# Macho Nachos: The Implicit Effects of Gendered Food Packaging on Preferences for Healthy and Unhealthy Foods

Luke (Lei) Zhu

University of Manitoba

Victoria L. Brescoll & George E. Newman

Yale University

Eric Luis Uhlmann

INSEAD

## Author Note

Luke Zhu, University of Manitoba, Victoria L. Brescoll and George E. Newman, Yale School of Management, and Eric Luis Uhlmann, INSEAD. The four authors contributed equally to this paper. Correspondence should be addressed to Luke (Lei) Zhu, Department of Business Administration, University of Manitoba, 181 Freedman Crescent, Winnipeg, MB, Canada, R3T 5V4, luke.zhu@umanitoba.ca.

Abstract

The present studies examine how culturally held stereotypes about gender (that women eat more healthfully than men) implicitly influence food preferences. In Study 1, priming masculinity led both male and female participants to prefer unhealthy foods, while priming femininity led both male and female participants to prefer healthy foods. Study 2 extended these effects to gendered food packaging. When the packaging and healthiness of the food were gender schema congruent (i.e., feminine packaging for a healthy food, masculine packaging for an unhealthy food) both male and female participants rated the product as more attractive, said that they would be more likely to purchase it, and even rated it as tasting better compared to when the product was stereotype incongruent. In Study 3, packaging that *explicitly* appealed to gender stereotypes ("The muffin for real men") reversed the schema congruity effect, but only among participants who scored high in psychological reactance.

*Keywords*: gender stereotypes, food preferences, implicit cognition, schema congruity, reactance

Two weeks prior to President Obama's 2009 inauguration, President Bush hosted a lunch that brought together all five living current, former, and future Presidents. Former White House chef Walter Scheib was asked about what he might serve these men with different tastes: "I think the key word there is *men.* There isn't blue state food and red state food. Food at the White House has a tendency to delineate along gender lines as opposed to political lines. Both first ladies that I worked with were…very much into nutrition. Both Presidents that I worked with, if we had opened up a BBQ pit or rib joint, they'd be just as happy" (National Public Radio, 2009). Although former Presidents and their families are not necessarily representative of the population at large, the idea that food is gendered — that healthy and unhealthy eating can be associated with femininity or masculinity — is intriguing. However, to date, surprisingly little attention has been paid to the potential effects of gender beliefs on food preferences.

People choose to eat healthy or unhealthy foods for many reasons. At a basic level, humans have an innate preference for sweet, salty and fatty foods (Brownell & Battle-Horgen, 2004). In addition to inborn preferences, however, cultural and social factors play a critical role in shaping people's food preferences (Rozin, Fischler, Imada, Sarubin & Wrzesniewski, 1999). Many food researchers believe that these sociocultural influences are among the most important factors in explaining individuals' food preferences (Allen, Gupta & Monnier, 2008; Fieldhouse, 1995; Rozin, 1996). As Rozin (1996, p. 235) explains, "(s)uppose one wishes to know as much as possible about the foods another person likes and eats and can ask that person only one question… There is no doubt about it, the question should be, what is your culture or ethnic group? There is no other single question that would even approach the informativeness of the answer to this question."

Not only do people tend to eat what others in their culture eat, but what people eat

communicates something about the kind of person they are (Allen et al., 2008). For example, in some cultures people do not eat meat or animal products because they believe it is morally wrong to harm animals or because it contradicts their religious beliefs (e.g., Hindus in India) (Keene, 2002). And proponents of the newly-formed "slow food" movement, which originated in Europe as a rejection of "fast food," advocate for organic, sustainable agriculture for environmental and political reasons (Petrini & Padovani, 2006). Thus, eating is not only a fundamental biological necessity, but is strongly imbued with cultural meaning. Such cultural influences are known to shape preferences not only explicitly (i.e., consciously and deliberatively), but also implicitly (i.e., intuitively and automatically; Greenwald & Banaji, 1995; Haidt, Koller & Dias 1993; Nisbett, Peng, Choi & Norenzayan, 2001).

In this vein, the present studies investigate how cultural stereotypes about gender influence Americans' food preferences. Americans, in particular, strongly associate healthy or light foods, such as salad, chicken, and yogurt with women, and unhealthy or heavy foods, such as beef, potatoes and beer with men (Counihan, 1999; Millman, 1980). To date, however, no empirical studies have directly examined how subtly activating these cultural stereotypes subsequently influences people's food preferences.

Other research has also found that men and women do, in fact, consume different types of food and express different desires with respect to dieting and healthy eating. Specifically, men are less concerned than women about eating healthfully (Rozin, Bauer & Catanese, 2003). Moreover, men report that they prefer more unhealthy foods, such as red meat, compared to women, while women report preferring more healthy foods, such as fruits and vegetables, compared to men (Cline, Allen, Patrick & Hunt, 1998; Colihan, 2008; Rozin et al., 2003).

Women are also more likely than men to consume "diet" or low-calorie foods (Rozin et

al, 2003), and are perceived as more feminine when they eat smaller quantities of food (Basow & Kobrynowicz, 1993). Given that men and women differ in their baseline preference for healthful eating, it is unclear whether men and women would respond differently when the concepts of masculinity and femininity are subtly activated – i.e., can stereotype activation occur regardless of baseline preferences, such that priming femininity leads both men and women to eat more healthfully and priming masculinity leads both men and women to eat less healthfully?

Allen et al. (2008) draw an important distinction between personal values and cultural values in shaping food preferences. They propose that people evaluate the taste of a food or beverage by comparing the values symbolized by the product (cultural values) to their own personal value preferences. When these are in alignment, people will rate the product as tasting better and will express intentions to consume the product in the future. For example, individuals who want to appear powerful (personal value preference) are more likely to choose a name brand (Pepsi) over a value brand (Woolworth Homebrand), even when no differences in taste or quality are detected between the two products (Allen et al., 2008). This suggests that men and women may respond very differently when gender stereotypes are activated—specifically that female consumers will respond more to femininity primes and male consumers to masculinity primes.

However, research and theory on implicit social cognition leads to very different predictions regarding the effects of subtly activating gender stereotypes. From this theoretical perspective, widespread cultural beliefs are reflected in automatic mental associations that can implicitly influence judgments and behaviors outside a person's awareness (Greenwald & Banaji, 1995). Importantly, the implicit-explicit dimension is continuous rather than dichotomous, and many if not most psychological phenomena have both implicit and explicit components to them. For instance, although people are typically aware of common cultural

associations (e.g., between “female” and “healthy eating”), they are frequently unaware of the consequences such associations hold for their own actions (i.e., they are aware of the association, but unaware of its influence; Bargh, 1992; Uhlmann, Pizarro, & Bloom, 2008). A considerable body of empirical evidence is consistent with the idea that subtly activating such cultural values and stereotypes can implicitly influence judgments and behaviors (Aarts & Dijksterhuis 2003; Bargh, Schwader, Hailey, Dyer, & Boothby, 2012; Bargh et al., 2001; Bargh & Chartrand, 1999; Bargh et al., 1996; Chartrand & Bargh, 2002; DeMarree, Wheeler & Petty, 2005; Shah, 2003).

Remarkably, individuals even behave in accordance with primed concepts related to cultural groups of which they are not personally a member (Aarts et al., 2005; Bargh et al., 1996, 2012; Wheeler & Petty, 2001). For instance, priming the faces of Black Americans led White college students to respond with greater hostility to a computer failure, consistent with the cultural stereotype of Black Americans as aggressive and hostile (Bargh et al., 1996). Similarly, American students primed with the first-person plural pronoun “we” made more collectivistic judgments, while students from Hong Kong primed with the first-person singular pronoun “I” made more individualistic judgments, going against well-established tendencies for Westerners to express individualistic beliefs and Easterners to express more collectivistic ones (Gardner, Gabriel, & Lee, 1999; see also Oyserman & Lee, 2008). Thus, schemas about a social group’s characteristics (e.g., Black = hostile) appear sufficient to activate relevant associations, implicitly influencing individuals to act or think similarly to members of the primed group.

Based on these findings, one would arrive at a different set of predictions than the self-congruity hypothesis that follows from Allen et al. (2008). Specifically, although women and men may differ in baseline preferences for healthy vs. unhealthy foods, at an implicit level, *both* men and women should have a culturally learned association between gender and healthy vs.

unhealthy eating. The widespread cultural belief that men eat less healthfully than women should lead to a schema of "female" that includes the characteristic "eats healthy foods," and a schema of "male" that includes the characteristic "eats unhealthy foods." Therefore, activation of the concept "female" should activate the characteristic "healthy eating" and activation of "male" should activate the characteristic "unhealthy eating." Consistent with prior work on stereotype priming (Aarts et al., 2005; Bargh et al., 1996, 2012; Wheeler & Petty, 2001), implicitly priming femininity and masculinity should therefore have similar effects for both men and women: activating the concept of femininity should lead both male and female participants to exhibit more healthy food preferences, while activating the concept of masculinity should lead both male and female participants to exhibit less healthy food preferences. Since both men and women have been conditioned with the relevant cultural stereotype, they should both be affected in the same way by its implicit activation (Bargh et al., 1996, 2012; Bargh & Chartrand, 1999; Greenwald & Banaji, 1995).

**Schema Congruity and Product Packaging**

Although establishing that gender schemas can implicitly influence individuals' preferences for healthy or unhealthy foods is interesting in-and-of-itself, an additional goal of the present work was to explore the applications of these findings. To this end, we draw upon related research on the effects of schema congruity on consumer preferences (Aggarwal & McGill, 2007; Meyers-Levy & Tybout, 1989; Peracchio & Tybout, 1996). Schemas are cognitive frameworks that contain information about a topic or concept, including its attributes and the relations among these attributes (Fiske & Linville, 1980). Previous research has demonstrated that individuals' appraisals of a new product may be dependent on the degree to which the product's features and the activated category schema are congruent (Aggarwal & McGill, 2007;

Meyers-Levy & Tybout, 1989). In general, objects that are schema congruent are evaluated more favorably than objects that are schema incongruent. Proposed theoretical mechanisms for schema congruity effects include greater liking for objects that conform to expectations, transfer of positive affect about the fit between the product's features and beliefs about the category to the object itself (Fiske, 1982), and the greater ease or fluency of processing schema-congruent information (Alter & Oppenheimer, 2009; Labroo, Dhar & Schwarz, 2009). Notably, these processes may operate in tandem and complement one another; people may like stimuli consistent with expectations in part because they are easier to process, and transfer some of that positive affect to the product.

For the present purposes, the interesting question is whether schema-congruity influences consumer behavior *implicitly*. We examined whether it was possible to subtly influence individuals' preferences for certain foods if the packaging was altered in a manner that was either consistent or inconsistent with relevant gender schemas (i.e., feminine and healthy or masculine and unhealthy). Consistent with the findings of previous research, we hypothesized that people would be more likely to prefer foods that were schema congruent compared to foods that were schema incongruent (i.e., femininely-packaged unhealthy foods and masculinely-packaged healthy foods).

Of further interest was whether the effects of gender schema congruity even extend to behavioral measures, such as the perceived taste of the product. Prior work indicates that the labeling of a food can influence its taste (Raghunathan, Naylor & Hoyer, 2006; Wansink & Park, 2002; Wansink, Park, Sonka & Morganosky, 2000). For example, consumers who were inaccurately told that a nutrition bar contained soy rated it as tasting worse than the same nutrition bar without a soy label (Wansink et al., 2000). We therefore expected that more

positive evaluations of foods with stereotype congruent packaging would extend to perceived taste; consumers should rate an unhealthy product as tasting better when it is contained in a masculine package than when the same unhealthy product is contained in a feminine package.

If the effects of schema-congruent packaging on consumer evaluations are implicit, packaging consistent with gender stereotypes should influence male and female consumers in the same way, just as activation of cultural stereotypes through priming influences people's behavior independent of their personal group memberships (Aarts et al., 2005; Bargh et al., 1996, 2012; Wheeler & Petty, 2001). Further, we expected that a careful debriefing (Bargh & Chartrand, 2000) would reveal no evidence that participants were aware that stereotype-consistent packaging had influenced their evaluations, much as consumers have been repeatedly shown to be unaware of the influence of primed associations (Bargh, 2002; Berger & Fitzsimons, 2008; Chartrand, 2005; Fitzsimons et al., 2002; Winkielman et al., 2005). Again, as in much prior work on implicit social cognition, the argument is not that people are unaware of cultural stereotypes or unaware of whether food packaging is consistent with such stereotypes, but rather that they are unaware of the *influence* of stereotype congruent packaging on their evaluations (Bargh, 1992; Uhlmann et al., 2008).

Another approach to demonstrating the implicitness of schema congruity effects is to show that when the activation of gender stereotypes is more explicit, it tends to backfire. Such an effect is anticipated by theories of psychological reactance, which argue that people have a need for self-determination and react against external influences when they become aware of them (Brehm, 1966; Brehm & Brehm, 1981). Indeed, conceptually related work on prime-to-behavior effects finds that when the priming manipulation is blatant rather than subtle, contrast effects are observed such that participants do the opposite of what the primes would seemingly indicate

(Erb, Bioy, & Hilton, 2002; Lombardi, Higgins, & Bargh, 1987; Newman & Uleman, 1990; Strack et al., 1993). We therefore hypothesized that food packaging that directly invoked gender stereotypes would lead to a reversal of the typically observed schema congruity effect. Moreover if such reversals are, as hypothesized, based on conscious psychological reactance, then they should be strongest among consumers who score high in individual differences in reactance (Hong & Page, 1989; Hong & Faedda, 1996). More broadly, if increasing the explicitness with which the packaging appeals to gender stereotypes reverses the typically observed schema congruity effects, this suggests that the influence of comparatively more subtle packaging occurs implicitly (Lombardi, Higgins, & Bargh, 1987; Strack et al., 1993).

**Overview**

The current studies empirically tested these hypotheses about the effects of cultural gender stereotypes on food preferences using two methods. Study 1 primed either the concept of masculinity, the concept of femininity, or neutral concepts and then assessed participants' food preferences. Thus, using a manipulation common in research on implicit social cognition (Bargh et al., 1996, 2012; Bargh & Chartrand, 1999; Chartrand & Bargh, 2002), this experiment provided a direct test of whether activating cultural gender stereotypes changes subsequent food preferences.

Study 2 employed a different logic, inspired by research on the subtle effects of schema congruity on preferences (Aggarwal & McGill, 2007; Fiske, 1982; Meyers-Levy & Tybout, 1989; Peracchio & Tybout, 1996). This study presented participants with either "healthy" or "unhealthy" food products as part of an ostensible taste-test. The product (a muffin) was either contained in masculine, feminine, or gender-neutral packaging. We hypothesized that when packaging is gendered (either masculine or feminine) both male and female participants'

preferences should shift such that stereotype-congruent products (i.e., the masculine-unhealthy muffin and the feminine-healthy muffin) are judged more favorably than the stereotype-incongruent products. Consistent with the idea that both priming and schema congruity effects represent implicit influences on consumer evaluations, we expected that funneled debriefings (Bargh & Chartrand, 2000) would reveal no evidence participants were aware that the primes (Study 1) or packaging (Study 2) had influenced them.

Study 3 used a different approach to test the hypothesized implicit nature of schema congruity effects. Specifically, we added a condition in which the packaging contained a slogan *explicitly* appealing to gender stereotypes ("The muffin for real men"). We hypothesized that a blatant appeal to stereotypes would reverse the typically observed schema congruity effect, such that an unhealthy muffin in masculine packing *and* with a blatantly gendered slogan would be rejected. Further, this reversal effect should be strongest among consumers high in individual differences in psychological reactance (Brehm, 1966; Brehm & Brehm, 1981; Hong & Faedda, 1996; Hong & Page, 1989).

Together, these experiments serve to inform our understanding of how gender stereotypes shape food preferences and more broadly, how widely shared cultural beliefs may implicitly influence behavior in surprising and unexpected ways. This research contributes to the special issue on masculinity by suggesting that cultural stereotypes about masculinity and femininity are so pervasive and psychologically ingrained that their implicit activation can lead men and women alike to behave consistently with such common beliefs. Thus, the influence of gender stereotypes can be contingent on basic social-cognitive processes rather than a person's own gender. Our findings further illustrate how prevailing beliefs about men and masculinity can nonconsciously influence consumers to make food choices that are detrimental to their physical

health.

## Study 1: Priming Gender Concepts

### Participants

Ninety-three adults (29 male, 64 female; $M_{age}$ = 35.47, *SD* = 16.65) were randomly assigned to either the masculinity, femininity, or neutral prime condition. In order to recruit a sample of lay adults and thus increase the generalizability of our findings (Sears, 1986), we set up a tent at public park in Connecticut and offered passers-by a small cash payment ($2) in return for participating in the study. 92.6% of our participants self-identified as White, 2.1% as Asian, 2.1% as Latino, 0% as Black, and 2.1% indicated "other" ethnic groups.

### Materials and Procedure

Participants were given a "word puzzle task" (the priming manipulation) and then a "consumer survey" (the dependent measures related to food preferences), which were presented as unrelated tasks. They completed the study in a designated sitting area, in some cases alone and in some cases with other participants sitting nearby. Participants were not allowed to speak to one another while completing the study.

**Gender priming manipulation**. Participants were randomly assigned to unscramble ten short sentences with either masculine, feminine or neutral words embedded in seven of the sentences (Cohen & Garcia, 2005; Srull & Wyer, 1979). To develop these words, a separate group of 35 participants completed a pre-test to identify words that were equated in terms of their active focus and the strength of their association with the concepts of masculinity and femininity. The goal of this pre-testing was to generate seven masculine and seven feminine words that were parallel with one another (e.g., "cologne" and "perfume") but also were not confounded with activity or passivity. Additionally, the masculine words had to be seen, on average, as either

"*very masculine*" or "*extremely masculine*" while the feminine words had to be rated, on average, as either "*very feminine*" or "*extremely feminine*."

Using these criteria, we generated seven words that were embedded in the ten scrambled sentences. In the masculinity priming condition, the masculine words included: *football, boys, blue, cologne, moustache, men,* and *hunting*. In the femininity priming conditions the feminine words included: *ballet, girls, pink, perfume, lipstick, women*, and *shopping*. Participants in the control condition unscrambled neutral sentences that did not contain any words relating to masculinity, femininity, men or women, such as "*The window is open*."

**Preferences for unhealthy over healthy versions of the same foods**. Participants were then asked their preferences for unhealthy over healthy versions of four different foods. Each item presented the same food but varied how healthy it was. Participants in Study 1 rated each pair of foods using a single 7-point scale where higher numbers indicated preferences for less healthy versions of the foods.

To establish the reliability of these items we pre-tested a list of 65 individual foods with a separate group of participants. Our goal was to develop a list of foods for the main study that could be either healthy or unhealthy but simultaneously the healthy versions were not associated with femininity and the unhealthy versions with masculinity. The four pairs of foods that met these criteria were: baked chicken vs. fried chicken, baked potato vs. French fries, light (or reduced-fat) potato chips vs. regular potato chips, and baked fish vs. fried fish. In the pre-test, each of the 65 foods was evaluated individually, and pairs of foods were selected that differed in their healthiness ratings but not in their masculinity-femininity. In the main study, participants were asked the question "Please indicate which of the following foods you would prefer, if given the choice" and then presented with each of the four pairs (e.g., baked chicken vs. fried chicken)

on a single 7-point scale with "1" indicating "strongly prefer" the healthy version and "7" indicating "strongly prefer" the unhealthy version of the food.

**Healthy and unhealthy foods**. Participants were then presented with a list of ten foods that varied in their healthiness but were rated as neither masculine nor feminine in pre-testing. From this list, participants were asked to rate the likelihood that they would eat each food item using a 7-point Likert-type scale ("*In the next month, how likely are you to eat each of these foods?*" *1=not at all likely*, to *7=extremely likely).* Using the pre-testing data as a guide and selecting healthy and unhealthy foods rated as similarly extreme in healthiness or unhealthiness, we divided the 10 items into two subscales: healthy foods (banana, oatmeal, spinach, orange) ($\alpha$ = .65), and unhealthy foods (soda, fried chicken, movie theatre popcorn, donuts, potato chips, French fries) ($\alpha$ = .74).

**Healthy eating intentions**. Using an 11-point scale (*1=completely disagree, 11=completely agree*), participants then reported their intentions to engage in a series of five healthy eating behaviors over the next month: "*I am going to try to eat healthier*," "*I will try to eat more fruits*," "*I will try to eat more vegetables*," "*I am going to go on a healthier diet*," and "*I am going to try to eat less junk food*" ($\alpha$ = .96).

**Background information and funneled debriefing**. Participants reported their ethnicity, their age, their gender, and any general dietary restrictions. Two participants reported dietary restrictions specific to the foods we measured (e.g., being vegetarian made some participants unable to answer questions about their preferences for chicken). Excluded vs. including these two participants did not change the results in any way. We also included a funneled debriefing (Bargh & Chartrand, 2000) asking participants whether they had 1) been influenced by the

priming manipulation and if so, 2) in what specific way. No participants were able to identify the purpose of the sentence unscrambling task.

## Results

**Preferences for unhealthy over healthy versions of the same foods**. A one-way ANOVA revealed a significant effect of priming condition on preferences for unhealthy versus healthy versions of the same foods, $F(2,90) = 9.81$, $p < .001$. Participants exposed to the masculinity prime ($M = 4.42$, $SD = 1.30$), were significantly more likely to prefer unhealthy versions of the food compared to participants in the femininity prime condition ($M = 2.88$, $SD = 1.63$), $t(60) = -4.12$, $p < .001$, $d = -1.06$, but not significantly more likely to do so than participants in the neutral prime condition ($M = 3.91$, $SD = 1.23$), $t(60) = 1.57$, $p = .12$, $d = .41$. In addition, participants exposed to the femininity prime were significantly less likely to prefer unhealthy versions of the foods than participants in the neutral prime condition, $t(60) = -2.82$, $p < .01$, $d = -.73$.

**Separate groups of healthy and unhealthy foods**. Preferences for the unhealthy and healthy foods were analyzed separately. A one-way ANOVA revealed a significant difference among the three priming conditions for the unhealthy foods, $F(2, 91) = 5.75$, $p < .01$. Participants in the masculinity prime condition ($M = 4.91$, $SD = 1.41$) were significantly more likely to report a preference for unhealthy foods than participants in the femininity prime condition ($M = 3.61$, $SD = 1.74$), $t(61) = -3.27$, $p < .01$, $d = -.84$, and marginally more likely to do so than participants in the neutral prime condition ($M = 4.17$, $SD = 1.42$), $t(61) = 2.09$, $p < .05$, $d = .53$. However, participants' preference for unhealthy foods did not differ significantly between the femininity and neutral prime conditions, $t(60) = -1.38$, $p = .17$, $d = -.36$.

A second ANOVA revealed a significant effect of priming condition on preferences for healthy foods, $F(2, 91) = 4.89$, $p < .01$. Participants in the femininity prime condition ($M = 4.87$, $SD = 1.33$) were significantly more likely to report that they would like to eat healthy foods compared to participants in the masculinity prime condition ($M = 3.70$, $SD = 1.59$), $t(61) = 3.17$, $p < .01$, $d = .81$, and marginally more likely to do so than participants in the neutral prime condition ($M = 4.22$, $SD = 1.53$), $t(60) = 1.80$, $p = .08$, $d = .47$. However, participants exposed to the masculinity prime were not significantly less likely to prefer healthy foods than participants in the neutral prime condition, $t(61) = -1.31$, $p = .20$, $d = -.34$.

**Healthy eating intentions**. A one-way ANOVA revealed a significant effect of priming condition on participants' self-reported intentions to eat healthy, $F(2, 91) = 7.48$, $p < .01$. Specifically, participants in the femininity prime condition ($M = 8.70$, $SD = 2.49$) were more likely to report intentions to eat healthfully in the next month than participants in the masculinity prime condition ($M = 6.19$, $SD = 2.76$), $t(61) = 3.79$, $p < .001$, $d = .97$, and marginally more likely to do so than participants in the neutral prime condition ($M = 7.45$, $SD = 2.48$), $t(60) = 1.98$, $p = .05$, $d = .51$. Additionally, participants in the masculinity prime condition were marginally less likely to report healthy eating intentions than participants in the neutral prime condition, $t(61) = -1.91$, $p = .06$, $d = -.49$.

Thus, across all of our dependent variables we observed a significant main effect of the priming manipulation, with the means in the masculinity prime, neutral prime, and femininity prime conditions patterning in the expected manner. Scores in the masculinity and femininity prime conditions were always significantly different from each other, with means in the neutral prime condition generally falling in between but not always significantly different from the other two conditions.

**Participant gender**. Further analyses revealed no evidence that participant gender moderated the observed effects. Several unsurprising main effects of participant gender did emerge, such that male participants were more likely to prefer unhealthy versions of the same food than women ($M$ = 4.38, $SD$ = 1.47 vs. $M$ = 3.46, $SD$ = 1.48), $F(1, 86) = 4.58$, $p < .05$, $d$ = .59, and marginally more likely to prefer unhealthy foods than women ($M$ = 4.78, $SD$ = 1.39 vs. $M$ = 3.98, $SD$ = 1.66), $F(1,87) = 3.17$, $p = .08$, $d = .48$. However, the main effects of participant gender on preference for healthy foods ($M$ = 3.84, $SD$ = 1.56 vs. $M$ = 4.45, $SD$ = 1.53), $F(1, 87) = 1.09$, $p = .30$, $d = -.37$, and healthy eating intentions ($M$ = 6.58, $SD$ = 2.92 vs. $M$ = 7.94, $SD$ = 2.47), $F(1, 87) = 2.16$, $p = .15$, $d = -.49$, were not significant. Further, and much more interestingly, participant gender did not interact with the priming manipulation to predict preferences for unhealthy over healthy versions of the same foods, $F(2, 86) = .36$, $p = .70$, preferences for healthy foods, $F(2, 87) = 1.41$, $p = .25$, preferences for unhealthy foods, $F(2, 87) = .14$, $p = .87$, or healthy eating intentions $F(2, 87) = 1.81$, $p = .17$. This suggests that, even if they often expressed different preferences overall, men and women were equally affected by the masculinity and femininity primes. Table 1 displays the means and standard deviations for the dependent variables by participant gender and experimental condition.

## Discussion

Implicitly priming concepts associated with masculinity led participants to prefer less healthy foods, while implicitly priming femininity led participants to prefer more healthy foods. Moreover, these effects were observed among both male and female participants and across a variety of outcome measures. As outlined earlier, this result argues in favor of cultural stereotypes implicitly affecting food preferences (Bargh et al., 1996, 2012; Greenwald & Banaji,

1995) and against a framework which relies on the congruence between personal identity and the activated schema (Allen et al., 2008).[1]

## Study 2: Gendered Food Packaging

To extend these findings, Study 2 varied the nature of the packaging with which food was presented. The same food (a muffin) was used in all conditions, but was either described as low-fat or full-fat. The muffin was either contained in masculine, feminine, or gender-neutral packaging (thus totaling six different conditions). We then obtained several different evaluative measures of the product including appeal of the product's packaging, intent to purchase the product, willingness to pay for the product, and evaluations of the product's taste. We predicted that across all of these measures, the stereotype-congruent products (i.e., feminine-healthy muffins and masculine-unhealthy muffins) would be rated more favorably than the stereotype-incongruent products (i.e., the femininely-unhealthy and masculine-healthy muffins) or the gender neutral healthy and unhealthy products. We further expected that a funneled debriefing (Bargh & Chartrand, 2000) would reveal no evidence that participants were aware the product packaging had influenced their judgments.

### Participants and Design

One hundred and forty adults (58 men, 82 women; $M_{age}$ = 35.98, $SD$ = 14.99) were randomly assigned to one of six conditions in a 3 (masculine vs. feminine vs. neutral packaging) x 2 (healthy vs. unhealthy product) between-subjects design. As in Study 1, we sought to increase the generalizability of our findings by recruiting lay adults rather than college students. We therefore rented a booth at a local fair in Connecticut and offered attendees a small cash payment in return for participating in the study. 90.8% of our participants self-identified as White, 0% as Asian, 3.5% as Latino, 3.5% as Black, and 2.1% indicated they were members of

"other" ethnic groups. 23.9% of our participants were politically liberal, 44.9% moderate, and 31.2% as politically conservative.

**Materials and Procedure**

Participants were told that they were participating in a taste test for a new product and that they would first evaluate the aesthetic appearance of a box of muffins and then taste one of the same muffins. To control for the actual muffin used, all participants actually tasted an Entemann's© individually-wrapped miniature blueberry muffin. The muffin was presented to subjects in a small, clear, zip-locked bag to prevent any influence of familiarity of the actual muffin brand. We chose blueberry muffins for three reasons: (1) blueberry muffins were pre-tested to be gender neutral, (2) blueberry muffins were also rated as being possibly healthy or unhealthy depending on their preparation (e.g., a muffin can be either low-fat, low-sugar and high-fiber, or high-fat, high-sugar and devoid of fiber), and (3) almost no one reported being allergic to the ingredients in blueberry muffins.

Participants were first presented with one of six blueberry muffin boxes. An artist created mock-ups of the muffin boxes to ensure that participants were unaware that the boxes were fictional. To manipulate the perceived healthiness of the muffins, in the unhealthy conditions, the muffins were labeled "*Mega Muffin*" and in the healthy conditions, the muffins were labeled "*Health Muffin*." The adjective "Mega" was always used to describe the unhealthy muffin and "Health" the healthy muffin, thus the product name and product attributes were part of the same healthiness manipulation. To manipulate how gendered the muffins were perceived to be, in the masculine conditions the box cover had a background of men playing football, in the feminine conditions the box cover had a woman dancing ballet in the background, and in the neutral conditions there was a picture of a field. This yielded six different boxes: a masculine

healthy muffin, a masculine unhealthy muffin, a feminine healthy muffin, a feminine unhealthy muffin, a neutral healthy muffin, and a neutral unhealthy muffin.

**Stimulus pre-testing**. To ensure that these fictional boxes were perceived accurately (as either healthy/unhealthy and either masculine/feminine/neutral), as well as that the masculine box was not more strongly associated with unhealthiness and the feminine box with healthiness, we conducted a pre-test with a separate group of 140 adults. Pre-test participants were randomly assigned to evaluate one of the six muffin boxes. After viewing one of the muffin boxes, they rated how masculine or feminine the box appeared and how healthy or unhealthy they perceived the muffin to be. As predicted, the feminine boxes were rated as significantly more feminine than the masculine boxes, $p < .001$, and the neutral boxes were rated in between the masculine and feminine boxes (both $ps < .001$). Additionally, the boxes with healthy information were seen as significantly more healthy than the boxes with unhealthy information, $p < .001$. More importantly, there was no significant interaction between the masculinity/femininity of the packaging and healthiness/unhealthiness of the muffin, for either judgments of masculinity-femininity, or for ratings of healthiness/unhealthiness. Thus, the pre-test confirmed that our boxes were significantly different on the dimensions of interest and critically, that the healthiness/unhealthiness and femininity/masculinity of the muffin boxes were not confounded.

**Product evaluation**. Participants in the main study were given a color reproduction of the muffin box and an individually wrapped miniature blueberry muffin (contained in a clear plastic bag). They were asked to evaluate the muffin box on four dimensions using a 9-point semantic differential scale: *unattractive-attractive, unappealing-appealing, bad-good,* and *unappetizing-appetizing* ($\alpha = .93$). After evaluating the muffin box, participants were asked to taste the muffin. They were instructed to eat as much or as little of it as they would like and then

rate their impression of the muffin along six dimensions using a 9-point semantic differential scale: *bland-flavorful, bitter-sweet, stale-fresh, tasteless-delicious, unappetizing-appetizing,* and *bad-good* ($\alpha = .91$). After evaluating the taste of the muffin, participants then indicated how much they would be willing to pay for a box containing two dozen of these miniature muffins and their likelihood of purchasing these muffins on a 9-point scale (*1 = extremely unlikely, 9 = extremely likely*).

**Background information and debriefing**. Participants reported their ethnicity, age, gender, and political orientation. Finally, participants were administered a funneled debriefing (Bargh & Chartrand, 2000) assessing whether they believed that the packaging had influenced their evaluations of the muffin. Participants were further asked, "*Did the packaging influence your evaluations of the muffin in any way*?" (*1 = definitely not, 5 = not sure, 9 = definitely yes*). If they responded affirmatively, they were then asked to explain how they thought the packaging may have influenced their evaluations. No participant responded above a 5 ("*not sure*").

Five individuals indicated that they could not, or did not want to taste the muffin and did not take part in the study.

## Results

**Taste test evaluation**. Ratings of the product's taste were submitted to a 2 x 3 ANOVA, which revealed a significant interaction between healthiness of the muffin and the gendered nature of the packaging, $F(2, 135) = 18.49$, $p < .001$. We unpacked this interaction by comparing the effects of the type of packaging separately within the healthy muffin and unhealthy muffin conditions. Participants rated the actual taste of the "healthy" muffins in the feminine packaging ($M = 7.65$, $SD = 1.17$) as better than the same muffins in masculine packaging ($M = 4.92$, $SD = 2.78$), $t(45) = -4.42$, $p < .001$, $d = -1.32$, but not significantly better than the same muffins in

neutral packaging ($M$ = 6.95, $SD$ = 1.75), $t(45) = 1.61$, $p = .11$, $d = .48$. Further, participants rated the taste of "healthy" muffins in masculine packaging as worse than the same muffins in neutral packaging, $t(135) = -2.96$, $p < .01$, $d = -.89$.

Strikingly, this pattern completely reversed in the "unhealthy" muffin condition. Participants rated the "unhealthy" muffins in the masculine packaging ($M$ = 7.65, $SD$ = .96) as tasting better than the same muffins in feminine packaging ($M$ = 5.62, $SD$ = 2.27), $t(48) = 3.84$, $p < .001$, $d = 1.11$, and neutral packaging ($M$ = 6.39, $SD$ = 1.93), $t(40) = 2.68$, $p < .05$, $d = .85$. The taste ratings of "unhealthy" muffins did not differ significantly between the neutral packaging and the feminine packaging conditions, $t(48) = -1.25$, $p = .22$, $d = -.36$.

**Purchase intentions**. We also observed a significant interaction between the healthiness of the muffin and the gender of the packaging on purchase intentions, $F(2,136) = 21.27$, $p < .001$. As before, we unpacked this interaction by comparing the effects of the packaging separately within the healthy muffin and unhealthy muffin conditions. Participants said that they would be more likely to purchase the healthy muffins in the feminine packaging ($M$ = 6.21, $SD$ = 2.43) compared to the healthy muffins in the masculine packaging ($M$ = 3.78, $SD$ = 2.33), $t(45) = -3.49$, $p < .01$, $d = -1.04$, or neutral packaging ($M$ = 4.87, $SD$ = 2.46), $t(45) = 1.88$, $p = .07$, $d = .56$. However, purchase intentions for the healthy muffins in masculine packaging did not differ significantly from the neutral packaging condition, $t(44) = -1.54$, $p = .13$, $d = -.46$.

As before, the reverse pattern emerged in the unhealthy muffins condition. Participants said that they were more likely to purchase the unhealthy muffins in the masculine packaging ($M$ = 6.87, $SD$ = 2.06) compared to the unhealthy muffins in the feminine packaging ($M$ = 3.23, $SD$ = 2.19), $t(49) = 5.96$, $p < .001$, $d = 1.70$, or neutral packaging ($M$ = 4.71, $SD$ = 2.15), $t(40) = 3.30$, $p < .01$, $d = 1.04$. Finally, participants were significantly less likely to purchase the unhealthy

muffins in feminine packaging than the same muffins in neutral packaging, $t(49) = -2.39$, $p < .05$, $d = -.68$.

**Willingness to pay**. We then analyzed how much participants were willing to pay (WTP) for a box of the muffins, and again found a significant interaction between the healthiness of the muffin and the gendered nature of the packaging, $F(2,135) = 19.54$, $p < .001$. Participants were willing to pay significantly more money for the healthy muffins in the feminine packaging ($M$ = \$5.73, $SD$ = \$3.38) compared to the healthy muffins in the masculine packaging ($M$ = \$2.72, $SD$ = \$1.76), $t(44) = -3.80$, $p < .001$, $d = -1.15$, or neutral packaging ($M$ = \$3.30, $SD$ = \$1.26), $t(44) = 3.24$, $p < .01$, $d = .98$. However, the price participants would pay for the healthy muffins did not differ significantly between the masculine packaging and the neutral packaging conditions, $t(44) = -1.30$, $p = .20$, $d = -.39$.

Conversely, participants said that they would pay significantly more for the unhealthy muffins in the masculine packaging ($M$ = \$5.38, $SD$ = \$2.72) compared to the unhealthy muffins in the feminine packaging ($M$ = \$2.84, $SD$ = \$1.78), $t(49) = 4.02$, $p < .001$, $d = 1.15$, or neutral packaging ($M$ = \$2.72, $SD$ = \$1.44), $t(40) = 3.95$, $p < .001$, $d = 1.25$. The price participants would pay for the unhealthy muffins did not differ significantly between the feminine packaging and the neutral packaging conditions, $t(49) = .26$, $p = .80$, $d = .07$.

**Evaluation of packaging**. A similar interaction was also observed with regard to ratings of the packaging itself, $F(2,136) = 12$, $p < .001$. For the "healthy" muffins, the feminine packaging ($M$ = 7.02, $SD$ = 1.38) was evaluated as significantly more appealing than the masculine packaging ($M$ = 4.40, $SD$ = 2.64), $t(45) = -4.29$, $p < .001$, $d = -1.28$, or the neutral packaging ($M$ = 5.11, $SD$ = 2.19), $t(45) = 3.60$, $p < .001$, $d = 1.07$. However, for the healthy

muffins, ratings of the masculine packaging did not differ significantly from ratings of the neutral packaging, $t(44) = -.99$, $p = .33$, $d = -.30$.

In contrast, for the "unhealthy" muffins, the masculine packaging ($M = 6.69$, $SD = 1.60$) was seen as significantly more appealing than the feminine packaging ($M = 5.45$, $SD = 2.17$), $t(49) = 2.23$, $p < .05$, $d = .64$, but not the neutral packaging ($M = 5.60$, $SD = 1.06$), $t(40) = 2.62$, $p < .05$, $d = .83$. For the unhealthy muffins, ratings of the packaging did not differ significantly between the feminine and the neutral packaging conditions, $t(49) = -.28$, $p = .78$, $d = -.08$.

Thus, across all dependent variables we observed the hypothesized interaction between type of packaging and the healthiness of the muffin, as well as the expected main effects of packaging within each healthiness condition. Further, within both the healthy and unhealthy muffin conditions the means in the masculine, neutral, and feminine packaging conditions generally patterned as expected, although means in the neutral packaging condition did not always differ significantly from the other two conditions.

**Participant gender**. Not surprisingly, female participants generally expressed healthier food preferences than male participants. Participant gender significantly interacted with the healthy muffin manipulation to predict taste test evaluations, $F(1, 127) = 5.04$, $p < .05$, and willingness to pay, $F(1, 127) = 5.98$, $p < .05$, and marginally interacted with the healthiness manipulation to predict purchase intentions, $F(1, 128) = 3.01$, $p = .09$. Female participants had significantly higher taste ratings than male participants for muffins labeled as healthy ($M = 7.07$, $SD = 1.76$ vs. $M = 5.71$, $SD = 2.80$), $F(1, 67) = 6.17$, $p < .05$, $d = -.61$, although the parallel mean differences were nonsignificant for purchase intentions ($M = 5.21$, $SD = 2.30$ vs. $M = 4.67$, $SD = 2.99$), $F(1, 67) = .74$, $p = .39$, $d = -.21$, and willingness to pay ($M = 4.23$, $SD = 2.72$ vs. $M = 3.38$, $SD = 2.49$), $F(1, 67) = 1.67$, $p = .20$, $d = -.32$. In contrast, men had nonsignificantly higher taste

ratings ($M$ = 6.60, $SD$ = 2.15 vs. $M$ = 6.27, $SD$ = 1.93), $F(1, 68) = .45$, $p = .50$, $d = .16$, nonsignificantly stronger purchase intentions ($M$ = 5.32, $SD$ = 2.63 vs. $M$ = 4.35, $SD$ = 2.49), $F(1, 69) = 2.55$, $p = .12$, $d = .38$, and were willing to pay marginally more money ($M$ = 4.11, $SD$ = 2.80 vs. $M$ = 3.17, $SD$ = 1.78), $F(1, 69) = 2.93$, $p = .09$, $d = .41$, than women for unhealthy muffins.

Of much greater theoretical interest, participant gender did not moderate the effects of our experimental manipulations on taste test evaluations, $F(2, 127) = 1.11$, $p = .33$, purchase intentions, $F(2, 128) = 2.18$, $p = .12$, or willingness to pay, $F(2, 127) = .09$, $p = .92$. Table 2 displays the means and standard deviations for the dependent measures by participant gender and experimental condition.

## Discussion

In sum, across all four dependent measures we observed the predicted interaction between the healthiness of the muffin and the gendered nature of the packaging. When the packaging was stereotype congruent (i.e., feminine packaging for the healthy muffin and masculine packaging for the unhealthy muffin) participants rated the product as more attractive, reported stronger purchase intentions, and were willing to pay more money for it compared to when the product was stereotype incongruent (i.e., feminine-packaged unhealthy muffin or masculine-packaged healthy muffin). Moreover, whether the product was stereotype congruent or incongruent even impacted judgments of the product's taste; participants rated the product as actually *tasting better* when the healthiness and the "gender" matched compared to when they did not match. As expected, a funneled debriefing (Bargh & Chartrand, 2000) revealed no evidence that participants were aware their evaluations had been influenced by the product packaging.

## Study 3: Reactance Against Explicit Appeals to Gender

Our final study examined the idea that consumers would react against comparatively more explicit appeals to gender stereotypes (Brehm, 1966; Brehm & Brehm, 1981). To test this hypothesis, we added a condition in which the packaging contained a blatantly gendered slogan ("The muffin for real men"). We hypothesized that an explicit gender appeal would reverse the schema congruity effect, especially among participants high in psychological reactance (Hong & Faedda, 1996; Hong & Page, 1989). Of further interest was whether male and female consumers would respond differently to an explicitly gendered slogan.

### Participants and Design

157 adults (58 men, 97 women, and 2 participants who failed to report their gender; $M_{age}$ = 39.90, *SD* = 15.72) were recruited from an online subject pool maintained by an East Coast university and assigned to one of four conditions in a 2 (healthy product vs. unhealthy product) x 2 (implicit masculine appeal vs. explicit masculine appeal) between-subjects design. 81% of our participants self-identified as White, 9% as Asian, 4% as Latino, 5% as Black, and 1% indicated "other"). Thirty-six percent of participants had a high school degree or less, 37% a college degree, 22% a master's degree, and 5% doctoral degree. The average annual income for our sample was $32,165 per year.

### Materials and Procedure

Participants were told that they were participating in an online consumer survey and were presented with images of muffin boxes based on those from Study 2. As before, in the *unhealthy muffin condition* the brand label was "Mega Muffin" and in the *healthy muffin condition* the brand label was "Health Muffin." In the *implicit masculine appeal condition*, the packaging depicted men playing football in the background, just as in Study 2. In the *explicit masculine*

*appeal condition,* the same football image was used but with the additional slogan "The Muffin for Real Men" included.

Next, all participants indicated how much they would be willing to pay for a box containing two dozen of the miniature muffins, and completed a 14-item individual-differences scale of psychological reactance (Hong & Faedda, 1996; Hong & Page, 1989). Participants responded to the scale by indicating their agreement with statements such as "*Regulations trigger a sense of resistance in me*", "*I find contradicting others stimulating*", and "*I consider advice from others to be an intrusion*", on 5-point Likert scales (*1 = strongly disagree, 5 = strongly agree*) ($\alpha$ = .87).

Further included were self-report measures of participants' goals to eat healthfully, limit caloric intake, and maintain an attractive appearance. The healthy eating measure consisted of three items: "*I try my best to include only healthy ingredients in my meals*," "*I eat healthy food whenever possible*," and "*It is my goal to eat healthfully on a regularly basis"* ($\alpha$ = .90). The low calorie measure consisted of the items: "*I try to consume as little calories as possible*," "*I strive to minimize my calorie intake every day*," and "*I buy foods that are low in calories whenever possible"* ($\alpha$ = .92). Finally, the attractive appearance measure consisted of the items: "*Maintaining an attractive appearance is an important goal of mine*," "*I am willing to do anything to maintain an attractive appearance*," and "*The idea of maintaining an attractive appearance is always in my mind"* ($\alpha$ = .83). Participants indicated their agreement or disagreement with all scale items on 7-point Likert scales (*1 = strongly disagree, 7 = strongly agree*).

Finally, participants reported demographic information including their age, ethnicity, education, income, and gender.

## Results

Because our design included a continuous variable (individual differences in psychological reactance), we regressed willingness to pay on the implicitness manipulation, healthiness manipulation, reactance, the two-way interaction between the implicitness manipulation and the healthiness manipulation, the two-way interaction between the implicitness manipulation and reactance, the two-way interaction between healthiness manipulation and reactance, and finally the three-way interaction between the implicitness manipulation, the healthiness manipulation, and reactance. Results revealed a significant main effect of the implicitness manipulation (dummy coded: 1 = implicit, 0 = explicit), $\beta$= 3.46, $p$ = .02, $\eta^2$ = .03, indicating that overall, participants were willing to pay more for a dozen muffins in the implicit appeal condition than in the explicit appeal condition. A marginally significant main effect of dispositional reactance also emerged ($\beta$ = -4.16, $p$ = .06, $\eta^2$ = .02), suggesting that willingness to pay was negatively related to reactance. Furthermore, all three two-way interactions between the implicitness manipulation and the healthiness manipulation ($\beta$ = -4.12, $p$ = .07, $\eta^2$ = .02), between the implicitness manipulation and reactance ($\beta$ = 7.67, $p$ < .01, $\eta^2$ = .05), and between the healthiness manipulation and reactance ($\beta$ = 5.65, $p$ = .05, $\eta^2$ = .02) emerged as significant or marginally significant. However, all of these effects were further qualified by the hypothesized three-way interaction between the implicitness manipulation, healthiness manipulation (dummy coded: 1 = healthy, 0 = unhealthy), and individual differences in reactance ($\beta$ = -9.80, $p$ = .02, $\eta^2$ = .04).

We further decomposed this significant three-way interaction by whether the appeal to gender stereotypes in the packaging was comparatively implicit or explicit. In the implicit condition, a significant main effect of the healthiness manipulation emerged ($\beta$ = -4.80, $p$ < .01,

$\eta^2$ = .09), indicating that participants in the implicit condition were willing to pay higher price for the unhealthy muffin than for the healthy muffin. This replicates the schema-congruity pattern observed in Study 2: consumers were willing to pay more for an unhealthy muffin in masculine packaging (stereotype consistent) than a healthy muffin in masculine packaging (stereotype inconsistent). In addition, a significant main effect of reactance on price also emerged in the implicit condition ($\beta$ = 3.51, $p$ = .04, $\eta^2$ = .05), indicating that when the packaging implicitly appealed to gender stereotypes, consumers high in reactance were actually willing to pay *more* for the product.

In the explicit condition, a significant main effect of reactance on price likewise emerged ($\beta$ = -4.16, $p$ = .04, $\eta^2$ = .06), but in the opposite direction: consumers high in reactance were willing to pay *less* for the product when its packaging contained a blatant gender appeal. This main effect was qualified by the hypothesized two-way interaction between reactance and the healthiness manipulation ($\beta$ = 5.65, $p$ = .03, $\eta^2$ = .06), such that reactance was marginally negatively related to price in the unhealthy muffin condition ($\beta$ = -4.16, $p$ = .07, $\eta^2$ = .08) but not in the healthy muffin condition ($\beta$ = 1.48, $p$ = .26, $\eta^2$ = .04). This is effectively the reverse of the schema congruity pattern observed in Study 2 and in the implicit appeal condition of Study 3. Consumers high in psychological reactance responded negatively to masculine packaging for an unhealthy product that further included the explicit slogan “The muffin for real men.”

**Participant gender**. There were no gender differences in reactance ($M_{\text{male}}$ = 3.11, $SD$ = .62, $M_{\text{female}}$ = 3.01, $SD$ = .57, on a 7-point scale), $F(1,153)$ = 1.01, $p$ = .32, $d$ = .16. In addition, participant gender did not interact with either the implicitness manipulation ($\beta$ = -4.71, $p$ = .13, $\eta^2$ = .01) or the healthiness manipulation ($\beta$ = -5.03, $p$ = .15, $\eta^2$ = .01), and there was no three-way interaction between gender and the two experimental manipulations ($\beta$ = 5.85, $p$ = .22, $\eta^2$ =

.01), or four way interaction between participant gender, the experimental manipulations, and psychological reactance ($\beta$ = 7.60, $p$ = .51, $\eta^2$ = .002). Table 3 displays the means and standard deviations for willingness to pay by participant gender and experimental condition.

**Self-reported goals.** Correlational analyses revealed modest correlations between the goals to eat healthfully and consume few calories ($r$ = .30, $p$ < .001), between eating healthfully and maintaining an attractive appearance ($r$ = .33, $p$ < .001), and between consuming few calories and maintaining an attractive appearance ($r$ = .51, $p$ < .001). Therefore these were treated as distinct variables for our moderator analyses.

Regression analyses revealed that participants' goals to eat healthfully did not have a significant main effect on the dependent variable of willingness to pay ($\beta$ = .31, $p$ = .73, $\eta^2$ = .001), and further did not interact with either the implicitness manipulation ($\beta$ = -.30, $p$ = .78, $\eta^2$ = .0005) or the healthiness manipulation ($\beta$ = -.59, $p$ = .60, $\eta^2$ = .002). Further, there was no three-way interaction between the goal to eat healthfully and the experimental manipulations ($\beta$ = -.20, $p$ = .89, $\eta^2$ = .0001), or four way interaction between the goal to eat healthfully, the experimental manipulations, and psychological reactance ($\beta$ = -2.02, $p$ = .46, $\eta^2$ = .003).

Similar regression analyses were conducted to examine the effects of the goal to eat fewer calories on willingness to pay for the muffins. Results suggested that the goal to eat fewer calories did not have a significant main effect on the dependent variable ($\beta$ = .55, $p$ = .28, $\eta^2$ = .01), nor did it interact with the implicitness ($\beta$ = -.74, $p$ = .35, $\eta^2$ = .01) or healthiness manipulations ($\beta$ = .07, $p$ = .93, $\eta^2$ = 0). Further, the three-way interaction between the experimental manipulations and the goal to eat fewer calories ($\beta$ = -.59, $p$ = .59, $\eta^2$ = .002) and the four way interaction between the experimental manipulations, the goal to eat fewer calories, and psychological reactance ($\beta$ = -1.00, $p$ = .61, $\eta^2$ = .002) were not significant.

Finally, we examined potential effects of the goal to maintain attractive appearance. Results suggested that the goal to maintain attractive appearance did not have a significant main effect on willingness to pay for the muffins ($\beta$ = .43, $p$ = .51, $\eta^2$ = .003), and did not interact with the implicitness manipulation ($\beta$ = -1.18, $p$ = .17, $\eta^2$ = .01) or the healthiness manipulation ($\beta$ = -.03, $p$ = .97, $\eta^2$ = 0). In addition, the three-way interaction between the experimental manipulations and the goal to maintain an attractive appearance was not significant ($\beta$ = .40, $p$ = .75, $\eta^2$ = .0006), and neither was the four way interaction between the experimental manipulations, the goal to maintain attractive appearance, and psychological reactance ($\beta$ = .69, $p$ = .77, $\eta^2$ = .0005).

## Discussion

As expected, packaging that explicitly appealed to gender ("The muffin for real men") reversed the schema congruity effect observed when comparatively more subtle packaging was employed. Further, this reversal effect in the explicit gender appeal condition was driven by participants who scored high on a scale of psychological reactance (Hong & Faedda, 1996; Hong & Page, 1989), and high-reactance participants did *not* respond negatively to a comparatively more implicit gender appeal which paralleled that in Study 2. This is consistent with the idea that the influence of schema congruent packaging on consumer evaluations found in in Study 2 and in the parallel conditions in Study 3 occurs implicitly. Finally, although psychological reactance emerged as a theoretically predicted moderator, self-report measures of participants' goals to eat healthfully, consume few calories, and maintain attractive appearance did not moderate the effects of the experimental manipulations, and (as in Studies 1 and 2) neither did participant gender.

Some prior work has found that reactance can occur implicitly as well as explicitly (Chartrand, Dalton, & Fitzsimons, 2007). In one especially fascinating study, Chartrand et al. found that subtly priming the name of a significant other who nagged them to work hard led participants to put significantly *less* effort into an academic task. Importantly, however, the present Study 3 used an explicit manipulation to elicit reactance, specifically a blatantly gendered advertising appeal ("The muffin for real men"), and further demonstrated moderation by consciously self-reported reactance. This is consistent with the idea that our study's blatant gender appeal activated explicit reactance in participants.

## General Discussion

The goal of the present studies was to examine the effects of experimentally activating gender stereotypes on food preferences. Results indicated that subtly activated gender stereotypes do in fact influence food choices, both through people's stated preferences (Study 1) as well as behavioral outcomes (Study 2). In Study 1, priming masculinity caused both men and women to prefer less healthy foods, while priming femininity caused both men and women to prefer more healthy foods. Although previous work has established that people believe that women are more likely to prefer healthy foods than men and vice versa, the present studies are (to our knowledge) the first to demonstrate that merely activating the concepts of femininity or masculinity (via an unobtrusive priming task) can cause both men and women to report a preference for either unhealthy or healthy foods.

Study 2 further demonstrated that food products whose packaging is consistent with gender stereotypes are preferred to food products that are inconsistent with those stereotypes. Drawing on past research on schema congruity, we used a method high in ecological validity (an ostensible taste-test for a new product) and found that food products whose packaging was

stereotype consistent (masculinity and unhealthiness, femininity and healthiness) were preferred to food products that were stereotype inconsistent. In fact, both male and female participants preferred stereotype-congruent products to stereotype-incongruent products; they rated the identical product as more appealing, said that they would be more likely to purchase it, said that they would pay money for it, and even rated the product as tasting better when the healthiness and the "gender" of the packaging matched compared to when they did not match. Such a result is particularly striking given that the exact same muffin was evaluated in all conditions— all that differed was the packaging.

Notably, even though men and women tended to show different food preferences on average, activating stereotypes related to masculinity and femininity had similar effects for both male and female participants. Men were just as likely as women to report an increase in their preference for healthy foods when primed with femininity and women were just as likely as men to report an increase in their preference for unhealthy foods when primed with masculinity (Study 1 and the supplementary replication study). Further, both men and women preferred unhealthy foods with masculine packaging and healthy foods with feminine packaging (Study 2). This is consistent with the hypothesis that cultural stereotypes implicitly shape food preferences regardless of the person's own gender, and inconsistent with a framework that relies on the alignment between personal identity and values and the activated schema (Allen et al., 2008). Further consistent with an implicit social cognition account, funneled debriefings revealed no evidence participants were aware of the influence of either the gender primes (Study 1) or the gendered packaging (Study 2), and increasing the explicitness with which the packaging appealed to gender stereotypes reversed the schema congruity effect among consumers high in self-reported psychological reactance (Study 3).

One important avenue for future research is potential cross-cultural differences in the observed effects. Both gender stereotypes (Glick et al., 2000, 2004; Nosek et al., 2009) and norms and attitudes related to obesity (Anderson-Fye, 2004; Becker, 1995; Brewis et al., 2011; Marini et al., 2012; Popenoe, 2004; Sobo, 1994) exhibit a great deal of cultural variability. Thus, what is stereotype-consistent or schema-congruent may be very different in a society where malnutrition is more common or gender roles less differentiated than in the United States. At the same time, people from cultures or subcultures that place less emphasis on individual self-determination (Henrich, Heine, & Norenzayan, 2010; Markus & Kitayama, 1991; Snibbe & Markus, 2005) may not consciously react against product packaging that explicitly appeals to common social stereotypes.

**Conclusion**

These effects highlight the power of cultural stereotypes to implicitly shape food preferences. Even though men tend to exhibit a preference for relatively unhealthy foods and women for healthy foods, here we demonstrate that unobtrusively activating gender concepts (masculinity or femininity) via either a subtle priming manipulation (Study 1) or a food's packaging (Study 2) leads both male and female participants to express food preferences that are in accordance with those cultural stereotypes. Illustrating that subtle influence attempts can sometimes be more powerful than blatant ones, adding an explicitly gendered slogan reversed the effects of stereotype consistent packaging, an effect driven by participants high in individual differences in psychological reactance (Study 3). These findings have a number of important implications for policy in highlighting the ways in which appealing to cultural beliefs can shape food choices.

## References

Aarts, H., Chartrand, T. L., Custers, R., Danner, U., Dik, G., Jefferis, V. E., & Cheng, C. M. (2005). Social stereotypes and automatic goal pursuit. *Social Cognition, 23,* 465-490.

Aarts, H., & Dijksterhuis, A. (2003). The silence of the library: Environment, situational norm, and social behavior. *Journal of Personality and Social Psychology, 84,* 18-28.

Aggarwal,, P., & McGill, A. L. (2007). Is that car smiling at me? Schema congruity as a basis for evaluating anthropomorphized products. *Journal of Consumer Research*, *34,* 468-79.

Allen, M. C., Gupta, R., & Monnier, A. (2008). The interactive effect of cultural symbols and human values on taste evaluation. *Journal of Consumer Research, 35,* 294-308.

Alter, A. L., & Oppenheimer, D. M. (2009). Suppressing secrecy through metacognitive ease: Cognitive fluency encourages self-disclosure. *Psychological Science, 20,* 1414-1420.

Anderson-Fye, E.P. (2004). A "coca-cola" shape: Cultural change, body image, and eating disorders in San Andrés, Belize. *Culture, Medicine, and Psychiatry, 28,* 561–595.

Bargh, J. A. (1992). Why subliminality does not matter to social psychology: Awareness of the stimulus versus awareness of its influence. In R. F. Bornstein & T. S. Pittman (Eds.), *Perception without awareness* (pp. 236-255). New York: Guilford.

Bargh, J. A. (2002). Losing consciousness: Automatic influences on consumer judgment, behavior, and motivation. *Journal of Consumer Research, 29,* 280-285.

Bargh, J. A., Chen, M., & Burrows, L. (1996). Automaticity of social behavior: Direct effects of trait construct and stereotype activation on action. *Journal of Personality and Social Psychology, 71,* 230-244.

Bargh, J. A., & Chartrand, T. L. (1999). The unbearable automaticity of being. *American*

*Psychologist, 54*, 462–479.

Bargh, J.A., & Chartrand, T.L. (2000). The mind in the middle: A practical guide to priming and automaticity research. In H.T. Reis & C.M. Judd (Eds.), *Handbook of research methods in social and personality psychology* (pp. 253-285). New York: Cambridge University Press.

Bargh, J. A., Gollwitzer, P. M., Lee-Chai, A., Barndollar, K., & Troetschel, R. (2001). The automated will: Nonconscious activation and pursuit of behavioral goals. *Journal of Personality and Social Psychology, 81*, 1014-1027.

Bargh, J. A., Schwader, K. L., Hailey, S. E., Dyer, R. L., & Boothby, E. J. (2012). Automaticity in social-cognitive processes. *Trends in Cognitive Science, 16(12),* 593-605.

Basow, S.A., & Kobrynowicz, D. (1993). "What Is she eating? The effects of meal size on impressions of a female eater. *Sex Roles, 28*, 335-344.

Becker, A.E. (1995). *Body, self, and society: The view from Fiji*. Philadelphia: University of Pennsylvania Press.

Berger, J. M., & Fitzsimons, G. M. (2008). Dogs on the street, pumas on your feet: How cues in the environment influence product evaluation and choice**.** *Journal of Marketing Research, 45*, 1-14.

Brehm, J. W. (1966). *A theory of psychological reactance*. Academic Press.

Brehm, S. S., & Brehm, J. W. (1981). *Psychological Reactance: A Theory of Freedom and Control*. Academic Press.

Brewis, A.A., Wutich A., Falletta-Cowden, A., & Rodriguez-Soto, I. (2011). Body norms and fat stigma in global perspectives. *Current Anthropology, 52*, 269–276.

Brownell, K. D., & Battle-Horgen, K. (2004). *Food fight: The inside story of the food industry, America's obesity crisis, and what we can do about it.* Chicago: Contemporary Books.

Chartrand, T. L. (2005). The role of conscious awareness in consumer behavior. *Journal of Consumer Psychology, 15,* 203-210.

Chartrand, T. L., & Bargh, J. A. (1996). Automatic activation of impression formation and memorization goals. *Journal of Personality and Social Psychology, 71,* 464-478.

Chartrand, T. L., & Bargh, J. A. (2002). Nonconscious motivations: Their activation, operation, and consequences. In A. Tesser, D. A. Stapel & J. V. Wood (Eds.), *Self and motivation: Emerging psychological perspectives* (pp. 13-41). Washington, DC, US: American Psychological Association.

Chartrand, T.L., Dalton, A., & Fitzsimons, G.J. (2007). Nonconscious relationship reactance: When significant others prime opposing goals. *Journal of Experimental Social Psychology, 43,* 719-726.

Cline, A. D., Allen, R. D., Patrick, K., & Hunt, A. E. (1998). Gender differences in food preferences of young men and women. *Journal of the American Dietetic Association, 98,* 104-110.

Cohen, G.L., & Garcia, J. (2005). " 'I Am Us:' Negative stereotypes as collective threats. *Journal of Personality and Social Psychology, 89,* 566-582.

Colihan, K. (March 19, 2008). Men choose chicken and meat; women opt for fruits and Veggies. *WedMD Health News*.

DeMarree, K. G., Wheeler, C.C., & Petty, R. E. (2005). Priming a new identity: Self-monitoring moderates the effects of non-self primes on self-judgments and behavior. *Journal of Personality and Social Psychology, 89,* 657-671.

Erb, H., Bioy, A., & Hilton, D.J. (2002). Choice preferences without inferences: Subconscious priming of risk attitudes. *Journal of Behavioral Decision Making, 15,* 251-262.

Fiske, S. T. (1982). Schema-triggered affect: Applications to social perception," In *Affect and cognition, 17th Annual Carnegie Symposium on Cognition*, Hillsdale (M. S. Clark & S. T. Fiske, Eds.), pp. 55-78. Hillsadale, NJ: Erlbaum.

Gardner, W. L., Gabriel, S., & Lee, A. Y. (1999) 'I' value freedom but 'we' value relationships: Self-construal priming mirrors cultural differences in judgment. *Psychological Science, 10*, 321-326.

Glick, P., Fiske, S. T., Mladinic, A., Saiz, J, Abrams, D., Masser, B., Adetoun, B., Osagie, J., Akande, A., Alao, A., Brunner, A., Willemsen, T. M., Chipeta, K., Dardenne, B., Dijksterhuis, A., Wigboldus, D., Eckes, T., Six-Materna, I., Expósito, F., Moya, M., Foddy, M., Kim, H-J., Lameiras, M., Sotelo, M. J., Mucchi-Faina, A., Romani, M., Sakalli, N., Udegbe, B., Yamamoto, M., Ui, M., Ferreira, M. C., & López, W. L. (2000). Beyond prejudice as simple antipathy: Hostile and benevolent sexism across cultures. *Journal of Personality and Social Psychology, 79*, 763-775.

Glick, P., Lameriras, M., Fiske, S. T., Eckes, T., Masser, B., Volpato, C., Manganelli, A. M., Pek, J., Huang, L-l., Sakalli-Ugurlu, N., Rodriguez Castro, Y. R., D'Avila Pereira, M. L., Willemsen, A. B., Six-Materna, I., & Wells, R. (2004). Bad but bold: Ambivalent attitudes toward men predict gender inequality in 16 nations. *Journal of Personality and Social Psychology, 86*, 713-728.

Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review, 102,* 4-27.

Haidt, J., Koller, S., & Dias, M. (1993). Affect, culture, and morality, or is it wrong to eat your

dog? *Journal of Personality and Social Psychology, 65,* 613-628.

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences, 33,* 61-83, 111-135.

Hong, S-M., & Faedda, S. (1996). Refinement of the Hong psychological reactance scale. *Educational and Psychological Measurement, 56,* 173-182.

Hong, S-M., & Page, S. (1989). A psychological reactance scale: development, factor structure and reliability. *Psychological Reports, 64,* 1323-1326.

Keene, M. (2002). *Religion in life and society*. Folens Limited.

Lombardi, W.J., Higgins, E.T., & Bargh, J.A. (1987). The role of consciousness in priming effects on categorization: Assimilation versus contrast as a function of awareness of the priming task. *Personality and Social Psychology Bulletin, 13,* 411-429.

Marini, M., Sriram, N., Schnabel, K., Maliszewski, N., Devos, T., Ekehammar, B., Wiers, R., Cai, H. J., Somogyi, M., Shiomura, K., Schnall, S., Neto, F., Bar-Anan, Y., Vianello, M., Ayala, A., Dorantes, G., Park, J., Kesebir, S., Pereira, A., Tulbure, B., Ortner, T., Stepanikova, I., Greenwald, A. G., & Nosek, B. A. (2012). Overweight people have low weight bias, while overweight nations have high weight bias. *PLoS ONE, 8,* e83543.

Markus, H., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review, 98,* 224-253.

Meyers-Levy, J., & Tybout, A. M. (1989). Schema congruity as a basis for product evaluation. *Journal of Consumer Research, 16,* 39-54.

Newman, L.S., & Uleman, J.S. (1990). Assimilation and contrast effects in spontaneous trait inference. *Personality and Social Psychology Bulletin, 16,* 224-240.

Nisbett, R. E., Peng, K., Choi, I., & Norenzayan, A. (2001). Culture and systems of thought:

Holistic vs. analytic cognition." *Psychological Review, 108*, 291-310.

Nosek, B. A., Smyth, F. L., Sriram, N., Lindner, N. M., Devos, T., Ayala, A., Bar-Anan, Y., Bergh, R., Cai, H., Gonsalkorale, K., Kesebir, S., Maliszewski, N., Neto, F., Olli, E., Park, J., Schnabel, K., Shiomura, K., Tulbure, B., Wiers, R. W., Somogyi, M., Akrami, N., Ekehammar, B., Vianello, M., Banaji, M. R., & Greenwald, A. G. (2009). National differences in gender-science stereotypes predict national sex differences in science and math achievement. *Proceedings of the National Academy of Sciences, 106*, 10593-10597.

Oyserman, D., & Lee, S. W. S. (2008). Does culture influence what and how we think? Effects of priming individualism and collectivism. *Psychological Bulletin, 134*, 311-342.

Peracchio, L. A., & Tybout, A. M. (1996). The moderating role of prior knowledge in schema-based product evaluation. *Journal of Consumer Research, 23*, 177-92.

Petrini, C., & Padovani, G. (2006). *Slow food revolution*. Rizzoli, New York.

Popenoe, R. (2004). *Feeding desire: fatness, beauty, and sexuality among a Saharan people*. Routledge. London.

Raghunathan, R., Naylor, R. W., & Hoyer, W. D. (2006). The unhealthy = tasty intuition and its effects on taste inferences, enjoyment, and choice of food products. *Journal of Marketing, 70*, 170-184.

Rozin, P. (1996). Socioiocultural influences on human food selection. In *Why we eat what we eat: The psychology of eating* (Elizabeth D. Capaldi, Ed.), pp 233-263. Washington, DC: American Psychological Association. .

Rozin, P., Bauer, R., & Catanese, D. (2003). Food and life, pleasure and worry, among American college students: Gender differences and regional similarities. *Journal of Personality and Social Psychology, 85*, 132-141.

Rozin, P., Fischler, C., Imada, S., Sarubin, A., & Wrzesniewski, A. (1999). Attitudes to food and the role of food in life: Comparisons of Flemish Belgium, France, Japan and the United States. *Appetite, 33,* 163-180.

Sears, D.O. (1986). College sophomores in the laboratory: Influences of a narrow data base on psychology's view of human nature. *Journal of Personality and Social Psychology, 51,* 515-530.

Shah, J. (2003). Automatic for the people: How representations of significant others implicitly affect goal pursuit. *Journal of Personality and Social Psychology, 84,* 661-681.

Snibbe, A., & Markus, H. R. (2005). You can't always get what you want: Social class, agency and choice. *Journal of Personality and Social Psychology, 88(4),* 703–720.

Sobo, E. (1994). *The sweetness of fat: Health, procreation, and sociability in rural Jamaica*. New Brunswick, NJ: Rutgers University Press.

Srull, T. K., & Wyer, R. S. (1979). The role of category accessibility in the interpretation of information about persons: Some determinants and implications. *Journal of Personality and Social Psychology, 37,* 1660–1672.

Strack, F., Schwarz, N., Bless, H., Kübler, A., & Wänke, M. (1993). Awareness of the influence as a determinant of assimilation versus contrast. *European Journal of Social Psychology, 23,* 53-62.

Uhlmann, E.L., Pizarro, D.A., & Bloom, P. (2008). Varieties of social cognition. *Journal for the Theory of Social Behaviour, 38,* 293-322.

Wansink, B., & Park, S. (2002). Sensory suggestiveness and labeling: Do soy labels bias taste? *Journal of Sensory Studies, 17,* 483-491.

Wansink, B., Park, S., Sonka, S., & Morganosky, M. (2000). How soy labeling influences

preference and taste. *International Food and Agribusiness Management Review, 3*, 85-94.

Wheeler, C., & Petty, R. E. (2001). The effects of stereotype activation on behavior: A review of possible mechanisms. *Psychological Bulletin, 127*, 797-826.

Table 1

Means and standard deviations for each dependent measure (preference for unhealthy over healthy versions of the same foods, preferences for different healthy and unhealthy foods, and healthy eating intentions) by participant gender and experimental condition (Study 1). The study employed a between-subjects design (femininity prime vs. masculinity prime vs. neutral prime).

| Male Participants | | | | |
|---|---|---|---|---|
| | Preference for unhealthy over healthy versions of the same foods | Preference for Healthy Foods | Preference for Unhealthy Foods | Healthy Eating Intentions |
| Femininity Prime | 3.17 (*SD*=2.05) | 5.21 (*SD*=1.51) | 3.92 (*SD*=1.85) | 9.58 (*SD*=1.08) |
| | *N*=6 | *N*=6 | *N*=6 | *N*=6 |
| Masculinity Prime | 4.86 (*SD*=1.03) | 3.42 (*SD*=1.26) | 5.27 (*SD*=.98) | 5.25 (*SD*=3.21) |
| | *N*=12 | *N*=12 | *N*=12 | *N*=12 |
| Neutral Prime | 4.54 (*SD*=1.24) | 3.58(*SD*=1.58) | 4.71(*SD*=1.39) | 6.40 (*SD*=2.19) |
| | *N*=12 | *N*=12 | *N*=12 | *N*=12 |
| Female Participants | | | | |
| | Preference for unhealthy over healthy versions of the same foods | Preference for Healthy Foods | Preference for Unhealthy Foods | Healthy Eating Intentions |
| Femininity Prime | 2.82 (*SD*=1.58) | 4.78 (*SD*=1.33) | 3.49 (*SD*=1.76) | 8.80 (*SD*=2.25) |
| | *N*=24 | *N*=24 | *N*=24 | *N*=24 |
| Masculinity Prime | 4.18 (*SD*=1.39) | 3.88 (*SD*=1.77) | 4.70 (*SD*=1.60) | 6.75 (*SD*=2.35) |
| | *N*=20 | *N*=20 | *N*=20 | *N*=20 |
| Neutral Prime | 3.52 (*SD*=1.07) | 4.62 (*SD*=1.39) | 3.83 (*SD*=1.37) | 8.12 (*SD*=2.47) |
| | *N*=19 | *N*=19 | *N*=19 | *N*=19 |

.

Table 2

Means and standard deviations for each dependent variable by participant gender and experimental condition (Study 2). The study employed a 2 (Healthy vs. Unhealthy Product) x 3 (Feminine, Masculine, or Neutral Packaging) between-subjects design.

| Healthy Packaging | | | | |
|---|---|---|---|---|
| Male Participants | | | | |
| | Taste Test Evaluation | Purchase Intentions | Willingness to Pay | Evaluation of packaging |
| Feminine Packaging | 7.44 (*SD*=1.35) | 6.50 (*SD*=2.28) | 5.13 (*SD*=2.67) | 7.29 (*SD*=1.51) |
| | *N*=12 | *N*=12 | *N*=12 | *N*=12 |
| Masculine Packaging | 3.97 (*SD*=2.86) | 2.91 (*SD*=2.47) | 1.86 (*SD*=1.27) | 3.50 (*SD*=2.59) |
| | *N*=11 | *N*=11 | *N*=11 | *N*=11 |
| Neutral Packaging | 5.29 (*SD*=3.23) | 4.00 (*SD*=3.56) | 2.72 (*SD*=1.51) | 5.56 (*SD*=2.59) |
| | *N*=4 | *N*=4 | *N*=4 | *N*=4 |
| Female Participants | | | | |
| | Taste Test Evaluation | Purchase Intentions | Willingness to Pay | Evaluation of packaging |
| Feminine Packaging | 7.85 (*SD*=.97) | 5.92 (*SD*=2.64) | 6.29 (*SD*=3.96) | 6.75 (*SD*=1.23) |
| | *N*=12 | *N*=12 | *N*=12 | *N*=12 |
| Masculine Packaging | 5.83 (*SD*=2.63) | 4.73 (*SD*=2.01) | 3.36 (*SD*=1.84) | 5.32 (*SD*=2.60) |
| | *N*=11 | *N*=11 | *N*=11 | *N*=11 |
| Neutral Packaging | 7.30 (*SD*=1.13) | 5.05 (*SD*=2.25) | 3.42 (*SD*=1.21) | 5.01 (*SD*=2.16) |
| | *N*=19 | *N*=19 | *N*=19 | *N*=19 |
| Unhealthy Packaging | | | | |
| Male Participants | | | | |
| | Taste Test Evaluation | Purchase Intentions | Willingness to Pay | Evaluation of packaging |
| Feminine Packaging | 5.82 (*SD*=2.79) | 4.27 (*SD*=2.80) | 3.68 (*SD*=2.12) | 6.32 (*SD*=2.30) |
| | *N*=11 | *N*=11 | *N*=11 | *N*=11 |
| Masculine Packaging | 7.70 (*SD*=.95) | 7.00 (*SD*=2.40) | 5.84 (*SD*=3.45) | 6.88 (*SD*=1.61) |
| | *N*=10 | *N*=10 | *N*=10 | *N*=10 |

| | | | | |
|---|---|---|---|---|
| Neutral Packaging | 6.28 (*SD*=2.01) | 4.80 (*SD*=1.93) | 2.84 (*SD*=1.95) | 5.68 (*SD*=.96) |
| | *N*=10 | *N*=10 | *N*=10 | *N*=10 |
| Female Participants | | | | |
| | Taste Test Evaluation | Purchase Intentions | Willingness to Pay | Evaluation of packaging |
| Feminine Packaging | 5.32 (*SD*=1.89) | 2.72 (*SD*=1.53) | 2.43 (*SD*=1.38) | 4.72 (*SD*=1.77) |
| | *N*=18 | *N*=18 | *N*=18 | *N*=18 |
| Masculine Packaging | 7.61 (*SD*=1.02) | 6.73 (*SD*=1.79) | 4.95 (*SD*=1.91) | 6.52 (*SD*=1.64) |
| | *N*=11 | *N*=11 | *N*=11 | *N*=11 |
| Neutral Packaging | 6.48 (*SD*=1.95) | 4.64 (*SD*=2.42) | 2.61 (*SD*=.83) | 5.52 (*SD*=1.18) |
| | *N*=11 | *N*=11 | *N*=11 | *N*=11 |

Table 3

Means and standard deviations for willingness to pay (WTP) by participant gender and experimental condition (Study 3). The study employed a 2 (healthy muffin vs. unhealthy muffin) x 2 (implicitly vs. explicitly gendered packaging) between-subjects design.

| | Healthy Packaging | | Unhealthy Packaging | |
|---|---|---|---|---|
| | Implicit Appeal | Explicit Appeal | Implicit Appeal | Explicit Appeal |
| Male Participants | 7.37 (*SD*=3.90) | 9.43 (*SD*=6.23) | 12.14 (*SD*=10.33) | 6.21 (*SD*=6.51) |
| | *N*=15 | *N*=10 | *N*=19 | *N*=14 |
| Female Participants | 6.05 (*SD*=4.98) | 6.41 (*SD*=4.03) | 9.88 (*SD*=8.30) | 8.73 (*SD*=7.62) |
| | *N*=20 | *N*=22 | *N*=27 | *N*=28 |

## Footnote

[1] A supplemental study using the same subject population replicated all the major findings of Study 1. The only methodological difference between the two studies is that in the supplementary study, the word stimuli used as primes were not pre-tested for their active focus and strength of association with masculinity and femininity. Results of one-way ANOVAs revealed a significant effect of the priming manipulation (masculine, neutral, feminine) on participants' preference for unhealthy over healthy versions of the same food, $F(2, 101) = 7.15$, $p < .01$, preference for healthy foods, $F(2, 100) = 7.73$, $p < .01$, and unhealthy foods, $F(2, 100) = 4.70$, $p < .05$, as well as their healthy eating intentions, $F(2, 101) = 4.86$, $p < .05$. The masculine and feminine prime conditions were significantly different in the expected direction for all dependent measures, with the neutral condition always in between but not always significantly different from the other two conditions. Further replicating Study 1, participant gender did not interact with the priming manipulation to predict preferences for unhealthy over healthy versions of the same foods, $F(2, 98) = .16$, $p = .86$, preference for healthy foods, $F(2, 97) = 1.21$, $p = .30$, and unhealthy foods, $F(2, 97) = .40$, $p = .67$, or healthy eating intentions $F(2, 98) = .40$, $p = .67$.