

Macho Nachos

The Implicit Effects of Gendered Food Packaging on Preferences for Healthy and Unhealthy Foods

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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, human beings 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 deliberately), 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 – that is, 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 (Woolworths 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 & Chartrand, 1999; Bargh, Chen, & Burrows, 1996; Bargh, Gollwitzer, Lee-Chai, Barndollar, & Troetschel, 2001; Bargh, Schwader, Hailey, Dyer, & Boothby, 2012; 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 versus unhealthy foods, at an implicit level, *both* men and women should have a culturally learned association between gender and healthy versus 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

190 both men and women: Activating the concept of femininity
 191 should lead both male and female participants to exhibit
 192 more healthy food preferences, while activating the concept
 193 of masculinity should lead both male and female
 194 participants to exhibit less healthy food preferences.
 195 Since both men and women have been conditioned with
 196 the relevant cultural stereotype, they should both be
 197 affected in the same way by its implicit activation (Bargh
 198 & Chartrand, 1999; Bargh et al., 1996, 2012; Greenwald
 199 & Banaji, 1995).

200 Schema Congruity and Product Packaging

201 Although establishing that gender schemas can implicitly
 202 influence individuals' preferences for healthy or unhealthy
 203 foods is interesting in-and-of-itself, an additional goal of
 204 the present work was to explore the applications of these
 205 findings. To this end, we draw upon related research on
 206 the effects of schema congruity on consumer preferences
 207 (Aggarwal & McGill, 2007; Meyers-Levy & Tybout,
 208 1989; Peracchio & Tybout, 1996). Schemas are cognitive
 209 frameworks that contain information about a topic or concept,
 210 including its attributes and the relations among these
 211 attributes (Fiske & Linville, 1980). Previous research has
 212 demonstrated that individuals' appraisals of a new product
 213 may be dependent on the degree to which the product's
 214 features and the activated category schema are congruent
 215 (Aggarwal & McGill, 2007; Meyers-Levy & Tybout,
 216 1989). In general, objects that are schema congruent are
 217 evaluated more favorably than objects that are schema
 218 incongruent. Proposed theoretical mechanisms for schema
 219 congruity effects include greater liking for objects that conform
 220 to expectations, transfer of positive affect about the fit
 221 between the product's features and beliefs about the category
 222 to the object itself (Fiske, 1982), and the greater ease
 223 or fluency of processing schema congruent information
 224 (Alter & Oppenheimer, 2009; Labroo, Dhar, & Schwarz,
 225 2009). Notably, these processes may operate in tandem
 226 and complement one another; people may like stimuli consistent
 227 with expectations in part because they are easier to process,
 228 and transfer some of that positive affect to the product.
 229

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

242 Of further interest was whether the effects of
 243 gender schema congruity even extend to behavioral measures,
 244 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, Schwarz, Bless, Kübler, & Wänke,
 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 & Faedda, 1996; Hong & Page,
 1989). 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

303	subtle packaging occurs implicitly (Lombardi et al., 1987;	nonconsciously influence consumers to make food choices	360
304	Strack et al., 1993).	that are detrimental to their physical health.	361
305	Overview		
306	The current studies empirically tested these hypotheses		
307	about the effects of cultural gender stereotypes on food		
308	preferences using two methods. Study 1 primed either the		
309	concept of masculinity, the concept of femininity, or neutral		
310	concepts and then assessed participants' food preferences.		
311	Thus, using a manipulation common in research on implicit		
312	social cognition (Bargh & Chartrand, 1999; Bargh et al.,		
313	1996, 2012; Chartrand & Bargh, 2002), this experiment		
314	provided a direct test of whether activating cultural gender		
315	stereotypes changes subsequent food preferences.		
316	Study 2 employed a different logic, inspired by research		
317	on the subtle effects of schema congruity on preferences		
318	(Aggarwal & McGill, 2007; Fiske, 1982; Meyers-Levy &		
319	Tybout, 1989; Peracchio & Tybout, 1996). This study pre-		
320	sented participants with either "healthy" or "unhealthy"		
321	food products as part of an ostensible taste test. The product		
322	(a muffin) was either contained in masculine, feminine, or		
323	gender-neutral packaging. We hypothesized that when		
324	packaging is gendered (either masculine or feminine) both		
325	male and female participants' preferences should shift such		
326	that stereotype-congruent products (i.e., the masculine-		
327	unhealthy muffin and the feminine-healthy muffin) are		
328	judged more favorably than the stereotype-incongruent		
329	products. Consistent with the idea that both priming and		
330	schema congruity effects represent implicit influences on		
331	consumer evaluations, we expected that funneled debrief-		
332	ings (Bargh & Chartrand, 2000) would reveal no evidence		
333	participants were aware that the primes (Study 1) or pack-		
334	aging (Study 2) had influenced them.		
335	Study 3 used a different approach to test the hypothe-		
336	sized implicit nature of schema congruity effects. Specifi-		
337	cally, we added a condition in which the packaging		
338	contained a slogan <i>explicitly</i> appealing to gender stereo-		
339	types ("The muffin for real men"). We hypothesized that		
340	a blatant appeal to stereotypes would reverse the typically		
341	observed schema congruity effect, such that an unhealthy		
342	muffin in masculine packing <i>and</i> with a blatantly gendered		
343	slogan would be rejected. Further, this reversal effect should		
344	be strongest among consumers high in individual differ-		
345	ences in psychological reactance (Brehm, 1966; Brehm &		
346	Brehm, 1981; Hong & Faedda, 1996; Hong & Page, 1989).		
347	Together, these experiments serve to inform our under-		
348	standing of how gender stereotypes shape food preferences		
349	and more broadly, how widely shared cultural beliefs may		
350	implicitly influence behavior in surprising and unexpected		
351	ways. This research contributes to the special issue on		
352	masculinity by suggesting that cultural stereotypes about		
353	masculinity and femininity are so pervasive and psycholog-		
354	ically ingrained that their implicit activation can lead men		
355	and women alike to behave consistently with such common		
356	beliefs. Thus, the influence of gender stereotypes can be		
357	contingent on basic social-cognitive processes rather		
358	than a person's own gender. Our findings further illustrate		
359	how prevailing beliefs about men and masculinity can		
		Study 1: Priming Gender Concepts	362
		Participants	363
		Ninety-three adults (29 male, 64 female; $M_{age} = 35.47$,	364
		$SD = 16.65$) were randomly assigned to either the mascul-	365
		inity, femininity, or neutral prime condition. In order to	366
		recruit a sample of lay adults and thus increase the general-	367
		izability of our findings (Sears, 1986), we set up a tent at	368
		public park in Connecticut and offered passersby a small	369
		cash payment (\$2) in return for participating in the study.	370
		92.6% of our participants self-identified as White, 2.1%	371
		as Asian, 2.1% as Latino, 0% as Black, and 2.1% indicated	372
		"other" ethnic groups.	373
		Materials and Procedure	374
		Participants were given a "word puzzle task" (the priming	375
		manipulation) and then a "consumer survey" (the depen-	376
		dent measures related to food preferences), which were pre-	377
		sented as unrelated tasks. They completed the study in a	378
		designated sitting area, in some cases alone and in some	379
		cases with other participants sitting nearby. Participants	380
		were not allowed to speak to one another while completing	381
		the study.	382
		Gender Priming Manipulation	383
		Participants were randomly assigned to unscramble ten	384
		short sentences with either masculine, feminine, or neutral	385
		words embedded in seven of the sentences (Cohen &	386
		Garcia, 2005; Srull & Wyer, 1979). To develop these words,	387
		a separate group of 35 participants completed a pretest to	388
		identify words that were equated in terms of their active	389
		focus and the strength of their association with the concepts	390
		of masculinity and femininity. The goal of this pretesting	391
		was to generate seven masculine and seven feminine words	392
		that were parallel with one another (e.g., "cologne" and	393
		"perfume") but also were not confounded with activity or	394
		passivity. Additionally, the masculine words had to be seen,	395
		on average, as either "very masculine" or "extremely mas-	396
		culine" while the feminine words had to be rated, on aver-	397
		age, as either "very feminine" or "extremely feminine."	398
		Using these criteria, we generated seven words that were	399
		embedded in the ten scrambled sentences. In the masculin-	400
		ity priming condition, the masculine words included: <i>foot-</i>	401
		<i>ball</i> , <i>boys</i> , <i>blue</i> , <i>cologne</i> , <i>moustache</i> , <i>men</i> , and <i>hunting</i> .	402
		In the femininity priming conditions the feminine words	403
		included: <i>ballet</i> , <i>girls</i> , <i>pink</i> , <i>perfume</i> , <i>lipstick</i> , <i>women</i> , and	404
		<i>shopping</i> . Participants in the control condition unscrambled	405
		neutral sentences that did not contain any words relating to	406
		masculinity, femininity, men or women, such as " <i>The win-</i>	407
		<i>dow is open</i> ."	408

509 foods compared to participants in the masculinity prime
 510 condition ($M = 3.70$, $SD = 1.59$), $t(61) = 3.17$, $p < .01$,
 511 $d = .81$, and marginally more likely to do so than partici-
 512 pants in the neutral prime condition ($M = 4.22$, $SD = 1.53$),
 513 $t(60) = 1.80$, $p = .08$, $d = .47$. However, participants
 514 exposed to the masculinity prime were not significantly less
 515 likely to prefer healthy foods than participants in the neutral
 516 prime condition, $t(61) = -1.31$, $p = .20$, $d = -.34$.

517 Healthy Eating Intentions

518 A one-way ANOVA revealed a significant effect of priming
 519 condition on participants' self-reported intentions to eat
 520 healthy, $F(2, 91) = 7.48$, $p < .01$. Specifically, participants
 521 in the femininity prime condition ($M = 8.70$, $SD = 2.49$)
 522 were more likely to report intentions to eat healthfully in
 523 the next month than participants in the masculinity prime
 524 condition ($M = 6.19$, $SD = 2.76$), $t(61) = 3.79$, $p < .001$,
 525 $d = .97$, and marginally more likely to do so than partici-
 526 pants in the neutral prime condition ($M = 7.45$, $SD = 2.48$),
 527 $t(60) = 1.98$, $p = .05$, $d = .51$. Additionally, participants in
 528 the masculinity prime condition were marginally less likely
 529 to report healthy eating intentions than participants in the
 530 neutral prime condition, $t(61) = -1.91$, $p = .06$, $d = -.49$.

531 Thus, across all of our dependent variables we observed
 532 a significant main effect of the priming manipulation, with
 533 the means in the masculinity prime, neutral prime, and femi-
 534 ninity prime conditions patterning in the expected manner.
 535 Scores in the masculinity and femininity prime conditions
 536 were always significantly different from each other, with
 537 means in the neutral prime condition generally falling in
 538 between but not always significantly different from the
 539 other two conditions.

Participant Gender

541 Further analyses revealed no evidence that participant gen-
 542 der moderated the observed effects. Several unsurprising
 543 main effects of participant gender did emerge, such that
 544 male participants were more likely to prefer unhealthy ver-
 545 sions of the same food than women ($M = 4.38$, $SD = 1.47$
 546 vs. $M = 3.46$, $SD = 1.48$), $F(1, 86) = 4.58$, $p < .05$,
 547 $d = .59$, and marginally more likely to prefer unhealthy
 548 foods than women ($M = 4.78$, $SD = 1.39$ vs. $M = 3.98$,
 549 $SD = 1.66$), $F(1, 87) = 3.17$, $p = .08$, $d = .48$. However,
 550 the main effects of participant gender on preference for
 551 healthy foods ($M = 3.84$, $SD = 1.56$ vs. $M = 4.45$,
 552 $SD = 1.53$), $F(1, 87) = 1.09$, $p = .30$, $d = -.37$, and
 553 healthy eating intentions ($M = 6.58$, $SD = 2.92$ vs.
 554 $M = 7.94$, $SD = 2.47$), $F(1, 87) = 2.16$, $p = .15$, $d = -.49$,
 555 were not significant. Further, and much more interestingly,
 556 participant gender did not interact with the priming manipu-
 557 lation to predict preferences for unhealthy over healthy
 558 versions of the same foods, $F(2, 86) = .36$, $p = .70$, prefer-
 559 ences for healthy foods, $F(2, 87) = 1.41$, $p = .25$, prefer-
 560 ences for unhealthy foods, $F(2, 87) = .14$, $p = .87$, or
 561 healthy eating intentions $F(2, 87) = 1.81$, $p = .17$. This
 562 suggests that, even if they often expressed different prefer-
 563 ences overall, men and women were equally affected by the
 564 masculinity and femininity primes. Table 1 displays the
 565 means and standard deviations for the dependent variables
 566 by participant gender and experimental condition.

Discussion

567 Implicitly priming concepts associated with masculinity led
 568 participants to prefer less healthy foods, while implicitly
 569

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)

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

570 priming femininity led participants to prefer more healthy
571 foods. Moreover, these effects were observed among both
572 male and female participants and across a variety of out-
573 come measures. As outlined earlier, this result argues in
574 favor of cultural stereotypes implicitly affecting food prefer-
575 ences (Bargh et al., 1996, 2012; Greenwald & Banaji,
576 1995) and against a framework that relies on the congru-
577 ence between personal identity and the activated schema
578 (Allen et al., 2008).¹

579 Study 2: Gendered Food Packaging

580 To extend these findings, Study 2 varied the nature of the
581 packaging with which food was presented. The same food
582 (a muffin) was used in all conditions, but was either
583 described as low-fat or full-fat. The muffin was either con-
584 tained in masculine, feminine, or gender-neutral packaging
585 (thus totaling six different conditions). We then obtained
586 several different evaluative measures of the product includ-
587 ing appeal of the product's packaging, intent to purchase the
588 product, willingness to pay for the product, and evaluations
589 of the product's taste. We predicted that across all of these
590 measures, the stereotype-congruent products (i.e., feminine-
591 healthy muffins and masculine-unhealthy muffins) would
592 be rated more favorably than the stereotype-incongruent
593 products (i.e., the feminine-unhealthy and masculine-
594 healthy muffins) or the gender neutral healthy and
595 unhealthy products. We further expected that a funneled
596 debriefing (Bargh & Chartrand, 2000) would reveal no evi-
597 dence that participants were aware the product packaging
598 had influenced their judgments.

599 Participants and Design

600 One hundred forty adults (58 men, 82 women;
601 $M_{\text{age}} = 35.98$, $SD = 14.99$) were randomly assigned to
602 one of six conditions in a 3 (masculine vs. feminine vs. neu-
603 tral packaging) \times 2 (healthy vs. unhealthy product)
604 between-subjects design. As in Study 1, we sought to
605 increase the generalizability of our findings by recruiting
606 lay adults rather than college students. We therefore rented
607 a booth at a local fair in Connecticut and offered attendees a
608 small cash payment in return for participating in the study.
609 90.8% of our participants self-identified as White, 0% as
610 Asian, 3.5% as Latino, 3.5% as Black, and 2.1% indicated
611 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

615 Participants were told that they were participating in a taste
616 test for a new product and that they would first evaluate the
617 aesthetic appearance of a box of muffins and then taste one
618 of the same muffins. To control for the actual muffin used,
619 all participants actually tasted an Entenmann's[®] individu-
620 ally-wrapped miniature blueberry muffin. The muffin was
621 presented to subjects in a small, clear, zip-locked bag to
622 prevent any influence of familiarity of the actual muffin
623 brand. We chose blueberry muffins for three reasons:
624 (1) blueberry muffins were pretested to be gender neutral,
625 (2) blueberry muffins were also rated as being possibly
626 healthy or unhealthy depending on their preparation (e.g.,
627 a muffin can be either low-fat, low-sugar, and high-fiber,
628 or high-fat, high-sugar, and devoid of fiber), and (3) almost
629 no one reported being allergic to the ingredients in blue-
630 berry muffins.

631 Participants were first presented with one of the six
632 blueberry muffin boxes. An artist created mock-ups of
633 the muffin boxes to ensure that participants were unaware
634 that the boxes were fictional. To manipulate the perceived
635 healthiness of the muffins, in the unhealthy conditions,
636 the muffins were labeled "Mega Muffin" and in the healthy
637 conditions, the muffins were labeled "Health Muffin." The
638 adjective "Mega" was always used to describe the
639 unhealthy muffin and "Health" the healthy muffin, thus
640 the product name and product attributes were part of the
641 same healthiness manipulation. To manipulate how
642 gendered the muffins were perceived to be, in the masculine
643 conditions the box cover had a background of men playing
644 football, in the feminine conditions the box cover had a
645 woman dancing ballet in the background, and in the
646 neutral conditions there was a picture of a field. This
647 yielded six different boxes: a masculine-healthy muffin, a
648 masculine-unhealthy muffin, a feminine-healthy muffin, a
649 feminine-unhealthy muffin, a neutral healthy muffin, and
650 a neutral unhealthy muffin.

Stimulus Pretesting

651 To ensure that these fictional boxes were perceived accu-
652 rately (as either healthy/unhealthy and either masculine/
653 feminine/neutral), as well as that the masculine box was
654

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 pretested 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 $F(2, 98) = .40$, $p = .67$.

not more strongly associated with unhealthiness and the feminine box with healthiness, we conducted a pretest with a separate group of 140 adults. Pretest 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 $p < .001$). 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, either for judgments of masculinity-femininity or for ratings of healthiness/unhealthiness. Thus, the pretest 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 nine-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 nine-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 nine-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 five ("*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 2×3 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 ($M = 7.65$, $SD = 0.96$) 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 ($M = 3.23$,

760 $SD = 2.19$), $t(49) = 5.96$, $p < .001$, $d = 1.70$, or neutral
 761 packaging ($M = 4.71$, $SD = 2.15$), $t(40) = 3.30$, $p < .01$,
 762 $d = 1.04$. Finally, participants were significantly less likely
 763 to purchase the unhealthy muffins in feminine packaging
 764 than the same muffins in neutral packaging, $t(49) =$
 765 -2.39 , $p < .05$, $d = -.68$.

766 Willingness to Pay

767 We then analyzed how much participants were willing to
 768 pay (WTP) for a box of muffins, and again found a signif-
 769 icant interaction between the healthiness of the muffin and
 770 the gendered nature of the packaging, $F(2, 135) = 19.54$,
 771 $p < .001$. Participants were willing to pay significantly
 772 more money for the healthy muffins in the feminine pack-
 773 aging ($M = \$5.73$, $SD = \$3.38$) compared to the healthy
 774 muffins in the masculine packaging ($M = \$2.72$,
 775 $SD = \$1.76$), $t(44) = -3.80$, $p < .001$, $d = -1.15$, or neu-
 776 tral packaging ($M = \$3.30$, $SD = \$1.26$), $t(44) = 3.24$,
 777 $p < .01$, $d = .98$. However, the price participants would
 778 pay for the healthy muffins did not differ significantly
 779 between the masculine packaging and the neutral packaging
 780 conditions, $t(44) = -1.30$, $p = .20$, $d = -.39$.

781 Conversely, participants said that they would pay signif-
 782 icantly more for the unhealthy muffins in the masculine
 783 packaging ($M = \$5.38$, $SD = \$2.72$) compared to the
 784 unhealthy muffins in the feminine packaging ($M = \$2.84$,
 785 $SD = \$1.78$), $t(49) = 4.02$, $p < .001$, $d = 1.15$, or neutral
 786 packaging ($M = \$2.72$, $SD = \$1.44$), $t(40) = 3.95$,
 787 $p < .001$, $d = 1.25$. The price participants would pay for
 788 the unhealthy muffins did not differ significantly between
 789 the feminine packaging and the neutral packaging condi-
 790 tions, $t(49) = .26$, $p = .80$, $d = .07$.

791 Evaluation of Packaging

792 A similar interaction was also observed with regard to rat-
 793 ings of the packaging itself, $F(2, 136) = 12$, $p < .001$. For
 794 the “healthy” muffins, the feminine packaging
 795 ($M = 7.02$, $SD = 1.38$) was evaluated as significantly more
 796 appealing than the masculine packaging ($M = 4.40$,
 797 $SD = 2.64$), $t(45) = -4.29$, $p < .001$, $d = -1.28$, or the
 798 neutral packaging ($M = 5.11$, $SD = 2.19$), $t(45) = 3.60$,
 799 $p < .001$, $d = 1.07$. However, for the healthy muffins, rat-
 800 ings of the masculine packaging did not differ significantly
 801 from ratings of the neutral packaging, $t(44) = -.99$,
 802 $p = .33$, $d = -.30$.

803 In contrast, for the “unhealthy” muffins, the masculine
 804 packaging ($M = 6.69$, $SD = 1.60$) was seen as significantly
 805 more appealing than the feminine packaging ($M = 5.45$,
 806 $SD = 2.17$), $t(49) = 2.23$, $p < .05$, $d = .64$, but not the neu-
 807 tral packaging ($M = 5.60$, $SD = 1.06$), $t(40) = 2.62$,
 808 $p < .05$, $d = .83$. For the unhealthy muffins, ratings of the
 809 packaging did not differ significantly between the feminine
 810 and the neutral packaging conditions, $t(49) = -.28$,
 811 $p = .78$, $d = -.08$.

812 Thus, across all dependent variables we observed the
 813 hypothesized interaction between the type of packaging

and the healthiness of the muffin, as well as the expected
 main effects of packaging within each healthiness condi-
 tion. Further, within both the healthy and unhealthy muffin
 conditions the means in the masculine, neutral, and femi-
 nine 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. Partici-
 pant 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 signifi-
 cantly higher taste ratings than male participants for muf-
 fins 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 will-
 ingness 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 con-
 trast, 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 manipula-
 tions on taste test evaluations, $F(2, 127) = 1.11$, $p = .33$,
 purchase intentions, $F(2, 128) = 2.18$, $p = .12$, or willing-
 ness 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 pack-
 aging 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”

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) \times 3 (feminine, masculine, or neutral packaging) between-subjects design

	Taste test evaluation	Purchase intentions	Willingness to pay	Evaluation of packaging
Healthy packaging				
Male participants				
Feminine packaging	7.44 (<i>SD</i> = 1.35) <i>N</i> = 12	6.50 (<i>SD</i> = 2.28) <i>N</i> = 12	5.13 (<i>SD</i> = 2.67) <i>N</i> = 12	7.29 (<i>SD</i> = 1.51) <i>N</i> = 12
Masculine packaging	3.97 (<i>SD</i> = 2.86) <i>N</i> = 11	2.91 (<i>SD</i> = 2.47) <i>N</i> = 11	1.86 (<i>SD</i> = 1.27) <i>N</i> = 11	3.50 (<i>SD</i> = 2.59) <i>N</i> = 11
Neutral packaging	5.29 (<i>SD</i> = 3.23) <i>N</i> = 4	4.00 (<i>SD</i> = 3.56) <i>N</i> = 4	2.72 (<i>SD</i> = 1.51) <i>N</i> = 4	5.56 (<i>SD</i> = 2.59) <i>N</i> = 4
Female participants				
Feminine packaging	7.85 (<i>SD</i> = .97) <i>N</i> = 12	5.92 (<i>SD</i> = 2.64) <i>N</i> = 12	6.29 (<i>SD</i> = 3.96) <i>N</i> = 12	6.75 (<i>SD</i> = 1.23) <i>N</i> = 12
Masculine packaging	5.83 (<i>SD</i> = 2.63) <i>N</i> = 11	4.73 (<i>SD</i> = 2.01) <i>N</i> = 11	3.36 (<i>SD</i> = 1.84) <i>N</i> = 11	5.32 (<i>SD</i> = 2.60) <i>N</i> = 11
Neutral packaging	7.30 (<i>SD</i> = 1.13) <i>N</i> = 19	5.05 (<i>SD</i> = 2.25) <i>N</i> = 19	3.42 (<i>SD</i> = 1.21) <i>N</i> = 19	5.01 (<i>SD</i> = 2.16) <i>N</i> = 19
Unhealthy packaging				
Male participants				
Feminine packaging	5.82 (<i>SD</i> = 2.79) <i>N</i> = 11	4.27 (<i>SD</i> = 2.80) <i>N</i> = 11	3.68 (<i>SD</i> = 2.12) <i>N</i> = 11	6.32 (<i>SD</i> = 2.30) <i>N</i> = 11
Masculine packaging	7.70 (<i>SD</i> = .95) <i>N</i> = 10	7.00 (<i>SD</i> = 2.40) <i>N</i> = 10	5.84 (<i>SD</i> = 3.45) <i>N</i> = 10	6.88 (<i>SD</i> = 1.61) <i>N</i> = 10
Neutral packaging	6.28 (<i>SD</i> = 2.01) <i>N</i> = 10	4.80 (<i>SD</i> = 1.93) <i>N</i> = 10	2.84 (<i>SD</i> = 1.95) <i>N</i> = 10	5.68 (<i>SD</i> = .96) <i>N</i> = 10
Female participants				
Feminine packaging	5.32 (<i>SD</i> = 1.89) <i>N</i> = 18	2.72 (<i>SD</i> = 1.53) <i>N</i> = 18	2.43 (<i>SD</i> = 1.38) <i>N</i> = 18	4.72 (<i>SD</i> = 1.77) <i>N</i> = 18
Masculine packaging	7.61 (<i>SD</i> = 1.02) <i>N</i> = 11	6.73 (<i>SD</i> = 1.79) <i>N</i> = 11	4.95 (<i>SD</i> = 1.91) <i>N</i> = 11	6.52 (<i>SD</i> = 1.64) <i>N</i> = 11
Neutral packaging	6.48 (<i>SD</i> = 1.95) <i>N</i> = 11	4.64 (<i>SD</i> = 2.42) <i>N</i> = 11	2.61 (<i>SD</i> = .83) <i>N</i> = 11	5.52 (<i>SD</i> = 1.18) <i>N</i> = 11

868 matched compared to when they did not match.
869 As expected, a funneled debriefing (Bargh & Chartrand,
870 2000) revealed no evidence that participants were aware
871 their evaluations had been influenced by the product
872 packaging.

873 Study 3: Reactance Against Explicit 874 Appeals to Gender

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

Participants and Design

886 One hundred fifty-seven adults (58 men, 97 women, and
887 2 participants who failed to report their gender;
888 $M_{\text{age}} = 39.90$, $SD = 15.72$) were recruited from an online
889 subject pool maintained by an East Coast university and
890 assigned to one of four conditions in a 2 (healthy product
891 vs. unhealthy product) \times 2 (implicit masculine appeal vs.
892 explicit masculine appeal) between-subjects design.
893 Eighty-one percent of our participants self-identified as
894 White, 9% as Asian, 4% as Latino, 5% as Black, and 1%
895 indicated “other.” Thirty-six percent of participants had a
896 high school degree or less, 37% a college degree, 22% a
897 master’s degree, and 5% doctoral degree. The average
898 annual income for our sample was \$32,165 per year.
899

Materials and Procedure

900 Participants were told that they were participating in an
901 online consumer survey and were presented with images
902 of muffin boxes based on those from Study 2. As before,
903 in the *unhealthy muffin condition* the brand label was
904

905 “Mega Muffin” and in the *healthy muffin condition* the
906 brand label was “Health Muffin.” In the *implicit masculine*
907 *appeal condition*, the packaging depicted men playing foot-
908 ball in the background, just as in Study 2. In the *explicit*
909 *masculine appeal condition*, the same football image was
910 used but with the additional slogan “The Muffin for Real
911 Men” included.

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

922 Further included were self-report measures of partici-
923 pants’ goals to eat healthfully, limit caloric intake, and
924 maintain an attractive appearance. The healthy eating mea-
925 sure consisted of three items: “I try my best to include only
926 healthy ingredients in my meals,” “I eat healthy food when-
927 ever possible,” and “It is my goal to eat healthfully on a
928 regularly basis” ($\alpha = .90$). The low-calorie measure con-
929 sisted of the items: “I try to consume as little calories as
930 possible,” “I strive to minimize my calorie intake every
931 day,” and “I buy foods that are low in calories whenever
932 possible” ($\alpha = .92$). Finally, the attractive appearance mea-
933 sure consisted of the items: “Maintaining an attractive
934 appearance is an important goal of mine,” “I am willing
935 to do anything to maintain an attractive appearance,” and
936 “The idea of maintaining an attractive appearance is always
937 in my mind” ($\alpha = .83$). Participants indicated their agree-
938 ment or disagreement with all scale items on seven-point
939 Likert scales (1 = *strongly disagree*, 7 = *strongly agree*).

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

943 Results

944 Because our design included a continuous variable (individ-
945 ual differences in psychological reactance), we regressed
946 willingness to pay on the implicitness manipulation, health-
947 iness manipulation, reactance, the two-way interaction
948 between the implicitness manipulation and the healthiness
949 manipulation, the two-way interaction between the implicit-
950 ness manipulation and reactance, the two-way interaction
951 between healthiness manipulation and reactance, and
952 finally the three-way interaction between the implicitness
953 manipulation, the healthiness manipulation, and reactance.
954 Results revealed a significant main effect of the implicit-
955 ness manipulation (dummy coded: 1 = implicit,
956 0 = explicit), $\beta = 3.46$, $p = .02$, $\eta^2 = .03$, indicating that
957 overall, participants were willing to pay more for a dozen
958 muffins in the implicit appeal condition than in the explicit
959 appeal condition. A marginally significant main effect of
960 dispositional reactance also emerged ($\beta = -4.16$,

961 $p = .06$, $\eta^2 = .02$), suggesting that willingness to pay was
962 negatively related to reactance. Furthermore, all three
963 two-way interactions between the implicitness manipulation
964 and the healthiness manipulation ($\beta = -4.12$, $p = .07$,
965 $\eta^2 = .02$), between the implicitness manipulation and react-
966 ance ($\beta = 7.67$, $p < .01$, $\eta^2 = .05$), and between the health-
967 iness manipulation and reactance ($\beta = 5.65$, $p = .05$,
968 $\eta^2 = .02$) emerged as significant or marginally significant.
969 However, all of these effects were further qualified by the
970 hypothesized three-way interaction between the implicit-
971 ness manipulation, healthiness manipulation (dummy
972 coded: 1 = healthy, 0 = unhealthy), and individual differ-
973 ences in reactance ($\beta = -9.80$, $p = .02$, $\eta^2 = .04$).

974 We further decomposed this significant three-way inter-
975 action by whether the appeal to gender stereotypes in the
976 packaging was comparatively implicit or explicit. In the
977 implicit condition, a significant main effect of the healthi-
978 ness manipulation emerged ($\beta = -4.80$, $p < .01$,
979 $\eta^2 = .09$), indicating that participants in the implicit condi-
980 tion were willing to pay higher price for the unhealthy muf-
981 fin than for the healthy muffin. This replicates the schema
982 congruity pattern observed in Study 2: consumers were
983 willing to pay more for an unhealthy muffin in masculine
984 packaging (stereotype consistent) than a healthy muffin in
985 masculine packaging (stereotype inconsistent). In addition,
986 a significant main effect of reactance on price also emerged
987 in the implicit condition ($\beta = 3.51$, $p = .04$, $\eta^2 = .05$), indi-
988 cating that when the packaging implicitly appealed to gen-
989 der stereotypes, consumers high in reactance were actually
990 willing to pay *more* for the product.

991 In the explicit condition, a significant main effect of
992 reactance on price likewise emerged ($\beta = -4.16$, $p = .04$,
993 $\eta^2 = .06$), but in the opposite direction: consumers high
994 in reactance were willing to pay *less* for the product when
995 its packaging contained a blatant gender appeal. This main
996 effect was qualified by the hypothesized two-way interac-
997 tion between reactance and the healthiness manipulation
998 ($\beta = 5.65$, $p = .03$, $\eta^2 = .06$), such that reactance was mar-
999 ginally negatively related to price in the unhealthy muffin
1000 condition ($\beta = -4.16$, $p = .07$, $\eta^2 = .08$) but not in the
1001 healthy muffin condition ($\beta = 1.48$, $p = .26$, $\eta^2 = .04$). This
1002 is effectively the reverse of the schema congruity pattern
1003 observed in Study 2 and in the implicit appeal condition
1004 of Study 3. Consumers high in psychological reactance
1005 responded negatively to masculine packaging for an
1006 unhealthy product that further included the explicit slogan
1007 “The muffin for real men.”

1008 Participant Gender

1009 There were no gender differences in reactance
1010 ($M_{\text{male}} = 3.11$, $SD = 0.62$, $M_{\text{female}} = 3.01$, $SD = 0.57$, on
1011 a seven-point scale), $F(1, 153) = 1.01$, $p = .32$, $d = .16$.
1012 In addition, participant gender did not interact with either
1013 the implicitness manipulation ($\beta = -4.71$, $p = .13$,
1014 $\eta^2 = .01$) or the healthiness manipulation ($\beta = -5.03$,
1015 $p = .15$, $\eta^2 = .01$), and there was no three-way interaction
1016 between gender and the two experimental manipulations

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) \times 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 (<i>SD</i> = 3.90) <i>N</i> = 15	9.43 (<i>SD</i> = 6.23) <i>N</i> = 10	12.14 (<i>SD</i> = 10.33) <i>N</i> = 19	6.21 (<i>SD</i> = 6.51) <i>N</i> = 14
Female participants	6.05 (<i>SD</i> = 4.98) <i>N</i> = 20	6.41 (<i>SD</i> = 4.03) <i>N</i> = 22	9.88 (<i>SD</i> = 8.30) <i>N</i> = 27	8.73 (<i>SD</i> = 7.62) <i>N</i> = 28

($\beta = 5.85$, $p = .22$, $\eta^2 = .01$), 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 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, Wutich, Falletta-Cowden, & Rodriguez-Soto, 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.

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