

When Temptations Come Alive: How Anthropomorphism Undermines Self-Control

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CONTRIBUTION STATEMENT

Previous literature suggests that self-control is a struggle between two antagonistic forces (impelling versus restraining; Carver 2005; Hoch and Loewenstein 1991; Hofmann, Friese, and Strack 2009). Based on this framework, the present research examines how anthropomorphizing a temptation affects consumer self-control, and finds that anthropomorphism impairs self-control not by increasing the impelling force (strength of desire for the temptation), but by decreasing the restraining force—specifically, preventing one from feeling conflicted toward consuming the temptation and initiating self-control. The present study contributes to the self-control literature by identifying anthropomorphism as an influential factor in self-control, and by demonstrating a reduction in experienced conflict as the precise mechanism for its effect. It also contributes to the anthropomorphism literature by going beyond the previous emphasis on target evaluations to self-control behavior and processes, and considering the role of long-term goals in target consumption.

ABSTRACT

We examine how anthropomorphizing a temptation impacts consumer self-control. Six studies show that anthropomorphizing a tempting product impairs self-control not by boosting desire strength but by decreasing consumers' experience of conflict toward consuming the product—an alarm that signals a need for self-control. As a result, consumers are less likely to initiate self-control and more likely to indulge in the product. This process occurs because an anthropomorphized product acts as another agent in the self-control dilemma, which decreases the extent to which consumers attribute the cause of and responsibility for their consumption to themselves (i.e., internal attribution).

“Schedule a break with some crunchy orange friends. Then eat your friends”

--An advertisement slogan of *Crunchy Cheetos* snacks

Our everyday environment is full of temptations. Grocery aisles, online shopping sites, and cafeterias are filled with tempting products, often resulting in a “tug-of-war” between impulses and self-control in consumers’ minds (Carver 2005; Hoch and Loewenstein 1991; Hofmann, Friese, and Strack 2009). For instance, products like rich chocolate cookies can be a temptation for consumers on a diet, because consuming the high-calorie cookies can directly hamper their goal of losing weight. Consumers thus struggle to restrain themselves from the impelling desires to consume products that interfere with their long-term goals, but often lose this fight and fail in self-control (Baumeister 2002). To make self-control failure even more likely, tempting products and brands are armed with effective marketing strategies developed to increase consumption (Kahn and Wansink 2004; Wansink and Chandon 2006).

One widely used marketing strategy is to anthropomorphize products and brands (Aggarwal and McGill 2012; Chandler and Schwarz 2010). Anthropomorphism, defined as “the tendency that people imbue nonhuman agents with humanlike characteristics, motivations, intentions, or emotions” (Epley, Waytz, and Cacioppo 2007), is a common phenomenon that people encounter in everyday environments, including consumer contexts. Consumers encounter countless anthropomorphized brands, services, and products such as car grills with facial expressions or ATM machines that speak in the first person (“I am now dispensing your money”).

Prior research has primarily focused on the effects of anthropomorphism on preferences or evaluations. For example, anthropomorphism may lead people to evaluate target products as more intelligent, responsible, and trustworthy (Gong 2008; Koda and Maes 1996). The present

research goes beyond the previous emphasis on evaluations to explore the impact of anthropomorphism on consumer self-control. Specifically, we focus on products or brands that evoke a self-control dilemma—they are desirable in the short-term but harmful in the long-term (i.e., temptations)—and investigate the mechanisms through which temptation anthropomorphism affects self-control. We propose that anthropomorphism undermines self-control, not by increasing the individual's strength of *desire* for the tempting product (an impelling force that encourages consumption), but by hampering the experience of *conflict* regarding product consumption, which prevents him or her from realizing a need for self-control (an initial part of the restraining force that counters the desire).

Consumer Self-Control: Desire and Conflict

According to the dual-process framework of self-control (Carver 2005; Hoch and Loewenstein 1991; Hofmann et al. 2009), self-control can be framed as a struggle between two antagonistic forces: an impelling force (i.e., desire that impels an individual to act) and a restraining force (i.e., a sense of conflict and willpower that necessitate restraint). That is, people fail in self-control due to either of the two distinct forces: 1) when their desire becomes too strong to resist (Redden and Haws 2013), or 2) when they experience insufficient feelings of conflict toward temptation indulgence, and thereby fail to realize a need for self-control (Botvinick et al. 2001) or fail to resolve the experienced conflict in accordance with their goals (Schmeichel and Inzlicht 2013).

Desire has been defined as an “affectively charged cognitive event in which an object or activity that is associated with pleasure or relief of discomfort is in focal attention” (Kavanagh, Andrade, and May 2005). In consumer contexts, desire means wanting to purchase, possess, or experience certain products, and is often described as a hunger or thirst for a consumer good

(Belk, Ger, and Askegaard 1997). It should be noted that the majority of everyday desires are unproblematic from a self-control perspective because, for example, there is nothing “wrong” with purchasing a bottle of water because of the desire to quench one’s thirst (Hofmann et al. 2012). Such a choice would only be problematic if one has a strong goal that interferes with the water purchase (e.g., saving money). Desire thus becomes problematic and turns into a “temptation” to the extent that it interferes with important long-term goals, such as wanting to buy a chocolate cake while having a goal of losing weight (Fishbach, Friedman, and Kruglanski 2003; Mele 2001).

When one encounters a temptation, it elicits feelings of conflict or psychological discomfort toward temptation indulgence (Botvinick et al. 2001). This conflict experience is a crucial first step toward successful desire restraint and self-control because it functions as an “alarm” that signals the need for restraint and the resolution of the conflict (Gray and McNaughton 2003). The absence or reduction of experienced conflict can therefore result in self-control failure, because without such an experience, it is difficult to realize a need to initiate self-control and attempt to resist the temptation by implementing self-control strategies (Botvinick et al. 2001). For instance, packaging tempting products in small sizes is shown to cause consumption to increase, because they are more likely to reduce the experience of self-control conflict, and “fly under the radar” of the long-term goals (Do Vale, Pieters, and Zeelenberg 2008).

Notably, the dual-process/dual-system literature on self-control generally argues that the impelling and restraining forces are independent of each other (Carver 2005; Strack and Deutsch 2004; Tidwell and Eastwick 2013). Applied to the present context, high or low desire strength does not imply, by itself, whether resulting conflict experience is strong or weak (Hofmann et al.

2012; Hofmann and Van Dillen 2012). Desire strength can change without changes in conflict experience, and vice versa: for instance, consumers can have a strong desire for a bottle of water in hot weather without any conflict experienced, and even weak desire can be utterly problematic when there is a strong goal opposing it, resulting in high conflict experience (e.g., a priest experiencing weak sexual desire).

The focus of our work is on these two fundamental but distinct antecedents of self-control: desire that impels one to fall for a temptation, and conflict experience that initiates restraint. That is, does imbuing a tempting product with humanlike features affect the strength of desire that consumers feel for the product? Or does it affect the extent to which consumers feel conflicted or uncomfortable toward consumption of the product? Distinguishing the two forces is theoretically important, because it helps to pinpoint the mechanism by which temptation anthropomorphism can undermine consumer self-control. Practically, each force has different implications for how to boost consumer self-control: either by improving consumers' ability to regulate strong desires for temptations or by making them feel more conflicted so they can set the self-control process in motion.

The Impact of Temptation Anthropomorphism on Desire and Conflict

Anthropomorphism has attracted much attention as a research topic in the fields of social psychology and consumer behavior, as researchers have focused on various consequences such as changes in a person's attitude toward the object (Aggarwal and McGill 2007; Chandler and Schwarz 2010; Waytz, Cacioppo, and Epley 2010). The use of anthropomorphism for a tempting product in the context of self-control settings, however, is distinct from past research due to the ambivalent nature of the anthropomorphized object: it is desirable in the short-term but at the same time detrimental in the long-term (e.g., tasty but unhealthy cookies). Self-control behavior

is not merely the expression of an attitude, but the product of two competing forces, each working to impel or restrain the individual. It thus remains unclear whether temptation anthropomorphism affects self-control, and if so, which of the two forces it affects.

Because anthropomorphism has been shown to enhance target evaluation, it might easily be expected to increase the impelling force or desire strength for temptation, which leads to a higher likelihood of self-control failure. Previous literature, however, finds that anthropomorphism does not always increase appeal or liking of a target (see Waytz et al. 2010), and suggests that one potential moderator is the perceived nature of the agent or object that is being anthropomorphized. That is, anthropomorphism increases appeal and liking when the agent is perceived as having positive qualities and traits (Delbaere, McQuarrie, and Phillips 2011; Gong 2008). For example, anthropomorphizing a computer interface increases users' enjoyment when the interface is perceived to have a helpful functionality (Burgoon et al. 2000). In contrast, when the target possesses negative qualities, anthropomorphism decreases evaluations because the negative outcomes appear more intentional (Morewedge 2009). For instance, anthropomorphism decreases brand evaluations when the brand faces negative publicity caused by a product wrongdoing, and consumers believe that the wrongdoing reflects stable negative traits of the brand (Puzakova, Kwak, and Rocereto 2013).

However, if the traits of the agent are seemingly neutral or ambivalent, anthropomorphism has no net effect on evaluation (Aggarwal and McGill 2012). For example, anthropomorphism does not affect liking of an autonomous vehicle that drives itself, which possesses both positive and negative qualities (i.e., capable but controlling; Waytz, Heafner, and Epley 2014). Temptations are by definition, desirable in the short-term but detrimental in the long-term (e.g., tasty but unhealthy, entertaining but time-wasting; Fitzsimons, Nunes, and

Williams 2007; Giner-Sorolla 2001; Ramanathan and Williams 2007). Due to the ambivalent nature of its valence, it is therefore quite possible that anthropomorphizing a tempting product may not necessarily increase or decrease product appeal or desire strength.

Alternatively, a less obvious possibility is that anthropomorphism undermines self-control by reducing the restraining force—in particular, by diminishing the likelihood that one experiences conflict regarding product consumption. Our reasoning in favor of this effect is based on the notion that individuals only experience conflict to the extent they feel capable of making a choice (Do Vale et al. 2008). If they feel no control or responsibility in the matter—although the product may be at odds with their long-term goals—they will not experience a sense of conflict about their actions, and hence feel less need to initiate self-control. A precondition for exercising self-control, therefore, is that the individual feels responsible for their own actions, and attributes their actions to their own volition and intention (Chambliss and Murray 1979; Heatherton and Nichols 1994).

We propose that anthropomorphizing a temptation reduces individuals' perceived control and responsibility for their actions, by creating the presence of another agent (i.e., the product) that implies a diffusion of responsibility. While a typical self-control dilemma involves consumers themselves as the only agent, anthropomorphizing a temptation brings another agent into the dilemma by imbuing a product with humanlike qualities (Guthrie 1993; Kiesler and Goetz 2002). Having another agent in the self-control dilemma then dilutes consumers' internal attributions—the tendency to attribute the cause of and responsibility for consumption strictly to themselves (“it is my fault”). In support of this line of reasoning, research suggests that the presence of other human agents in a situation can reduce internal attributions due to the diffusion of responsibility for the situation (Bem, Wallach, and Kogan 1965; Yamaguchi 1998), especially

in contexts that require self-control (Darley and Latane 1968). For example, merely priming the presence of others can automatically make one feel less responsible and less likely to help a victim of misfortune (Garcia et al. 2002). Similarly, the presence of close others implicitly makes an individual delegate responsibility to them and be less likely to exercise self-control in joint goal-pursuit (Baker 2011). We expect that this dilution of internal attributions in self-control can occur not only with the presence of other human agents, but also with non-human agents that have been anthropomorphized.

The dilution of internal attributions in self-control situations then reduces the experience of internal conflict toward temptation indulgence (Do Vale et al. 2008), which prevents people from recognizing a need for self-control (Inzlicht and Gutsell 2007). One's perceived control for his/her behavior is a strong predictor for internal conflict (Mele 1995). That is, the more control a person believes that he or she has over behavior, the more conflicted the person feels if that behavior is problematic. Therefore, when consumers feel less responsible for their behavior, they are less likely to feel conflicted when deciding whether to indulge in the temptation. In support, research shows that reduced internal attributions of control and responsibility lead to more self-control failures (Polivy and Herman 2002; Weiner 2001). For instance, when participants in a weight-reduction program believe they have less control for their behavior, they are more likely to fail at losing weight (Chambliss and Murray 1979). Our theory builds on this established negative link between internal attributions and self-control by suggesting that the reduction in internal attributions reduces the experience of inner conflict, turning off an alarm that signals the need for initiating self-control.

As a final consideration on conflict, we point out that the impact of an anthropomorphized product on conflict experience and self-control should be observed only to

the extent that one holds a long-term goal that involves a trade-off with the tempting alternative. If there is no focal long-term goal, there is no need for self-control, and thus no potential for self-control conflict. For example, for non-dieters who are not health conscious, there is no reason to exercise self-control and experience a self-control conflict toward a high-calorie cookie. We therefore suggest that consumers' long-term goals act as a crucial prerequisite for our research question regarding anthropomorphized temptations and consumer self-control.

OVERVIEW OF RESEARCH

We report six studies that tested our hypotheses across a variety of tempting consumer products. Study 1 provides an initial demonstration that anthropomorphizing a tempting product decreases conflict experience regarding consumption of a product, but does not increase desire strength for the product. Study 2 provides a more rigorous test of our hypotheses by manipulating the presence of long-term goals and demonstrating that anthropomorphism decreases conflict experience only when a product interferes with the focal goals. It also tests the impact of anthropomorphism on self-control behavior by assessing willingness to indulge in the tempting product. Study 3 extends earlier findings by assessing participants' strength of a long-term goal, instead of manipulating it, and showing that goal strength moderates the effect of anthropomorphism on conflict experience.

Studies 4 – 6 examine the underlying mechanism of our effect. Study 4 shows that temptation anthropomorphism reduces the degree to which individuals attribute the cause of consumption to internal factors, which in turn reduces feelings of conflict. Study 5 replicates this finding by assessing participants' perceived control and responsibility, and also explores the effect of anthropomorphism on external attributions of responsibility for temptation indulgence. Finally, Study 6 provides more complete evidence for our predictions by demonstrating a three-

step process: anthropomorphism decreases internal attributions for temptation indulgence, which leads to reduced conflict experience, which further leads to more temptation indulgence.

STUDY 1: TEMPTATION WITH A HUMAN FACE

The main purpose of Study 1 was to examine whether anthropomorphizing a tempting product reduces individuals' experience of conflict toward the product without having a significant effect on their desire strength. We recruited participants with a strong dieting goal (self-identified female dieters) and presented them with either an anthropomorphized or a plain high-calorie cookie. We anthropomorphized the product by applying human-face features, and then assessed the extent to which participants desired to consume the product and the extent to which they felt conflicted toward consumption of the product.

Method

Fifty-seven undergraduates from South Korea (all women, $M_{\text{age}} = 22$), who identified themselves as dieters, participated in the study in exchange for 3,000 Won (\approx US \$3). Only women were invited to participate, because they tend to value health and fitness goals more than men do (Fishbach et al. 2003). The study employed a 2 (product: anthropomorphized vs. control) between-subject design.

We anthropomorphized a tempting product by putting human-face features on a round-shaped cookie (Arnheim 1969; Kim and McGill 2011), based on previous research suggesting that physical resemblance to humans induces the tendency to anthropomorphize. We applied face-like features to a cookie of 3.5 inch in diameter using icing (two small dots and one straight line below; Gong 2008; Haley and Fessler 2005; see fig. 1). We employed these abstract, emotionless features in order to avoid priming emotions (Winkielman and Cacioppo 2001). The same round-shaped cookie without human-face features was used in the control condition. The

cookies in both conditions were identical in every other aspect, including ingredients, taste, and weight. We also provided mock-up nutrition information indicating that the cookie contained high calories and fat (e.g., 150 calories, 90 calories from fat).

-----Insert figure 1 about here-----

To test the effectiveness of the anthropomorphism manipulation, we asked a pilot sample of participants from the same population (female dieters; $N = 30$) to evaluate the same real cookie from the main study (either anthropomorphized or not). Participants then rated its anthropomorphic qualities (“To what extent does the cookie remind you of some humanlike qualities?”) on a 7-point scale (1 = *not at all*, 7 = *very much*). As expected, participants attributed a higher degree of humanlike qualities to the cookie in the anthropomorphism condition ($M = 5.25$, $SD = 1.44$) than the one in the control condition ($M = 2.21$, $SD = 1.31$; $t(28) = 6.01$, $p < .001$), confirming the success of our manipulation.

For the main study, the survey was presented as a “Consumer Product Evaluation Task,” in which participants evaluated a new cookie product. Participants were presented with a cookie that either did or did not contain a human face, depending on the condition. Before tasting the cookie, participants reported their strength of desire to eat the cookie (“How strong is your desire to eat the cookie?”) on a 7-point scale (1 = *not at all*, 7 = *very much*). They also rated their level of experienced conflict toward eating the cookie (“How conflicted do you feel about eating the cookie?”) on a 7-point scale (1 = *not conflicted*, 7 = *highly conflicted*). Participants were then asked to taste and evaluate the cookie on two items that are not related to our hypotheses: its naturalness and suitability for children (whether its taste was more appropriate for children than adults). Upon completion of the study, participants provided demographic information, and were fully debriefed.

Results and Discussion

Our analysis on participants' desire to consume the cookie revealed that participants in the anthropomorphism and control conditions did not differ in the strength of desire ($M_{\text{Anthropomorphism}} = 3.93$, $SD = 1.38$, $M_{\text{Control}} = 4.30$, $SD = 1.53$; $t(55) = -.96$, $p = .34$). In contrast, the analysis on conflict experience showed that those in the anthropomorphism condition felt less conflicted toward eating the cookie ($M = 3.07$, $SD = 1.64$) than those in the control condition ($M = 4.03$, $SD = 1.75$; $t(55) = -2.13$, $p < .05$). Moreover, there were no effects of anthropomorphism on the two after-taste items: naturalness ($M_{\text{anthropomorphism}} = 3.89$, $SD = 1.60$, $M_{\text{control}} = 3.70$, $SD = 1.53$; $t < 1$) and suitability for children ($M_{\text{anthropomorphism}} = 3.78$, $SD = 1.58$, $M_{\text{control}} = 4.03$, $SD = 1.83$; $t < 1$). These findings provide initial evidence for our prediction that anthropomorphizing a tempting product reduced the degree of experienced conflict regarding the decision to consume the product, but did not increase the strength of desire for it.

In Study 1, we selected only dieters as our participants because the target cookie is a temptation only when people hold a higher-order long-term goal (dieting goal). In our next study, we employed a more rigorous design to replicate and extend these initial findings by experimentally manipulating the presence of a long-term goal. We predicted that our effect on conflict experience would be replicated only when the focal goal is present. When the focal goal is not present, the goal-interfering product will not be qualified as a temptation, and thus no feelings of self-control conflict will be triggered.

STUDY 2: TALKING TEMPTATION

The main objective of Study 2 was to examine whether the presence of a focal long-term goal moderates the effect of temptation anthropomorphism on conflict experience. To demonstrate the robustness of our effects, we moved to a different goal context (an academic

goal for college students), and employed a Digital Multimedia Broadcasting TV (DMB) gadget as a tempting product, based on previous studies showing that watching TV is perceived to be an activity interfering with academic goals (Fishbach et al. 2003). We also used a different operationalization of anthropomorphism by providing the TV with a human name (May and Monga 2014) and having it talk like a person (Aggarwal and McGill 2007).

Specifically, we first primed participants with either an academic (focal) goal or a dieting (alternative) goal that would present no potential for self-control conflict with a TV gadget, and presented either an anthropomorphized product or a regular product. In addition to desire strength and conflict experience, we measured participants' willingness to pay for the product as a proxy measure of temptation resistance (Haws, Bearden, and Nenkov 2012). Research on self-control often uses one's willingness-to-pay for a temptation as a measure of self-control, because a higher willingness to pay reflects a higher intention to purchase and indulge in the tempting product (Kivetz and Zheng 2006; Vohs and Faber 2007). We hypothesized that participants would be less likely to experience conflict regarding the use of the TV gadget and be willing to pay more to indulge in it when the gadget was anthropomorphized, but only when primed with a focal goal (academic goal). Analogous to Study 1, we expected no effect of anthropomorphism on desire strength for the tempting product.

Method

104 undergraduate students of both genders from the USA (49 women, $M_{\text{age}} = 21$) participated in the study in exchange for US\$3. Gender did not yield any effects in this study and subsequent studies. The study employed a 2 (goal prime: focal versus alternative) \times 2 (product: anthropomorphized versus control) between-subjects design.

We presented the study as two unrelated, separate experiments. In the first part of the study, to prime a long-term goal, participants were asked to write about either their academic goals or their dieting goals, depending on the condition. In this writing task, participants described their current states and their ideal goals (i.e., current and ideal grade or weight), and why achieving the goals would be meaningful for them and bring changes to their lives. For instance, one participant in the academic (focal) goal condition described goals such as “I would like to achieve two A’s and at least an A- in my three classes this quarter... It is important that I achieve my goals so that I can prove to myself that I can deliver on my plans to do well... This shows me that I can, in fact, achieve what I set out to do. I also want to be able to tell people I did well in a difficult academic environment.” One participant in the dieting (alternative) goal condition wrote, “I would like to lose some fat (maybe 5-10 lbs), and gain some muscle... That is important to me because I don’t want to be “that fat girl” who nobody thinks is attractive... If I did achieve this goal... that would make me feel a lot more confident.”

The second part of the study was presented as a “Consumer Evaluation Study.” Participants viewed a photograph of a TV and read a brief product description. The TV was introduced as a new product coming out on the market with the latest features. As a manipulation of anthropomorphism, we named the TV Pat (gender neutral) and described it in the first person (“I”) in the anthropomorphism condition (see fig. 2). In the control condition, we did not provide the human name and referred to the product in objective and impersonal language (“It”). Specifically, participants in the *anthropomorphism* [vs. control] condition read the following:

“Hi, *my name is Pat*, [this is] a new Pocket TV coming out this summer. *I have* [It has] a great screen display and fast internet (4G). *I* [It] can stream thousands of movies, TV shows, and videos through Netflix and Youtube. ... Since *I* only weigh [it only weighs]

4.2 ounces, you can carry *me* [it] anywhere you want! Take *me* [it] to the park, to class, or even around the world!”

-----Insert figure 2 about here-----

This manipulation was based on previous research suggesting that providing an object with human names (May and Monga 2014) and describing it in the first person (Aggarwal and McGill 2007) encourages people to think of the non-human object in human terms. Moreover, framing the product description as if the product is introducing itself increases the anthropomorphic qualities of the product, because intentionality and communication ability signify humanlike qualities in non-human agents (Dennett 1996). The photograph and the content of the product description were otherwise identical between the two conditions.

To test the effectiveness of our manipulation, we asked a pilot sample of participants from the same population ($N = 36$) to evaluate the product either in the anthropomorphism or the control condition after viewing the same photograph and the description from the main study. Participants rated the anthropomorphic qualities on a 7-point scale (“To what extent does the TV gadget remind you of some humanlike qualities?”). As expected, participants attributed a higher degree of humanlike qualities to the TV gadget in the anthropomorphism condition ($M = 2.89$, $SD = 1.53$) than the one in the control condition ($M = 1.50$, $SD = .92$; $t(34) = 3.30$, $p < .01$), confirming the success of our manipulation.

For the main study, participants answered several filler questions pertaining to the overall quality and perceived nature of the product (entertaining). Our goal prime and anthropomorphism manipulation did not have any effect on filler items ($ps > .10$). Participants then rated experienced conflict regarding the use of the product (“How conflicted do you feel about using the TV gadget?”). We also added a measure assessing whether the experienced

conflict emerges to a more cognitive level (“To what extent does the product conflict with any of your goals in life?”; Hofmann et al. 2012). We then assessed the strength of desire for the tempting product (“How tempted do you feel to spend some time with the product?”) and overall liking of the product (“How much do you like the product overall?”) on a 7-point scale (1 = *not at all*, 7 = *very much*). Lastly, participants indicated willingness to pay to indulge in the product (“If you purchased the product, how much would you be willing to pay for it (in US dollars)?”). Participants then provided demographic information, and were fully debriefed.

Results and Discussion

We first analyzed desire strength and liking. A 2 (goal prime) \times 2 (anthropomorphism) ANOVA on desire strength yielded no main effect for either goal prime ($F < 1$) or anthropomorphism ($F(1, 100) = 1.92, p = .17$) and also no interaction ($F(1, 100) = .64, p = .43$). Similarly, the analysis on product liking yielded no main effects ($F_s < 1$) and no interaction ($F(1, 100) = .55, p = .46$). Analogous to Study 1, this null effect suggests that anthropomorphism has no effect on desire strength for the tempting product. Interestingly, this null effect was independent of goal prime, probably because our goal manipulation did not alter the perceived nature of the product, and thus did not influence the desire strength. In support, our analysis on filler items revealed that participants in the focal- and alternative-goal conditions rated the product as equally entertaining ($M_{\text{focal}} = 4.53, SD = 1.67; M_{\text{alternative}} = 5.02, SD = 1.49; t(99) = -1.56, p = .12$), and in equal overall quality ($M_{\text{focal}} = 4.56, SD = 1.41; M_{\text{alternative}} = 4.52, SD = 1.46; t(100) = .13, p = .90$).

Next, we analyzed participants’ levels of experienced conflict. The two conflict items were highly correlated ($r = .53, p < .001$), and thus we averaged them to create a conflict index. A two-way ANOVA on this index yielded no main effect for either goal prime or

anthropomorphism (both $F_s < 1$), but yielded the predicted goal prime \times anthropomorphism interaction ($F(1, 100) = 6.74, p < .05$; see fig. 3). When primed with the focal academic goal, those in the anthropomorphism condition felt less conflicted toward using the gadget ($M = 2.64, SD = 1.62$) than those in the control condition ($M = 3.76, SD = 1.73; t(51) = -2.43, p < .05$). However, when they were primed with the alternative dieting goal, anthropomorphizing the product did not yield any significant effect ($M_{\text{anthropomorphism}} = 3.44, SD = 1.84; M_{\text{control}} = 2.86, SD = 1.46; t(49) = 1.25, p = .22$). These results suggest that, as expected, anthropomorphizing a product hampers conflict experiences only when the focal long-term goal that interferes with the product is present, demonstrating that the experienced conflict arises from the self-control dilemma between a focal goal and a temptation. When the unrelated goal is primed, the product is not qualified as a temptation and hence there is no potential for self-control conflict.

-----Insert figure 3 about here-----

Finally, we analyzed willingness to pay for the product as a measure of intentions for temptation indulgence. Because this measure was positively skewed ($s = 1.98$), we applied a log-transformation to achieve a normal distribution and performed a two-way ANOVA. The analysis yielded no main effect for either goal prime ($F(1, 100) = 1.01, p = .32$) or anthropomorphism ($F(1, 100) = 2.10, p = .15$), but yielded the predicted interaction ($F(1, 100) = 3.99, p < .05$). When primed with the focal academic goal, participants were willing to pay more for the gadget when it was anthropomorphized ($M = 4.17, SD = 1.13$) compared to when it was not ($M = 3.58, SD = .97; t(50) = 2.01, p = .05$). However, when primed with the alternative diet goal, anthropomorphizing the product did not yield any effect ($M_{\text{anthropomorphism}} = 4.06, SD = .90; M_{\text{control}} = 4.26, SD = .97; t(49) = -.75, p = .46$).

The results of Study 2 are consistent with those of Study 1: anthropomorphizing a tempting product did not affect desire strength for it, but decreased conflict experience and increased participants' willingness to pay for it. Furthermore, the findings show that this effect on conflict experience and willingness to pay was limited to when the product interfered with a salient long-term goal.

The findings thus far suggest that anthropomorphism does not affect desire strength for a tempting product—that is, no change in the impelling force. Despite the null effect on strength of desire, one could still argue that anthropomorphism may increase the appeal of the product (Delbaere et al. 2011), which could further affect product consumption. Our next study aimed to rule out this possibility by measuring both desire strength and product appeal. Moreover, Study 2 identified the presence of a long-term goal as a crucial precondition for the effect of anthropomorphism on conflict experience and willingness to pay. Instead of manipulating the presence of a focal goal, we assessed the strength of participants' long-term goals in Study 3, and predicted that the effect of anthropomorphism on conflict experience would be a function of goal strength: the stronger the long-term goal, the higher the potential for self-control conflict. Lastly, we employed an existing temptation brand (Krispy Kreme) in Study 3 instead of new or non-branded tempting products in previous studies.

STUDY 3: TEMPTING BRAND

The main objective of Study 3 was to replicate the results of Study 2, while measuring individuals' strength of long-term goals and employing an existing tempting brand. We used Krispy Kreme as a tempting brand that interferes with a dieting goal, and manipulated anthropomorphism by having participants imagine and describe the target brand as a person (Aggarwal and McGill 2012). As dependent variables, participants reported desire strength,

appeal, and conflict experience regarding the brand consumption.

Method

One hundred participants from the United States (57 women, $M_{\text{age}} = 35$) were recruited via an online subject pool through Amazon's Mechanical Turk in exchange for \$.35. The study employed a 2 (brand: anthropomorphized versus control) between-subjects design with one self-report variable: the strength of the dieting goal.

We selected Krispy Kreme as a tempting brand for dieters based on a pilot study ($N = 202$) in which participants evaluated thirty food brands (e.g., Nestlé, Dole, and Dannon) with a 7-point scale, along multiple dimensions including perceived healthiness ("How healthy do you think the following brands are?") and helpfulness for a dieting goal ("How helpful do you think the following brands are to one's diet?"). Krispy Kreme was rated as the unhealthiest ($M = 1.38$, $SD = .89$) and the least helpful brand for one's diet ($M = 1.29$, $SD = .88$) among the thirty food brands.

The study was presented as a "Brand Evaluation Study." Participants first completed a writing task as a manipulation of anthropomorphism. In the anthropomorphism condition, participants were asked to imagine that Krispy Kreme had come to life as a person, and to describe the sort of person the brand would be in terms of its personality, physical appearance, opinions, conversational style, social approach, profession, and so forth (Aggarwal and McGill 2012). In the control condition, participants were told to describe Krispy Kreme in as much detail as possible in terms of the features, characteristics, and other aspects of the brand of which they may have heard. There was no significant difference in the number of words written or time taken to complete the task between the two conditions ($t_s < 1$), which ensures that this manipulation did not lead to any differences in degree of elaboration or engagement in the task.

Upon completion of the writing task, participants first reported their strength of desire for Krispy Kreme (“How tempted do you feel to consume Krispy Kreme doughnuts?”), and levels of experienced conflict on two items (“How conflicted do you feel about eating Krispy Kreme doughnuts?”, “How uncomfortable do you feel about consuming Krispy Kreme doughnuts?”; 1 = *not at all*, 7 = *very much*). They also rated appeal of Krispy Kreme on two items (“How appealing is Krispy Kreme?”; “How attractive is Krispy Kreme?”; 1 = *not at all*, 7 = *very much*). As a measure of dieting goal strength, participants also reported how often they were on a diet (1 = *never*, 5 = *always*). Upon completion of the study, participants provided demographic information, and were fully debriefed.

Results and Discussion

To analyze participants’ strength of desire to consume the brand, we first performed a moderated regression analysis with three independent variables: brand (1 = anthropomorphized, - 1 = control), goal strength centered on the mean of the scale ($M = 2.49$, $SD = 1.19$), and the interaction between the two variables. As predicted, the regression yielded no brand \times goal-strength interaction ($b = .29$, $t(96) = 1.584$, $p = .12$), replicating the null effect of anthropomorphism on desire strength. There was no main effect for either the anthropomorphism manipulation ($b = .24$, $t(96) = 1.10$, $p = .27$) or goal strength ($b = .24$, $t(96) = 1.30$, $p = .20$).

We then analyzed appeal of the brand. The two items (appeal and attractiveness) were positively correlated ($r = .91$, $p < .001$), and thus we collapsed them to create an appeal index. As predicted, the regression yielded no brand \times goal-strength interaction ($b = .25$, $t(36) = 1.45$, $p = .15$), demonstrating the null effect of anthropomorphism on appeal of the brand. There was no main effect for either the anthropomorphism manipulation ($b = .27$, $t(96) = 1.35$, $p = .18$) or goal strength ($b = .01$, $t(96) = .05$, $p = .96$).

Next, we analyzed conflict experience. The two items (conflict and discomfort) were positively correlated ($r = .29, p = .003$), and thus we collapsed them to create a conflict index. We conducted a similar moderated regression analysis with the conflict index as the outcome variable. As predicted, the regression yielded the brand \times goal-strength interaction ($b = -.26, t(96) = -2.03, p < .05$), suggesting that the stronger participants' dieting goals were, the less conflicted they felt about consuming Krispy Kreme when it was anthropomorphized than when it was not (see fig. 4). There was no main effect for the anthropomorphism manipulation ($b = -.14, t(96) = -.92, p = .36$) but a main effect for goal strength ($b = .54, t(96) = 4.15, p < .001$), indicating that participants with stronger dieting goals felt stronger conflict toward consuming Krispy Kreme.

-----Insert figure 4 about here-----

Specifically, simple slope tests (Aiken and West 1991) showed there was a reliable association between goal strength and conflict experience in the control condition ($b = .80, t(96) = 4.09, p < .001$), indicating higher levels of conflict among those with strong rather than weak dieting goals. However, this relationship was absent in the anthropomorphism condition ($b = .27, t(96) = 1.61, p = .11$), indicating that those with strong versus weak goals did not differ in their level of experienced conflict. Consistent with previous results, these findings support our prediction that anthropomorphizing a tempting brand prevents those with a stronger long-term goal from experiencing the higher level of conflict.

Taken together, the findings of Study 3 show that the strength of a long-term goal moderates the effect of anthropomorphism on conflict experience, which provides strong evidence that our effects indeed center on self-control processes. That is, if a long-term goal is not strong, there is less potential for self-control conflict to be realized. Moreover, the null effects of anthropomorphism on desire and appeal indicate that heightened desire or appeal

cannot be accountable for the effect of anthropomorphism on self-control.

The findings thus far suggest that temptation anthropomorphism hampers self-control, not by increasing desire strength for the tempting product, but by decreasing feelings of conflict regarding product consumption. Nevertheless, the question remains as to why people are less likely to feel conflicted when a temptation is anthropomorphized. Our theory posits that when a tempting product is imbued with humanlike qualities, the perception of another agent makes people less likely to attribute the cause of and responsibility for their consumption purely to themselves, leading them to feel less conflicted because temptation indulgence is not perceived as solely their fault. Our next study tests this prediction.

STUDY 4: HOW ANTHROPOMORPHISM DECREASES CONFLICT

The main purpose of Study 4 was to examine the underlying process of how temptation anthropomorphism reduces conflict experience. We used high-calorie cookies as a tempting product that interferes with a dieting goal, and manipulated the anthropomorphic qualities by applying a human shape and name to the product. As dependent variables, participants reported conflict experience regarding the consumption of the cookies, and the degree to which they attributed the cause of their consumption to internal factors (i.e., their own preferences; Kardes 1988). We predicted that anthropomorphizing the tempting product would decrease the degree of internal attribution, which in turn would reduce the degree of feeling conflicted. Analogous to Study 3, we predicted that these effects would be moderated by the strength of an individual's dieting goal.

Method

Forty undergraduates from South Korea (28 women, $M_{\text{age}} = 22$) participated in the study in exchange for 3,000 Won (\approx US\$3). The study employed a 2 (product: anthropomorphized

versus control) between-subjects design with one self-report variable: the strength of the dieting goal.

Participants completed a similar procedure as in Study 1, in which they evaluated a high-calorie cookie that either was or was not anthropomorphized. As a manipulation of anthropomorphism, we manipulated the shape and name of high-calorie cookies. Specifically, participants were presented with a photograph of a human-shaped cookie with a human name (“Jamie”) in the anthropomorphism condition, or a regular round-shaped cookie without a human name in the control condition (see fig. 1). The shape manipulation was based on previous research that shows objects in a humanlike form are more likely to be anthropomorphized (Graham and Poulin-Dubois 1999). We also provided mock-up nutrition information about the product as in Study 1.

To test the effectiveness of the anthropomorphism manipulation as in the previous studies, we asked a pilot sample of participants ($N = 34$) to evaluate a photograph of a cookie, presented along with its nutrition information, in either the anthropomorphism condition or the control condition. Participants rated the anthropomorphic qualities (“To what extent does the cookie remind you of some humanlike qualities?”) and perceived healthiness (“How healthy do you think the cookie is?”) on a 7-point scale. As expected, participants attributed a higher degree of humanlike qualities to the cookie in the anthropomorphism condition ($M = 4.82$, $SD = 1.29$) than the one in the control condition ($M = 3.59$, $SD = 1.70$; $t(32) = 2.39$, $p < .05$), confirming the success of our manipulation. Moreover, participants in the two conditions rated the cookie equally unhealthy ($M_{\text{anthropomorphism}} = 2.59$, $SD = .93$; $M_{\text{control}} = 2.53$, $SD = 1.50$; $t(32) = .14$, $p = .89$), suggesting that anthropomorphism does not influence the product’s healthiness perception.

For the main study, participants first reported on a 7-point scale their strength of desire for the product and how conflicted they felt about consuming it. They next rated the degree of internal attribution they would make for consuming the cookie. Specifically, we measured attribution to one's personal preference, based on previous research on attributional locus that identifies personal preference as a key internal factor (Calder and Burnkrant 1977; Kardes 1988). Specifically, participants responded to the following question (translated from Korean): "If you purchase and consume the cookie, how well does the following statement represent the reason for your consumption?; My *personal preference* for sweets is why I consume the cookie" (1 = *strongly disagree*, 7 = *strongly agree*). As in Study 3, participants then reported how often they were on a diet (1 = *never*, 5 = *always*) as a measure of dieting goal strength. Upon completion of the study, participants were fully debriefed.

Results and Discussion

To analyze participants' strength of desire to consume the product, we first performed a moderated regression analysis with three independent variables: product (1 = anthropomorphized, -1 = control), goal strength centered on the mean of the scale ($M = 2.70$, $SD = 1.22$), and the interaction between the two variables. As predicted, the regression yielded no product \times goal-strength interaction ($b = -.21$, $t(36) = -1.09$, $p = .28$), replicating the null effect of anthropomorphism on desire strength for the product. There was no main effect for the anthropomorphism manipulation ($b = -.33$, $t(36) = -1.42$, $p = .16$) and a marginal main effect for goal strength ($b = .36$, $t(36) = 1.86$, $p = .07$).

We then conducted a similar moderated regression analysis with conflict experience as the outcome variable. As predicted, the regression yielded the product \times goal-strength interaction ($b = -.45$, $t(36) = -2.17$, $p < .05$; see fig. 5). There was no main effect for the anthropomorphism

manipulation ($b = -.13$, $t(36) = -.52$, $p = .60$) or for goal strength ($b = .28$, $t(36) = 1.33$, $p = .19$). Simple slope tests showed there was a reliable association between goal strength and conflict experience in the control condition ($b = .73$, $t(36) = 2.30$, $p < .05$), indicating higher levels of conflict among those with strong rather than weak dieting goals. However, this relationship was absent in the anthropomorphism condition ($b = -.17$, $t(36) = -.65$, $p = .52$), indicating that those with strong versus weak goals did not differ in their level of experienced conflict.

-----Insert figure 5 about here-----

Next, we conducted a similar moderated regression analysis with internal attribution as the outcome variable. As predicted, this analysis yielded the product \times goal-strength interaction ($b = -.42$, $t(36) = -2.36$, $p < .05$). There was no main effect for the anthropomorphism manipulation ($b = .21$, $t(36) = .97$, $p = .34$) but a main effect for goal strength ($b = .41$, $t(36) = 2.29$, $p < .05$), suggesting that participants with stronger dieting goals were more likely to make internal attributions. As in the analysis of conflict, simple slope tests showed a reliable association between dieting goal strength and internal attribution in the control condition ($b = .83$, $t(36) = 3.05$, $p < .01$), indicating higher levels of internal attribution among those with strong rather than weak dieting goals. However, this relationship was absent in the anthropomorphism condition ($b = -.01$, $t(36) = -.06$, $p = .96$), indicating that people with strong versus weak dieting goals did not differ in their level of internal attribution.

Lastly, to test whether internal attribution serves as a mediator of the above interactive effect of anthropomorphism and goal strength on conflict experience, we conducted a moderated mediation analysis utilizing the PROCESS Multiple Mediation Model 8 (Preacher and Hayes 2004; Hayes 2013). The regression model employed the three independent variables used above (anthropomorphism, goal strength, and anthropomorphism \times goal strength), internal attribution

as the mediating variable, and conflict experience as the dependent variable. The mean indirect effects excluded zero for internal attribution ($\beta = -.18$; 95% CI = $-.6075$ to $-.0016$), indicating a significant mediating role of internal attribution. Accordingly, the direct effect of the interaction (anthropomorphism \times goal strength) on conflict experience was no longer significant ($t(35) = -1.29, p = .20$).

The findings of Study 4 provide converging evidence for our prediction that anthropomorphizing a tempting product does not change desire strength for the product, but decreases the level of conflict experience regarding product consumption. Based on prior work (Hofmann et al. 2012), we assumed that desire strength and conflict experience are independent antecedents of self-control. To demonstrate, we conducted an internal meta-analysis with the correlation coefficients between desire strength and conflict experience from the four studies thus far (Hunter and Schmidt 1990). In support of our prediction, the analysis showed that desire strength and conflict experience were not significantly correlated in any of the studies (average $r = .06$; 95% CI = $-.0564$ to $.1695$). The strength of desire strength and the level of conflict experience indeed represent two competing forces (impelling versus restraining) in self-control.

The results of Study 4 extend our findings by showing the underlying mechanism of how temptation anthropomorphism decreases conflict experience: consumers shift the locus of self-control away from themselves when the tempting product is anthropomorphized, and are therefore less likely to make an internal causal attribution for their consumption. In our next study, we aim to provide converging evidence for the underlying mechanism in two ways. First, instead of focusing on a specific internal cause of the consumption (e.g., strong preference), we assessed the extent to which participants attribute responsibility for and control over the consumption to themselves as a measure of internal attribution. Second, in addition to reducing

internal attribution, we explored the possibility that anthropomorphism may increase external attribution toward the anthropomorphized product (“the product is responsible”).

STUDY 5: INTERNAL ATTRIBUTION OF RESPONSIBILITY AND CONTROL

The main purpose of Study 5 was to more rigorously examine the underlying mechanism of how temptation anthropomorphism reduces conflict experience. We recruited only dieters, a group for which the presence of dieting goals can be assumed, and presented them with a high-calorie cookie as a tempting product. We employed a similar manipulation of anthropomorphism as in Studies 1 and 2 (a human face and a human name), and assessed internal and external attributions of responsibility for cookie consumption in addition to the degree of experienced conflict.

Method

Seventy undergraduates (49 women, $M_{\text{age}} = 22$), who identified themselves as dieters, were recruited through an online subject pool maintained by a major university in South Korea, and participated in the study in exchange for 2,000 Won (\approx US\$2). The study employed a 2 (product: anthropomorphized versus control) between-subjects design.

The study was presented as a “Consumer Product Evaluation Task,” in which participants evaluated a new cookie product presented as a photograph. Participants completed a similar procedure as in Study 1, in which they evaluated a high-calorie cookie that either was or was not anthropomorphized, along with mock-up nutrition information. We anthropomorphized the cookie by applying face-like features (Study 1), providing a human name and describing it in the first (vs. third) person (Study 2). Specifically, participants were presented with a photograph of a single cookie—either the human-face cookie with a human name (“Mr. Cookie”) in the anthropomorphism condition, or a regular round-shaped cookie without a human name

(“Cookie”) in the control condition, with the following product description (translated from Korean):

“Hi, *I am Mr. Cookie* [This is Cookie], a new cookie product coming into the market. *I have* [It has] a delicious and rich flavor, soft texture and appealing scent. *I am* [This cookie is] made with the finest ingredients like butter, sugar and eggs. *I am* [The cookie is] freshly baked, coming right out from the oven, and truly made by hand. *I am* [The cookie is] good for both kids’ and adults’ tastes and *I am* [it is] also suitable for various occasions from parties to picnics. *I can bring* [It brings] mouth-watering joy to your day!”

After reading the description, participants reported the level of experienced conflict toward cookie consumption (“How uncomfortable do you feel about eating this cookie, considering the unhealthiness of cookie products?”). They then rated the extent to which they internally attribute responsibility for and control over cookie consumption to themselves on the following two items: “Consider whether you will consume the cookie or not. How do you feel about your decision to purchase and eat it?” (1 = *I am not at all responsible for the decision*, 7 = *I am fully responsible for the decision*; 1 = *the decision is totally out of my control*, 7 = *the decision is totally under my control*). In addition, they rated the extent to which they externally attribute responsibility for cookie consumption to the target product, on the following item: “The cookie product is fully responsible for my decision to consume the cookie” (1 = *strongly disagree*, 7 = *strongly agree*). Upon completion of the study, participants provided demographic information, and were fully debriefed.

Results and Discussion

We first analyzed conflict experience. Analogous to previous studies, participants in the anthropomorphism condition felt less conflicted toward consuming the cookie ($M = 4.51$, $SD =$

1.74) than those in the control condition ($M = 5.34$, $SD = 1.45$; $t(68) = -2.16$, $p < .05$), suggesting that anthropomorphizing the product decreased the likelihood of experiencing conflict.

Next, we analyzed the degree of internal attribution for the consumption decision. The two items (responsibility and control) were positively correlated ($r = .48$, $p < .001$), and thus we collapsed them to create an internal-attribution index. Analogous to Study 4, participants in the anthropomorphism condition were less likely to feel responsible and perceive control over their consumption decision ($M = 5.24$, $SD = 1.51$) than those in the control condition ($M = 5.90$, $SD = .88$; $t(68) = -2.23$, $p < .05$), confirming that anthropomorphism decreases the tendency to make an internal attribution. In addition, we analyzed the degree of external attribution. Those in the anthropomorphism condition were somewhat more likely to attribute responsibility for their consumption to the target product ($M = 5.63$, $SD = 1.31$) than those in the control condition ($M = 5.03$, $SD = 1.48$; $t(68) = 1.79$, $p = .08$), although this difference did not reach statistical difference. The internal- and external-attribution items were marginally negatively correlated ($r = -.21$, $p = .08$).

Lastly, we conducted a mediation analysis utilizing PROCESS Mediation Model 4 (Preacher and Hayes 2004; Hayes 2013) to test whether the effect of anthropomorphism on conflict experience would be mediated by reduced internal attribution and/or increased external attribution. The model used the anthropomorphism manipulation as the independent variable, internal attribution and external attribution as the mediating variables, and conflict experience as the dependent variable. The mean indirect effects excluded zero for internal attribution ($\beta = -.20$; 95% CI = $-.4446$ to $-.0290$), but not for external attribution ($\beta = -.004$; 95% CI = $-.0800$ to $.1062$). Furthermore, the direct effect of anthropomorphism on conflict experience was no longer significant ($t(66) = -1.22$, $p = .23$), suggesting that internal attribution served as the

mediator, as predicted.

The results of Study 5 provide converging evidence for the underlying mechanism of how temptation anthropomorphism reduces conflict experience. Analogous to Study 4, anthropomorphizing a tempting product decreases the degree to which consumers attribute responsibility for product consumption to themselves. Interestingly, anthropomorphism also somewhat increased the tendency to attribute responsibility to the target product, but the effect did not reach statistical significance, nor mediate the effect of anthropomorphism on conflict experience. This stronger effect of anthropomorphism on internal rather than external attribution might be attributable to the advantage of self-insight (Funder 1989), which involves less cognitive effort to assess one's own internal control and responsibility than to consciously delegate them to external sources. In support, previous research suggests that the presence of other agents can reduce internal attribution of responsibility without necessarily involving explicit external attribution toward the agents (Garcia et al. 2002). At the same time, an alternative possibility is that framing our task as "product evaluation" might have led participants to expect they would be asked to consume the product in order to evaluate its taste, which could have prompted them to attribute responsibility to the experimenter instead of the product itself. Future research should explore the relationship between internal and external attributions in understanding the role of anthropomorphism.

Building on the results of Studies 4 and 5 that showed the link between internal attribution and conflict experience, in our next study, we aimed to provide more complete evidence for the underlying mechanism by assessing actual self-control behavior in addition to internal attribution and conflict experience. We predicted that anthropomorphizing a tempting product would decrease participants' tendency to make an internal attribution for their

indulgence, which would then reduce conflict. The reduction in conflict experience would in turn lead to failure in self-control and more indulgence in a tempting product.

STUDY 6: UNDERLYING PATHS OF HOW ANTHROPOMORPHISM REDUCES SELF-CONTROL

The main purpose of Study 6 was to examine how temptation anthropomorphism reduces actual self-control behavior in a three-step process: anthropomorphism decreases internal attributions for the indulgence, which leads to reduced conflict experience, which further leads to more temptation indulgence. We recruited only dieters, a group for which the presence of self-control goals can be assumed. We used an actual high-calorie cookie as a tempting product for dieters, and employed the same manipulation of anthropomorphism used in Study 5. In addition to the degree of internal attribution and experienced conflict, we assessed self-control behavior by measuring the proportion of the cookie consumed by participants when they had a chance to freely indulge.

Method

Forty-four undergraduates from South Korea (27 women, $M_{\text{age}} = 23$), who identified themselves as dieters, participated in the study in exchange for 3,000 Won (\approx US\$3). The study employed a 2 (product: anthropomorphized versus control) between-subjects design.

The study was presented as a “Consumer Product Evaluation Task,” in which participants tasted and evaluated a new cookie product. We presented an actual cookie (3.15 inch in diameter) as a tempting product, and used the same procedure and anthropomorphism manipulation in Study 5 (face-like features, a human name, product description in the first person).

To test the effectiveness of our manipulation, we asked a pilot sample of participants from the same population ($N = 40$) to evaluate the same real cookie from the main study (either

anthropomorphized or not). Participants rated the anthropomorphic qualities (“To what extent does the cookie remind you of some humanlike qualities?”) and appeal of the cookie (“To what extent do you find the cookie appealing?”) on a 7-point scale. They also reported their mood state on a reduced-item version of the Nowlis Mood Adjective Check List (Batra and Stayman 1990; Nowlis 1965), which consists of eleven items grouped into three mood categories (positive: happy, positive: warm, negative). As expected, participants attributed a higher degree of humanlike qualities to the cookie in the anthropomorphism condition ($M = 5.67$, $SD = 1.24$) than the one in the control condition ($M = 3.74$, $SD = 1.56$; $t(38) = 4.36$, $p < .001$). There was no difference on appeal of the product ($p = .54$) or mood state between the anthropomorphism and control conditions ($ps > .30$), suggesting that our anthropomorphism manipulation did not affect product appeal or participants’ mood.

For the main study, after reading the description and before tasting the cookie, participants reported the level of experienced conflict toward cookie consumption (“How conflicted do you feel about consuming this cookie?”; “How uncomfortable do you feel about eating this cookie, considering the unhealthiness of cookie products?”). They then rated the extent to which they attribute the cause of cookie consumption to internal factors. Building on one’s personal preference (Study 4) and responsibility and control (Study 5), we assessed attribution to one’s willpower, based on previous research indicating that one’s own willpower is a key internal factor in self-control (O’Connell and Martin 1987; Polivy and Herman 2002). Specifically, participants responded to the following question: “If you purchase and consume the cookie, how well does the following statement represent the reason for your consumption? My *weak willpower* is why I consume the cookie” (1 = *strongly disagree*, 7 = *strongly agree*).

Participants were then given a chance to taste and consume as much of the presented cookie as they wished. Two independent coders who were blind to our hypotheses assessed the percentage of the cookie eaten by each participant, which served as a measure of temptation indulgence (rater agreement = 98%). After tasting the cookie, participants evaluated it in terms of texture, sweetness, and deliciousness on a 7-point scale. Upon completion of the study, participants provided demographic information, and were fully debriefed.

Results and Discussion

There were no differences on the three taste-evaluation items ($t_s < 1$) between the anthropomorphism and control conditions, suggesting that our anthropomorphism manipulation did not affect participants' after-taste-evaluations (texture, sweetness, and deliciousness of the product).

Next, we analyzed conflict experience. The two items (conflict and discomfort) were positively correlated ($r = .30, p = .05$), and thus we collapsed them to create a conflict index. Analogous to previous studies, participants in the anthropomorphism condition felt less conflicted toward consuming the cookie ($M = 3.23, SD = 1.22$) than those in the control condition ($M = 4.25, SD = 1.38; t(42) = -2.61, p < .05$), suggesting that anthropomorphizing the product decreased the likelihood of experiencing conflict. We also analyzed the degree of internal attribution for cookie consumption. As predicted, those in the anthropomorphism condition were less likely to attribute their consumption to their weak willpower ($M = 3.04, SD = 1.71$) than those in the control condition ($M = 4.26, SD = 1.73; t(42) = -2.32, p < .05$), confirming that anthropomorphism decreases the tendency to make an internal attribution.

We next analyzed the amount of the cookie eaten by each participant, as a measure of temptation indulgence. In support of our prediction, participants in the anthropomorphism

condition consumed more of the tempting product ($M = 83.54\%$, $SD = 28.49\%$) than those in the control condition ($M = 59.50\%$, $SD = 31.16\%$; $t(42) = 2.67$, $p < .05$), demonstrating that anthropomorphism decreased self-control.

Because we hypothesized that the internal attribution mediates the effect of anthropomorphism on conflict experience, which in turn should mediate the effect of anthropomorphism on temptation indulgence, we ran a serial multiple mediation model utilizing the PROCESS Multiple Mediation Model 6 (Preacher and Hayes 2004; Hayes 2013). The regression model used anthropomorphism as the independent variable, internal attribution as the first mediating variable, conflict experience as the second mediating variable, and temptation indulgence as the dependent variable. The mean indirect effects excluded zero for the multiple mediators (internal attribution and conflict experience) ($\beta = 1.60$; 95% CI = .0781 to 5.8732). Furthermore, in the mediation model, the direct effect of anthropomorphism on temptation indulgence was no longer significant ($t(39) = 1.53$, $p = .13$), suggesting that internal attribution and conflict served as the first and second mediators, as predicted (see fig. 6).

-----Insert figure 6 about here-----

Taken together, the results of Study 6 extend our previous findings by demonstrating the sequential pathway of how temptation anthropomorphism impairs self-control behavior. That is, anthropomorphizing a tempting product decreases the degree to which consumers attribute a cause of product consumption to themselves, which reduces the degree of experiencing conflict toward product consumption that serves as a signal of the need for self-control. Reduced conflict in turn leads to a higher likelihood of self-control failure or temptation indulgence.

GENERAL DISCUSSION

Consumer self-control can be conceptualized as a struggle between two psychological

forces, impelling desires and the restraint of long-term goals (Carver 2005; Hoch and Loewenstein 1991; Hofmann et al. 2009). Based on this framework, the present research examines the effect of an anthropomorphized temptation on consumer self-control, and suggests that temptation anthropomorphism does not influence the strength of desire for the temptation, but the extent to which one experiences conflict regarding the decision to indulge in it—the latter being an initial step for exercising self-control. Across six studies with different samples, different anthropomorphism manipulations (i.e., face, shape, name) and different goal contexts (i.e., dieting and academic goals), we found consistent results suggesting that anthropomorphizing tempting products hampers consumer self-control by decreasing the experience of conflict toward consuming the product.

Study 1 documented that anthropomorphizing a tempting product reduced dieters' experience of conflict regarding consumption of the product, but did not influence desire strength. Study 2 replicated these effects in a different goal context and with a different anthropomorphism manipulation. In addition, by manipulating the presence of the focal goal, we showed that the effects of anthropomorphism on conflict experience and willingness to indulge in the product were unique to situations in which product consumption interfered with focal long-term goals. Study 3 replicated the effects with an existing brand while measuring the strength of the focal goal, instead of manipulating it. Studies 4 and 5 further investigated the underlying mechanism of how anthropomorphism reduces conflict experience, by showing that consumers were less likely to make internal attributions for the cause, control, and responsibility for their consumption decision, when the product was anthropomorphized. Study 6 assessed actual product consumption as a measure of self-control, and provided more complete evidence for the sequential pathway of these effects by employing internal attribution and conflict

experience as two sequential mediators.

Theoretical Implications

Our findings have important implications for the anthropomorphism literature, which has primarily focused on antecedents of anthropomorphism (Morewedge 2009), and changes in target evaluations as consequences of anthropomorphism (Aggarwal and McGill 2007). The current work explores its impact on self-control, especially when the target serves as a temptation that is both desirable and harmful. Although some prior studies have employed similar products (e.g., Krispy Kreme; Aggarwal and McGill 2012), no research to date has systematically explored the impact of anthropomorphism on self-control behavior, the process through which it exerts influence, or the role of long-term goals (e.g., dieters or non-dieters).

Our findings also have implications for prior work, which has provided mixed results regarding the effect of anthropomorphism on target evaluations (i.e., liking, appeal; Delbaere et al. 2011; Puzakova et al. 2013). We found that anthropomorphizing a tempting product does not change desire strength and appeal of the product, consistent with previous findings for similar products (Aggarwal and McGill 2012; Waytz et al. 2010). We reasoned that the ambivalent nature of a temptation prevents anthropomorphism from effecting unidirectional changes in desire strength—a line of reasoning consistent with previous findings that imply the perceived nature and function of the agent as a potential moderator (Waytz et al. 2010; Waytz et al. 2014).

Notably, in our studies, we employed relatively neutral anthropomorphism manipulations (e.g., face with emotionless features) to avoid priming any positive or negative emotions (Winkielman and Cacioppo 2001), but the perceived ambivalence toward a target does not seem to be affected by the valence of anthropomorphic traits (e.g., smiling, blank, frowning face). In support, research finds that anthropomorphism does not affect liking of a tempting product even

when it is only advertised in a positive light (e.g., cute, smiling cookie; Nenkov and Scott 2014). In other words, one's ambivalent view toward a product may not be necessarily affected by how marketers advertise it. For example, consumers might retain ambivalent views toward a product even when it is marketed in strictly positive terms (Priester and Petty 1996; Priester, Petty, and Park, 2007).

However, it remains a possibility that anthropomorphism increases or decreases desire or appeal when consumers hold a clearly positive or negative view of the product. For example, if the product is perceived to be unambiguously good (e.g., healthy and tasty), anthropomorphism may increase desire strength whereas if the product is perceived to be simply bad (e.g., unhealthy and tasteless), anthropomorphism may decrease desire strength. While the present research focuses on one type of target (temptation) that produces null effects of anthropomorphism on desire and appeal, further investigation is needed to fully resolve the mixed findings in existing research.

An additional avenue for future research is to examine the conditions under which anthropomorphism triggers an explicit delegation of responsibility to the target. Although the effect of anthropomorphism on external attribution appeared only marginally significant (Study 5), it may depend on the type of targets. For example, if the target is not a product (as in current studies) but a company that produces tempting products, consumers may be more inclined to attribute responsibility to the target, and anthropomorphism may significantly increase external attribution. Companies tend to be perceived as sovereign actors in society with agentic capabilities (King, Felin, and Whetten 2010), which may encourage consumers to explicitly assign responsibilities to them for negative outcomes, even to the point of filing lawsuits against them (Mello, Rimm, and Studdert 2003). Future research, for example, could therefore explore

whether consumers who indulge in high-fat products place more blame for personal and societal weight-related health problems on the companies when they are anthropomorphized.

The present research also makes several contributions to the self-control literature. First, it not only identifies anthropomorphism as an inhibiting factor of self-control, but also empirically demonstrates that desire and conflict are indeed two independent paths through which anthropomorphism has or does not have influence on self-control behavior. Second, by inspecting the precise mechanism of the conflict path, our findings provide additional support for the critical role of conflict experience in self-control (Hofmann et al. 2012). Lastly, this research contributes to research establishing a negative link between internal attributions and self-control, by revealing how internal attributions diminish the experience of inner conflict that serves as an internal alarm for the need of self-control (Gray and McNaughton 2003).

One related question is whether anthropomorphism affects the self-conscious emotion of guilt. Guilt is triggered when people attribute their self-control transgressions to themselves (Lewis 2000). By reducing the degree of internal attribution for consumption, anthropomorphism might not only increase indulgence in the temptation, as shown in the present studies, but also decrease guilt after people have indulged in it. This reduction in guilt might further increase the likelihood of subsequent failures in self-control, because the association of guilt with a temptation tends to inhibit future indulgence in it (Giner-Sorolla 2001).

Future research should also examine the extent to which the process of reducing internal attribution and conflict experience occurs at a conscious level. We speculate that the process is relatively unconscious and automatic. Previous research has considered anthropomorphism as an automatic psychological process, in which people perceive humanlike features in non-human agents effortlessly and quickly, and interact with them accordingly (Epley et al. 2007; Guthrie

1993; Mitchell, Thompson, and Miles 1997). For example, when asked, individuals would consciously acknowledge that an anthropomorphized gadget does not provide human interactions; but they still feel less lonely by anthropomorphizing it (Epley et al. 2008). Likewise, our participants must have been able to consciously acknowledge that the anthropomorphized products are not actual people, but their self-control behavior was still affected by anthropomorphism's cue that another agent was present. Moreover, previous research on the implicit bystander effect (Garcia et al. 2002) and automatic dissonance reduction (Lieberman et al. 2001) suggests that diffusion of responsibility and conflict reduction occur instantly and without explicit memory or conscious justification. Similarly, it is possible that temptation anthropomorphism reduces internal attributions of responsibility and subsequent conflict experience without necessarily involving explicit delegation of responsibility.

Another related question is whether the reduced conflict is a by-product of justification for temptation indulgence. We speculate that our process does not involve conscious justification of self-licensing (Kivetz and Zhang 2006). Our meta-analysis on correlation coefficients between desire strength and conflict experience provides preliminary support. That is, if consumers downplay conflict experience by actively justifying their consumption, the magnitude of the reduction should be predicted by the strength with which the product is desired: the stronger desire, the more intense justification (Kroese et al. 2011; Sayette and Hufford 1997). The absence of such a link, as demonstrated by no correlations between desire and conflict, suggests the possibility that our anthropomorphism manipulation lowered the potential for conflict to be recognized and experienced, rather than initiating the motivated reduction of full-blown conflict. Again, however, these questions await future research.

Practical Implications

The present research has practical implications for marketing strategies and public-health messages. First, our findings suggest that when employing anthropomorphism strategies, marketers should be aware of the nature of the target product. When the target serves as a temptation that is desirable in the short-term but detrimental in the long-term, anthropomorphism increases consumption by reducing conflict experience toward the indulgence. However, the null effect on desire and product appeal suggests that the anthropomorphism strategy might not be effective in creating a favorable attitude toward their product or brand, nor increasing consumers' recommendations or positive word-of-mouth advertising (Brown et al. 2005; Chen and Xie 2008).

Moreover, the present findings have practical implications for public policy makers in utilizing anthropomorphism in the framing of public-health messages (Kim and McGill 2011) and prosocial campaigns (Ahn, Kim, and Aggarwal 2014). Previous research has shown that the framing of health messages involving self-control problems, such as obesity, can significantly facilitate or impede the target population's reaction and self-control behavior (Hoyt, Burnette, and Auster-Gussman 2014). Our findings indicate that framing temptations (e.g., high-calorie food items, cigarettes) with anthropomorphic terms in health messages can actually harm the target population's self-control by reducing the conflict they feel about temptation indulgence. Thus, when employing anthropomorphism strategies, policy makers should be mindful about the relationship between the target population and the anthropomorphized agents.

In conclusion, we investigated the consequences that anthropomorphized temptations have on self-control. Results suggest that anthropomorphizing tempting products hampers consumer self-control by decreasing the likelihood that they experience conflict toward product consumption. When temptations come alive, it is harder to see their true colors.

REFERENCES

- Ahn, Hee-Kyung, Hae Joo Kim, and Pankaj Aggarwal (2014), "Helping Fellow Beings Anthropomorphized Social Causes and the Role of Anticipatory Guilt," *Psychological science*, 25 (1), 224–29.
- Aiken, Leona S. and Stephen G. West (1991), *Multiple Regression: Testing and Interpreting Interactions*, Thousand Oaks, CA: Sage.
- Aggarwal, Pankaj and Ann McGill (2007), "Is That Car Smiling at Me? Schema Congruity as a Basis for Evaluating Anthropomorphized Products," *Journal of Consumer Research*, 34 (December), 468–79.
- (2012), "When Brands Seem Human, Do Humans Act Like Brands? Automatic Behavioral Priming Effects of Brand Anthropomorphism," *Journal of Consumer Research*, 39 (August), 307–23.
- Arnheim, Rudolf (1969), *Visual Thinking*, Berkeley: University of California Press.
- Baker, Evander (2011), "Implicit Delegation of Responsibility Joint Self-Control in Close Relationships," *Social Psychological and Personality Science*, 2 (3), 277–83.
- Batra, Rajeev and Douglas M Stayman (1990), "The Role of Mood in Advertising Effectiveness," *Journal of Consumer Research*, 203–14.
- Baumeister, Roy F. (2002), "Yielding to Temptation: Self-Control Failure, Impulsive Buying, and Consumer Behavior," *Journal of Consumer Research*, 28 (March), 670–76.
- Belk, Russell W., Güliz Ger, and Sören Askegaard (1997), "Consumer Desire in Three Cultures: Results from Projective Research," in *Advances in Consumer Research*, Vol. 24, ed. Merrie Brucks and Debbie MacInnis, Provo, UT: Association for Consumer Research, 24–28.

- Bem, Daryl J., Michael A. Wallach, and Nathan Kogan (1965), "Group Decision Making under Risk of Aversive Consequences," *Journal of Personality and Social Psychology*, 1 (5), 453.
- Botvinick, Matthew M., Todd S. Braver, Deanna M. Barch, Cameron S. Carter, and Jonathan D. Cohen (2001), "Conflict Monitoring and Cognitive Control," *Psychological Review*, 108 (3), 624.
- Brown, Tom J., Thomas E. Barry, Peter A. Dacin, and Richard F. Gunst (2005), "Spreading the Word: Investigating Antecedents of Consumers' Positive Word-of-Mouth Intentions and Behaviors in a Retailing Context," *Journal of the Academy of Marketing Science*, 33 (2), 123–38.
- Burgoon, Judee K, Joseph A Bonito, Bjorn Bengtsson, Carl Cederberg, Magnus Lundeberg, and L Allsach (2000), "Interactivity in Human–Computer Interaction: A Study of Credibility, Understanding, and Influence," *Computers in Human Behavior*, 16 (6), 553–74.
- Calder, Bobby J. and Robert E. Burnkrant (1977), "Interpersonal Influence on Consumer Behavior: An Attribution Theory Approach," *Journal of Consumer Research*, 29–38.
- Carver, Charles S. (2005), "Impulse and Constraint: Perspectives from Personality Psychology, Convergence with Theory in Other Areas, and Potential for Integration," *Personality and Social Psychology Review*, 9(4), 312–33.
- Chambliss, Catherine A. and Edward J. Murray (1979), "Efficacy Attribution, Locus of Control, and Weight Loss," *Cognitive Therapy and Research*, 3 (4), 349–53.
- Chandler, Jesse and Norbert Schwarz (2010), "Use Does Not Wear Ragged the Fabric of Friendship: Thinking of Objects as Alive Makes People Less Willing to Replace Them,"

Journal of Consumer Psychology, 20 (2), 138–45.

Chen, Yubo and Jinhong Xie (2008), "Online Consumer Review: Word-of-Mouth as a New Element of Marketing Communication Mix," *Management Science*, 54 (3), 477–91.

Darley, John M. and Bibb Latane (1968), "Bystander Intervention in Emergencies: Diffusion of Responsibility," *Journal of Personality and Social Psychology*, 8 (4p1), 377.

Delbaere, Marjorie, Edward F. McQuarrie, and Barbara J. Phillips (2011), "Personification in Advertising," *Journal of Advertising*, 40 (1), 121–30.

Dennet, Daniel C. (1996), *Kinds of Minds: Towards an Understanding of Consciousness, The Science Masters Series*, New York, NY: Basic Books.

Do Vale, Rita Coelho, Rik Pieters, and Marcel Zeelenberg (2008), "Flying under the Radar: Perverse Package Size Effects on Consumption Self-Regulation," *Journal of Consumer Research*, 35 (3), 380–90.

Epley, Nicholas, Adam Waytz, and John Cacioppo (2007), "On Seeing Human: A Three-Factor Theory of Anthropomorphism," *Psychological Review*, 114 (4), 864–86.

Epley, Nicholas, Scott Akalis, Adam Waytz, and John T Cacioppo (2008), "Creating Social Connection through Inferential Reproduction Loneliness and Perceived Agency in Gadgets, Gods, and Greyhounds," *Psychological Science*, 19 (2), 114–20.

Fishbach, Ayelet, Rohn S. Friedman, and Arie W. Kruglanski (2003), "Leading Us Not unto Temptation: Momentary Allurements Elicit Overriding Goal Activation," *Journal of Personality and Social Psychology*, 84 (February), 296–309.

Fitzsimons, Gavan J., Joseph C. Nunes, and Patti Williams (2007), "License to Sin: The Liberating Role of Reporting Expectations." *The Journal of consumer research*, 34 (1), 22–31.

- Funder, David C (1989), "Accuracy in Personality Judgment and the Dancing Bear," in *Personality Psychology*: Springer, 210–23.
- Garcia, Stephen M., Kim Weaver, Gordon B. Moskowitz, and John M. Darley (2002), "Crowded Minds: The Implicit Bystander Effect," *Journal of Personality and Social Psychology*, 83 (4), 843.
- Giner-Sorolla, Roger (2001), "Guilty Pleasures and Grim Necessities: Affective Attitudes in Dilemmas of Self-Control," *Journal of personality and social psychology*, 80 (2), 206–21.
- Gong, Li (2008) "How social is social responses to computers? The Function of the Degree of Anthropomorphism in Computer Representations," *Computers in Human Behavior*, 24(4), 1494–1509.
- Graham, Susan A. and Diane Poulin-Dubois (1999), "Infants' Reliance on Shape to Generalize Novel Labels to Animate and Inanimate Objects," *Journal of Child Language*, 26 (2), 295–320.
- Gray, Jeffrey Alan and Neil McNaughton (2003), *The Neuropsychology of Anxiety: An Enquiry into the Function of the Septo-Hippocampal System*: Oxford University Press.
- Guthrie, Stewart (1993), *Faces in the Clouds. A New Theory of Religion*, New York, NY: Oxford University Press.
- Haley, Kevin J. and Daniel MT Fessler (2005), "Nobody's Watching?: Subtle Cues Affect Generosity in an Anonymous Economic Game," *Evolution and Human behavior*, 26 (3), 245–56.
- Haws, Kelly L., William O. Bearden, and Gergana Y. Nenkov (2012), "Consumer Spending Self-Control Effectiveness and Outcome Elaboration Prompts," *Journal of the Academy*

of Marketing Science, 40 (5), 695–710.

Hayes, Andrew F. (2013), *An Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*. New York: Guilford Press.

Heatherton, Todd F. and Patricia A. Nichols (1994), "Personal Accounts of Successful Versus Failed Attempts at Life Change," *Personality and Social Psychology Bulletin*, 20 (6), 664–75.

Hoch, Stephen J. and George F. Loewenstein (1991), "Time Inconsistent Preferences and Consumer Self-Control," *Journal of Consumer Research*, 17 (4), 492–507.

Hofmann, Wilhelm, Roy F. Baumeister, Georg Forster, and Kathleen D. Vohs (2012), "Everyday Temptations: An Experience Sampling Study of Desire, Conflict, and Self-Control," *Journal of Personality and Social Psychology*, 102 (6), 1318–35.

Hofmann, Wilhelm, Malte Friese, and Fritz Strack (2009), "Impulse and Self-Control from a Dual-Systems Perspective," *Perspectives on Psychological Science*, 4 (2), 162–76.

Hofmann, Wilhelm and Lotte Van Dillen (2012), "Desire the New Hot Spot in Self-Control Research," *Current Directions in Psychological Science*, 21 (5), 317–22.

Hoyt, Crystal L., Jeni L. Burnette, and Lisa Auster-Gussman (2014), "'Obesity Is a Disease' Examining the Self-Regulatory Impact of This Public-Health Message," *Psychological science*, 25 (4), 997–1002.

Hunter, John E and Frank L Schmidt (1990), "Dichotomization of Continuous Variables: The Implications for Meta-Analysis," *Journal of Applied Psychology*, 75 (3), 334–49.

Inzlicht, Michael and Jennifer N. Gutsell (2007), "Running on Empty: Neural Signals for Self-Control Failure," *Psychological Science*, 18 (11), 933–37.

Kahn, Barbara E. and Brian Wansink (2004), "The Influence of Assortment Structure on

- Perceived Variety and Consumption Quantities,” *Journal of Consumer Research*, 30 (4), 519–33.
- Kardes, Frank R. (1988), "Base Rate Information, Causal Inference, and Preference," *Advances in consumer research*, 15 (1).
- Kavanagh, David J., Jackie Andrade, and Jon May (2005), "Imaginary Relish and Exquisite Torture: the Elaborated Intrusion Theory of Desire," *Psychological Review*, 112 (2), 446.
- Kim, Sara and Ann McGill (2011), "Gaming with Mr. Slot or Gaming the Slot Machine? Power, Anthropomorphism, and Risk Perception," *Journal of Consumer Research*, 38 (1), 94–107.
- Kiesler, Sara and Jennifer Goetz (2002), “Mental Models and Cooperation with Robotic Assistants,” in *Proceedings of Conference on Human Factors in Computing Systems*, Minneapolis: ACM, 576–77.
- King, Brayden G., Teppo Felin, and David A. Whetten (2010), "Perspective—Finding the Organization in Organizational Theory: A Meta-Theory of the Organization as a Social Actor," *Organization Science*, 21 (1), 290–305.
- Kivetz, Ran and Yuhuang Zheng (2006), “Determinants of Justification and Self-Control,” *Journal of Experimental Psychology: General*, 135 (4), 572–87.
- Koda, Tomoko, and Pattie Maes (1996) "Agents with Faces: The Effect of Personification," *Proceedings of IEEE Workshop on Robot and Human Communication*, 5, 189–94.
- Kroese, Floor M, Catharine Evers, and Denise TD De Ridder (2011), "Tricky Treats: Paradoxical Effects of Temptation Strength on Self-Regulation Processes," *European Journal of Social Psychology*, 41 (3), 281–88.
- Lewis, Michael (2000), "Self-Conscious Emotions," *Handbook of emotions*, 2, 623–36.

- Lieberman, Matthew D, Kevin N Ochsner, Daniel T Gilbert, and Daniel L Schacter (2001), "Do Amnesics Exhibit Cognitive Dissonance Reduction? The Role of Explicit Memory and Attention in Attitude Change," *Psychological Science*, 12 (2), 135–40.
- May, Frank and Ashwani Monga (2014), "When Time Has a Will of Its Own, the Powerless Don't Have the Will to Wait: Anthropomorphism of Time Can Decrease Patience," *Journal of Consumer Research*, 40 (5), 924–42.
- Mele, Alfred R. (1995), "Autonomous Agents: From Self-Control to Autonomy." ----- (2001), *Self-deception Unmasked*, Princeton: Princeton University Press.
- Mello, Michelle M., Eric B. Rimm, and David M. Studdert (2003), "The McLawsuit: the Fast-Food Industry and Legal Accountability for Obesity," *Health Affairs*, 22 (6), 207–16.
- Mitchell, Robert W., Nicholas S. Thompson, and H. Lyn Miles, eds. (1997), *Anthropomorphism, Anecdotes, and Animals*, Albany: SUNY Press.
- Morewedge, Carey K (2009), "Negativity Bias in Attribution of External Agency," *Journal of Experimental Psychology: General*, 138 (4), 535–45.
- Nenkov, Gergana Y. and Maura L. Scott (2014), "'So Cute I Could Eat it Up': Priming Effects of Cute Products on Indulgent Consumption." *Journal of Consumer Research*, 41 (2), 326-41
- Nowlis, Vincent (1965), "Research with the Mood Adjective Check List," in *Affect, Cognition, and Personality: Empirical Studies*, eds. Silvan S. Tomkins and Carroll E. Izard, New York: Springer, 352–89.
- O'Connell, Kathleen A. and Edwin J. Martin (1987), "Highly Tempting Situations Associated with Abstinence, Temporary Lapse, and Relapse among Participants in Smoking Cessation Programs," *Journal of Consulting and Clinical Psychology*, 55 (3), 367.

- Polivy, Janet and C. Peter Herman (2002), "If at First You Don't Succeed: False Hopes of Self-Change," *American Psychologist*, 57 (9), 677.
- Preacher, Kristopher J. and Andrew F. Hayes (2004), "SPSS and SAS Procedures for Estimating Indirect Effects in Simple Mediation Models," *Behavior Research Methods, Instruments, and Computers*, 36 (4), 717–31.
- Priester, Joseph R. and Richard E. Petty (1996), "The Gradual Threshold Model of Ambivalence: Relating the Positive and Negative Bases of Attitudes to Subjective Ambivalence," *Journal of Personality and Social Psychology*, 71 (3), 431–49.
- Priester, Joseph R., Richard E. Petty, and Kiwan Park (2007), "Whence Univalent Ambivalence? From the anticipation of Conflicting Reactions," *Journal of Consumer Research*, 34 (1), 11–21.
- Puzakova, Marina, Hyokjin Kwak, and Joseph F. Rocereto (2013), "When Humanizing Brands Goes Wrong: The Detrimental Effect of Brand Anthropomorphization Amid Product Wrongdoings," *Journal of Marketing*, 77 (3), 81–100.
- Ramanathan, Suresh and Patti Williams (2007), "Immediate and Delayed Emotional Consequences of Indulgence: The Moderating Influence of Personality Type on Mixed Emotions," *Journal of Consumer Research*, 34 (2), 212–23.
- Redden, Joseph P and Kelly L Haws (2013), "Healthy Satiation: The Role of Decreasing Desire in Effective Self-Control," *Journal of Consumer Research*, 39 (5), 1100–14.
- Sayette, Michael A and Michael R Hufford (1997), "Effects of Smoking Urge on Generation of Smoking-Related Information1," *Journal of Applied Social Psychology*, 27 (16), 1395–405.
- Schmeichel, Brandon J. and Michael Inzlicht (2013), "Incidental and Integral Effects of

- Emotions on Self-Control," *Handbook of Cognition and Emotion*, 272–90.
- Strack, Fritz and Roland Deutsch (2004), "Reflective and Impulsive Determinants of Social Behavior." *Personality and Social Psychology Review*, 8 (3), 220–47.
- Tidwell, Natasha D and Paul W Eastwick (2013), "Sex Differences in Succumbing to Sexual Temptations a Function of Impulse or Control?," *Personality and Social Psychology Bulletin*, 39 (12), 1620–33.
- Vohs, Kathleen D. and Ronald J. Faber (2007), "Spent Resources: Self-Regulatory Resource Availability Affects Impulse Buying," *Journal of Consumer Research*, 33 (March), 537–47.
- Wansink, Brian and Pierre Chandon (2006), "Can 'Low-Fat' Nutrition Labels Lead to Obesity?" *Journal of Marketing Research*, 43 (4), 605–17.
- Waytz, Adam, John Cacioppo, and Nicholas Epley (2010), "Who Sees Human? The Stability and Importance of Individual Differences in Anthropomorphism," *Perspectives on Psychological Science*, 5 (3), 219–32.
- Waytz, Adam, Kurt Gray, Nicholas Epley, and Daniel M. Wegner (2010), "Causes and Consequences of Mind Perception," *Trends in Cognitive Sciences*, 14 (8), 383–88.
- Waytz, Adam, Joy Heafner, and Nicholas Epley (2014), "The Mind in the Machine: Anthropomorphism Increases Trust in an Autonomous Vehicle," *Journal of Experimental Social Psychology*, 52, 113–17.
- Waytz, Adam, Carey K Morewedge, Nicholas Epley, George Monteleone, Jia-Hong Gao, and John T Cacioppo (2010), "Making Sense by Making Sentient: Effectance Motivation Increases Anthropomorphism," *Journal of personality and social psychology*, 99 (3), 410–35.

Weiner, Bernard (2001), "Intrapersonal and Interpersonal Theories of Motivation from an Attribution Perspective," in *Student Motivation*: Springer, 17–30.

Winkielman, Piotr and John T. Cacioppo (2001), “Mind at Ease Puts a Smile on the Face: Psychophysiological Evidence That Processing Facilitation Increases Positive Affect,” *Journal of Personality and Social Psychology*, 81 (6), 989–1000.

Yamaguchi, Susumu (1998), "Biased Risk Perceptions among Japanese: Illusion of Interdependence among Risk Companions," *Asian Journal of Social Psychology*, 1 (2), 117–31.

FIGURE 1

PHOTOGRAPHS OF THE ANTHROPOMORPHIZED VERSUS CONTROL PRODUCTS

(1) STUDY 1



(2) STUDY 4



FIGURE 2

**STUDY 2: A PHOTOGRAPH AND DESCRIPTION OF THE ANTHROPOMORPHIZED
PRODUCT**

Please take a look at our new TV gadget and the feature description below:



"Hi, my name is **Pat**, a new Pocket TV coming out this summer. I have a great screen display and fast internet (4G). I can stream thousands of movies, TV shows, and videos through Netflix and Youtube. I also have a user-friendly touch screen interface, so you can get to your shows faster. With a 128GB hard drive, you can fill me with all your favorite videos. I can also make good suggestions on the newest TV shows and movies depending on your past choices.

Since I only weigh 4.2 ounces, you can carry me anywhere you want! Take me to the park, to class, or even around the world!"

FIGURE 3

STUDY 2: THE EFFECT OF GOAL PRIME AND ANTHROPOMORPHISM ON CONFLICT EXPERIENCE

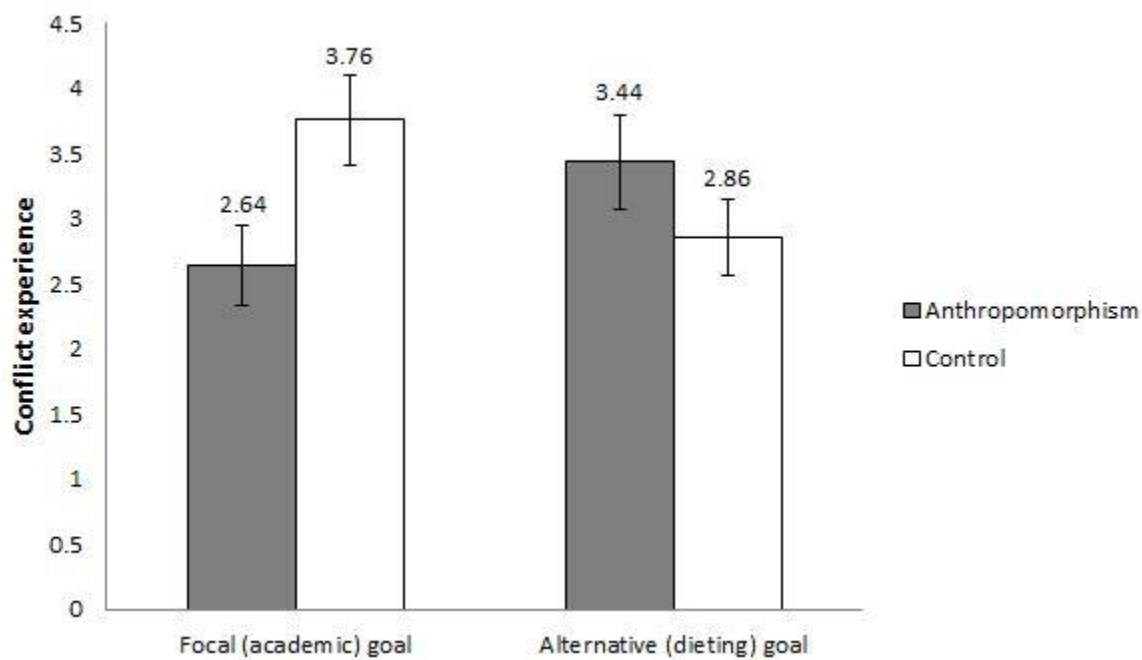


FIGURE 4

STUDY 3: THE EFFECT OF GOAL STRENGTH AND ANTHROPOMORPHISM ON
CONFLICT EXPERIENCE

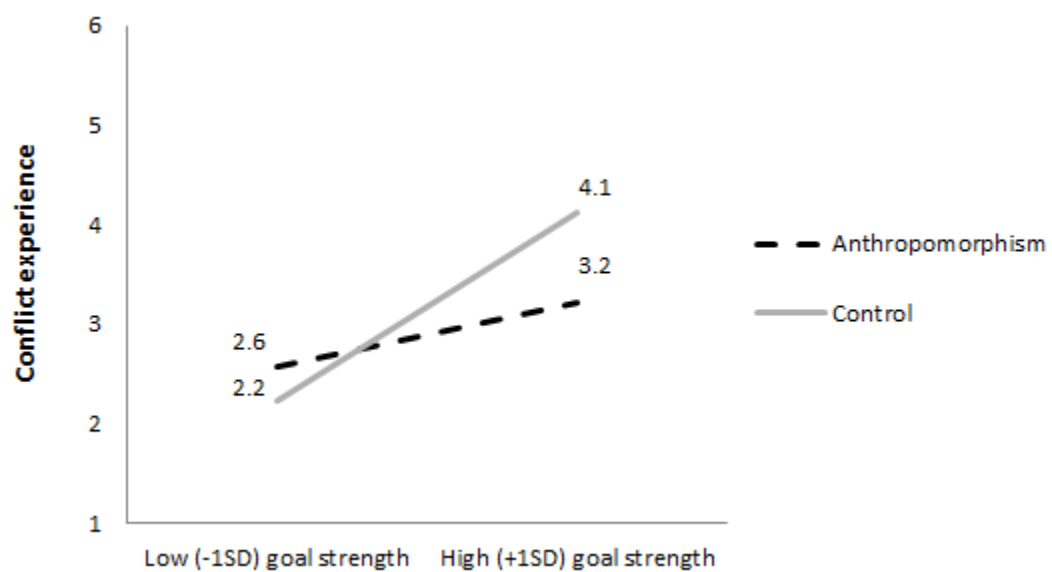


FIGURE 5

STUDY 4: THE EFFECT OF GOAL STRENGTH AND ANTHROPOMORPHISM ON
CONFLICT EXPERIENCE

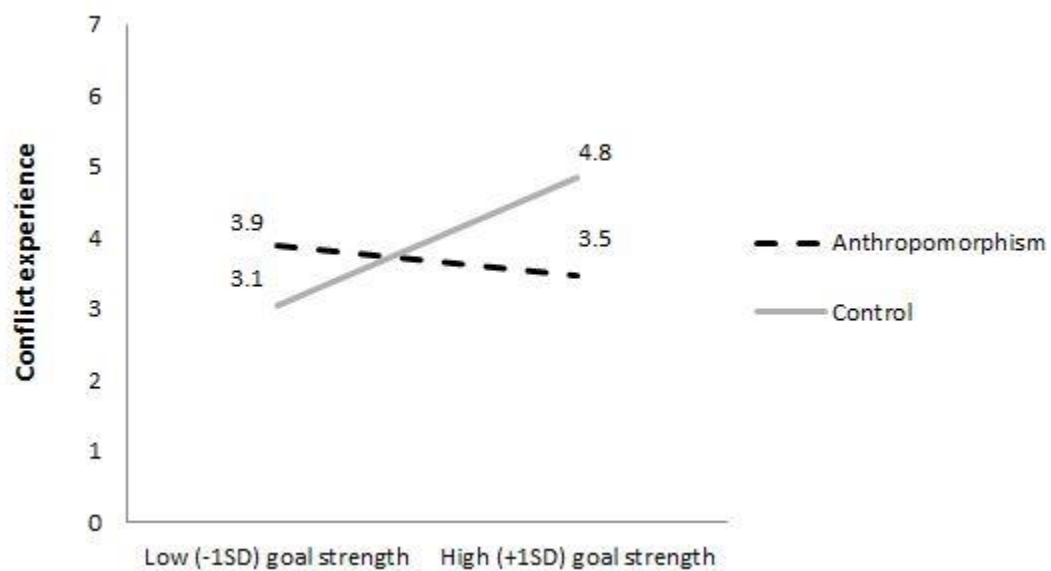
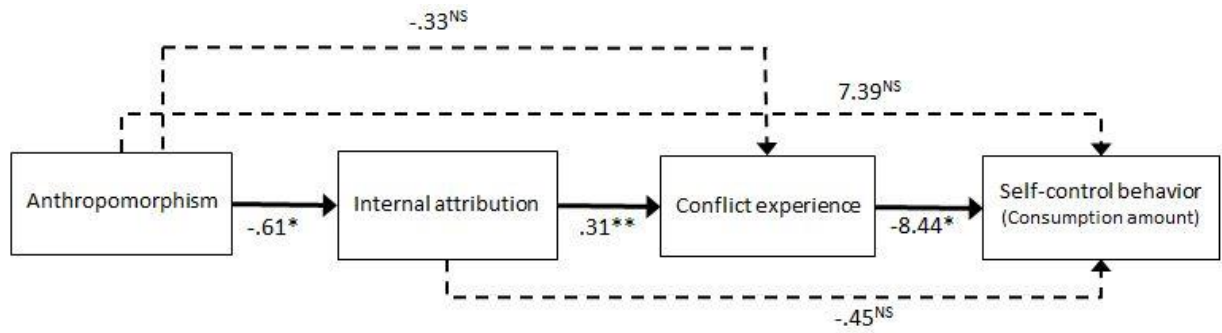


FIGURE 6

**STUDY 6: THE UNDERLYING PROCESS OF HOW ANTHROPOMORPHISM REDUCES
SELF-CONTROL**



Note: Unstandardized regression coefficients are shown below each line. $*$ = $p < .05$, $**$ = $p < .01$, NS = nonsignificant.