

From Oldie to Goldie: Humanizing Old Produce Enhances Its Appeal

MINKYUNG KOO, HYEWON OH, AND VANESSA M. PATRICK

ABSTRACT Worldwide food waste amounts to approximately 1.3 billion tons every year. The desire for perfection (fresh and unblemished) in produce has been identified as one of the key reasons underlying this immense waste. This article identifies the need to shape consumer's aesthetic preference for perfect produce to increase the acceptance of old and imperfect produce. We suggest that when old produce is humanized, it is evaluated more favorably, since it leads consumers to evaluate the old produce with a more compassionate lens. Four experiments show that (1) humanizing old produce enhances evaluation and purchase intent, and (2) consumer lay beliefs about human aging (an "old is gold" vs. a "young is good" lay theory) can influence the effectiveness of humanizing old produce to enhance its appeal. The current work offers practical managerial implications for retailers and marketers about the transformative potential of aesthetics in helping reduce food waste.

Wabi-sabi is a centuries-old Japanese design aesthetic that honors the imperfections of aging and the inevitable passage of time. This "Japanese rustic" aesthetic, attributed to sixteenth-century tea master Sen no Rikyu, reveres the nuances that come with change, maturation, and growing old. The term wabi-sabi is the combination of two words: "wabi," which refers to simplicity, humility, and living in tune with nature, and "sabi," which refers to the natural transformations that occur with the passage of time (Saito 2007). The wabi-sabi aesthetic thus embraces transience—the natural cycle of growth, death, and the imperfections that accompany that progression.

Consumers appreciate aesthetic transience in some objects and consumption environments. For instance, contemporary consumers are increasingly drawn to old artworks and antiquities (Hsiao 2015). Similarly, an aged aesthetic in homes such as the use of distressed wood for flooring has become a popular choice. Eric Wind of Christie's auction house notes this trend when he observes "One of the most interesting evolutions in vintage watch collecting has been the desire to move away from watches that have been restored and polished to look 'like new' in favor of watches in original

condition with honest patina. Nicks, scratches, and fading that may have developed over the course of decades of wear can enhance a watch's desirability" (Christie's 2018). Modern consumers may have begun to adopt the wabi-sabi mindset of "old is gold."

However, this is not the case in all consumption domains. A shabby couch is often replaced rather than being reupholstered, and a torn shirt is thrown away instead of being repaired. Admittedly, in a lot of cases, this constitutes waste of a perfectly usable item, but no waste is more prevalent and pervasive than that of fresh produce. It is estimated that approximately 1.3 billion tons of food is lost or wasted every year worldwide (FAO 2011), which is equivalent to 24% of all food calories produced for human consumption (Lipinski et al. 2013). Fruit and vegetables are among the most wasted foods, often avoided by consumers when they fail to meet market standards in terms of appearance and freshness even when they are perfectly safe to consume (Aubrey 2015; Loebnitz and Grunert 2015). Indeed, consumers often reject produce based on visual signs of aging, making the aesthetic evaluation of produce as old (not fresh) one of the key reasons for this immense food waste (Porpino 2016).

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Consumers discard produce when they observe damage from mishandling or evidence of spoilage that might render the food inedible. This decision to waste is based on functional considerations regarding the compromised nutritional value (Rickman, Barrett, and Bruhn 2007), quality, or remaining shelf life of the food. However, aesthetic cues can also have a significant impact on consumers' disposal decisions (Huang et al. 2019). Produce, especially, may be abandoned for purely aesthetic reasons based on slight visual imperfections that result in the produce not meeting market standards of visual appeal (e.g., a lopsided tomato) or freshness (e.g., a banana with minor blemishes). In this case, perfectly edible food is discarded simply because it does not look good. In this article, we focus on this latter category of "food wastage," wastage of edible foods stemming from visual evidence of aging. In extreme cases, produce may elicit a feeling of disgust with the pronounced aging process and its associated visual signs of imperfections. However, the focus of our research is on the old produce that shows signs of aging, but appears edible and benign. Indeed, finding ways to solve the problem of food waste is so critical that the United Nations (2014) has placed it on their global agenda as one of the 17 sustainable development goals for the period 2015–30. The UN goal is by 2030 to "halve per capita global food waste at the retail and consumer level." The purpose of the current research is to help solve this problem by using the transformative potential of aesthetics to shape consumer preferences to increase the acceptance and appeal of old produce.

We approached this compelling issue by adopting a "wabi-sabi" lens to identify a means by which consumers might see old, and consequently imperfect-looking, produce as more appealing. We propose that generating positive sentiments, such as feelings of warmth and compassion, in association with the natural process of aging might result in old produce being seen in a more favorable light. Consequently, we suggest that humanizing old produce might enhance its appeal by making salient the natural process of aging in human beings (MacInnis and Folkes 2017). We suggest that making human aging salient might result in old produce being evaluated with a warmer and more compassionate lens (Chandler and Schwarz 2010; Zhou, Kim, and Wang 2019). We further demonstrate that consumers rely on prevalent lay theories regarding (human) aging to evaluate old (vs. fresh) produce. We find that when consumers hold a wabi-sabi or "old is gold" mind-set, the appeal of humanized old produce is enhanced, but if a "young is good" mind-set is made salient, the appeal of old produce, even though humanized, is diminished.

The current work makes three theoretical contributions. First, we contribute insights for the transformative potential of aesthetics in everyday life by examining how visual aesthetics can enhance the evaluation of older products, in line with wabi-sabi's spirit of accepting aging as a natural growth process. We show that humanizing old produce is one way to reduce food waste. This transformative potential of aesthetics is germane to the goals of this special issue.

Second, from a theoretical perspective, the research sheds light on how aesthetic preferences can be shaped (Patrick 2016). We propose that generating positive associations with the process of aging might be an effective means by which to alter existing aesthetic preferences. The insight that humanizing old produce makes the consumer's own humanity salient and activates a compassionate lens in evaluating other old, humanized products makes an important theoretical contribution on how aesthetic preferences might be shaped. Further, although the effect of anthropomorphism is well documented across a variety of nonhuman objects, the present research highlights produce as a viable domain in which humanization can impact consumer perceptions (MacInnis and Folkes 2017), particularly in regard to the aging process.

Finally, based on the similarities between aging in humans and aging of produce, the current work demonstrates how the consumer lay theories of aging (either "old [or young] is good") in human perception can be transferred to a seemingly unrelated domain—food evaluation—when the produce is anthropomorphized. As such, we contribute to prior literature on how people apply lay theories involving human perception to comprehend anthropomorphized products (Wan, Chen, and Jin 2017).

The findings of this research offer practical insight into how marketers can increase the shelf life and acceptability of produce, particularly as products age. Given the far-reaching impact of food waste on food security (Van Doorn 2016), food production and the environment (FAO 2013), and the preservation of our ecosystems and climate change (FAO 2011), research on reducing food waste is becoming increasingly important (Porpino 2016). Our findings reveal a novel use of anthropomorphization that can help address this critical issue.

THEORETICAL BACKGROUND AND HYPOTHESES

Aesthetics of Perfection and Imperfection

Perfection in aesthetics is often translated into meeting the standards of beauty established by society. The pervasive notion that "what is beautiful is good" (Dion, Berscheid,

and Walster 1972; Eagly et al. 1991) often colors the consumer's evaluation of people, places, and objects, while shaping their choices. This "beauty is good" stereotype results in physically attractive individuals being seen as more socially desirable, able to secure better occupational status, and to enjoy more fulfilling lives (Dion et al. 1972).

A strong preference toward aesthetic perfection influences consumers' perceptions of products and has a significant impact on consumers' reactions to marketers' offerings (Bloch 1995; Patrick 2016). Prior work has shown that aesthetic considerations influence consumer preferences (Liu et al. 2017; Mourey and Elder 2019), perceived tastiness/healthiness of products (Schnurr 2019), purchase behavior (Patrick and Hagtvedt 2011), financial decision making (Townsend and Shu 2010), and consumption enjoyment (Wu et al. 2017). Germane to the current research is the finding that aesthetically unappealing (vs. appealing) produce decreases consumers' willingness to pay because they believe the consumption of unattractive produce negatively affects how they view themselves (Grewal et al. 2019).

Food, particularly produce, is an important category of consumer products where the pursuit of aesthetic perfection is pronounced primarily due to its aging process. Aesthetic perfection is a critical factor shaping consumers' attitudes toward produce because produce is often displayed without packaging or in transparent bags (Deng and Srinivasan 2013). Consumers are thus able to easily notice changes in visual appearance of produce particularly because the natural aging process is readily observable. Most consumers prefer fresh produce, leading to the massive wastage of discarded fruit and vegetables that are perfectly safe to consume but simply do not meet aesthetic standards (Aubrey 2015; Loebnitz and Grunert 2015).

We propose humanizing old produce as a means by which the aesthetic preferences for perfection and beauty (in produce) might be shaped to increase the acceptability of age and imperfection, to help resolve the food waste issue, and also to impact the retailer's bottom line. Prior research finds that when products are humanized, consumers evaluate them more favorably, particularly when the humanlike features are congruent with a human schema (Aggarwal and McGill 2007), feel more strongly attached to them (Zhang and Patrick 2018), and are less willing to replace them (Chandler and Schwarz 2010). Building on this prior research, we surmise that when consumers evaluate old humanized produce, a set of positive traits associated with the natural process of human aging may become salient that can result in a warmer, more compassionate lens by which old produce is evaluated.

Humanizing Old Produce

The current research examines anthropomorphism as one way to mitigate the negative perception of old yet still edible and healthy produce. Anthropomorphism refers to the attribution of humanlike properties, characteristics, or emotions to nonhuman agents or objects (Epley, Waytz, and Cacioppo 2007), thus imbuing them with a sense of being alive. Although prior research has explored a wide range of consequences of anthropomorphism, the findings have centered around consequences that flow from different consumer characteristics such as how lonely (Chen, Wan, and Levy 2017; Mourey, Olson, and Yoon 2017) or how powerful (Kim and McGill 2011) they are. Moreover, research exploring the features of consumer products has examined how different product design elements such as shape or form alter the effect of anthropomorphism (Aggarwal and McGill 2007; Landwehr, McGill, and Herrmann 2011; Newman 2018) and how the match between product features and consumers' moods and motivations influence consumer preferences (Labroo and Patrick 2008; Awad and Youn 2018; Wan 2018). Recent research demonstrates the consequences of anthropomorphism on consumer well-being such that anthropomorphizing a product can enhance consumers' sense of vitality and subsequently their self-control (Chen, Sengupta, and Adaval 2018). However, to the best of our knowledge, no research has likened the transience, aging, or the changes in the nature of a product over time, to that of human aging.

Indeed, anthropomorphism of old produce has face validity since some foods do reflect humanlike characteristics of aging. Fresh produce ages quickly, enabling consumers to infer a sense of life and vitality that decreases over time with distinct changes in appearance, such as increasing wrinkles or dark spots. In other words, produce shows visual signs of aging very much like humans do. We thus investigate whether this aging aspect of produce acts as a contingent condition for the effect of anthropomorphism on consumer evaluation of the produce.

Drawing on theories of anthropomorphization, we expect that old produce that is humanized will be evaluated more favorably. Since anthropomorphization can result in a product being evaluated with greater warmth (Zhou et al. 2019), compassion (Chandler and Schwarz 2010), and tenderness (Wang, Mukhopadhyay, and Patrick 2017), we theorize that when old produce is humanized, consumers adopt a more compassionate lens and thus evaluate it more favorably. Since fresh produce is perceived as superior to aged produce in terms of both functional (quality, shelf life, etc.) and aesthetic considerations, there is little room for

improvement in the evaluation of fresh produce. As such, we expect that old produce will benefit more from humanization than produce that is fresh.

Formally, we hypothesize:

H1: Consumers are likely to evaluate old produce more positively when it is humanized than when it is not, while the evaluation of fresh produce (humanized or not) will remain unaffected.

H2: Evoked warmth mediates the effect of humanizing old produce on evaluation.

In the two studies that follow, we demonstrate our focal effect—the interaction between anthropomorphism and freshness of produce on consumer evaluation. Study 1 demonstrates that consumers enhance their evaluation of anthropomorphized produce, but only when the produce is old (vs. fresh; hypothesis 1). Study 2 replicates the findings of study 1 using different stimuli and provides some evidence that old produce that is humanized is evaluated with enhanced feelings of warmth and compassion.

STUDY 1: HUMANIZING OLD PRODUCE ENHANCES ITS APPEAL

Method

Participants and Design. Three hundred participants were recruited online using the Amazon Mechanical Turk website

for monetary compensation ($M_{\text{age}} = 35.48$, $SD = 11.20$). The study used a 2 (anthropomorphism: anthropomorphized vs. control) \times 2 (freshness: old vs. fresh) between-subjects design.

Procedure and Measures. Participants imagined a grocery store situation where they found a placard showing cucumbers along with other food products in the store. Participants were either shown an image of an anthropomorphized or control cucumber, which was either fresh or old (fig. 1). In addition, for the old condition, we explicitly modified the slices to look more weathered than those in the fresh condition. The cucumbers were humanized by arranging the elements to visually resemble a human face (Hur, Koo, and Hofmann 2015; Kim, Chen, and Zhang 2016) with a neutral facial expression (to avoid evoking positive or negative emotion with the stimuli). Participants evaluated the image by indicating the extent to which they thought the cucumber was desirable, favorable, and positive using the 7-point scales (1 = undesirable, 7 = desirable; 1 = unfavorable, 7 = favorable; 1 = negative, 7 = positive; $\alpha = .95$).

As a manipulation check of produce freshness, we asked participants to rate the cucumber on two dimensions (fresh, old [reverse-coded]; $\alpha = .84$) on a 7-star scale with more stars indicating a higher rating. To test the effectiveness of the anthropomorphism manipulation, we asked participants to rate to what extent the cucumber reminded them of humanlike features on a 7-point scale (1 = not at all,

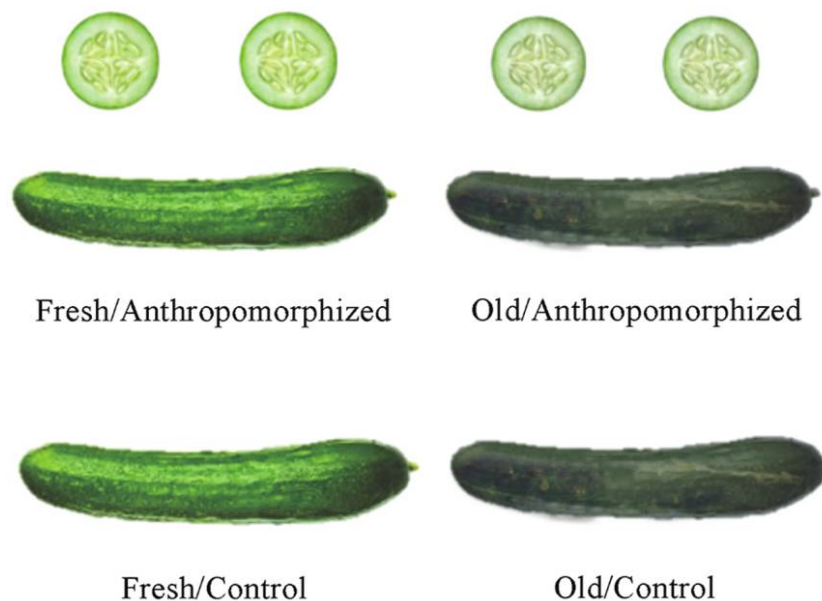


Figure 1. Study 1: Cucumber stimuli.

7 = extremely). To account for familiarity and existing preference for certain types of cucumbers, we asked participants to indicate how often they bought cucumbers (1 = very rarely, 7 = very often) and the type of cucumbers they usually bought (1 = a fresh cucumber image, 7 = an old cucumber image), respectively. The results with these two variables as covariates were reported in appendix A (apps. A–C are available online). Finally, participants answered demographic questions and were debriefed.

Results and Discussion

Manipulation Checks. Confirming the success of both the freshness and anthropomorphism manipulations, a one-way ANOVA on perceived freshness and anthropomorphism each showed that participants perceived fresh cucumbers as fresher than old cucumbers ($M_{\text{fresh}} = 5.96$, $SD = 1.02$ vs. $M_{\text{old}} = 4.46$, $SD = 1.66$; $F(1, 298) = 87.73$, $p < .001$, $\eta^2 = .23$) and anthropomorphized cucumbers as more humanlike than nonanthropomorphized cucumbers ($M_{\text{anthro}} = 4.71$, $SD = 2.05$ vs. $M_{\text{control}} = 2.84$, $SD = 1.84$; $F(1, 298) = 67.23$, $p < .001$, $\eta^2 = .23$). In a separate posttest, we ensured that the slices in the two conditions differed in terms of perceived freshness. On a 7-point scale ($-3 = \text{not fresh at all}$; $3 = \text{very fresh}$), the cucumber stimulus in the fresh condition scored significantly higher above the midpoint ($M = 1.76$, $SD = 1.20$, $t(241) = 22.85$, $p < .001$), whereas those in the old condition scored below the midpoint ($M = -0.14$, $SD = 1.64$, $t(241) = -1.29$, $p = .198$), although this difference did not reach significance.

Produce Evaluation. A 2 (anthropomorphism: anthropomorphized vs. control) \times 2 (freshness: old vs. fresh) ANOVA revealed a marginally significant interaction for product evaluation ($F(1, 296) = 3.58$, $p = .06$, $\eta_p^2 = .01$; see fig. 2) supporting hypothesis 1. Participants who saw the placard with an anthropomorphized old cucumber reported the cucumber to be more desirable, favorable, and positive than participants who saw the placard with the old/control cucumber ($M_{\text{anthro}} = 4.49$, $SE = 0.17$ vs. $M_{\text{control}} = 3.70$, $SE = 0.17$; $F(1, 296) = 10.97$, $p = .001$, $\eta_p^2 = .04$). There was no impact of anthropomorphism on the fresh cucumbers ($M_{\text{anthro}} = 5.73$, $SE = 0.17$ vs. $M_{\text{control}} = 5.58$, $SE = 0.17$; $F(1, 296) = 0.39$, $p = .534$). As expected, the analysis also revealed a significant main effect of freshness, suggesting that consumers prefer fresh produce to old produce ($M_{\text{fresh}} = 5.65$, $SE = 0.12$ vs. $M_{\text{old}} = 4.10$, $SE = 0.12$; $F(1, 296) = 85.90$, $p < .001$, $\eta_p^2 = .23$) and a main effect of anthropomorphism

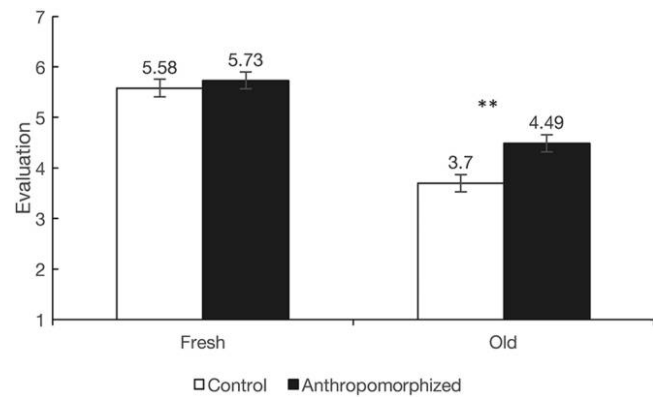


Figure 2. Study 1: Consumer evaluation of produce as a function of anthropomorphism and freshness (** $p < .01$).

($M_{\text{anthro}} = 5.11$, $SE = 0.12$ vs. $M_{\text{control}} = 4.64$, $SE = 0.12$; $F(1, 296) = 7.70$, $p = .006$, $\eta_p^2 = .03$), replicating previous research on the positive effects of anthropomorphization. We also note that although the main effect of anthropomorphism was significant, the significant interaction between anthropomorphism and freshness suggests that it was driven by its impact on old, not fresh, produce.

In the next study, we replicated the impact of anthropomorphism on old produce with a different food product and examined the underlying process.

STUDY 2: THE MEDIATING ROLE OF WARM FEELINGS

The objective of study 2 was twofold. First, we replicate the findings of study 1 using a different manipulation of anthropomorphization in which the target produce (banana) was seen engaging in a typical human activity, sunbathing at the beach, which has been shown by prior research to anthropomorphize by increasing human schema accessibility (Puzakova, Kwak, and Rocereto 2013). Second, we had proposed that one reason why humanizing old produce results in a more favorable evaluation is because the implied association of being human induces a more compassionate lens for the evaluation of old produce. In this study we provide some evidence for this underlying process, by implicating warm feelings as a factor that helps explain the effect of anthropomorphizing old produce on evaluation.

Method

Participants and Design. Three hundred fifty-five participants were recruited online using the Amazon Mechanical Turk website for monetary compensation ($M_{\text{age}} = 36.90$, $SD = 12.26$; 56.3% female). Participants were randomly

assigned to one of four conditions in a 2 (anthropomorphism: anthropomorphized vs. control) \times 2 (freshness: old vs. fresh) between-subjects design.

Procedure and Measures. Using a similar setup to that in study 1, participants were either shown an image of an anthropomorphized or control banana, which was either fresh or old. The banana was anthropomorphized by making it appear as if it were sunbathing on a beach chair wearing a hat (fig. 3). Both conditions used the same visual elements except that the banana and the hat were placed on the ground instead of a chair in the control condition. A pretest of the advertisements used ensured that the ads did not differ in visual appeal, eliminating visual appeal as a possible mechanism underlying the hypothesized effect. Specifically, the

pretest ($n = 163$) found that the stimuli in both anthropomorphized and control conditions were equally visually appealing ($M_{\text{anthro}} = 4.81$, $SD = 1.70$ vs. $M_{\text{control}} = 4.69$, $SD = 1.86$; $F(1, 161) = 0.19$, $p = .664$). Participants evaluated the produce on a five-item scale (1 = undesirable, 7 = desirable; 1 = unfavorable, 7 = favorable; 1 = negative, 7 = positive; 1 = bad, 7 = good; 1 = not tasty, 7 = tasty; $\alpha = .94$). To capture the mechanism underlying the hypothesized effect, they then indicated to what extent they felt warmth toward the banana they saw depicted (1 = not at all, 7 = very much).

The manipulation check for produce freshness ($\alpha = .70$) was identical to study 1. The anthropomorphism manipulation check assessed six items (e.g., look human, have human elements; 1 = not at all, 7 = very much; $\alpha = .93$).

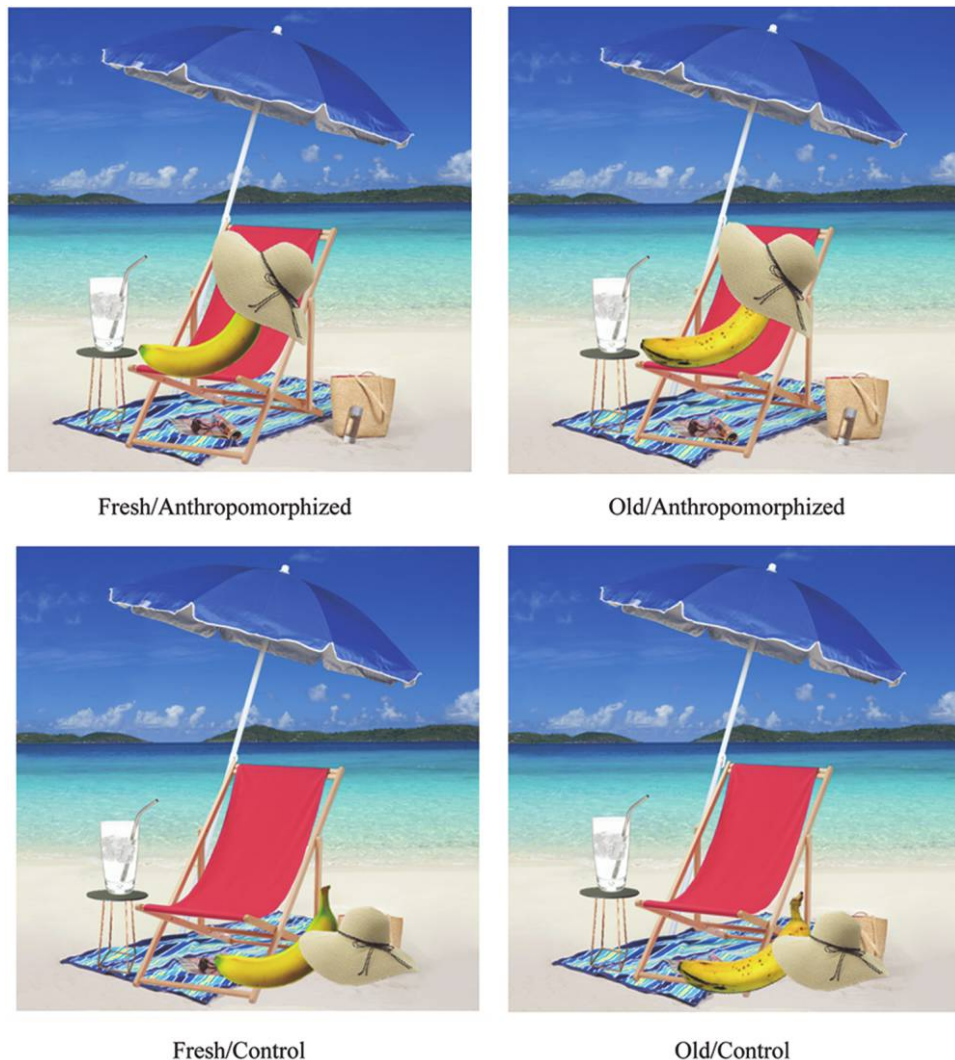


Figure 3. Study 2: Banana advertisements.

To control for familiarity and any existing preference for certain types of bananas, we asked participants to indicate how often they bought bananas (1 = very rarely, 7 = very often) and the type of bananas they usually bought (1 = fresh bananas, 7 = old bananas). The covariates did not affect the results and are not discussed further. Finally, participants answered demographic questions and were debriefed.

Results and Discussion

Manipulation Checks. Confirming the success of both the freshness and anthropomorphism manipulations, a one-way ANOVA on perceived freshness and anthropomorphism each showed that participants perceived fresh bananas as fresher than old bananas ($M_{\text{fresh}} = 6.01, SD = 1.49$ vs. $M_{\text{old}} = 4.27, SD = 1.13; F(1, 353) = 153.57, p < .001, \eta^2 = .30$), and perceived anthropomorphized bananas as more humanlike than the nonanthropomorphized ones ($M_{\text{anthro}} = 3.20, SD = 1.66$ vs. $M_{\text{control}} = 2.04, SD = 1.46; F(1, 353) = 48.42, p < .001, \eta^2 = .12$).

Produce Evaluation. As expected and replicating the results of study 1, a 2 (anthropomorphism: anthropomorphized vs. control) \times 2 (freshness: old vs. fresh) ANOVA on product evaluation revealed a significant interaction between anthropomorphism and freshness ($F(1, 351) = 6.03, p = .015, \eta_p^2 = .02$; see fig. 4). Participants who saw the ad with the anthropomorphized old banana evaluated the produce more positively than those who saw an ad with a non-anthropomorphized old banana ($M_{\text{anthro}} = 4.82, SE = 0.15$ vs. $M_{\text{control}} = 3.92, SE = 0.15; F(1, 351) = 17.14, p < .001, \eta_p^2 = .05$). Again, anthropomorphizing did not alter the evaluation of the fresh banana ($M_{\text{anthro}} = 4.80, SE = 0.15$ vs.

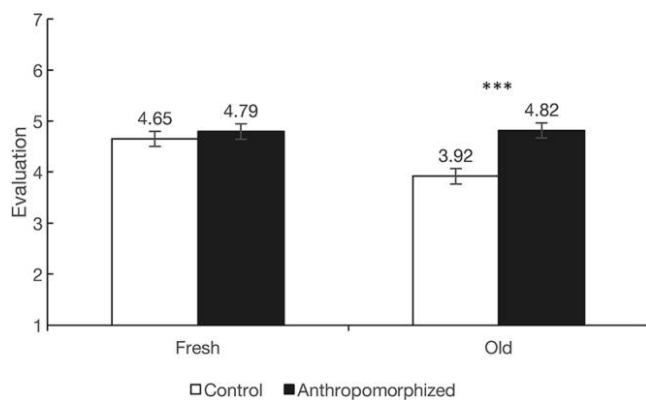


Figure 4. Study 2: Consumer evaluation of produce as a function of anthropomorphism and freshness (** $p < .001$).

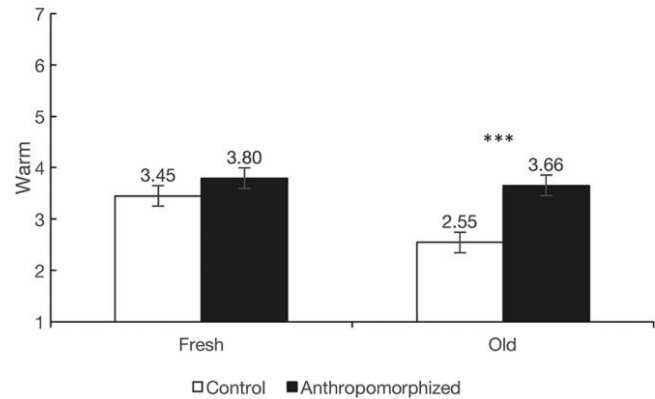


Figure 5. Study 2: Warm feelings as a function of anthropomorphism and freshness (** $p < .001$).

$M_{\text{control}} = 4.65, SE = 0.15; F(1, 351) = 0.44, p = .510$). We also found the same significant main effect of freshness ($M_{\text{fresh}} = 4.72, SE = 0.11$ vs. $M_{\text{old}} = 4.37, SE = 0.11; F(1, 351) = 5.34, p = .021, \eta_p^2 = .02$) and anthropomorphism ($M_{\text{anthro}} = 4.81, SE = 0.11$ vs. $M_{\text{control}} = 4.29, SE = 0.11; F(1, 351) = 11.50, p = .001, \eta_p^2 = .03$) as in study 1.

Warm Feelings. To test whether the effect of anthropomorphism on perceived warmth was moderated by freshness of produce, we conducted a 2 (anthropomorphism: anthropomorphized vs. control) \times 2 (freshness: old vs. fresh) ANOVA on perceived warmth. The analysis revealed a marginally significant interaction between anthropomorphism and freshness ($F(1, 351) = 3.64, p = .057, \eta_p^2 = .01$; see fig. 5). The ad with an anthropomorphized old banana evoked enhanced feelings of warmth than the ad with the nonanthropomorphized old banana ($M_{\text{anthro}} = 3.66, SE = 0.20$ vs. $M_{\text{control}} = 2.55, SE = 0.20; F(1, 351) = 15.42, p < .001, \eta_p^2 = .04$). There was no difference in the ads featuring the fresh banana ($M_{\text{anthro}} = 3.80, SE = 0.20$ vs. $M_{\text{control}} = 3.45, SE = 0.20; F(1, 351) = 1.49, p = .223$). The results did reveal a significant main effect of anthropomorphism ($M_{\text{anthro}} = 3.73, SE = 0.14$ vs. $M_{\text{control}} = 3.00, SE = 0.14; F(1, 351) = 13.23, p < .001, \eta_p^2 = .04$) and freshness ($M_{\text{fresh}} = 3.62, SE = 0.14$ vs. $M_{\text{old}} = 3.10, SE = 0.14; F(1, 351) = 6.80, p = .01, \eta_p^2 = .02$) on warm feelings. Germane to our research is the idea that the old anthropomorphized produce evokes enhanced warm feelings than control/old produce, which may help explain the effect on evaluation.

Mediating Role of Warm Feelings. To test whether the effect of anthropomorphism on the enhanced evaluation of old (vs. fresh) produce may be driven by the feeling of warmth

evoked by anthropomorphizing old produce, we conducted a moderated mediation analysis, using bootstrapping with repeated extraction of 5,000 samples (Hayes 2013, model 8; see fig. 6). The analysis included anthropomorphism as the independent variable (0 = control, 1 = anthropomorphized), freshness as the moderator (0 = fresh, 1 = old), the perceived warmth as the mediator, and the evaluation index as the dependent variable. The analysis revealed a significant moderated mediation effect (index = 0.32, SE = 0.17, 95% CI [.0006, .67]) indicating that the indirect effect of anthropomorphism on product evaluation was significant when the banana was old (indirect effect = 0.47, SE = 0.12, 95% CI [.24, .73]), whereas no significant indirect effect appeared when the banana was fresh (indirect effect = 0.15, SE = 0.12, 95% CI [-.08, .40]). The results suggest that the underlying impact of perceived warmth was significant particularly when the banana was old.

The results of study 2 replicated the findings of study 1 and provided further evidence for our hypothesis 1, showing that anthropomorphizing old produce leads to it being evaluated more favorably, whereas this is not the case for fresh produce. Study 2 also provided some initial evidence on the underlying process suggesting that warm feelings associated with old produce could be the driver of this effect. In other words, although fresh produce in general may be superior to old produce in its aesthetic appeal and quality, the evaluation of produce can be much more enhanced when the produce is old as compared to when it is fresh. In the next study, we further examined the underlying process by using an experimental manipulation of warmth following Spencer, Zanna, and Fong (2005).

STUDY 3: DEACTIVATING WARM FEELINGS

Study 3 further tested the underlying mechanism using a moderation-of-process approach. If anthropomorphizing old

produce enhances consumers' evaluation by evoking warm feelings associated with it, then deactivating these feelings should attenuate this positive effect.

Method

Participants and Design. Two hundred fifty participants were recruited online using the Amazon Mechanical Turk website for monetary compensation ($M_{age} = 36.82$, $SD = 11.53$; 60.8% female). Participants were randomly assigned to one of four conditions in a 2 (anthropomorphism: anthropomorphized vs. control) × 2 (warmth: deactivated vs. neutral) between-subjects design.

Procedure and Measures. To deactivate warmth, we used a scrambled sentence task (Srull and Wyer 1979). In the ostensibly first study, participants engaged in a scrambled sentence test. Participants had to rearrange 10 word-groups consisting of five words each and create one grammatically correct sentence for each group, using four out of the five words. In the deactivated warmth condition, participants rearranged word-groups that contained one word intended to decrease warmth (e.g., coldhearted, hatred, unkindness, apathy). The neutral condition was identical to the deactivated warmth condition except that each word related to deactivated warmth was replaced by a neutral word.

In the purportedly second study—described as a market research study—participants were either shown an image of an old banana—either anthropomorphized or not (control). Since the evaluation of fresh produce did not differ as a function of anthropomorphism in study 2, in this study, we focused on old produce. We used the same banana stimuli as those used in study 2. As in the previous studies, participants evaluated the produce on a five-item scale (1 = undesirable, 7 = desirable; 1 = unfavorable, 7 = favorable; 1 = negative, 7 = positive; 1 = bad, 7 = good; 1 = not tasty, 7 = tasty;

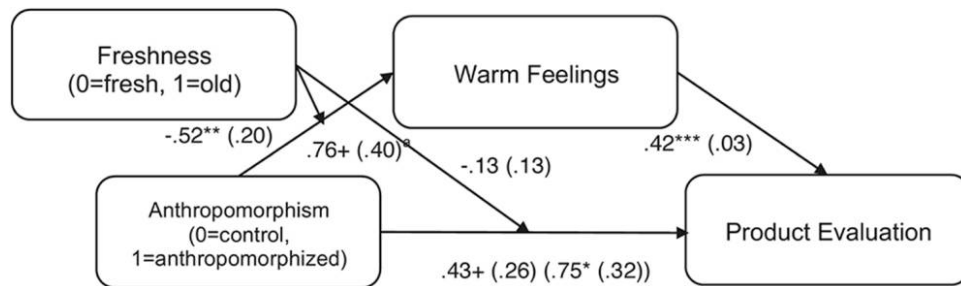


Figure 6. Study 2: Effects of anthropomorphism and freshness on product evaluation through warm feelings (+ $p < .10$, ** $p < .01$, *** $p < .001$; *the effect of anthropomorphism × freshness on warm feelings).

$\alpha = .94$). To control for familiarity and any existing preference for certain types of bananas, we asked participants to indicate how often they bought bananas (1 = very rarely, 7 = very often) and the type of bananas they usually bought (1 = fresh bananas, 7 = old bananas). The covariates did not affect the results and are not discussed further. Finally, participants answered demographic questions and were debriefed.

Results and Discussion

Produce Evaluation. If anthropomorphism enhances the evaluation of old produce by activating warmth, deactivating warmth should attenuate the positive effect of anthropomorphism on evaluation. As predicted by our hypothesis, a 2 (anthropomorphism: anthropomorphized vs. control) \times 2 (warmth: deactivated vs. neutral) ANOVA on product evaluation revealed a significant interaction between anthropomorphism and warmth ($F(1, 246) = 15.16, p = .016, \eta_p^2 = .02$; see fig. 7). Participants who saw the ad with the anthropomorphized old banana evaluated the produce more positively than those who saw an ad with a nonanthropomorphized old banana, but only in the neutral condition ($M_{\text{anthro}} = 4.89, SE = 0.20$ vs. $M_{\text{control}} = 4.02, SE = 0.20$; $F(1, 246) = 9.36, p = .002, \eta_p^2 = .04$). When warmth was deactivated, anthropomorphizing did not influence the evaluation of the banana ($M_{\text{anthro}} = 4.24, SE = 0.22$ vs. $M_{\text{control}} = 4.36, SE = 0.19$; $F(1, 246) = 0.16, p = .692$). We also found a marginally significant main of anthropomorphism ($M_{\text{anthro}} = 4.57, SE = 0.15$ vs. $M_{\text{control}} = 4.19, SE = 0.14$; $F(1, 246) = 3.42, p = .066, \eta_p^2 = .01$). There was no significant main effect of warmth ($p = .437$).

Consistent with the findings of study 2, the results revealed that when warm feelings were deactivated, human-

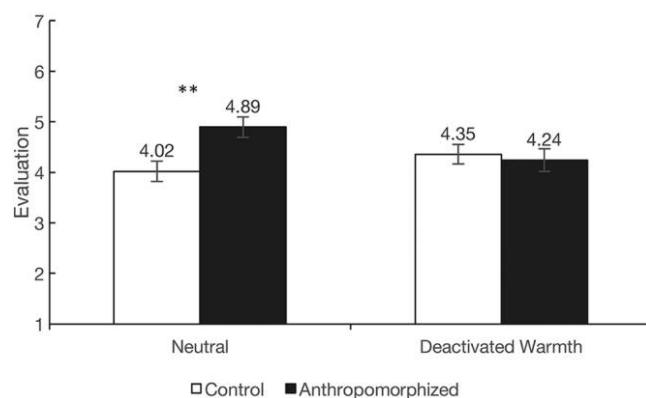


Figure 7. Study 3: Consumer evaluation of old produce as a function of anthropomorphism and warmth (** $p < .01$).

izing old produce did not enhance its appeal, which further supports warm feelings as the process underlying the impact of anthropomorphization on product evaluation contingent on the freshness of produce.

MODERATING EFFECT OF LAY THEORY OF AGING

Thus far our focus has been on how consumers evaluate humanized old produce, which was grounded in the notion that people tend to draw upon their knowledge from the social world to evaluate the anthropomorphized product (e.g., Aggarwal and McGill 2007; Chandler and Schwarz 2010; Puzakova et al. 2013; Kim et al. 2016). In other words, when evaluating anthropomorphized entities, people engage in mental processes similar to those that are involved in perceiving human beings (Epley et al. 2007).

As such, the lay beliefs a consumer holds about human aging could influence how humanizing old produce is perceived. Lay theories about the nature of human psychological attributes or phenomena have been shown to guide people's attitudes, judgments, and decision making in various domains (Dweck 1999; Jain, Mathur, and Maheswaran 2009; Labroo and Mukhopadhyay 2009; Mathur et al. 2013), which in turn leads to systematic behavioral consequences. In the present research, we investigate the lay theory in human perception that "old is gold," as compared to "young is good," and examine how the attitude toward human aging impacts consumer evaluation of anthropomorphized produce that goes through an aging process similar to that of humans. The transfer of the lay theory of human aging is particularly important to examine in the food domain, where aging prompts visible changes and creates a connection with the essential human quality of aging when food is anthropomorphized.

Previous research has suggested that lay theories about aging can either be positive or negative. On the positive side of aging, being old represents being kind and generous to others in general (Harris 1975). People also tend to believe that the elderly are emotionally more stable and mature (Drolet, Lau-Gesk, and Scott 2011), possess more wisdom (Thomas and Yamamoto 1975), and enjoy a higher quality of life, all of which in turn contributes to societal well-being, as compared to their younger counterparts (Tibbitts 1979). On the other hand, the elderly may also be perceived more negatively than the young. People respond more quickly to decisions involving negative traits after being primed with "old" as compared to "young" (Perdue and Gurtman 1990). Also, elderly people tend to be

perceived as incompetent and slow (Cuddy and Fiske 2002), and merely activating the elderly stereotype slows down one's walking speed, consistent with the negative stereotype of the elderly (Bargh, Chen, and Burrow 1996).

The current research proposes that the effectiveness of humanizing old produce depends on the extent to which an individual endorses the lay theory that "old is gold." We expect that consumers with a positive view of aging to adopt a more positive, wabi-sabi, mind-set while evaluating old produce ("old is gold," which we restate as "old is good" for the purpose of equivalence in the hypotheses and studies) than those who hold a negative view of aging ("young is good"). Given the aesthetic preference for fresh produce, we do not expect that the lay theory of aging to apply to evaluating fresh produce.

H3: Humanizing old produce results in higher evaluations when people hold the lay theory that "old is good," whereas this positive impact is diminished when people hold the lay theory that "young is good." Fresh produce will remain unaffected by the lay theory of aging.

STUDY 4: THE IMPORTANCE OF THE "OLD IS GOLD" LAY THEORY

In study 4, we aimed to extend the findings of the anthropomorphic effect on enhancing the evaluation of old (vs. fresh) produce by examining a novel boundary condition, namely, people's lay theory about human aging. We attempted to test our hypothesis 3 by manipulating the endorsement of the lay theory of aging.

Method

Three hundred and thirty-six undergraduates at the University of Illinois at Urbana-Champaign ($M_{\text{age}} = 20.35$, $SD = 1.62$; 61.10% female; 3 missing) participated in this 2 (anthropomorphism: anthropomorphized vs. control) \times 2 (freshness: old vs. fresh) \times 2 (lay theory: young = good vs. old = good) between-subjects design.

The study was presented as two ostensibly different studies. In the first study, adapted from past research (Chen, Pang, and Koo 2017; Wan et al. 2017), participants read a mock news article entitled "Why Young (vs. Old) Is Good" (see app. B) that explained the advantages of being young or being old. Participants summarized the main idea of the article and wrote about an experience that supported the main idea. After this task, participants indicated the

extent to which they agreed or disagreed with two statements related to the lay theory of aging on a 7-point scale ("Young people in general live a better life than older people"; "Quality of life tends to decrease with age"; $\alpha = .80$; 1 = not at all, 7 = very much), which served as our manipulation check.

The second part was identical to study 1 except that the stimuli were zucchini. Participants evaluated the given zucchini (desirable, favorable, positive; $\alpha = .92$) and, as a manipulation check, rated its freshness ($\alpha = .85$) and human likeness. As in the previous studies, participants indicated their familiarity and existing preferences for certain types of zucchini, but these covariates did not affect the results and are not discussed further. Participants were then asked to write down anything about our study to probe suspicion. No participants indicated suspicion about the purpose of the study. Finally, participants answered demographic questions and debriefed.

Results and Discussion

Manipulation Check. Confirming the success of both of our freshness and anthropomorphism manipulations, one-way ANOVAs on perceived freshness and anthropomorphism each showed that participants perceived fresh zucchini as fresher than old zucchini ($M_{\text{fresh}} = 5.76$, $SD = 1.23$ vs. $M_{\text{old}} = 4.31$, $SD = 1.77$; $F(1, 334) = 76.11$, $p < .001$, $\eta^2 = .23$) and perceived anthropomorphized zucchini as more humanlike than nonanthropomorphized zucchini ($M_{\text{anthro}} = 4.63$, $SD = 1.97$ vs. $M_{\text{control}} = 3.11$, $SD = 1.73$; $F(1, 334) = 56.19$, $p < .001$, $\eta^2 = .14$). Lay theory priming was also successful. A one-way ANOVA on the endorsement of a lay theory showed that those who engaged in a writing task about the young = good lay theory reported a higher degree of agreement on the two lay theory statements than those who were in the old = good condition ($M_{\text{young = good}} = 4.61$, $SD = 1.32$ vs. $M_{\text{old = good}} = 3.55$, $SD = 1.28$; $F(1, 334) = 55.72$, $p < .001$, $\eta^2 = .14$).

Anthropomorphism \times Freshness \times Lay Theory Interaction. Hypothesis 3 was tested by conducting a 2 (anthropomorphism: anthropomorphized vs. control) \times 2 (freshness: old vs. fresh) \times 2 (lay theory: young = good vs. old = good) ANOVA on product evaluation. We found a significant three-way interaction ($B = 1.86$, $SE = .67$, $p = .006$, $\eta^2 = .02$; see fig. 8). For those who were primed to think that old is good, there was a significant interaction between anthropomorphism and freshness on product evaluation ($b = 1.36$, $t(328) = 2.88$, $p = .004$), which replicated the

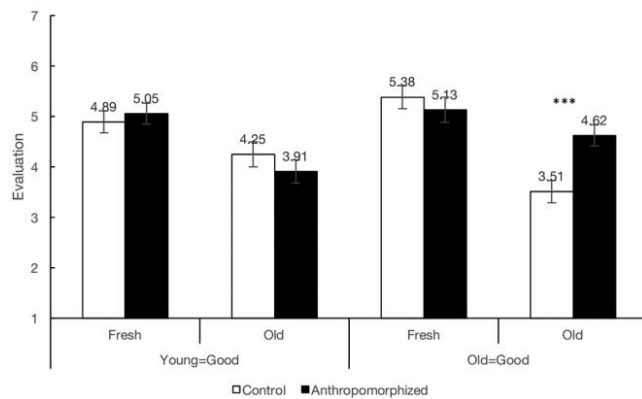


Figure 8. Study 4: Moderating effect of lay theory on consumer evaluation (** $p < .001$).

findings in our previous studies. These participants evaluated the old zucchini more positively when it was anthropomorphized than when it was not ($M_{\text{anthro}} = 4.62$, $SE = 0.22$ vs. $M_{\text{control}} = 3.51$, $SE = 0.23$; $b = 1.11$, $t(328) = 3.52$, $p < .001$, $\eta^2 = .04$), whereas their evaluation was not affected by anthropomorphism when the zucchini was fresh ($M_{\text{anthro}} = 5.13$, $SE = 0.26$ vs. $M_{\text{control}} = 5.38$, $SE = 0.24$; $b = -0.26$, $t(328) = -0.72$, $p = .470$). However, this interaction disappeared for those who were primed to think that young is good ($p = .289$). Among these participants, anthropomorphism did not enhance the evaluation of old produce ($M_{\text{anthro}} = 3.91$, $SE = 0.24$ vs. $M_{\text{control}} = 4.25$, $SE = 0.26$; $b = -0.34$, $t(328) = -0.95$, $p = .341$) just as in the evaluation of fresh zucchini ($M_{\text{anthro}} = 5.05$, $SE = 0.22$ vs. $M_{\text{control}} = 4.89$, $SE = 0.22$; $b = 0.16$, $t(328) = 0.52$, $p = .600$). The analysis also revealed a significant main effect of freshness, with fresh zucchini evaluated more positively than old zucchini ($b = -1.04$, $t(328) = -6.23$, $p < .001$, $\eta^2 = .11$). No other main effects of anthropomorphism and lay theory or two-way interactions between anthropomorphism, freshness, and lay theory were significant (all $p > .126$).

Taken together, the findings of study 4 revealed a novel lay theory and examined it as a boundary condition for our focal anthropomorphic effect and indicated that the way consumers perceive human aging can be transferred to their evaluation and purchase intention of humanized products in the marketplace. Whereas those who believed that old is good evaluated the old produce more positively when anthropomorphized than when it was not, as in the previous studies, those who believed that young is good did not show such an effect. The results suggest that anthropomorphizing produce is particularly beneficial when produce is old

(vs. fresh) and when people have a positive (vs. negative) attitude toward aging.

GENERAL DISCUSSION

This research provides converging evidence that humanizing old produce can enhance consumer evaluations. We test this effect across different types of produce, including cucumbers (study 1), bananas (studies 2 and 3), and zucchini (study 4), and we rely on different ways to anthropomorphize the produce, to demonstrate the robustness of our focal effect. We also provide some initial evidence that humanizing old produce leads consumers to experience warm feelings (studies 2 and 3) that might help explain the mechanism underlying this effect. Our studies also identified a novel boundary condition, showing that the focal effect is attenuated for individuals who hold a lay theory that “young (vs. old) is good.”

Based on the theoretical contributions we outlined at the outset, in the sections that follow we focus on how managers and policy makers can leverage the transformative potential of visual aesthetics to reduce food waste and identify future research directions and limitations of the current research.

TRANSFORMATIVE IMPLICATIONS

Our results suggest that grocery store managers should consider anthropomorphism as a viable strategy to enhance the positive evaluation of produce, especially as it begins to show signs of aging but is still perfectly tasty and nutritious. By making food (or other items) that might be otherwise wasted more appealing to consumers through anthropomorphism in a PR campaign or in-store point-of-purchase promotions, marketers may reap more profits without having to markdown produce that appears less fresh. For example, retailers could sell a bundle of less fresh fruits as a fruit family or use a sign that could activate humanlike features or messages such as “pick me.” This tactic may help decrease costs resulting from discarding produce that are imperfect but is still safe and healthy to consume.

Our findings regarding the lay theory of aging suggest that marketers should be aware of the need to portray aging in a positive light if they intend to use anthropomorphism to promote less fresh produce. For example, if in-store marketing highlights the advantages of youthfulness, then humanizing old produce might not work as intended. Our research adds to prior findings demonstrating that the impact of particular behaviors on food waste may differ

depending on consumers' characteristics and thus offers insights into identifying antecedents of food waste (e.g., income; Edin et al. 2013; Porpino 2016).

The current work also demonstrates one possible low-cost but effective tool for attenuating problems associated with old produce and thus urges more attention to finding ways to solve food waste problems in society as a whole. Every year 30% of the global food supply of food is wasted. This is the retail equivalent of a trillion dollars worth of wasted food. In addition, there is a human health cost of \$150 billion associated with the use of pesticides that are used to prevent aesthetically unattractive insect markings and a cost of \$280 billion in loss of natural resources (Hoffman 2014). Environmental campaigns that remind consumers of these statistics are not necessarily as effective as might be expected (Turner 2017). Food waste can occur across "squander sequence," which refers to waste that occurs at every stage of consumption—preacquisition, acquisition, consumption, and disposition (Block et al. 2016). The findings in the present research suggest that a subtle change in the arrangement of produce at the point of sale (i.e., preacquisition stage) could serve as an initial step that could potentially have as much impact as direct pleas to conserve resources at the disposal stage.

FUTURE RESEARCH AND LIMITATIONS

The present research provides several fruitful avenues for future research. First, new research could build on our work to examine whether our observed effect is more or less pronounced depending on consumers' individual differences. For example, cultural backgrounds can determine a consumer's attitude toward aging and transience (Koo and Shavitt 2011; Riemer et al. 2014; Shavitt and Koo 2015). Indeed, the wabi-sabi concept, having originated in Japan, might be more integrated into the Eastern cultural mindset, while Western cultures may naturally favor youth over old age (Ng 2002). In addition, research shows that individuals engage in different thinking styles depending on their cultures (Nisbett et al. 2001). While Westerners tend to hold an analytic thinking style, whereby they think of objects as being composed of independent elements, East Asians view the world as more interconnected and interrelated, reflecting a more holistic thinking style (Choi, Koo, and Choi 2007; Koo, Choi, and Choi 2018). The interplay between cultural differences in lay theory of aging coupled with processing style differences could influence the effectiveness of humanizing old produce. In addition to cultural backgrounds, other individual differences such as financial

status may influence the type of shapes people prefer (Jiang, Su, and Zhu 2019). Future research could examine how these individual differences interact with the condition of produce and impact consumers' evaluation.

Second, the present research also opens a new avenue for future research on the lay theory of aging in consumption-related contexts. Although our findings illustrate that those who have a strong belief in "young (vs. old) is good" do not enhance their evaluation of old produce when it is anthropomorphized, a question remains as to whether there would be any other types of foods that might override this contingent effect of lay theory. For example, for aged food products such as cheese or wine, where aging is critical and appreciated in determining their value, the difference in attitude between those who value youth and those who value aging could be minimal when humanlike properties are imbued in those products. Relatedly, given that the lay beliefs a consumer endorses about human aging moderate how humanized old produce is perceived, future research could examine whether and how a consumer's age moderates the effect of anthropomorphism on the evaluation of old produce (see app. C for the further discussion within the current studies).

Third, our findings may seem inconsistent with prior research that examined another lay theory (Wan et al. 2017), which demonstrated that anthropomorphism enhances the evaluation of products that have superior appearance because when consumers process humanized products, they apply a "beautiful is good" lay theory that is held in human perception. These findings imply that fresh produce should be evaluated more positively than old produce when it is humanized due to the aesthetic superiority associated with freshness. In contrast, our findings indicate that when old produce is humanized albeit its visual imperfections, it is evaluated as positively as fresh produce is. Here we posit that the positive effect of anthropomorphism on old produce is driven by sentimental feelings of warmth toward humanized old produce, which could have overridden a possible negative impact resulting from the application of the "beautiful is good" lay theory. Future research can empirically test this possibility.

Finally, our research focused on freshness of produce and visual imperfections stemming from aging process as only one of a broad range of visual cues. However, there are other visual signs that could bring about food waste such as visual imperfections resulting from contamination, a disease, damage from mishandling, or not meeting the beauty standards (e.g., a lopsided tomato). These signs may involve

different interpretations of visual imperfections with which anthropomorphism may not necessarily evoke sentimental feelings toward produce and thus not enhance the evaluation of the produce even if it is humanized. Future research can examine more systematically how the effect of humanizing produce may be contingent on the various types of visual imperfections. More broadly, drawing on the insights uncovered by Bublitz et al. (2019), future research might apply their best-practices framework to the problem of food waste to uncover additional ways by which the transformative power of aesthetics might be harnessed to reduce food waste.

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