the impact of different chatbot language styles (cute vs. straightforward) on unethical behavioral tendencies. As shown in Fig. 5, participants in the experimental group who interacted with the chatbot using a cute language style reported significantly higher levels of unethical behavior tendencies ($M_{cute} = 4.391$, $SD_{cute} = 1.682$) than those in the control group who interacted with the chatbot using a straightforward language style ($M_{non\text{-}cute} = 3.565$, $SD_{non\text{-}cute} = 2.049$), $t(90) = 2.113$, $p < 0.05$.

Moreover, as illustrated in Fig. 4, participants in the experimental group who interacted with the chatbot using a cute language style reported significantly higher moral self-concept scores ($M_{cute} = 4.100$, $SD_{cute} = 1.831$) than those in the control group who interacted with the chatbot using a straightforward language style ($M_{non\text{-}cute} = 3.207$, $SD_{non\text{-}cute} = 1.686$), $t(90) = 2.428$, $p < 0.05$.

4.2.3. Mediation effect analysis

To explore the mechanism through which chatbot language style influences consumer unethical behavior, we conducted a bias-corrected bootstrapping analysis (5000 samples) using SPSS Process Model 4, examining the mediating effect of moral self-concept in the relationship between chatbot language style and consumer unethical behavior (Hayes & Preacher, 2014). As shown in Fig. 6, the direct effect of chatbot language style on consumer unethical behavior was not significant (β = 0.321, $LLCI = -0.362$, $ULCI = 1.003$, including 0). However, moral self-concept played a significant full mediating role in the effect of chatbot language style on consumer unethical behavior ($\beta = 0.505$, $LLCI$ = 0.098, $ULCI = 0.947$, not including 0). This indicates that the cute language style of the chatbot increases consumers' moral self-concept, which in turn leads to a higher tendency toward unethical behavior. Therefore, Hypothesis 2 (H2) is supported.

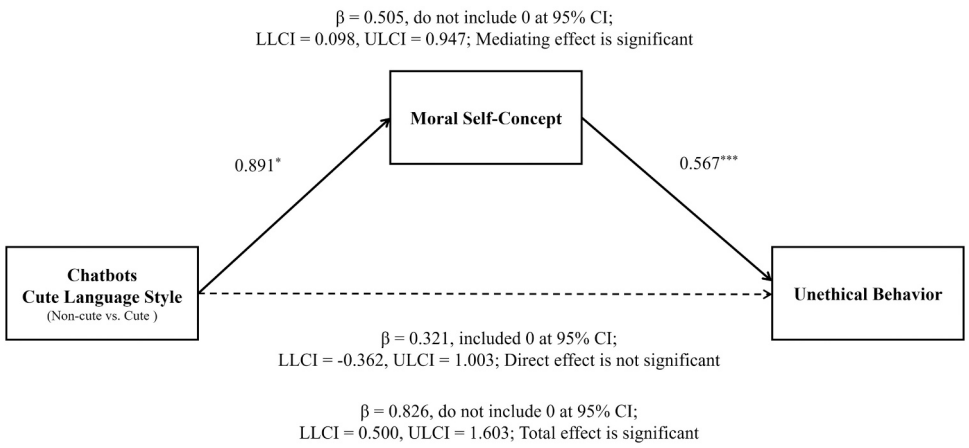

Fig. 6. Mediation Analysis in Study 2. Note: CI = Confidence Interval; LLCI = Lower Limit of Confidence Interval; ULCI = Upper Limit of Confidence Interval. ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

5. Study 3: the moderating role of avatar type

5.1. Method

5.1.1. Participants and design

Study 3 aims to examine the moderating effect of avatar type, specifically testing whether chatbots utilizing a cute language style with robot avatars are more likely to enhance consumers' moral self-concept, thereby increasing their tendency to engage in unethical behavior, compared to those using human avatars. This study employs a 2 × 2 between-subjects design, with two factors: avatar type (human vs. robot) and language style (cute vs. straightforward). Participant recruitment was conducted through the Credamo platform, and participants completed the online experiment. A total of 112 participants were recruited for this study, including 42 females (37.5 %), with an average age of 28.0 years. Regarding educational background, 42.9 % of participants held a bachelor's degree. In terms of income, 38.4 % of participants reported a monthly income between 6000 and 8999 RMB.

5.1.2. Stimulus materials

In this study, participants took on the role of consumers in a simulated scenario, interacting with chatbots to resolve predefined service issues. To ensure that the dialogue content, key information points, and interaction flow were precisely aligned with the experimental design, the script was carefully adjusted. Additionally, the language style of the chatbot was specifically tailored to either a "cute" or "straightforward" expression, depending on the experimental condition. To examine the moderating effect of avatar type, not only was the chatbot's language style fine-tuned, but the avatar used was also modified. These adjustments aimed to gain a deeper understanding of how language style and avatar type jointly influence users' perceptions of the customer service experience (see Fig. 7).

5.1.3. Procedures and measurements

Participants were explicitly informed that they would participate in an "offline retail store product information inquiry" experiment, and were randomly assigned to one of four experimental groups. The

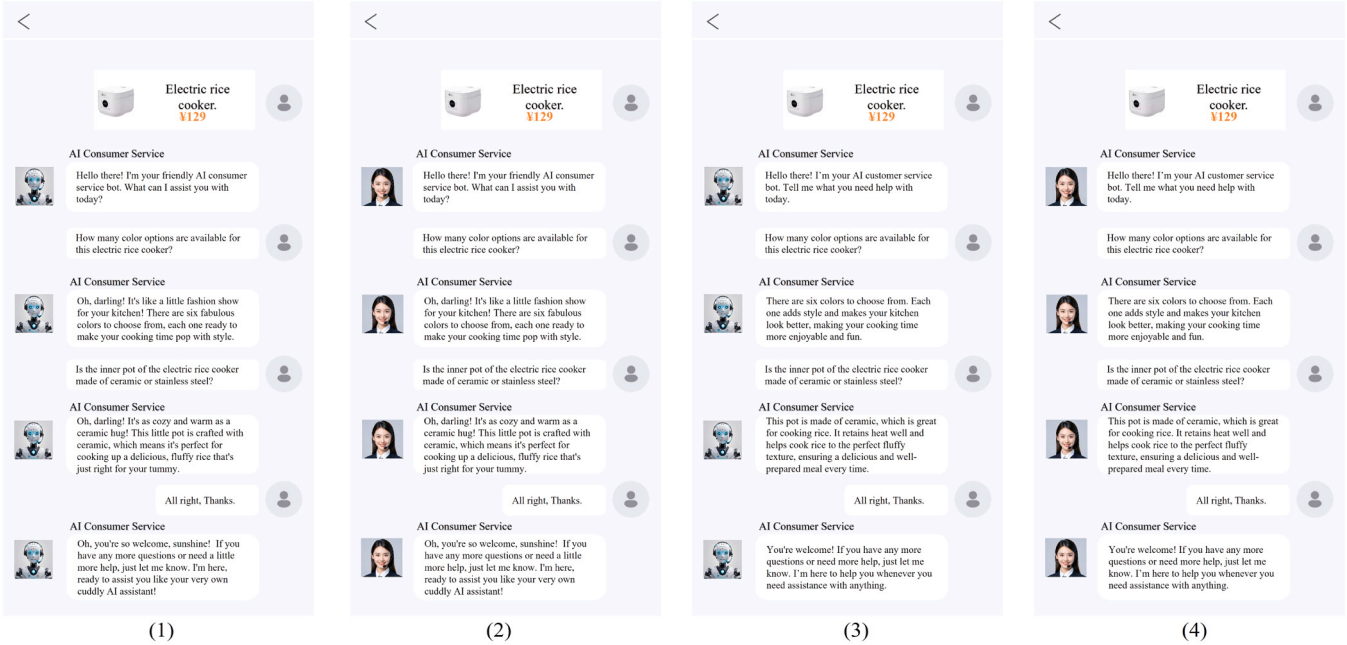

Fig. 7. Stimulus Materials of Study 3. Note: Fig. (1) is the stimulus material for the chatbot with a robot avatar and cute language style. Fig. (2) is the stimulus material for the chatbot with a human avatar and cute language style. Fig. (3) is the stimulus material for the chatbot with a robot avatar and straightforward language style. Fig. (4) is the stimulus material for the chatbot with a human avatar and straightforward language style.

experimental procedure was divided into three main stages. First, participants were randomly assigned to one of the four experimental conditions: (1) product information introduction presented by a robot-avatar chatbot with a cute language style, (2) product information introduction presented by a human-avatar chatbot with a cute language style, (3) product information introduction presented by a robot-avatar chatbot with a straightforward language style, (4) product information introduction presented by a human-avatar chatbot with a straightforward language style. Afterward, participants completed a moral judgment measurement ($\alpha = 0.772$). Second, participants received experimental instructions and interacted with the AI customer service in real-time to inquire about the details of a new rice cooker product. The specified questions included: (1) What color options are available for the rice cooker? (2) Is the inner pot made of ceramic or stainless steel? Following this, participants were asked to subjectively evaluate the product and assess their purchase intention to avoid revealing the true purpose of the experiment. Next, participants were asked to evaluate the chatbot's "cuteness" ($\alpha = 0.829$). They were also required to evaluate the type of chatbot avatar with two questions: (1) Is the chatbot's avatar a human? (2) Is the chatbot's avatar a robot? Additionally, participants were asked to rate their moral self-concept ($\alpha = 0.923$) as well as their perception of the perceptual conflict between the AI customer service chatbot's avatar and its identity, using a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Third, in study 3, participants were required to rate their tendency to engage in unethical behavior in a consumer context using a 7-point Likert scale. The specific scenario was adapted from the passive profit behavior scenario in the Consumer Ethics Scale (CES) (Vitell & Muncy, 1992). Participants were asked to imagine that after paying for a product using a coupon issued by the retailer, they discovered that the coupon had expired. They were then asked to rate the likelihood of engaging in the following behavior (item: "I might pretend not to know about this issue"). The higher the score, the greater the participant's tendency to engage in unethical behavior. At the end of the experiment, participants provided basic demographic information and were asked to guess the purpose of the experiment. However, none of the participants accurately identified the true aim of the study.

5.2. Result

5.2.1. Manipulation checks

This study aims to examine the differences in perceptions of chatbot cuteness among four participant groups. A two-way ANOVA was conducted using SPSS 26.0 software, followed by post-hoc comparisons. The analysis results indicate significant differences in perceived cuteness based on language style ($F(1, 111) = 40.694$, $p < 0.001$), but no significant differences based on avatar type ($F(1, 111) = 0.031$, $p = 0.861$). The cute language style-robot avatar group ($M_{\text{cute-robot}} = 5.143$, $SD_{\text{cute-robot}} = 1.671$) and the cute language style-human avatar group ($M_{\text{cute-human}} = 5.357$, $SD_{\text{cute-human}} = 0.911$) perceived the chatbot as significantly cuter than the straightforward language style-robot avatar group ($M_{\text{non-cute-robot}} = 3.250$, $SD_{\text{non-cute-robot}} = 1.789$) and the straightforward language style-human avatar group ($M_{\text{non-cute-human}} = 3.357$, SDnon-cute-human $= 1.890$), with these differences reaching statistical significance ($p < 0.001$). Furthermore, there was no significant difference in perceived cuteness between the cute language style-robot avatar group and the cute language style-human avatar group ($p = 0.620$). This suggests that the manipulation of chatbot cuteness was effective in the experiment, and avatar type did not influence participants' judgment of the chatbot's language style.

Additionally, to assess whether baseline moral levels were effectively controlled across groups, a two-way ANOVA was conducted, followed by post-hoc comparisons, to analyze participants' moral judgment. The results show no significant differences in moral judgment between the different language style groups ($F(1, 111) = 0.031$, $p = 0.861$), and no significant differences between the different avatar type groups ($F(1, 111) = 0.002$, $p = 0.965$). Moreover, the interaction between language style and avatar type did not have a significant effect on moral judgment ($F(1, 111) = 0.123$, $p = 0.726$). This suggests that the baseline moral levels of participants were consistent across all groups.

Furthermore, to examine whether there is any perceptual conflict between different types of chatbot avatars and the identity associated with "AI customer service," and to assess its potential impact on participants' perceptions, an independent samples t-test was conducted to analyze participants' perceptual conflict. The results showed no significant difference in perceptual conflict between the human avatar group ($M_{\text{human}} = 3.482$, $SD_{\text{human}} = 1.537$) and the robot avatar group ($M_{\text{robot}} = 3.554$, $SD_{\text{robot}} = 1.560$, $t(110) = -0.244$, $p = 0.808$). Additionally, there were no significant differences between the groups with different avatar types in terms of moral self-concept ($M_{\text{robot}} = 3.844$, $SD_{\text{robot}} = 1.910$ vs. $M_{\text{human}} = 3.344$, $SD_{\text{human}} = 1.791$, $t(110) = -1.429$, $p = 0.156$) and consumer unethical behavior ($M_{\text{robot}} = 4.196$, $SD_{\text{robot}} = 1.794$ vs. $M_{\text{human}} = 3.732$, $SD_{\text{human}} = 1.958$, $t(110) = -1.308$, $p = 0.193$). This suggests that there is no perceptual conflict between different types of chatbot avatars and the identity of "AI customer service," and that this does not influence participants' perceptions.

Finally, an independent samples t-test was conducted to examine participants' ability to distinguish between avatar types. The results showed that participants could clearly differentiate between the human avatar ($M_{\text{robot}} = 3.391$, $SD_{\text{robot}} = 0.947$ vs. $M_{\text{human}} = 4.536$, $SD_{\text{human}} = 0.990$, $t(110) = -3.663$, $p < 0.001$) and the robot avatar ($M_{\text{robot}} = 4.054$, $SD_{\text{robot}} = 0.961$ vs. $M_{\text{human}} = 3.000$, $SD_{\text{human}} = 1.009$, $t(110) = 8.129$, $p < 0.001$). This indicates that the manipulation of avatar types in the experiment was effective.

5.2.2. Moderating effect analysis

First, a two-way ANOVA was conducted to examine the impact of chatbot language style and avatar type on consumers' moral self-concept. The results indicated that neither language style ($F(1, 111) = 1.693$, $p = 0.196$) nor avatar type ($F(1, 111) = 2.123$, $p = 0.148$) had a significant effect on consumers' moral self-concept. However, the interaction between language style and avatar type showed a significant effect on moral self-concept ($F(1, 111) = 4.664$, $p < 0.05$). Post-hoc comparisons revealed that the moral self-concept of the cute language style-robot avatar group ($M_{\text{cute-robot}} = 4.438$, $SD_{\text{cute-robot}} = 1.879$) was significantly higher than that of the cute language style-human avatar group ($M_{\text{cute-human}} = 3.196$, $SD_{\text{cute-human}} = 1.590$), the straightforward language style-robot avatar group ($M_{\text{non-cute-robot}} = 3.250$, $SD_{\text{non-cute-robot}} = 1.780$), and the straightforward language style-human avatar group ($M_{\text{non-cute-human}} = 3.491$, $SD_{\text{non-cute-human}} = 1.990$), with the differences reaching statistical significance ($p < 0.05$) (see Fig. 8).

To further explore the mechanism through which chatbot language style influences consumer unethical behavior, we conducted a bias-corrected bootstrapping analysis using SPSS Process Model 7 (5000 samples). The aim was to examine the moderating effect of avatar type on the relationship between chatbot language style and moral self-concept, as well as the mediating role of moral self-concept in this process (Hayes, 2018). As shown in Fig. 9, the direct effect of chatbot language style on unethical behavior was not significant ($LLCI = -0.305$, $ULCI = 0.897$, including 0).

For chatbots with human avatars, the influence of language style on consumer unethical behavior did not show a significant mediating effect through moral self-concept ($LLCI = -0.708$, $ULCI = 0.353$, including 0). However, for chatbots with robot avatars, the influence of language style on consumer unethical behavior was significantly mediated by moral self-concept ($LLCI = 0.101$, $ULCI = 1.216$, not including 0), with a mediation effect of 0.638. Furthermore, the difference in indirect effects between robot and human avatars was 0.797, with a bootstrapped confidence interval of [0.062, 1.608], indicating a significant difference. These results suggest that the type of avatar significantly moderates the mediation mechanism of language style's effect on unethical behavior. Therefore, Hypothesis 3 (H3) is supported.

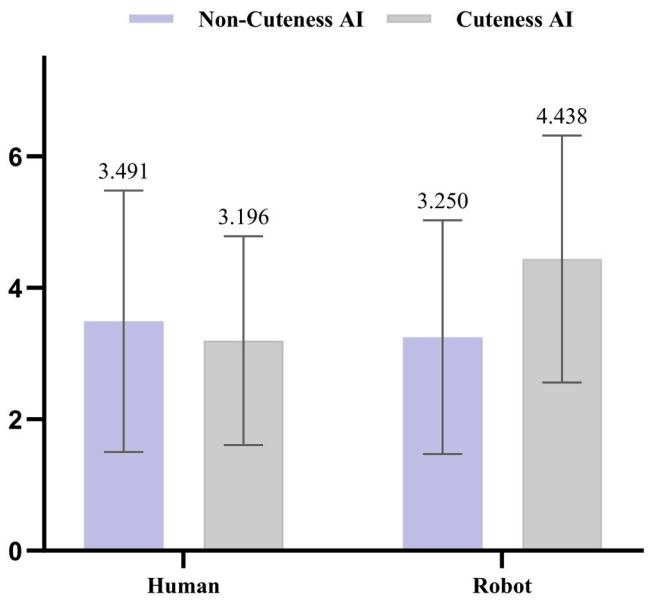

Fig. 8. Results of Study 3. Note: The numerical values represent the mean of the variable, and the error bars represent the standard deviation. Both variables were measured using a 7-point Likert scale.

6. Study 4: the emotional arousal as an underlying mechanism in the impact of cute chatbots on consumer unethical behavior

6.1. Method

6.1.1. Participants and design

Study 4 aims to examine the psychophysiological mechanism underlying the effect of cute chatbots on consumers' unethical behavior and to test the serial mediation effect of emotional arousal and moral self-concept in the relationship between chatbot language style and individuals' unethical behavior. This study adopts a three-factor, eight-level mixed design (between-subjects factors: avatar type [human vs. robot] × language style [cute language style vs. straightforward language style]; within-subjects factor: time periods [AI customer service interaction phase vs. unethical behavior consumption scenario test phase]). The study recruited participants through the Credamo platform and organized an offline experiment. A total of 108 participants were recruited, including 58 females (53.7 %), with an average age of 27.4 years. Regarding educational background, 50.0 % of participants held a bachelor's degree, and in terms of income, 42.6 % of participants had a monthly income between 6000 and 8999 RMB.

6.1.2. Procedures and measurements

Participants were explicitly informed that they would be taking part in an "in-store product information inquiry" experiment and were randomly assigned to one of four experimental conditions. The experimental procedure consisted of three main phases. First, participants were randomly allocated to one of the four experimental groups and subsequently completed a measure of moral judgment ($\alpha = 0.784$). Next, participants received standardized instructions and were required to engage in a real-time interaction with an AI customer service chatbot to inquire about a newly released smartwatch. Specifically, participants were instructed to ask two questions: (1) What color options are available for the smartwatch? and (2) What is the size of the watch face? After the interaction, participants were asked to subjectively evaluate the product and assess their purchase intention, with the aim of masking the true purpose of the experiment. During this phase, skin conductance was recorded using Ag/AgCl electrodes attached to the fingertip pads of the left index and ring fingers. Finally, participants completed evaluations of the chatbot's perceived cuteness ($\alpha = 0.894$), perceptions of the chatbot avatar type, and moral self-concept ($\alpha = 0.804$).

In study 4, participants rated their likelihood of engaging in unethical behavior in a consumer context using a 7-point Likert scale. The specific scenario was adapted from the passive benefit situations in the Consumer Ethics Scale (CES; Vitell & Muncy, 1992). Participants were asked to imagine the following situation: while purchasing the product shown in the first part of the experiment, the store clerk mistakenly entered a price that was lower than the actual value of the item. Participants then rated the likelihood that they would engage in a specific behavior—namely, "I might ignore the mistake." Higher scores indicated a greater tendency toward unethical behavior. At the conclusion of the experiment, participants provided basic demographic information and were asked to guess the purpose of the study. None of the participants were able to correctly identify the true objective of the experiment.

6.1.3. Measurement of emotional arousal

Emotional responses are a critical component of human psychological activity, often reflecting changes in individuals' internal feelings, which are typically manifested through the autonomic nervous system (ANS) (Kreibig, 2010). The ANS plays a vital role in emotional fluctuations and can trigger a range of physiological responses, such as changes in heart rate, facial expressions, skin conductance, and pupil dilation. These physiological characteristics have become important indicators in the study of emotional responses and psychological processes. Among these, skin conductance has been widely used as a psychophysiological measure in consumer behavior research (Caruelle et al., 2019). Skin conductance signals are primarily divided into two components: a slow-changing tonic activity known as Skin Conductance Level (SCL), and a fast-changing phasic activity known as Skin Conductance Response (SCR). The fluctuation trend of SCL reflects emotional experiences over a period of time. When individuals experience emotional stimuli—particularly under conditions of heightened arousal—sweat gland activity on the skin increases, resulting in changes in conductance levels (Marques et al., 2025). Compared with self-reported measures, skin conductance offers significant advantages. It avoids common biases and errors inherent in subjective assessments, such as social desirability bias or memory inaccuracy (Li et al., 2018). Furthermore, electrodermal activity (EDA) captures unconscious emotional responses that are often difficult to express through self-report (Li, 2019). Thus, measuring emotional arousal through skin conductance not only enhances the objectivity and accuracy of the data but also strengthens the robustness of the research findings, thereby offering deeper and more reliable insights into consumer behavior.

Accordingly, this study employed Skin Conductance Level (SCL) as a physiological indicator to measure participants' emotional arousal, with higher SCL values indicating greater levels of emotional arousal. Specifically, the study examined participants' SCL levels across two key time periods: (1) during the interaction with the AI customer service chatbot and (2) during the subsequent unethical consumption scenario test. The physiological data were collected using the MP150 multichannel physiological recording system produced by Biopac Systems, Inc. Electrodes were connected to the EDA100C module for electrodermal activity (EDA) data acquisition, with a sampling rate of 2000 Hz. The recorded physiological signals were subsequently analyzed and processed offline using MATLAB 2018a.

6.2. Result

6.2.1. Manipulation checks

This study aimed to examine differences in perceived cuteness of chatbots across four experimental groups. A two-way ANOVA was conducted using SPSS 26.0, followed by post hoc comparisons. The analysis revealed a significant main effect of language style on perceived cuteness, $F(1, 107) = 16.911$, $p < 0.001$, whereas the effect of avatar type was not significant, $F(1, 107) = 0.027$, $p = 0.870$. Participants in

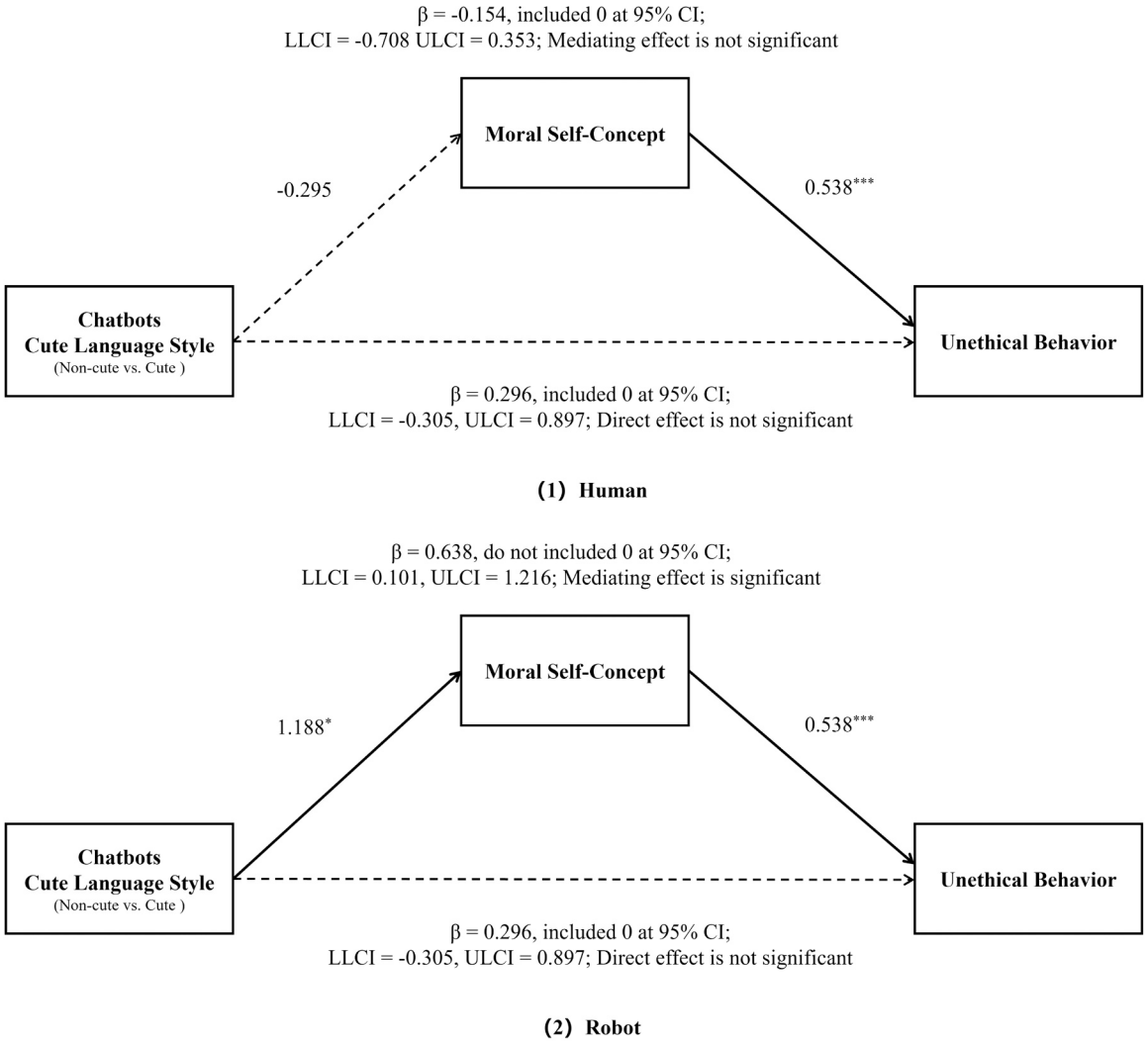

Fig. 9. Mediation Analysis in Study 3. Note: Fig. (1) is the mediation effect test result diagram for a chatbot with a human avatar. Fig. (2) is the mediation effect test result diagram for a chatbot with a chatbot avatar. CI = Confidence Interval; LLCI = Lower Limit of Confidence Interval; ULCI = Upper Limit of Confidence Interval. ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

the cute language style–robot avatar group ($M_{\text{cute- robot}} = 4.926$, $SD_{\text{cute-robot}} = 2.055$) and the cute language style–human avatar group ($M_{\text{cute-human}} = 4.741$, $SD_{\text{cute-human}} = 1.130$) reported significantly higher levels of perceived cuteness than those in the non-cute language style–robot avatar group ($M_{\text{non-cute- robot}} = 3.407$, $SD_{\text{non-cute- robot}} = 1.966$) and the non-cute language style–human avatar group ($M_{\text{non-cute- human}} = 3.481$, $SD_{\text{non-cute- human}} = 1.718$), with all differences reaching statistical significance ($p < 0.001$). Moreover, no significant difference in perceived cuteness was found between the cute language style–robot avatar group and the cute language style–human avatar group ($p = 0.699$). These results indicate that the manipulation of chatbot cuteness in this experiment was effective, and that avatar type did not influence participants' perceptions of the chatbot's language style.

In addition, to examine whether baseline moral standards were effectively controlled across groups, a two-way ANOVA was conducted on participants' moral judgment scores, followed by post hoc comparisons. The results showed no significant main effect of language style on moral judgment, $F(1, 107) = 0.019$, $p = 0.891$, and no significant main effect of avatar type, $F(1, 107) = 0.008$, $p = 0.927$. Furthermore, the interaction between language style and avatar type was also not significant, $F(1, 107) = 0.677$, $p = 0.412$. These findings indicate that participants across all groups exhibited comparable baseline levels of moral judgment.

Finally, an independent samples *t*-test was conducted to assess participants' judgments regarding avatar types. The results revealed that participants were able to clearly distinguish between human avatars ($M_{\text{robot}} = 3.648$, $SD_{\text{robot}} = 1.403$) and robot avatars ($M_{\text{human}} = 2.815$, $SD_{\text{human}} = 1.415$), $t(106) = -3.073$, $p < 0.001$, as well as between robot avatars ($M_{\text{robot}} = 4.093$, $SD_{\text{robot}} = 1.377$) and human avatars ($M_{\text{human}} = 2.889$, $SD_{\text{human}} = 1.313$), $t(106) = 4.649$, $p < 0.001$. These findings suggest that the manipulation of avatar types in the experiment was effective.

6.2.2. Results of behavioral data

This study first employed a two-way analysis of variance (ANOVA) to investigate the differences in unethical behavior tendencies based on different language styles and avatar types of chatbots. The results revealed that language style did not have a significant effect on unethical behavior ($F(1, 107) = 3.873$, $p = 0.052$), whereas avatar type ($F(1, 107) = 5.531$, $p < 0.05$) and the interaction between language style and avatar type had a significant impact on unethical behavior ($F(1, 107) = 4.665$, $p < 0.05$). Post-hoc comparisons (Fig. 10) indicated that the cute language style-robot avatar group ($M_{\text{cute-robot}} = 5.185$, $SD_{\text{cute-robot}} = 1.981$) exhibited significantly higher unethical behavior than the cute language style-human avatar group ($M_{\text{cute-human}} = 3.444$, $SD_{\text{cute-human}} = 1.948$), the straightforward language style-robot avatar group ($M_{\text{non-cute-}}$

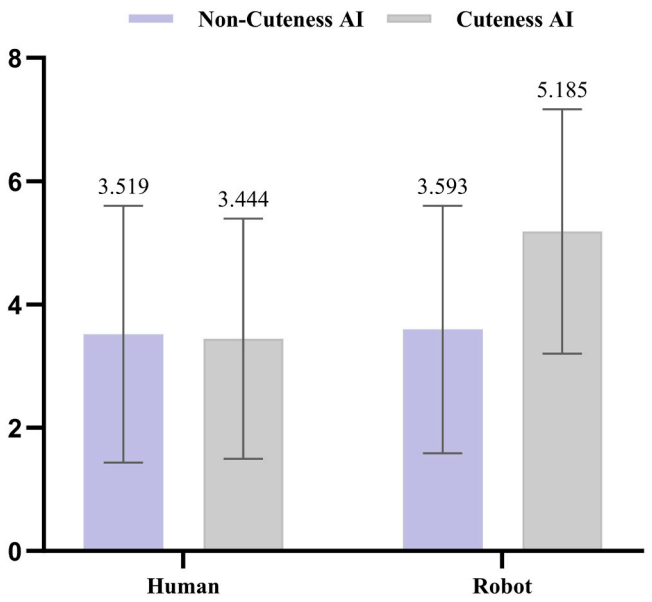

Fig. 10. Unethical Behavior Results of Study 4. Note: The numerical values represent the mean of the variable, and the error bars represent the standard deviation. Both variables were measured using a 7-point Likert scale.

$_{robot}$ = 3.593, $SD_{non\text{-}cute\text{-}robot}$ = 2.005), and the straightforward language style-human avatar group ($M_{non\text{-}cute\text{-}human}$ = 3.519, $SD_{non\text{-}cute\text{-}human}$ = 2.082), with the differences reaching statistical significance ($p < 0.01$).

Secondly, this study investigates the differences in consumers' moral self-concept based on the chatbot's language style and avatar type. The results show that language style ($F(1, 107) = 3.349$, $p = 0.070$) does not have a significant effect on consumers' moral self-concept. However, avatar type ($F(1, 107) = 7.998$, $p < 0.01$) and the interaction between language style and avatar type have a significant impact on moral self-concept ($F(1, 107) = 4.677$, $p < 0.05$). Post-hoc comparisons (Fig. 11) reveal that the moral self-concept of the cute language style-robot avatar group ($M_{cute\text{-}robot}$ = 4.907, $SD_{cute\text{-}robot}$ = 1.749) is significantly higher than that of the cute language style-human avatar group ($M_{cute\text{-}human}$ = 3.380, $SD_{cute\text{-}human}$ = 1.331), the straightforward language style-robot

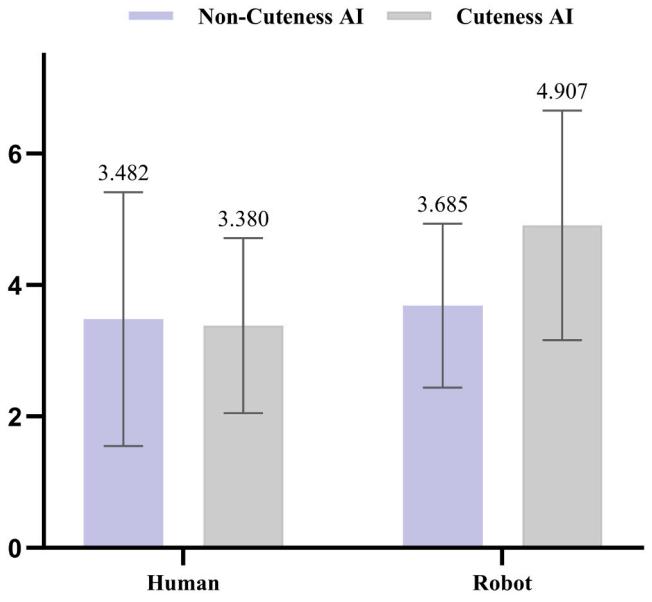

Fig. 11. Moral Self-Concept Results of Study 4. Note: The numerical values represent the mean of the variable, and the error bars represent the standard deviation. Both variables were measured using a 7-point Likert scale.

avatar group ($M_{non\text{-}cute\text{-}robot}$ = 3.685, $SD_{non\text{-}cute\text{-}robot}$ = 1.247), and the straightforward language style-human avatar group ($M_{non\text{-}cute\text{-}human}$ = 3.482, $SD_{non\text{-}cute\text{-}human}$ = 1.933), with the differences being statistically significant ($p < 0.01$).

6.2.3. Results of skin conductance response

This study first uses a three-factor repeated measures analysis of variance to explore the electrophysiological mechanisms underlying the impact of cute chatbots on consumers' unethical behavior. The results show that language style ($F(1, 107) = 2.303$, $p < 0.05$), avatar type ($F(1, 107) = 2.660$, $p < 0.01$), and time period ($F(1, 107) = -4.239$, $p < 0.001$) all have significant effects on SCL (skin conductance level). Furthermore, the interaction between language style, avatar type, and time period ($F(1, 107) = 2.755$, $p < 0.01$) also significantly influences SCL. Simple effects analysis (Fig. 12) shows that during the AI customer service interaction phase, the cute language style-robot avatar group ($M_{cute\text{-}robot}$ = 4.616, $SD_{cute\text{-}robot}$ = 1.219) has a significantly higher SCL than the cute language style-human avatar group ($M_{cute\text{-}human}$ = 3.251, $SD_{cute\text{-}human}$ = 1.400, $p < 0.05$), the straightforward language style-robot avatar group ($M_{non\text{-}cute\text{-}robot}$ = 3.333, $SD_{non\text{-}cute\text{-}robot}$ = 1.462, $p < 0.05$), and the straightforward language style-human avatar group ($M_{non\text{-}cute\text{-}human}$ = 3.186, $SD_{non\text{-}cute\text{-}human}$ = 1.346, $p < 0.01$). In the unethical behavior consumption scenario testing phase, the cute language style-robot avatar group ($M_{cute\text{-}robot}$ = 4.667, $SD_{cute\text{-}robot}$ = 1.463) shows a significantly higher SCL than the cute language style-human avatar group ($M_{cute\text{-}human}$ = 2.748, $SD_{cute\text{-}human}$ = 1.312, $p < 0.001$), the straightforward language style-robot avatar group ($M_{non\text{-}cute\text{-}robot}$ = 2.860, $SD_{non\text{-}cute\text{-}robot}$ = 1.449, $p < 0.001$), and the straightforward language style-human avatar group ($M_{non\text{-}cute\text{-}human}$ = 2.724, $SD_{non\text{-}cute\text{-}human}$ = 1.170, $p < 0.001$).

Furthermore, the SCL in the cute language style-robot avatar group does not show significant differences across different time periods ($p = 0.497$). However, the SCL in the cute language style-human avatar group ($p < 0.001$), the straightforward language style-robot avatar group ($p < 0.001$), and the straightforward language style-human avatar group ($p < 0.001$) is significantly higher during the AI customer service interaction phase than in the unethical behavior consumption scenario testing phase. These results suggest that when interacting with the cute language style combined with a robot avatar, the emotional arousal level is more pronounced compared to other interaction forms. Additionally, during the testing process of the unethical consumption scenario, this emotional arousal remains at a high level without showing signs of attenuation. This unique emotional arousal pattern is likely to be an intrinsic driving factor leading to an increase in consumers' moral self-concept, which in turn elevates their tendency toward unethical behavior. Therefore, Hypothesis 4 (H4) is supported.

6.2.4. Results of serial mediation effect

First, this study employed SPSS Process Model 6 to conduct a bias-corrected bootstrapping test (with 5000 resamples) to examine the serial mediation effect of emotional arousal and moral self-concept in the relationship between chatbot cute language style and individuals' unethical behavior (Hayes & Preacher, 2014). As shown in Table 1, the direct effect of chatbot language style on unethical behavior was not significant (β = 0.399, $LLCI$ = –0.456, $ULCI$ = 1.254, including 0). However, the serial mediation effect from emotional arousal to moral self-concept was significant ($\beta = 0.708$, $LLCI = 0.200$, $ULCI = 1.404$, not including 0). This indicates that cute chatbot language style increases consumers' emotional arousal, which in turn enhances their moral self-concept and ultimately increases their tendency to engage in unethical behavior. Therefore, Hypothesis 5 (H5) was supported.

Second, SPSS Process Model 83 was used to conduct a bias-corrected bootstrapping test (with 5000 resamples) to examine the serial mediation effect of emotional arousal and moral self-concept in the effect of cute chatbot language style on unethical behavior, and to test the

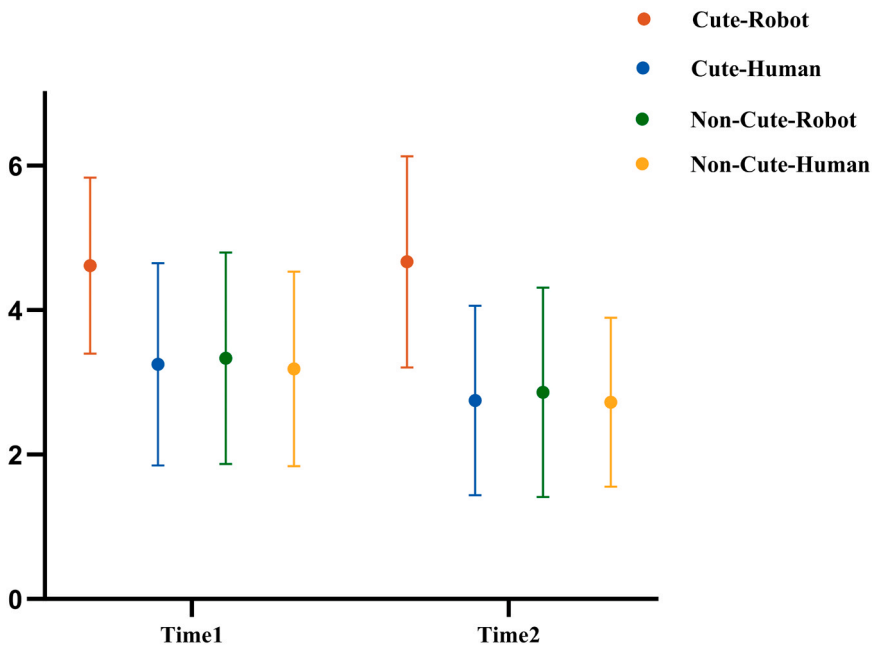

Fig. 12. Electrodermal Activity Results of Study 4. Note: The numerical values represent the mean of the variable, and the error bars represent the standard deviation. Time1 = Interaction stage with AI customer service, Time2 = Testing stage for unethical behavior consumption scenarios.

Table 1
Serial Mediation Analysis in Study 4.

Effect type Mediator	Effect	Standard error	95 %CI	
			LLCI	ULCI
Direct effects	0.399	0.426	−0.456	1.254
Indirect effects				
Cute Language Style → Emotional Arousal → Unethical Behavior	0.143	0.271	−0.338	0.749
Cute Language Style → Moral Self-Concept → Unethical Behavior	0.342	0.340	−0.305	1.066
Cute Language Style → Emotional Arousal → Moral Self-Concept → Unethical Behavior	0.708	0.310	0.200	1.404

moderating role of avatar type in this mediation process (Hayes & Rockwood, 2020). First, the direct effect of chatbot language style on unethical behavior remained non-significant ($\beta = 0.252$, $LLCI = -0.384$, $ULCI = 0.898$, including 0). In addition, for human avatars, the serial mediation effect from emotional arousal to moral self-concept was not significant ($\beta = 0.024$, $LLCI = -0.323$, $ULCI = 0.344$, including 0). In contrast, for robot avatars, the serial mediation effect was significant ($\beta = 0.472$, $LLCI = 0.115$, $ULCI = 0.973$, not including 0). The difference in indirect effects between the robot avatar and human avatar conditions was 0.448, with a bootstrapped confidence interval of [0.020, 1.092], indicating a significant difference. These results suggest that when the chatbot adopts a robot avatar, the cute language style is more likely to elicit emotional arousal, which subsequently enhances moral self-concept and ultimately increases the likelihood of unethical behavior.

7. Discussion

Despite preliminary explorations in previous research on the impact of cute expressions by chatbots, the existing literature has yet to fully reveal the potential negative effects they may have, necessitating further in-depth study. In light of this, the present study focuses on evaluating the potential impact of a cute language style displayed by chatbots in conversations on consumer unethical behavior. Additionally, this study investigates the moderating role of avatar type in the effect of chatbot language style on consumers' moral self-concept. Finally, this study explores the potential mechanism of emotional arousal in the influence of cute chatbots on consumer unethical behavior. Through these explorations, the study aims to deepen our understanding of how moral self-concept changes in consumers during interactions with artificial intelligence and how these changes influence their unethical behavior.

The main findings of this study are as follows. First, in the field of artificial intelligence, "cuteness" is often embodied in the design of robots or virtual assistants, making them appear more friendly and human-like, which in turn enhances user acceptance and willingness to interact (Zhang et al., 2022). While prior research has generally highlighted the positive effects of cuteness (Li et al., 2023; Van den Abeele et al., 2024; Xu et al., 2022), it has largely overlooked its potential negative impact on consumers, particularly in the context of unethical behavior (Dale et al., 2016; Yim et al., 2025). Many studies have focused on comparing interactions between consumers and chatbots versus humans, often finding that consumers exhibit greater moral restraint and a stronger sense of responsibility when interacting with human agents. However, growing evidence suggests that consumers tend to display weaker moral restraint in interactions with chatbots, making them more prone to engage in unethical behavior (Kim et al., 2023). Previous research on unethical consumer behavior toward AI has primarily emphasized cognitive mechanisms while neglecting the role of emotional factors. Drawing on affect-as-information theory and the moral licensing effect, the present study reveals that consumers interacting with chatbots using a cute language style are more likely to engage in unethical behavior in subsequent consumption contexts, with moral self-concept acting as a mediator. Specifically, cuteness is a complex construct that can evoke emotional responses such as sympathy, tenderness, and empathy (Huddy and Gunnthorsdottir, 2000; Lishner et al., 2011), and these emotions may influence individuals' moral self-concept. According to affect-as-information theory, such emotions not only function as immediate feedback but also serve as an important basis for self-evaluation. When consumers experience positive emotions induced by interacting with a cute chatbot, they may unconsciously attribute those feelings to their own internal moral qualities, thereby forming an enhanced moral self-concept. However, this heightened moral self-concept may trigger a moral licensing effect, whereby individuals

who perceive themselves as moral become more likely to relax their moral constraints and subsequently engage in unethical behavior (Merritt et al., 2010).

Second, this study finds that the avatar type of a chatbot plays a moderating role in shaping consumers' moral self-concept. As a form of identity cue, the avatar influences consumers' perceptions of the nature of the interaction partner (Barfield, 2021; Etemad-Sajadi, 2016). A robot avatar reinforces the chatbot's non-human identity, making it easier for consumers to recognize that they are interacting with an artificial system rather than a human-like entity. In this context, compared to a human avatar, a robot avatar reduces consumers' psychological burden, allowing them to feel more relaxed and at ease during the interaction. This relaxed state can facilitate the emergence of positive emotions and enhance moral self-concept (Li et al., 2024). In contrast, a human avatar is more likely to activate self-awareness in consumers, drawing attention to their own self-presentation during the interaction. This additional psychological concern may hinder the generation of positive emotions and suppress the formation of a moral self-concept. Furthermore, prior research has shown that in service scenarios involving private or sensitive content, consumers tend to prefer robot service providers over human ones (Holthöwer & Van Doorn, 2023). Therefore, this study highlights the critical role of chatbot avatar type in influencing consumers' psychological responses, particularly in the context of a cute language style, where differences in the information conveyed by avatars significantly affect how consumers assess their own moral state.

Finally, this study explains the relationship between cute chatbots and consumers' unethical behavior through the intrinsic mechanism of emotional arousal. Specifically, after interacting with a cute-style chatbot, consumers experience sustained emotional arousal, which maintains a higher level in unethical consumption situations, without significant attenuation. This finding aligns with existing research, which suggests that cute stimuli can evoke strong emotional reactions, particularly stimuli associated with baby schema or "cute" characteristics (such as smallness, roundness, helplessness, etc.), which elicit more sympathy, warmth, and goodwill (Dijker, 2014; Griskevicius et al., 2010). However, in contrast to previous studies that emphasize the promotion of prosocial behavior through cute style, this study reveals a potential link between cute style and unethical behavior. Further analysis shows that emotional arousal plays a key role in this process by enhancing consumers' moral self-concept. This mechanism involves the interaction between the activation of positive emotions and the self-evaluation process. According to affective information theory, strong positive emotions not only serve as immediate feedback but also become an important basis for self-evaluation (Greene and Haidt, 2002; Haidt et al., 2003). Positive emotions can reduce consumers' self-centered tendencies, prompting them to focus on moral values beyond personal interests and further strengthening their moral self-concept (Monin and Miller, 2001; Yip and Lee, 2022). It is noteworthy that emotional arousal is not only reflected in subjective experience but is also accompanied by a series of physiological responses. For example, research shows that emotional activation typically triggers an increase in skin conductance response (SCL), which not only reflects emotional intensity but also plays an important role in an individual's self-cognition process (Cacioppo et al., 2000; Caruelle et al., 2019). Specifically, when consumers interact with cute-style chatbots, their emotional arousal not only affects their cognitive experience but may also reinforce their awareness of their moral self-concept through physiological feedback mechanisms (Gross, 2002). As emotional responses persist, the increase in skin conductance response may further deepen an individual's perception of their moral tendencies, resulting in a stronger moral self-concept in subsequent behaviors (Kreibig, 2010). Therefore, this study argues that the emotional arousal triggered by interactions with cute chatbots not only affects consumers' immediate behavior but also continuously shapes their moral self-concept in subsequent situations through physiological feedback mechanisms, potentially influencing their tendencies toward unethical behavior. This finding provides a new theoretical perspective on the enduring impact of emotional arousal on consumer behavior.

7.1. Theoretical contributions

The theoretical contributions of this study are mainly reflected in the following aspects:

First, this study innovatively integrates affect-as-information theory and the moral licensing effect to investigate how the language style of AI-based chatbots influences consumers' unethical behavior, and to uncover the underlying psychological mechanisms. Existing research rarely combines these two theories to explain how, in human–machine interaction contexts—particularly when a cute language style is used—consumer unethical behavior may be affected. This study demonstrates that affect-as-information theory effectively explains how positive emotions generated during consumer interactions with chatbots using a cute language style influence individuals' moral self-concept through emotional information processing, thereby affecting their tendency toward unethical behavior. The contribution lies in extending the application of affect-as-information theory from traditional interpersonal contexts to AI service interactions, and in examining the specific role of cute language style as an interactive element in the process of emotional information processing. In addition, the study introduces a novel application of the moral licensing effect, particularly in the context of consumer unethical decision-making following interactions with artificial intelligence. The moral licensing effect typically refers to the phenomenon whereby individuals, after perceiving or recalling prior moral behavior, feel a sense of "moral credit," which subsequently makes them more likely to engage in unethical behavior. This study contributes by clearly identifying how positive emotions elicited by interaction with a cute chatbot enhance moral self-concept through emotional information processing, thereby activating the moral licensing effect and increasing the likelihood of subsequent unethical behavior. This finding not only validates the applicability of the moral licensing effect in the emerging field of human–AI interaction but also clarifies how the effect is triggered in chatbot interactions—namely, through emotional responses and the resulting elevation of moral self-concept. The results enrich current understanding of the conditions under which the moral licensing effect is activated, showing that internal emotional states and changes in self-perception, elicited by interactions with chatbots using a cute language style, can provide psychological permission for later unethical behavior. Furthermore, while previous studies have primarily focused on the positive effects of chatbot cuteness (Hu and Pan, 2024; Lv et al., 2021; Zhang et al., 2022), the present study proposes that a cute language style may actually increase consumer unethical behavior, offering a critical extension to the current discourse on AI interaction and design ethics.

Additionally, this study further explores the moderating role of avatar type in the impact of chatbot language style on consumers' moral self-concept. As a visual identifier of the chatbot, the avatar plays an important role in conveying emotional and social cues during human-computer interactions. The study found that when a cute language style chatbot is paired with a robot avatar, consumers' moral self-concept is significantly enhanced compared to when a human avatar is used. This finding reveals the important influence of avatar type on consumers' psychological states and behavioral tendencies during human-computer interactions. Therefore, this study not only provides new insights into AI service design but also expands our understanding of how chatbot avatar types and language styles jointly influence consumer psychology and behavior. Furthermore, the study emphasizes the necessity of considering avatar type in chatbot design, providing important theoretical support for addressing ethical issues in human-computer interactions.

Finally, this study introduces physiological measurement methods, such as Skin Conductance Level (SCL), to objectively measure consumers' emotional differences during interactions with cute and

straightforward language style chatbots. Unlike traditional survey methods, physiological measurements provide more objective data support for this study, further validating the relationship between chatbot language style and consumers' emotional responses (Wang et al., 2023). This method not only enhances the reliability of the research findings but also offers new physiological indicators for consumer behavior research, especially in the study of emotional experiences in human-computer interaction environments. By analyzing consumers' physiological responses during interactions with different types of chatbots, this study reveals the relationship between emotional responses and unethical behavior, further elucidating how emotional activation during human-computer interactions influences consumers' tendencies toward unethical behavior. Therefore, this study provides new research methods and theoretical support for understanding consumers' emotional activation in chatbot interaction environments and its impact on unethical behavior.

7.2. Practical implications

The results of this study provide important managerial insights for offline retailers when utilizing chatbots and virtual assistants for customer interactions, particularly in guiding moral behavior and interacting with consumers' moral emotions. First, retailers should pay attention to the potential impact of language style on consumer behavior when designing and optimizing chatbots. The study shows that chatbots using a cute language style may encourage unethical behavior among consumers. Therefore, offline retailers should weigh the balance between increasing customer affinity and promoting moral behavior when selecting the language style for chatbots. While cute language styles can enhance emotional connection with customers, overuse of this style may increase consumers' tendency toward unethical behavior. Thus, retailers could consider combining the cute language style with more moral guidance content, such as reminders to follow ethical behavior or language that reinforces a sense of responsibility, in order to help maintain consumers' moral standards.

Moreover, the type of avatar plays a significant moderating role in the effect of chatbot language style on consumer behavior. Research shows that, compared to human avatars, robot avatars can enhance consumers' moral self-concept, but this enhancement may also increase the likelihood of unethical behavior through the "moral licensing effect." Therefore, offline retailers should fully consider the potential impact of avatar type on consumer behavior when designing chatbots. Especially in service scenarios with high moral sensitivity (e.g., financial transactions or membership point redemptions), human avatars, due to their social presence, may increase consumers' public self-awareness, thereby inhibiting unethical behavior. In contrast, in general retail interactions, robot avatars paired with cute language styles may significantly enhance consumers' enjoyment of the interaction and strengthen their moral self-concept, but they may also increase the likelihood of unethical behavior. Thus, when optimizing chatbot design, retailers should reasonably select avatar types based on different service scenarios and introduce timely moral reminder mechanisms, such as system prompts that reinforce moral norms or guide responsible consumption, to reduce potential moral risks.

Finally, considering the offline retail environment, personalized and emotional interaction methods have a significant impact on consumer behavior. Similar to personalized recommendation systems on digital platforms, retailers can design different chatbot interaction strategies based on customers' preferences and needs. By understanding customers' shopping behavior and emotional tendencies, retailers can adjust the chatbot's language style and interaction methods to better guide customers in making moral decisions and enhance the overall quality of the shopping experience.

7.3. Limitation and future research

Although this research provides both theoretical and practical contributions, it also has certain limitations that suggest directions for future research. First, building on prior studies, this research primarily focuses on examining the potential negative consequences of chatbots using a cute language style in offline retail customer service. However, other forms of cuteness were not considered. Cuteness is a multidimensional concept, and existing academic literature has rarely categorized the dimensions of chatbot cuteness, nor have many studies explored the effects of different types of cute styles (Wang et al., 2017). Therefore, future research should examine other types of cuteness (such as baby-schema cuteness or whimsical cuteness) in consumer–AI interactions.

Second, this research mainly employed scenario-based experiments as the primary method of investigation. Although this method facilitates the manipulation of various conditions and allows for real-time interaction between participants and artificial intelligence, which helps simplify complex issues and identify key variables, the consumption scenarios used in the experiments were not real-world situations. This limitation may reduce the applicability of the findings to actual consumer contexts and pose challenges for participants to intuitively understand the complexity of human-AI interactions in real consumption environments (Xie et al., 2024). Therefore, future research could consider conducting field experiments to enhance the ecological validity of the findings.

Furthermore, one limitation of this study is that it focused solely on the role of chatbots in effective service delivery, without examining the effectiveness of using a cute language style in the context of service failures. Given the prevalence of chatbot service failures in real-world settings, it is crucial to identify strategies that can mitigate and minimize their adverse effects (Zhang et al., 2024). Therefore, a promising direction for future research would be to explore how chatbots can effectively express cuteness in service failure scenarios.

Finally, this study adopted a cross-sectional research design to measure both the mediating and dependent variables. This limits the ability to establish causal relationships, as only associations between variables can be observed. Moreover, the use of cross-sectional data does not allow for capturing consumers' long-term responses to cute language styles or behavioral changes over time, which may result in an incomplete assessment of their impact (Chen & Wu, 2024). Future research should consider employing a longitudinal design to address these limitations and enhance the robustness and reliability of the findings.

CRediT authorship contribution statement

Jian Zhang: Writing – review & editing, Writing – original draft, Conceptualization. **Yin Wu:** Writing – review & editing, Methodology, Conceptualization. **Wenxin Ke:** Investigation, Funding acquisition, Data curation. **Jialiang Chen:** Writing – original draft, Funding acquisition, Formal analysis, Conceptualization.

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Declaration of Competing Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.ijinfomgt.2025.102941.

Data Availability

If you need access to raw data, you can contact the authors.

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