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The effect of brand names on flavor perception and consumption in restrained and unrestrained eaters

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ABSTRACT

In an increasingly obesogenic food environment, making healthful food decisions can be difficult. Because consumers are often bombarded with excessive information about foods they often rely on simple heuristics to decide whether to purchase or consume a food. In the present study we tested females who were either restrained ($n = 33$) or unrestrained ($n = 33$) to determine whether their sensory perception and intake of a food would be affected by brand information. Participants were provided with in an *ad libitum* snack of cookies which was labeled with a brand typically associated with healthful snacks or a brand associated with unhealthy snacks. Results indicated that all participants rated the cookies with the healthful brand label as more satisfying and as having a better taste and flavor. Furthermore, restrained eaters consumed more of the healthful brand than the unhealthy brand, whereas unrestrained eaters' consumption did not differ. Thus it appears that food-related beliefs do influence consumers' intake, especially that of restrained eaters. Further research is warranted to investigate these beliefs in order to improve recommendations for healthful eating in a society facing an increased prevalence of overeating and obesity.

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1. Introduction

In an increasingly obesogenic environment, health care professionals encourage individuals to make healthier decisions about the types and amount of foods they consume (Faith, Fontaine, Baskin, & Allison, 2007; Goldberg & Gunasti, 2007; Howlett, Burton, & Kozup, 2008). However, while previous research suggests that most adults are capable of identifying healthful foods (Carels, Harper, & Konrad, 2006; Carels, Konrad, & Harper, 2007; Oakes & Slotterback, 2001), other factors such as palatability, price, and convenience often interfere with consumption of these foods (Steptoe, Pollard, & Wardle, 1995).

Daily food choice decisions are made more complex by marketers' attempts to persuade consumers to purchase their particular brand over their competitors. Misleading claims such as "low fat", "whole grain" or strategically placed pictures or labels on packaging may affect consumers' food choices (Aaron, Mela, & Evans, 1994; Goerlitz & Delwiche 2004; Kahkonen & Tuorila, 1998; Lee, Frederick, & Ariely, 2006; Olson & Dover, 1978; Silverglade & Heller, 2010; Wansink, Park, Sonka, & Morganosky 2000; Wansink, van Ittersum, & Painter 2005; Wardle & Solomons,

1994). In one such study, participants who ate a nutrition bar that indicated that it contained soy on the package described the taste as "more grainy, less flavorful, and as having a strong aftertaste" compared to those who ate an identical nutrition bar without such a label (Wansink et al., 2000).

Messages displayed on product packaging become associated with the larger brand image which serves to differentiate products (Aaker 1991, 1996). In this manner, brand identities are established that provide a sense of purpose and meaning to a targeted group of consumers. Indeed, a well-communicated brand image plays an important role in affecting consumers' product perceptions (Park, Jaworski, & MacInnis, 1986) and loyalty (Hartley, 1992; Kressmann et al., 2006). This was shown in an early study conducted by Makens (1965) which demonstrated that consumers, who were presented with the same brand of turkey, indicated that it tasted better if it was branded as a local, well-recognized brand name than an unfamiliar brand name.

Similarly, Hartley (1992) provides an example of the powerful effect that brands can have on consumers' purchasing behavior in his discussion of Coca Cola's failed attempt to introduce a newer, improved version of Coke into the market in 1985. When consumers tasted Classic Coke® and "New Coke®" in a blind taste-test, they rated New Coke® as better tasting than Classic Coke®. Yet when New Coke® was officially launched into the market, consumers rejected the product because it tasted and looked different than the cola previously represented by the brand name, to which they had become loyal.

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How brand name products affect restrained eaters; i.e., those who cognitively restrict their intake of certain foods in order to maintain or control their weight (Fedoroff, Polivy, & Herman, 1997), is not clear. To date, research has focused instead on how the physical characteristics (i.e., ingredients) of foods and package size affect restrained eaters' acceptance. For example, Scott, Nowlis, Mandel, and Morales (2008) found that restrained eaters consume more calories when they eat small foods in small packages, relative to large foods in large packages, presumably because they associate smaller foods and packages with dieting. However, Provencher, Polivy, and Herman (2009) found that restrained eaters' consumption was not differentially affected by health information. In this study participants were exposed to cookies (presented without a brand name) that were verbally described as consisting of natural, healthy ingredients or unnatural, unhealthy ingredients. They found that all participants, regardless of their restraint classification, consumed significantly more of the cookies described with "healthful" ingredients compared to those with "unhealthful" ingredients. Similarly, Aaron et al. (1994) failed to find a difference between restrained and unrestrained eaters' perceptions or consumption of foods labeled as "high fat" and "low fat".

Given the apparent power that brands have on liking and consumption of foods in general (as demonstrated by Hartley, 1992; Makens, 1965), the goal of the present study was to extend this research to determine whether restrained eaters would differentially respond to brands that are typically associated with healthful versus unhealthful foods. To this end, restrained and unrestrained eaters were invited to participate in a taste-test in which they were offered a snack in the form of cookies. However, rather than providing a verbal description of their ingredients (as in Provencher et al., 2009), the cookies were labeled with one of two brand names; either one that is typically associated with healthful snack foods, or one that is commonly associated with unhealthful snack foods. We hypothesized that restrained eaters may be more likely than unrestrained eaters to fall prey to the heuristic that foods associated with healthy brands are less caloric than those associated with unhealthful brands and therefore would be more likely to over-consume the snack.

2. Materials and method

2.1. Participants

Ninety nine undergraduate women between 18 and 23 years participated for course credit during January and February of 2012. They were recruited through their introductory psychology course at a medium-sized liberal arts college and received course credit for their participation. All procedures were approved by the school's Protection of Human Subjects Committee, and written informed consent was obtained from each participant.

2.2. Design

This study used a 2 × 2 between-subjects design with brand name (healthful vs. unhealthful) and dieting restraint (restrained vs. unrestrained) as independent variables.

Participants participated in a "taste-test" in which they consumed and rated cookies in terms of their flavor and palatability. Half were told that the cookies were made by a brand that is typically associated with healthful eating (i.e., Kashi®), whereas the remaining participants were told the cookies were made by a brand not associated with healthful eating (Nabisco®).

2.2.1. Test stimuli

2.2.1.1. Cookies. Each participant was given three soft-baked, oat-meal dark chocolate Kashi® cookies, each of which was broken in

half. One cookie (30 g) was considered one serving size and contained 130 calories. These cookies were chosen because they are ambiguous in that they have ingredients that are associated with a healthy lifestyle (e.g., whole grains) as well as ingredients that are typically associated with unhealthy eating (e.g., chocolate chips). Based on pilot testing conducted in the form of an online questionnaire with a sample of 28 undergraduate psychology students, approximately 92% of students were familiar with these brands (91.0% for Kashi®, 93.0% for Nabisco®) and most considered Kashi® to be healthy (92.6%) and Nabisco® to be unhealthy (92.9%).

2.2.2. Questionnaires

In addition to collecting demographic information (e.g., age and race) for all participants, several other questionnaires were administered and are described below.

2.2.2.1. Taste-test questionnaire. A taste-testing questionnaire was created based on formatting (Sepple & Read, 1989) and validation (Parker, Sturm, MacIntosh, & Feinle, 2004) of the Visual Analog Scale (VAS) methodology. Using a 50 mm VAS scale, participants rated qualities of the cookies; i.e., sweetness, bitterness, saltiness, sourness, crunchiness. The questionnaire also included 7-point likert-scale questions (1 = Strongly Dislike, 7 = Strongly Like) such as "How much do you like the taste/odor/flavor of this snack?"; "How much did you like consuming these cookies as a snack food?" (Satisfaction), and "How would you rate the snack overall?" (Overall rating). Participants were asked to complete this questionnaire as they were sampling the cookies. The logo for Kashi or Nabisco was displayed at the top of the questionnaire depending on the group to which the participant was assigned.

2.2.2.2. Three-factor eating questionnaire (TFEQ). All participants completed the three-factor eating questionnaire/eating inventory (Stunkard & Messick, 1985). This questionnaire contains subscales for cognitive dietary restraint (the degree to which individuals cognitively restrain their food intake in order to lose or maintain their weight), disinhibition (the extent to which an individual perceives that their control of food intake diminishes in response to factors such as preloads of food and dysphoric emotions), and susceptibility to hunger. Internal consistency ($\alpha = .90$) and test-retest reliability ($r = .91$) have been shown to be adequate for this measure. Because this questionnaire is scored on a dichotomous scale, we calculated Kuder-Richardson Formula 20 (KR-20) for each of the subscales for the current sample. These analyses revealed acceptable levels of internal consistency for cognitive restraint (KR-20 = 0.86), disinhibition (KR-20 = 0.79), and susceptibility to hunger (KR-20 = 0.75). Consistent with Stunkard and Messick (1985), cut-off scores were used to separate participants into dichotomous categories. Participants with restraint scores higher than 11 were classified as restrained eaters.

2.2.2.3. Brand engagement in self-concept scale (BESC). All participants completed an 8-item scale that measured consumer's general engagement with brands (Sprott, Czellar, & Spangenberg, 2009). A sample question from this scale would be: "I feel as if I have a close personal connection with the brands I most prefer." Measures for this scale are taken on a 7-point scale ranging from 1 = Strongly Disagree to 7 = Strongly Agree. Sprott et al. (2009) showed that this scale has adequate internal consistency ($\alpha = .86$). For the current sample, Chronbach's α was .93.

2.3. Procedure

Participants were tested individually and randomly assigned to one of the two brand conditions before they arrived at the laboratory. Upon arrival, they were told that the purpose of the study was

to examine taste-perceptions in snack foods popular among college students and that they would be given 10 min to taste and rate cookies made by Kashi® (Kashi Condition) or Nabisco® (Nabisco Condition). Participants were told that they could eat as much or as little as they wanted, and to answer all questions as accurately as possible on the questionnaire. After completion of informed consent, the experimenter left the room for 10 min. When the experimenter returned, the uneaten cookies were collected. Cookies were weighed before and after each session to measure consumption.

Participants were then seated in front of a computer to complete further questionnaires using Qualtrics survey software (Qualtrics Labs Inc., Provo, UT) which included questions that asked about their demographics, as well as a question that asked “What brand of cookies did you eat today?” with four options (Kashi®, Nabisco®, & two distracters), which served as a manipulation check to ensure participants’ awareness of the brand. Participants then completed the validated questionnaires described above. Upon completion of the online questionnaires, the experimenter weighed each participant and measured their height. Participants were then fully debriefed and asked not to share information about the study with other students who may take the study before leaving.

3. Results

3.1. Participant characteristics

Of the 99 participants recruited, nine participants were excluded because they suspected the study was evaluating brands on food consumption ($n = 2$), did not complete the online questionnaire ($n = 1$), or failed the aforementioned manipulation check of Condition ($n = 6$). Additionally, participants were removed if they incorrectly evaluated the healthfulness of the brands used in the study. For example, participants who rated Nabisco® as more healthful than Kashi® or Kashi® as less unhealthful than Nabisco® were removed from analysis ($n = 24$). These participants were removed because the goal of the manipulation was for participants to associate Kashi® with healthful snacks and Nabisco® with unhealthful snacks.

Of the 66 remaining participants, fifty two participants (78.8%) were Caucasian, seven were African-American (10.6%), and seven were Asian (10.6%). As shown in Table A.1 there were no differences between the groups’ age, BMI, disinhibition, susceptibility to hunger, time since last ate, or overall brand loyalty (all p values $>.05$). However, the restrained eaters’ restraint scores were significantly higher than those of the unrestrained eaters, $F(1, 64) = 46.00, p < .001$.

Table A.1

Descriptive characteristics of the sample in each experimental condition (Mean \pm SE).

	Group Kashi		Group Nabisco	
	Restrained eaters ($N = 16$)	Unrestrained eaters ($N = 22$)	Restrained eaters ($N = 18$)	Unrestrained eaters ($N = 10$)
Age (years)	18.60 \pm 0.21	19.00 \pm 0.23	18.67 \pm 0.16	18.90 \pm 0.38
BMI (kg/m ²)	24.16 \pm 1.29	21.58 \pm 0.73	25.31 \pm 0.95	24.70 \pm 1.24
Three factor eating questionnaire				
Restraint (range: 1–21) [*]	14.27 \pm 0.77	6.64 \pm 0.63	15.17 \pm 0.65	5.90 \pm 0.86
Disinhibition (range: 1–18)	6.87 \pm 1.00	5.82 \pm 0.59	7.44 \pm 0.90	4.40 \pm 0.62
Hunger susceptibility (range: 1–14)	6.33 \pm 0.80	7.00 \pm 0.71	5.30 \pm 0.72	5.88 \pm 0.52
Time since late ate (h)	4.33 \pm 0.46	5.32 \pm 1.07	4.86 \pm 1.11	4.85 \pm 0.95
Overall brand loyalty (range: 1–7)	2.22 \pm 0.24	3.00 \pm 0.30	2.09 \pm 0.26	2.22 \pm 0.34

^{*} Restraint scores significantly larger for Restrained eaters compared to Unrestrained eaters in the Kashi and Nabisco groups ($p < 0.05$).

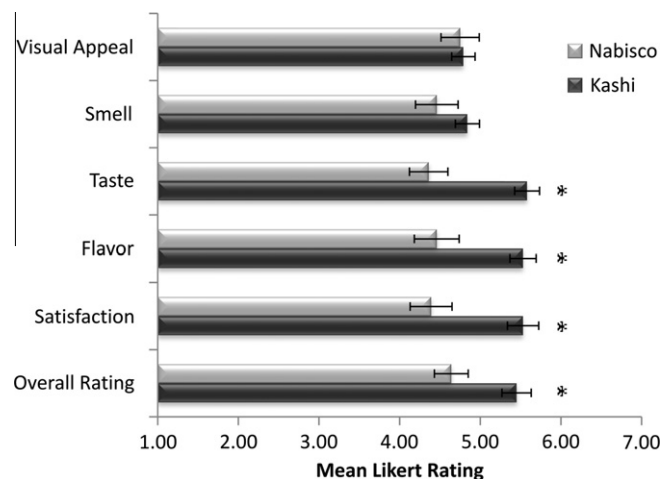


Fig. A.1. Mean Likert score ratings of the cookie which were labeled as either Kashi (black bars) or Nabisco (grey bars). Error bars depict standard error of the mean, ^{*} $p < 0.05$.

3.2. Taste perception

Participant’s ratings of the cookies sampled were analyzed by Condition and Restraint group using separate Fig. A.1 mixed two-way Analyses of Variance (ANOVA) for all the variables measured with the VAS (e.g., sweetness, crunchiness) and the likert scales (e.g., visual appeal, flavor, overall rating, and how much they enjoyed the cookies). For this and all subsequent analyses, IBM SPSS statistics for windows, Version 19.0 (IBM Corp., 2010) was used. These analyses revealed that there was no effect of Condition on any of the variables measured with the VAS scale. Similarly, Condition did not affect ratings of visual appeal, $t(64) = 0.14, ns$, or smell, $t(64) = 1.19, ns$. However, these analyses revealed a main effect of Condition for taste $t(64) = 4.01, p < .001$, flavor $t(64) = 3.90, p < .001$, overall rating $t(64) = 3.05, p < .01$, and satisfaction $t(64) = 3.97, p < .001$, with participants in the Kashi Condition rating the cookies higher on all of these dimensions than those in the Nabisco Condition.

3.3. Food consumption

In order to examine how brand names affected food consumption, a 2-way mixed Analysis of Covariance (ANCOVA) with Condition and Restraint group as the independent variables, the amount of cookies consumed as the dependent variable, and flavor and time since last ate as covariates. Flavor was included as a covariate because individuals in the Kashi condition may have consumed more cookies simply because they thought the product tasted better. Time since late ate was included as a covariate in order to con-

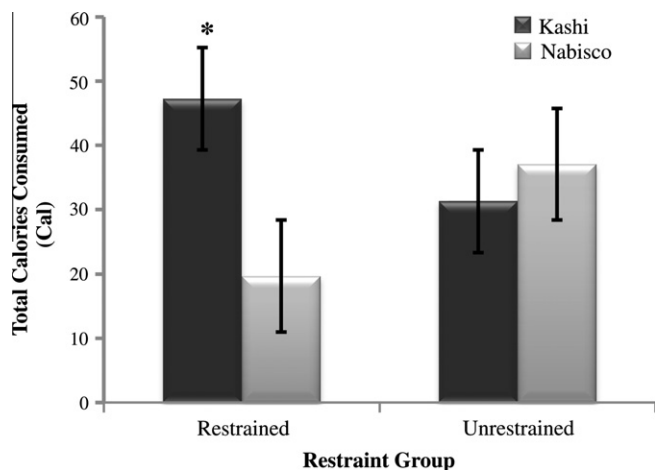


Fig. B.1. Total Calories Consumed as a function of Restraint Group and whether the cookies were labeled as Kashi (black bars) or Nabisco (grey bars). Error bars depict standard error of the mean, * $p < 0.05$.

control for the inherent variability in participants' level of hunger. While all participants complied in that they did not eat for two hours before the session, several participants indicated they had not eaten since the night before.

As shown in Fig. B.1, these analyses revealed a main effect of Condition; $F(1, 64) = 9.74, p < .005, \eta^2 = .136$ and an interaction between Condition and Restraint group; $F(1, 64) = 4.17, p < .05, \eta^2 = .063$. Simple main effects analyses revealed that for restrained eaters, those in the Kashi Condition consumed more than those in the Nabisco Condition; $t(31) = 3.68, p < .01$, whereas the unrestrained eaters did not differ in their consumption of the two brands $t(31) = 0.76, ns$.

4. Discussion

The results of the current study demonstrate that brand names influence flavor perception and predict food intake. Participants rated the food with the healthful label as having a better taste and flavor. Similar to Provencher et al. (2009), participants consumed more of the food that was associated with a healthful brand than they did of the same food that was associated with an unhealthy brand. However, in contrast to Provencher et al. (2009), this main effect was qualified by a significant interaction, in that restrained eaters ate more of the cookies if they were associated with a healthful brand than an unhealthy brand. No such differences were observed for unrestrained eaters who are less concerned about losing or maintaining their weight. These results further support the sensory-normative distinction theory proposed by Herman and Polivy (2008) in that restrained eaters in the current study were more influenced by the sensory cues provided by the brand logo. This study is the first to report differential consumption between restrained and unrestrained eaters as a function of branding.

Given that restrained, but not unrestrained eaters, consumed more of the healthful than the unhealthy brand it is possible that participants mistakenly assumed that the healthful brand was less caloric. Because unrestrained eaters do not focus on caloric content of foods, their consumption was not significantly affected by this heuristic. However, for restrained eaters, who strive to limit their caloric intake, the heuristic that healthful foods are less calorically dense may have led to overconsumption of the cookies. If restrained eaters typically follow this heuristic when caloric information is not available, this may contribute to their inability to control their intake and lose weight, especially if they fail to com-

pensate for these additional calories in later meals. Future research should further examine whether this branding effect extends to other foods items; that is, how would restrained eaters respond to a range of healthful, yet caloric foods (such as avocados or nuts) relative to less healthful, equally caloric foods. Moreover, it would be interesting to determine whether restrained eaters' intake is affected by brands to the same degree when caloric information is additionally available.

Although the current study closely followed the procedures of Provencher et al. (2009), there were differences between these studies that may help to explain our disparate results. While Provencher et al. (2009) provided a verbal description of the ingredients in the cookies that was either healthful or unhealthy, the present study provided participants merely with one of two brand names and logos that are typically associated with healthful or unhealthy snacks. Given the strong image that brands can project, it is possible that participants' behavior was affected more by learning about the brand of the cookie than by its ingredients. Furthermore, the presentation of a logo may have triggered an even stronger connection with the brand than presentation of the brand name alone, as previous research has shown that pictures have more direct access to semantic information than words (De Houwer & Hermans, 1994; Huijding & de Jong, 2005). It is also worth noting that while Provencher et al. (2009) used the Restraint Scale (Herman & Polivy, 1980), the TFEQ was used to measure restraint in the current study. Although these scales overlap considerably (as discussed in Craighead & Smith, 2011), it is possible that the use of different restraint scales explain the disparate results reported in these studies.

In the present study almost 25% of the participants were excluded from the final sample because they failed the manipulation check in which they were asked which of the two brands was more healthful. Given the high percentage of participants who rated Kashi® as healthy and Nabisco® as unhealthy in the pilot test, it was surprising that so many participants rated Kashi® as less healthy than Nabisco®. It is possible that these inconsistencies resulted from differences between the questions in the pilot test and the study. Whereas, the pilot test required participants to rate brands on a dichotomous scale (e.g. healthful or unhealthy), the questions in the main study required participants to rate the healthfulness of Nabisco® and Kashi® cookies on 7-point likert scales. Second, participants in the study answered these questions after the "taste test", which may have swayed their responses. A further limitation of the present study was that we recruited only female undergraduates, whose average BMI was within or close to the overweight range. Therefore more research needs to be conducted to establish the generality of the findings reported herein.

Despite the limitations of this study, the findings continue to build on an existing body of literature that demonstrates restrained eaters' vulnerabilities to branding (Abratt & Sacks, 1988). Future research should examine the effects that different marketing messages (e.g., health claims) have on consumers' brand perception. Whether the branding effects reported in the current study are further amplified by the inclusion of health food claims on labels warrants further investigation. In addition, future research should focus on factors other than restrained eating to determine what role concerns about health, price, and the environment (Step toe et al., 1995) play in motivating the purchasing and consumption of various brands.

5. Conclusions

Developing an understanding of the factors that moderate both food choice and food intake is important from both a health and marketing perspective. From a health perspective, the present

study suggests that healthful brands may actually confuse individuals who are attempting to restrict their caloric intake. From a public health perspective, while it is generally important to promote policy and environmental changes that make healthful foods more accessible while decreasing the marketing of unhealthful foods, additionally educating people to focus on the caloric content of foods, rather than making assumptions based on brands, should further enable effective weight management and improved health.

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