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Igniting Positive Emotions in Youth Living Alone through Anthropomorphic Design in Soft Drink Packaging

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Abstract
With rising emotional challenges among youth living alone, regulating positive emotions has become crucial. Grounded in the Three Factor Theory of Anthropomorphism and Emotional Contagion Theory, this study builds a dynamic model within a positive psychology framework to explore how anthropomorphic packaging influences positive emotions. Three experiments confirm that anthropomorphic design significantly enhances positive emotions, with empathy as a mediator. Visual cues are more effective than verbal cues. The study offers practical insights for optimising anthropomorphic strategies in emotion regulation and product design.
Keywords: Anthropomorphic Design; Soft Drink Packaging Design; Consumer Emotions; Youth Living Alone

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1.0 Introduction

Living alone is no longer a novel phenomenon in contemporary society (Reher & Requena, 2018). Even in collectivism-oriented China, the number of youth living alone has steadily increased in recent years. (Dang & Liu, 2023). Previous studies have shown that living alone can trigger a range of negative emotional experiences, such as prolonged loneliness, anxiety, fear, and depression, which may adversely affect individuals' mental health and subjective well-being (McClelland et al., 2020). However, compared with older populations, empirical research focusing specifically on youth living alone and experiencing negative emotions remains limited and often yields inconsistent findings (Huang & Li, 2023).

Recent research in positive psychology demonstrates that moderate positive emotions can alleviate and even reverse negative psychological states, thereby strengthening psychological resilience (Pressman et al., 2023). Positive emotions—such as joy, contentment, and satisfaction—are understood as affective states arising from internal or external stimuli during the fulfillment of psychological or physiological needs (Kiken et al., 2022). These emotions broaden individuals' thought–action repertoires by enhancing openness, curiosity, and optimism, effectively counteracting the cognitive and behavioural narrowing associated with negative affective states (Chakhssi et al., 2021; Pressman et al., 2023). Importantly, recent empirical work continues to support the principle that a predominance of positive over negative emotional experiences is associated with optimal psychological functioning and higher subjective well-being, even as rigid ratio thresholds are interpreted with greater conceptual flexibility (Brown et al., 2021; Hefferon et al., 2023). In this sense, cultivating positive emotions is increasingly recognised as a core pathway to mental health enhancement, rather than merely focusing on the reduction of negative affect (Kiken et al., 2022). Although prior research has explored various ways to enhance positive

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emotions (e.g. travel, yoga, music, virtual games), daily sensory stimuli such as packaging design also play a critical role. Visual and verbal elements on packaging influence the intensity and quality of positive emotional experiences (Ding et al., 2021). Especially for natural or artificially prepared soft drinks, which are frequently consumed by young people for health and enjoyment.

Anthropomorphism, defined as "seeing the human in non-human forms", has been widely adopted in marketing (Khan et al., 2023). Studies have demonstrated that anthropomorphic strategies can significantly shape consumers' cognitive and empathic responses, thereby enhancing product favorability (Dang & Liu, 2023), improving brand attitudes (Hur, Kim, & Park, 2022), and even promoting prosocial behaviors (Ding et al., 2021). Because anthropomorphic communication creates a socially engaging atmosphere, reduces perceived interaction pressure, and mitigates psychological resistance during consumer–brand interactions (Tian et al., 2025). Collaboration between marketing and anthropomorphic packaging is widespread (Khan et al., 2023). Recent global branding and packaging studies continue to report extensive use of anthropomorphic elements verbal, visual, and structural across major consumer brands, underscoring its strategic importance in contemporary packaging design (Puzakova, Kwak, & Rocereto, 2022). However, despite its widespread use in practice, the psychological mechanisms by which anthropomorphic packaging influences positive emotions, as well as the boundary conditions of these effects, remain unclear in current research. Accordingly, this study aims to examine how anthropomorphic packaging design influences positive emotional experiences among youth living alone. It specifically seeks to investigate the effect of anthropomorphic packaging on positive emotions, to examine the mediating role of positive empathy in this relationship, and to compare the emotional impact of visual versus verbal anthropomorphic cues. The findings are expected to offer theoretical insights into anthropomorphism in emotion regulation, as well as practical implications for packaging design strategies.

2.0 Literature Review

2.1 Anthropomorphic design

Anthropomorphism refers to attributing human-like characteristics to nonhuman objects (Khan et al., 2023). Contemporary research identifies three core psychological drivers underlying this tendency: accessibility of human knowledge, effectance motivation, and sociality motivation. When encountering unfamiliar objects, individuals draw on human knowledge to interpret them. Packaging with human-like features, such as smiling cartoon characters, enables youth living alone to engage through this lens, eliciting positive emotional responses. Effectance motivation reflects the desire to understand and control the environment; anthropomorphic packaging can enhance perceived control and confidence, reduce uncertainty, and facilitate interaction. Sociality motivation addresses the need for connection and affiliation; for youth living alone, anthropomorphic designs may offer a sense of emotional companionship and enhance positive affect. Empirical evidence suggests that individuals experiencing loneliness are more likely to anthropomorphize and respond favourably to such designs (Dang & Liu, 2023). Heightened needs for belonging and loneliness reduction further increase the tendency to seek anthropomorphic cues, allowing inanimate objects to fulfil social connection needs (Khan et al., 2023). Thus, anthropomorphizing products reflects fundamental human needs for understanding, connection, and belonging.

In addition, schema-based and congruity-oriented perspectives suggest that anthropomorphic cues activate pre-existing "human schemas" within consumers' cognitive structures, thereby shaping emotional and behavioural responses (Hur, Kim, & Park, 2022). Packaging functions as a silent salesman, with visual and verbal elements serving as key anthropomorphic cues. Common manifestations include human-like structural forms (Kwak, Puzakova, & Rocereto, 2021), playful facial expressions (Hur et al., 2022), and humorous first-person language (Ding et al., 2021). These cues can trigger anthropomorphic tendencies, influencing emotional experience and perceptual processing (Tian et al., 2025).

Prior studies consistently show that, compared to non-anthropomorphic packaging, anthropomorphic designs enhance product evaluations (Kwak et al., 2021), purchase intentions (Han et al., 2019), and pro-environmental behaviours such as recycling willingness (Ding et al., 2021). This effect is attributed to stronger emotional connections, whereby consumers perceive products as relational partners rather than purely transactional objects. Visual anthropomorphic cues are particularly effective, as concrete visual information evokes emotional closeness more directly than verbal descriptions, leading to stronger emotional and behavioural responses (Ding et al., 2021).

Building on this theoretical foundation, this study proposes that anthropomorphic packaging, via visual and verbal cues, facilitates emotional interaction between the product and youth living alone, thereby enhancing positive emotional experiences. It is further hypothesized that visual cues are more effective than verbal cues in eliciting these responses. Based on this, three hypotheses (H1, H2, and H3) are proposed.

H1: Anthropomorphic packaging with visual cues significantly enhances the positive emotions of youth living alone compared to non-anthropomorphic packaging.

H2: Anthropomorphic packaging with verbal cues significantly enhances the positive emotions of youth living alone compared to non-anthropomorphic packaging.

H3: Visual cues in anthropomorphic packaging have a stronger effect on the positive emotions of youth living alone than verbal cues.

2.2 Positive *Empathy*

Empathy refers to the ability to understand and share another individual's emotional experience and is conceptualised as both a stable dispositional trait and a context-dependent situational response (Zaki, Knutson, & Wager, 2020). It comprises cognitive empathy, involving recognition of others' emotions and intentions, and affective empathy, involving emotional sharing. Empathy arises from

emotional resonance and compassionate concern, with expression shaped by situational factors such as the valence of the target emotion (Morelli & Lieberman, 2021; Depow et al., 2023). While earlier research focused primarily on empathy for negative emotions, recent studies indicate that such empathy may increase emotional burden for the empathizer (Depow et al., 2023). In contrast, empathy for positive emotions enhances shared positive affect, relational bonds, and subjective well-being (Zaki et al., 2020; Morelli & Lieberman, 2021). The innermost layer of empathic cognition is emotional contagion, a basic and unconscious process of affective resonance and spontaneous simulation. This process can be explained by contemporary extensions of the Perception–Action Model (PAM), which propose that observing others' behaviours or emotional expressions activates corresponding affective or motor representations in the observer, producing congruent emotional responses (Zaki, Knutson, & Wager, 2020). In positive empathy, perceivers experience emotions congruent with the target, engaging brain regions linked to positive affect, such as the ventromedial prefrontal cortex (Morelli & Lieberman, 2021).For youth living alone, anthropomorphic packaging can elicit such contagion via visual and verbal cues, enabling indirect emotional sharing. This foundation supports higher-order processes, including transpersonal thinking and self–other differentiation, which promote internalization and self-regulation.

Anthropomorphizing non-human objects by assigning human traits enhances their perceived agency (Puzakova et al., 2022). Packaging that incorporates human-like features, such as facial expressions, gestures, or emotional cues, can evoke empathy. Thus, anthropomorphizing soft drink packaging is expected to enhance human likeness, elicit empathy, and increase positive emotions among youth living alone. Accordingly, H4 is proposed.

In addition, empathy involves recognizing the needs of others, which requires perceiving them as conscious agents (Depow et al., 2023). Anthropomorphism, the attribution of human characteristics to non-human objects, facilitates this perception (Puzakova et al., 2022). Packaging that incorporates human-like features such as expressive faces, gestures, or emotional cues can evoke empathy. Therefore, we propose that anthropomorphizing soft drink packaging enhances perceived human-likeness, fosters empathy, and subsequently elicits positive emotions among youth living alone. Thus, we propose H4.

H4: Positive empathy mediates the effects of anthropomorphic design on positive emotions in youth living alone.

3.0 Methodology

This study employed a quantitative experimental design to examine the effects of anthropomorphic features in beverage packaging on positive emotions among youth living alone. A **between-subjects design** was adopted across all experiments to minimise demand characteristics and carryover effects, allowing participants to evaluate only one packaging condition and thus providing a clearer assessment of emotional responses attributable to anthropomorphic cues.Data were collected via Sojump (http://www.sojump.com/), a widely used online survey platform in China comparable to MTurk Prime. **Online sampling was deemed appropriate given the digitally mediated lifestyles of young adults and the study's focus on everyday consumer perceptions**, enabling efficient access to individuals who live alone and frequently engage with packaged consumer products. To ensure linguistic and conceptual equivalence, survey items were developed using a back-translation procedure, and the final questionnaire was administered in Chinese. Informed consent was obtained prior to participation, and all items were set as mandatory to minimise missing data.

3.1 Participants

The target population of this study comprised **youth living alone**, a group identified in prior research as being particularly vulnerable to emotional loneliness and thus more responsive to anthropomorphic stimuli. **Living alone was operationalised as residing without family members or cohabiting partners**, consistent with definitions used in recent loneliness and consumer psychology research. Participants who did not meet this criterion were excluded during the screening stage.

Three experiments were conducted to systematically examine the effects of anthropomorphic packaging and the mediating role of empathy. Experiment 1 compared visual anthropomorphic cues with non-anthropomorphic packaging, Experiment 2 examined verbal anthropomorphic cues, and Experiment 3 directly compared visual and verbal cues. **This sequential experimental structure was designed to isolate cue-specific effects before making direct comparisons**, thereby strengthening internal validity. A total of 117 participants were recruited for Experiment 1 (53% female; M = 27.71, SD = 3.94), 128 participants for Experiment 2 (46.9% female; M = 27.25, SD = 3.83), and 136 participants for Experiment 3 (48.5% female; M = 27.83, SD = 3.58). All participants received appropriate monetary compensation and were randomly assigned to experimental conditions to complete the respective measurement tasks.

3.2 Procedure

A commonly available orange juice packaging was selected as the experimental stimulus. The procedure followed a contemporary anthropomorphic manipulation framework widely adopted in consumer research and aimed to compare consumers' emotional responses toward anthropomorphic versus non-anthropomorphic packaging designs (Khan et al., 2023). Specifically, in the visual anthropomorphic cue condition, the packaging featured a smiling facial expression, bodily gestures, and a human-like structure. In the verbal anthropomorphic cue condition, the product description was written in the first person to convey a sense of personality. In contrast, the non-anthropomorphic condition presented a conventional, function-oriented packaging design without any human-like features. To control for potential confounding variables, all packaging stimuli were standardized in size, color, and image resolution across conditions. After viewing the stimuli, participants completed a questionnaire measuring perceived anthropomorphism, empathy, positive emotion, and demographic information, along with manipulation check items.

3.3 Measures

Anthropomorphic Design. Anthropomorphic perception was measured using four items: "The packaging looks human-like," "The packaging seems to have a mind and consciousness of its own," "The packaging has its own character traits," and "The packaging has feelings just like human beings." The scale demonstrated good internal consistency (Cronbach's α = 0.871).

Positive Emotions. Participants reported their emotional responses using five items, including "The package makes me feel amused," "joyful," "excited," "relaxed," and "satisfied." This scale exhibited excellent internal consistency (Cronbach's α = 0.913).

Empathy. Empathy was assessed using four items: "When looking at the package, I seem to be able to understand what it is feeling," "It is as if I am in the package and experiencing what the package is experiencing," "I seem to be able to immerse myself in the feelings of the package," and "I feel like I am the package." The scale showed acceptable reliability (Cronbach's α = 0.841).

4.0 Findings

In all three studies, anthropomorphic versus non-anthropomorphic design was manipulated as the independent variable, and perceived anthropomorphism was measured as the dependent variable. Independent samples t-tests were conducted to assess the effectiveness of the anthropomorphism manipulation. Results indicated that in Study 1, participants in the anthropomorphic condition reported significantly higher perceived anthropomorphism scores than those in the non-anthropomorphic condition ($M = 3.93$, $SD = 1.09$ vs. $M = 2.73$, $SD = 0.77$; $t(116) = –6.94$, $p < 0.001$, $d = 1.34$). Similarly, in Study 2, anthropomorphic packaging was rated significantly higher in human-likeness ($M = 3.98$, $SD = 0.58$) than the control condition ($M = 2.81$, $SD = 1.05$; $t(127) = –6.97$, $p < 0.001$, $d = 1.27$). Study 3 further replicated this effect, with significantly higher ratings in the anthropomorphic condition ($M = 4.14$, $SD = 0.44$) compared to the non-anthropomorphic condition ($M = 2.39$, $SD = 0.92$; $t(58) = –8.54$, $p < 0.01$, $d = 2.42$). These findings collectively confirm the effectiveness of the anthropomorphic manipulation.

To further examine the effect of anthropomorphic design on positive emotions among young adults living alone, an independent samples t-test conducted in Study 1 revealed that participants exposed to the anthropomorphic condition reported significantly higher positive emotion scores ($M = 4.316$, $SD = 0.381$) than those in the non-anthropomorphic condition ($M = 2.375$, $SD = 0.901$; $t(116) = –14.053$, $p < 0.001$, $d = 2.802$), supporting H1. Regarding empathic responses, participants in the anthropomorphic condition also reported significantly higher levels of empathy ($M = 4.196$, $SD = 0.489$) compared to the non-anthropomorphic group ($M = 2.969$, $SD = 1.128$; $t(116) = –7.086$, $p < 0.001$, $d = 1.411$). Moreover, a mediation analysis using the bootstrap method (Hayes, 2013; Zhao et al., 2010) indicated a significant indirect effect of empathy in this pathway (see Fig. 1), thus supporting H1 and H4.

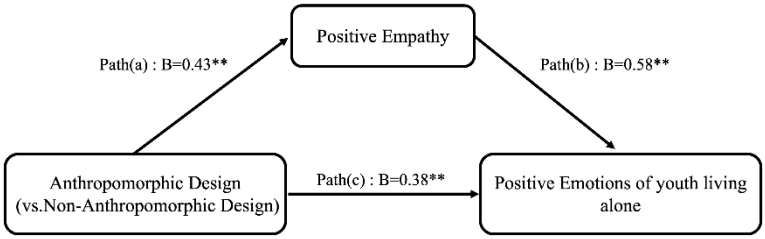

Fig. 1: Mediation analysis in study 1
(Source: Created by the authors)

Study 2 also employed an independent sample t-test. Results showed that participants in the anthropomorphic condition reported significantly higher levels of positive emotion ($M = 4.249$, $SD = 0.466$) than those in the non-anthropomorphic condition ($M = 2.531$, $SD = 0.959$; $t(127) = –12.392$, $p < 0.001$, $d = 2.278$), thereby supporting H2. Similarly, empathy scores were significantly higher in the anthropomorphic condition ($M = 4.120$, $SD = 0.575$) compared to the non-anthropomorphic condition ($M = 3.105$, $SD = 1.116$; $t(116) = –6.612$, $p < 0.001$, $d = 1.144$).

Furthermore, a mediation analysis using the bootstrap method was conducted to examine the mediating role of empathy in the relationship between anthropomorphic design and positive emotion. The analysis revealed a significant indirect effect of anthropomorphism on positive emotion via enhanced empathy (see Fig. 2), providing further support for H4.

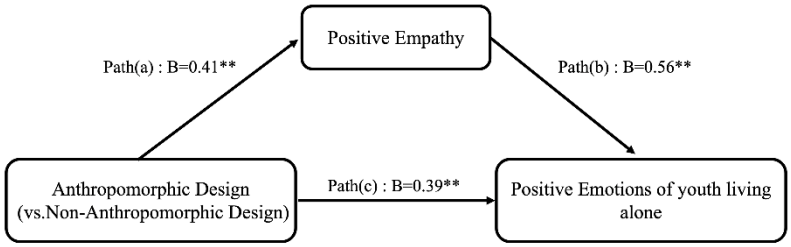

Fig. 2: Mediation analysis in study 2
(Source: Created by the authors)

Study 3 employed a one-way analysis of variance (ANOVA) to compare the effects of visual versus verbal anthropomorphic cues on positive emotion and empathy among young adults living alone. Results indicated that participants in the visual cue condition reported significantly higher levels of empathy than those in the verbal cue condition ($M = 4.010$, $SD = 0.717$ vs. $M = 3.470$, $SD = 1.073$; $F(1, 134) = 10.280$, $p < 0.01$), demonstrating the superior effectiveness of visual anthropomorphic cues in eliciting empathic responses. Similarly, positive emotion scores were significantly higher in the visual cue condition ($M = 4.100$, $SD = 0.788$) compared to the verbal cue condition ($M = 3.074$, $SD = 1.185$; $F(1, 134) = 30.585$, $p < 0.01$), suggesting that visual anthropomorphism is more effective in eliciting positive emotional reactions. These findings provide further support for H3.

5.0 Discussion

Despite the practical relevance of anthropomorphic packaging as an emotion-enhancing strategy, its application is subject to several constraints and sources of heterogeneity. Youth living alone do not constitute a uniform consumer group; individual differences in loneliness severity, emotional sensitivity, cultural background, and anthropomorphic tendency may moderate responses to human-like packaging cues. For instance, while some individuals may perceive anthropomorphic designs as emotionally supportive, others may regard them as artificial, intrusive, or inauthentic, potentially reducing their effectiveness. In addition, excessive or poorly executed anthropomorphism may lead to negative reactions such as discomfort or scepticism, particularly in utilitarian consumption contexts. Practical implementation is also constrained by brand identity, production costs, and cultural norms that shape acceptable degrees of human likeness in packaging. Therefore, anthropomorphic strategies should be applied selectively and contextually, with careful consideration of target audience characteristics and design appropriateness rather than as a one-size-fits-all solution.

Findings from Study 1 indicate that when soft drink packaging adopts anthropomorphic design with visual cues, young adults living alone report significantly higher levels of positive emotion compared to those exposed to standard packaging. Moreover, empathy was found to mediate the relationship between anthropomorphic design and positive emotion, suggesting that visual anthropomorphism not only enhances emotional experience directly but also exerts an indirect effect through affective mechanisms. This finding extends the application of anthropomorphic design within the empathy framework and highlights its potential value in improving the emotional well-being of individuals living alone.

Study 2 further demonstrated that anthropomorphic designs employing first-person language elicited stronger positive emotional responses among solitary young adults compared to those using third-person descriptions. The mediating role of empathy was again confirmed. These results underscore the effectiveness of verbal cues in activating emotional responses and broaden the theoretical boundaries of existing research on anthropomorphic product design by highlighting its impact on consumer preference and willingness to pay.

Study 3 further revealed that visual cues were more effective than verbal cues in enhancing positive emotions among youth living alone. This effect may stem from the greater immediacy and perceptual concreteness of visual information, which more effectively elicits emotional responses and empathy. These findings extend the literature on anthropomorphic cue types and offer theoretical guidance for choosing between visual and verbal strategies in anthropomorphic design.

6.0 Conclusion & Recommendations

This study demonstrates that anthropomorphic packaging can enhance positive emotions among youth living alone, with empathy serving as a key mediating mechanism. From a practical perspective, the findings suggest that anthropomorphic design strategies should be tailored through systematic consumer segmentation, such as differences in living arrangements, emotional sensitivity, or anthropomorphic tendency. Practitioners may operationalise such tailoring by employing pre-design testing methods, including A/B visual experiments, emotion-rating scales, or empathy-based screening, to identify optimal levels and forms of anthropomorphic cues before market implementation.

For future research, several directions are recommended with clearer methodological pathways. First, studies may extend the current framework to other product categories (e.g., household goods or personal care products) by replicating the experimental design using category-specific stimuli. Second, the combined effects of visual, verbal, and structural anthropomorphic cues can be examined using factorial experimental designs to assess interaction effects. Third, longitudinal approaches, such as repeated-measure experiments or diary-based emotion tracking, are recommended to evaluate the durability of anthropomorphism-induced emotional benefits over time. These methodological extensions would strengthen causal inference and broaden the applicability of anthropomorphic design as an emotion-regulation strategy.

Acknowledgement

Not applicable.

Paper Contribution to Related Field of Study

This study contributes to environment–behaviour and design research by reframing anthropomorphic packaging as an affective element within everyday consumption environments. It advances a mechanism-based understanding by integrating anthropomorphism with positive empathy and emotional contagion perspectives. Empirically, it addresses youth living alone as an underexplored population

and provides comparative evidence on the emotional effectiveness of visual versus verbal anthropomorphic cues, offering theoretically grounded insights for both design research and applied packaging practice.

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