Health halo effects of values-based food claims

by

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ABSTRACT

When judging nutritional aspects of foods, perceivers tend to overgeneralize from one "healthy" nutrition claim (e.g., "no cholesterol") by assuming that foods feature other healthy attributes as well (e.g., low in fat). This finding has been discussed in terms of the classic halo effect in person perception, whereby impressions from strongly valenced attributes (e.g., social warmth) evoke similarly valenced evaluations of the target person on other attributes (e.g., sociability). Despite their popularity and health associations, scant research has explored whether claims like "organic" and "fair trade"—known as values-based claims—can similarly bias judgment. This dissertation explores this possibility. Specifically, despite being silent on nutrient content, values-based claims and other ethics-related production qualities (e.g., favorable worker treatment) are expected to promote unwarranted health inferences (e.g., reduced calorie estimates), especially when these qualities are personally relevant (i.e., strongly congruent or incongruent with perceivers' personal values). Five experimental studies find support for this prediction. Describing cookies as "organic" decreases calorie judgments and thereby increases consumption recommendations, an effect that is larger among the pro-environmental (Studies 1 and 2). Extending to the social ethics domain, describing chocolate as "fair-trade" decreases calorie judgments; moreover, socially *unethical* production *increases* calorie judgments, among perceivers reporting high ethical food values (Studies 3 and 4). Exploring effects on downstream choice outcomes, exercise is deemed less important

after a person chooses "organic" over conventional dessert, an effect that correlates

positively with pro-environmentalism (Study 5). Overall, larger bias was observed among

perceivers with strongly congruent (or incongruent) personal values, or those who likely

felt especially positively (or negatively) toward the focal qualities, consistent with the

logic of halo effects. Amid the ongoing obesity crisis, these findings reveal ethical health

halos that lead perceivers to see nutritionally poor but ethically produced foods as

healthy. Theoretical and practical implications are discussed.

Chapter I

Introduction

The ethical implications of product choice are on Americans' minds and food packages like never before. Take, for example, the rapid growth of the organic food industry, which saw U.S. sales rise from approximately $1 billion in 1990 to $25 billion in 2009 (OTA, 2010), reflecting growing concerns about the negative environmental consequences of conventional food production. Beyond "organic" and other claims conveying environmentally ethical production standards, known as *eco-labels* (e.g., "bird friendly" coffee; Lefferts & Heinicke, 1996), claims conveying socially ethical production ("fair trade," "no child labor") as well as a combination of environmental and social values ("locally produced") are increasingly commonplace. Collectively known as *values-based claims* (Barham, 2002), these labels signal difficult-to-discern production qualities related to socioeconomic progressivism that are likely to enter the utility functions of many consumers but are typically ignored in standard utility models (DiMaggio, 1994).

Although this is an age of enlightened food options, it is also one of pronounced confusion about food. Approximately 33% of Americans now meet the government's criteria for obesity (Flegal, Carroll, Ogden, & Curtin, 2010), up from 23% two decades ago (CDCP, 2008), and obesity-related illnesses, such as heart disease and diabetes, are among the leading causes of death in the United States (CDCP, 2010a). Scholars

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interested in the cognitive factors underlying excessive weight gain have suggested that calorie underestimation may be a contributing factor (Lichtman, Pisarska, Berman et al., 1992; Young & Nestle, 2002; Livingstone & Black, 2003), and in this vein, research finds that "healthy" nutrition claims (e.g., "low-fat") can lead consumers to erroneously infer that those foods contain fewer calories (e.g., Wansink & Chandon, 2006a). Despite the heightened popularity of "organic" and other values-based claims, scant research has investigated whether such claims can similarly evoke health halos, perhaps encouraging consumers to eat more than they otherwise would.

This dissertation explores this possibility. Drawing on the person perception literature on halo effects and consumer research on overgeneralizations from nutrition claims, I hypothesize that values-based claims—despite being silent on nutrient content including calorie content—can bias calorie estimates and other health-related judgments. Moreover, because values-based claims might be considered *peripheral qualities*, or attributes that are unlikely to strongly and uniformly influence subsequent evaluations during impression formation (Asch, 1946), health halos from values-based claims are expected to emerge especially among perceivers whose personal values are highly congruent (or incongruent) with the claim, who are likely to feel especially favorably (or unfavorably) toward the claim in the first place (e.g., "organic" halos among the pro-environmental). Note that there is a compelling alternative hypothesis: perceivers with highly claim-relevant personal values presumably know more about the claim and thus may be *less* susceptible to these unwarranted healthy inferences because they should realize that the focal claim ("organic") is irrelevant to the judgment at hand (calorie content). The present research tests these competing predictions. By predicting that these

effects depend on the perceivers' personal values or predisposition toward the claim, it also examines an assumed but often untested factor in halo effects.

It is important to note that judging "organic" and "fair trade" foods as lower-calorie would be warranted if such foods did in fact contain fewer calories on average. This is a reasonable possibility, given that companies routinely align the nutritional profile of packaged foods positioned as healthy options in the marketplace. However, the available evidence suggests that the calorie content of organic and fair trade foods likely matches that of their conventional counterparts (FMI, 2006; Roberto, unpublished data).

In the following section, I review relevant literature and discuss the theoretical rationale for the current work before outlining the experimental hypotheses.

Halo effects in person perception

In his classic demonstration of the halo effect, Asch (1946) read participants a list of adjectives describing a target person that included a positive or negative central quality (e.g., "warm" vs. "cold") and solicited evaluations of the target on various personality dimensions. Results showed that the "warm" targets were judged as more generous, sociable, and good-natured than were the "cold" targets. In related work on the power of first impressions, Kelley (1950) told students that a guest lecturer was known "…to be a rather 'warm' ['cold'] person, industrious, critical, practical, and determined" (p. 433). In addition to replicating Asch's findings, Kelley found that the warm versus cold manipulation affected students' behavior toward the target: 56% of students in the warm condition subsequently participated in the class discussion compared to just 32% in the cold condition. In later work manipulating social warmth behaviorally rather than

descriptively, Nisbett and Wilson (1977) found that a target was judged more favorably on his physical appearance, mannerisms, and accent when he behaved in a warm fashion, demonstrating that warmth halos can bias evaluations even when perceivers have ample independent information on which to base their judgments.

In addition to warmth, research demonstrates powerful halos arising from physical attractiveness. In their demonstration of the "what-is-beautiful-is-good" effect, Dion, Berscheid, and Walster (1972) presented participants with photographs of people high, low, or intermediate on physical attractiveness and solicited judgments of the targets' personalities and likelihood of success in various life domains. Results showed that attractive targets were judged to have more sociable personalities as well as better marriage and career prospects. In follow-up work, Snyder, Tanke, and Berscheid (1977) suggested that attractive individuals might actually be more sociable in part because perceivers' actions toward beautiful people might elicit behavior that is consistent with the "beautiful-is-good" stereotype. They had male participants speak via telephone with a female (research confederate) who they believed to be either attractive or unattractive on the basis of an experimentally manipulated photograph. Analysis of the taped conversations revealed the self-fulfilling nature of beauty halos: the woman behaved more warmly and sociably when the male participants believed that she was beautiful. Given that physical attractiveness is among a person's most salient characteristics (Dion et al., 1972) and that it likely evokes a uniformly positive response across perceivers (Aharon, Etcoff, Ariely, et al., 2001), it would appear that physical beauty—like warmth —may be considered a *central quality* in person perception (Asch, 1946), on which the construal of other qualities depends and which is capable of influencing a wide range of

specific evaluations. This is in contrast to a peripheral quality mentioned earlier, on which the construal of other qualities does not depend and which has more limited influence over specific evaluations (e.g., when Asch replaced the central qualities "warm" and "cold" with the peripheral qualities "polite" and "blunt," the effect on subsequent evaluations was dramatically reduced).

Although central qualities influence a wider range of evaluations than do peripheral qualities, evidence that they cast a universally positive or negative glow over all evaluations—a true halo effect—is elusive, even in the seminal work described above. Kelley (1950) points out like Asch (1946) before him that his data show a differential effect of the warm-cold manipulation across specific evaluations: warm targets were seen as more good-natured and popular but not as more self-assured or intelligent. Foreshadowing more explicitly cognitive work on activation theory (Collins & Loftus, 1975), Kelley speculated that the halo effect "seems to depend upon the closeness of the relation between the specific dimension of any given rating scale and the central quality…" (p. 435).

Kelley's point about concept proximity in the associative network is relevant to the current hypotheses. Perceivers may not overgeneralize from a values-based claim (e.g., "organic") or another ethical quality (e.g., favorable worker treatment) as they do from a relative nutrition claim (e.g., "low fat") because values/ethical qualities speak to a food's production process, which may be too far removed from nutrient-related concepts in the associative network to exert an effect. However, ethical production labels may bias nutrient inferences to a greater extent among certain perceivers, namely those whose personal values are strongly congruent or incongruent with the values/ethics labeling.

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That is, values/ethical labels may function as peripheral qualities in impression formation, given that they are not core qualities of foods that are sought by all consumers but instead matter especially to a subset who may be motivated to view these foods in a favorable or unfavorable light. Thus, even though production-related qualities may not bias nutrient-related inferences across perceivers in general, they may do so among a subset of perceivers with relevant personal values. These points are discussed in further detail below.

Health halos from relative nutrition claims

Spurred by the passage of the Nutrition Labeling and Education Act (NLEA) of 1990 which was intended to increase the transparency of nutritional information and to provide regulatory oversight for food advertising claims, numerous studies have examined the ways that consumers process and react to food labeling (e.g., Moorman, 1996; Andrews, Netemeyer, & Burton, 1998; Roe, Levy, & Derby, 1999; Garretson & Burton, 2000). Although the Food and Drug Administration (FDA) promptly issued guidelines for relative nutrition claims such as "high fiber" and "low cholesterol," government officials continued to express concern that consumers might misinterpret them (FTC, 1994). In this vein, research finds that margarine advertised as low in cholesterol is erroneously perceived as low in fat (Andrews et al., 1998), an example of the so-called "health halo" effect (Andrews, Burton, & Netemeyer, 2000; Chandon & Wansink, 2007).

Amid rising concerns about excessive weight gain and obesity-related illnesses, recent research has examined whether relative nutrition claims paradoxically promote

calorie underestimation and overeating. Wansink and Chandon (2006a) found that "low-fat" labels on snack foods (M&Ms, granola) lead to decreased calorie estimates, increased perceptions of serving size, and increased caloric intake. In addition, consumers have been shown to underestimate the calorie content of sandwiches from brands marketed as healthy (Subway) relative to sandwiches from other brands (McDonalds), increasing the likelihood that they will order calorie-dense side dishes and a higher-calorie meal overall from the "healthy" restaurant (Chandon & Wansink, 2007).

In contrast to central qualities in person perception (e.g., social warmth), the appeal of nutrition claims may vary across perceivers. For instance, consumers on restricted diets or those looking to lose weight may hold especially favorable attitudes toward low fat foods, perhaps evoking larger health halos among this group. Consistent with this expectation, a closer look at the Wansink and Chandon (2006a) findings is suggestive. Although the authors conclude that the effect of the "low-fat" claim was equivalent across normal weight and overweight participants, their Study 2 data (p. 610) reveal that the interaction with weight approached significance ($p = .10$), such that the claim's largest effect occurred among overweight participants judging M&Ms ($M_{regular} = 1377$ vs. $M_{low-fat} = 942$).[1] This pattern suggests that relative nutrition claims may be conceptualized as peripheral qualities that exert greater influence when the claim is personally relevant (and when people are motivated to view desired targets positively).

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[1] The authors do not report the three-way interaction between claim (low-fat vs. no claim), specific food (candy vs. granola), and participant BMI (normal weight vs. overweight) or the simple effect of claim on M&M judgments by overweight participants.

Health halos from values-based claims?

Whether values-based claims such as "organic" and "fair trade" are capable of activating health halos remains an open question. Consistent with activation theory (Collins & Loftus, 1975) and Kelley's (1950) speculations about the proximity of evaluation dimensions to the central quality, specific nutrient claims (e.g., "no cholesterol") have been shown to affect judgments of closely associated nutrients (fat) but not of more general, distal concepts (cancer risk) (Andrews et al., 1998). As mentioned above, "organic" and other production-related information (e.g., favorable worker treatment) may be seen as unlikely to activate "calories" and other nutrient-related concepts from this perspective.

On the other hand, there are a number of reasons to expect that values-based claims may indeed affect nutrient-related judgments, including judgments of calorie content. First, claims such as "organic" and "fair-trade" carry strong connotations of healthiness in contemporary America, associations that are promoted by marketers and reflected in survey data revealing that a majority of Americans endorse organic foods as "healthier" (Harris Interactive, 2007). In addition, more natural foods, as opposed to those altered by humans in some significant way, tend to be seen as inherently good and healthy (Rozin, Spranca, Krieger, et al., 2004); as such, generalized "organic" halos seem plausible given the back-to-nature connotations of organic production, associations that may extend to "fair trade" given that these claims reflect overlapping values (Raynolds, 2000) and frequently co-occur on food packages. Second, because calorie estimation is cognitively demanding (Livingstone & Black, 2003; Berman & Lavizzo-Mourey, 2008), consumers may even substitute the associatively related attribute "healthy" when

processing values-based claims like "organic" in order to simplify their calorie judgment, consistent with attribute substitution as a general judgment heuristic (Kahneman & Frederick, 2002).

Third, consumers may go beyond the literal meaning of the producer's claim (Grice, 1975; Schwarz, 1996) and infer that a producer who adheres to ethical production standards may also care about health-related aspects of the product (Wansink & Chandon, 2006a). Beyond any specific ethical = healthy heuristic rooted in conversational logic, consumers may more generally take the presence of an advertising claim that is only vaguely related to the judgment at hand as an implicit persuasive appeal on the part of producers (Wänke & Reutner, 2010); given that producers routinely attempt to position their products as healthy and that consumers likely assume that many people desire healthier options, virtually any advertising claim may lead perceivers to infer that the product is healthier than similar products that do not bear the claim.

Fourth, the related literature on corporate social responsibility demonstrates that consumers are prone to positive attributions for a company's behavior when the firm has behaved ethically in the past (Klein & Dawar, 2004), an ethical halo that may extend beyond evaluations of companies and brands and promote unwarranted inferences about the nutrient content and health consequences of their products.

Implicit in the above reasoning is that "low-calorie" and "healthy" are nearly synonymous in calorie-rich contemporary Western cultures (Crawford & Krebs, 2008), and as such, the inference that ethical foods are lower-calorie may readily follow from their "good"/"healthy" associations. Although not explicitly examined here, the meaning of "healthy" is expected to vary across contexts, and in turn, the specific nutrient-related

inferences (e.g., calorie content) are expected to shift accordingly. For instance, it is not difficult to imagine contexts in which "high-calorie" may be a highly desirable and healthy quality of foods, as it may be in developing nations where malnutrition far outranks obesity as a public health concern. I return to this point in the next section.

Health halos for some or all? The moderating role of personal values

Although the above considerations point to generalized halo effects of values-based claims, the effects likely depend on perceivers' personal values. As mentioned above, attitudes toward "organic" and other values-based claims are likely more variable than are attitudes toward central qualities in person perception (e.g., social warmth) (Chen, 2009). Given that halo logic presumes that focal qualities elicit strongly valenced impressions, values-based halos may be most pronounced among individuals who value and feel positively about the claim in the first place (e.g., "organic" claims among pro-environmentalists) (see Figure 1 for the conceptual model). These general positive (and negative) impressions are expected to activate associatively related "healthy" (and "unhealthy") inferences that may be unwarranted—for example, that snacks are lower-calorie when they are "organic" and that chocolate is *higher-calorie* when produced in socially *unethical* ways. These specific inferences, in turn, are expected to have downstream consequences on choice outcomes that can be conceptualized as indulgent versus resistant and that manifest, for example, in the form of higher versus lower consumption recommendations and ultimately as higher versus lower consumption.

Importantly, these general positive and negative impressions are not expected to evoke the same "healthy" and "unhealthy" inferences across contexts. In line with a

situated cognition perspective on judgment and decision making (Smith & Semin, 2004; Schwarz, 2007), the meaning of "healthy" is conceived as highly context-dependent—for instance, whereas "low-calorie" is strongly associated with healthy in calorie-rich cultures such as the United States, the same attribute is likely construed as unhealthy in contexts where calories are scarce, such as during times of famine or in developing nations where malnutrition is a pressing public health concern. Although the present work is conducted within a calorie-rich culture where "low-calorie" is considered healthy (Crawford & Krebs, 2008), cultural associations and meanings are likely crucial to predicting perceivers' specific nutrient-related inferences and downstream choice outcomes arising from values-based claims.

If supported, the person values model—which predicts greater bias among perceivers with relevant personal values—would carry interesting theoretical implications for dual-process theories of human judgment. These theories generally distinguish between two types of cognitive systems, one that is relatively fast, intuitive, and automatic (termed System 1) and one that is relatively slow, deliberative, and controlled (System 2) (e.g., Chaiken, 1980; Petty & Cacioppo, 1984; Sloman, 1996; see Chaiken & Trope, 1999 and Stanovich & West, 2000 for reviews). In general, these models assume that System 1 guides judgment most of the time and that System 2 comes online when people are sufficiently knowledgeable, motivated, or capable of deeper processing.

Thus, dual-process models would predict that heuristic cues should exert less influence among perceivers whose personal values are aligned with the values-based claim for at least two reasons. First, high personal relevance typically motivates perceivers to overlook heuristic cues in favor of deeper processing (e.g., Cacioppo, Petty,

Kao, & Rodriguez, 1986). Second, high personal relevance in the present domain of ethical foods presumably correlates positively with knowledge, which should lead perceivers to realize that the values-based claim is irrelevant to the focal judgment (e.g., because of its personal relevance, pro-environmentalists presumably prefer "organic" *and* know what it means). Dual-process theories would predict that this relevance should *protect* pro-environmentalists from unwarranted healthy inferences (e.g., "organic" = "low-calorie") by eliciting deliberative processing and the realization that the claim does not bear on the focal judgment. In contrast, halo theory would predict that pro-environmentalists should be *more vulnerable* to these unwarranted inferences because their strongly positive impression, evoked by the claim, may spill over and affect their evaluations on unrelated dimensions. In sum, values-based health halos may occur among perceivers with claim-relevant values despite their superior knowledge, which dual-process models predict should buffer them from the hypothesized bias.

Five experimental studies were designed to test for health halos from values-based claims. Specifically, these studies examine some of the key components of the person values model by testing the following four hypotheses:

(1) *Despite being silent on calorie content, the same food product will be judged as lower-calorie when it bears a values-based claim (e.g., "organic")*. A main effect of values-based claims on specific "healthy" inferences (e.g., "low-calorie") is expected to the extent that the claim carries strong associations of "good"/"healthy" for most perceivers. Given the popularity of organic foods coupled with their widespread healthy associations (Harris Interactive, 2007), "organic" may decrease calorie judgments regardless of their personal environmental values. Nevertheless, the effect is expected to
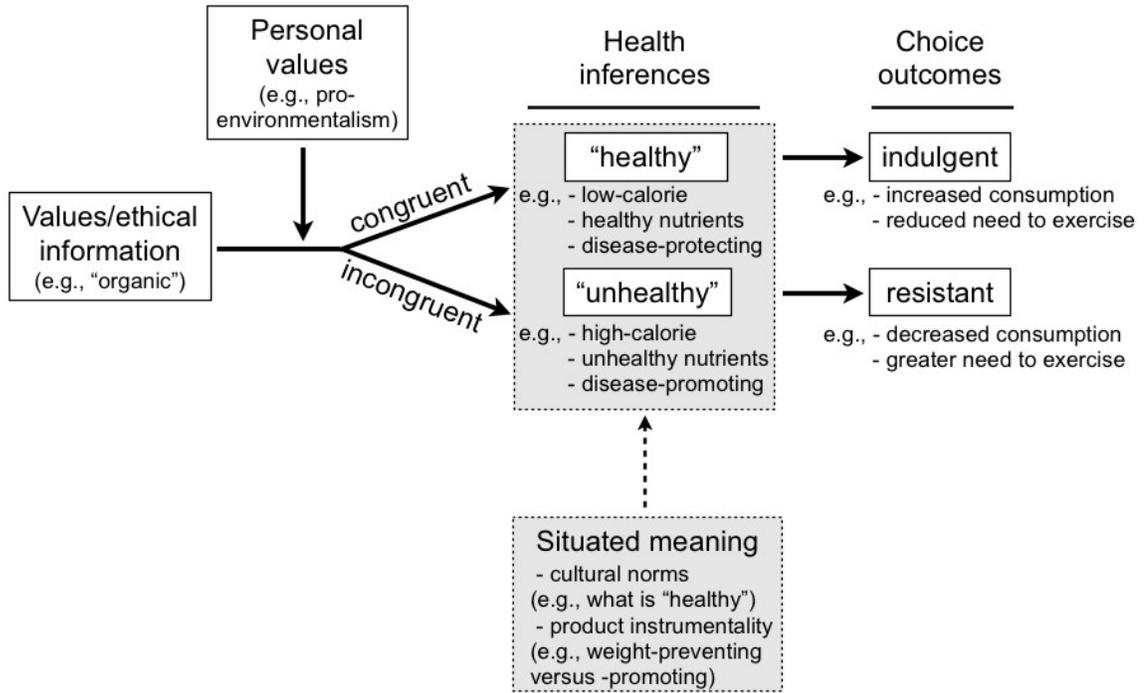
be more pronounced among those high in pro-environmentalism, following halo logic (see 2 below).

(2) *The effect of values-based claims on health-related inferences (e.g., calorie content) will be moderated by personal values, such that perceivers with claim-congruent values will be more likely to provide unwarranted healthy judgments (e.g., reduced calorie estimates).* As mentioned above, this hypothesis follows from halo logic by acknowledging that qualities should evoke halos to the extent that they elicit strongly valenced impressions among perceivers. Just as the peripheral qualities "polite" and "blunt" have a weaker influence on subsequent impressions than do the central qualities "warm" and "cold" (Asch, 1946), the ethical qualities examined here are not core attributes of food for most people and likely matter more to a subset of consumers with relevant personal values.

(3) *Values-based halos will emerge even when perceivers have ample information for forming a judgment.* Past research on person perception halos finds that general impressions can color specific evaluations even when perceivers have access to ample independent information that directly bears on the judgment (Nisbett & Wilson, 1977). Similarly, might values-based health halos emerge even when perceivers are provided with objective nutritional information, such as the Nutrition Facts panel, which speaks directly to the focal judgment? Whereas dual-process models predict that objective information should attenuate these effects especially among those motivated to engage in deliberative processing, halo theory predicts that the same perceivers may overlook this objective information because the high personal relevance of the focal ethical quality leads them to engage in affect-based heuristic processing.

(4) *Specific healthy inferences arising from values-based claims will mediate downstream choice outcomes.* In line with a situated cognition perspective on decision making (Smith & Semin, 2004; Schwarz, 2007), I predict that downstream decisions and choices will be influenced by the specific "healthy" or "unhealthy" inferences that are brought to mind in the immediate context (see 2 above). Given that decisions about how much to eat and whether or not to exercise are complex, with multiple inputs and competing considerations, the information that becomes activated in the immediate context—by the interaction between values-based claims and personal values—may disproportionately influence subsequent choice outcomes relevant to weight gain and obesity, presumably because it is deemed relevant because it came to mind (Higgins, 1998). Of course, perceivers likely overlook the extent to which small situational manipulations (here, changing just a few words relevant to values) can dramatically shift their judgments and choices. Instead, they likely believe that their judgments and decisions are driven by objective nutritional profile of the food itself (see 3 above).

Figure 1. The person values model depicting the hypothesized effect of values/ethics information on healthy/unhealthy inferences.

Chapter II

Health halos from eco-labeling: An "organic" claim reduces calorie judgments

Study 1

Method

As an initial test of the hypothesized effect of values-based claims on unwarranted health-related inferences, twenty-four students from the University of Michigan Introductory Psychology subject pool participated in a 30-minute laboratory session for which they received partial course credit. After providing consent, they first completed a series of paper-and-pencil tasks unrelated to the present hypothesis. Near the end of the 30-minute session, they were randomly assigned to view one of two versions of a fictional food product description. In one condition, the product ("Aunt Martha's Chocolate Chip Cookie") was described as "organic" each time the product name appeared (i.e., 5 times) ($n = 13$); in the other condition, the description featured no such claim but was otherwise identical ($n = 11$) (see Appendix A for the complete text).

Participants were instructed to read the description carefully before completing the following measures intended to capture their judgment of calorie content (in order): 1) *How many calories would you guess are in a typical Aunt Martha's [Organic] Chocolate Chip Cookie?* (open-ended); 2) *How do you think the calories in this Aunt Martha's [Organic] Chocolate Chip Cookie compare to those of other brands of*

chocolate chip cookies (assuming the same serving size)? (*1 = Many fewer calories*; *11 = Many more calories*). The task typically took approximately two minutes to complete.

Results and discussion

The open-ended and rating scale measures were z-scored and averaged to yield a standardized composite measure of relative calorie content. Consistent with expectations, the organic cookie was judged as significantly lower-calorie ($M_{\text{z-score}}$ = -0.32) than was the conventional cookie ($M_{\text{z-score}}$ = 0.38), t (22) = 2.26, p = .03. The unstandardized data revealed that the cookie was estimated to contain 20% fewer calories when it was described as "organic" than when it was not (M_{organic} = 195.38, SD = 87.33 vs. $M_{\text{conventional}}$ = 252.27, SD = 158.29)—a difference that was not statistically reliable on its own (t (22) = 1.11, p = .27)—and that, relative to other brands, the cookie was rated as significantly lower-calorie when it was described as "organic" (M_{organic} = 6.31, SD = 1.25 vs. $M_{\text{conventional}}$ = 7.55, SD = 1.13), t (22) = 2.53, p = .02.

That the rating scale showed a significant effect while the open-ended estimates did not may seem somewhat surprising. However, it is well demonstrated that consumers typically lack an accurate awareness of absolute calorie content (Livingstone & Black, 2003; Berman & Lavizzo-Mourey, 2008), and the greater variance associated with open-ended estimates may make it difficult to detect effects. For these reasons, the following studies feature rating scales for assessing calorie judgments.

Appendix A

"Organic" cookie description

Instructions: Below is a picture and description of a food product. We are interested in your judgments about nutritional aspects of this food. Please read over the description provided and answer the questions appearing below.

Name: Aunt Martha's [Organic] Chocolate Chip Cookie

Origin: Bennington, Vermont

Description: Among the most popular of all cookies, the chocolate chip cookie is an American classic. Aunt Martha's [Organic] Chocolate Chip Cookie, made by a small company noted for using the finest and freshest ingredients, has won a handful of regional competitions. Aunt Martha's uses chunks of chocolate (in addition to chips), and are famous for their crisp outer layer and a soft middle, giving them a truly homemade taste. The average Aunt Martha's [Organic] Chocolate Chip Cookie is approximately 4 to 4.5 inches in diameter, which represents a typical "serving size."

How many calories would you guess are in a typical Aunt Martha's [Organic] Chocolate Chip Cookie?

_____ calories

How do you think the calories in this Aunt Martha's [Organic] Chocolate Chip Cookie compare to those of other brands of chocolate chip cookies (assuming the same serving size)? Please rate on the following scale, where 1 = many fewer calories than other brands, and 11 = many more calories than other brands (circle one)

1--------2--------3--------4--------5--------6--------7-------8--------9-------10--------11
Many fewer calories   Many more calories

Chapter III

The moderating effect of personal values: Larger "organic" health halos among the highly pro-environmental

Results from Study 1 are consistent with the hypothesis that a values-based claim can activate health halos capable of reducing calorie judgments. However, Study 1 is limited in a number of ways. First, the lack of personal background variables made it impossible to test a key feature of the proposed model, namely, whether the magnitude of the effect varied across perceivers. Second, the featured product was fictional, and although participants were not explicitly told so, this raises the possibility that "organic" may bias calorie judgments when products are unfamiliar because consumers lack other information on which to base their judgment. If so, the generalizability of this effect would be quite limited.

Study 2 was designed to address these limitations. First, various personal background variables were collected, including a common scale measure of pro-environmentalism, the hypothesized moderator. Again, larger organic halos were expected among those scoring highly on this measure because their congruent personal values were expected to activate positive halos manifesting in the form of reduced calorie judgments (as depicted in Figure 1). Additionally, Study 2 featured organic and conventional versions of a real-world cookie brand, namely, conventional Oreos and Oreos "made with organic flour and sugar." These products were marketed at the time of data collection and featured identical calorie content. Study 2 also tested for an effect on

downstream choice outcomes, namely, on judgments of how often the food should be eaten (i.e., a consumption recommendations). Finally, it examined whether calorie judgments mediated any effect of organic claim on consumption recommendations, in line with the present model's situated cognition perspective on judgment and decision making.

<center>Study 2</center>

Method

One hundred and fourteen students (80 females, 34 males) from the University of Michigan Introductory Psychology subject pool completed this laboratory experiment in exchange for partial course credit. As part of an approximately 30-minute session on "thinking about food," participants provided consent and then completed a questionnaire soliciting personal background information including age, sex, political ideology, and the importance of eating healthfully. Participants also reported their height and weight, which were used to calculate body mass index (BMI) according to the current government guidelines (CDCP, 2010),[2] found to moderate calorie judgments in previous research (Wansink & Chandon, 2006a, 2006b).

Participants were then randomly assigned by computer algorithm to a web page displaying the actual Nutrition Facts panel for either conventional Oreos ($n = 42$) or for Oreos "made with organic flour and sugar" ($n = 72$) (Figure 2). Providing this objective nutritional information allowed for testing whether the hypothesized effects occurred despite participants having access to information that was directly relevant to their

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[2] BMI was calculated according to the formula currently used by the Centers for Disease Control and Prevention: weight (pounds) / height (inches)]^2 x 703.

judgments. The Nutrition Facts indicated the same number of calories (i.e., 160 per 34g

serving), and participants' attention was drawn to this fact using the following

instructions (underlines original):

> Below is a nutritional label from a package of <u>Oreo cookies</u> [<u>Oreo cookies made with organic flour and sugar</u>]. Notice that the serving size (34g) is equal to <u>2 cookies</u>, which together contain <u>160 calories</u>. Feel free to consult any of the nutritional information provided below before answering the questions.

Beneath these instructions appeared the respective Nutrition Facts followed by a question

capturing the calorie judgment (*Compared to other cookie brands, do you think that 1*

serving of these [organic] Oreo cookies contains fewer calories or more calories?; *1 =*

Fewer calories, *7 = More calories*) and a question capturing the consumption

recommendation (*Compared to other cookie brands, how often should these [organic]*

Oreo cookies be eaten?; *1 = Less often*, *7 = More often*).

Near the end of the session, all participants completed the 15-item New

Ecological Paradigm scale (NEP; Dunlap, Van Liere, Mertig, & Jones, 2000), a common

measure of pro-environmentalism, which allowed for testing whether this variable

interacted with organic claim as predicted. Sample items are "We are approaching the

limit of the number of people the earth can support" and "Humans are severely abusing

the environment."

Results

As predicted, participants' judgments of calorie content relative to other brands

were influenced by the organic claim. Even though all participants had just read that one

serving of their randomly assigned product contained 160 calories, the cookies received

lower calorie judgments in the organic condition ($M = 3.94$) than in the conventional

condition ($M = 5.17$); $F(1, 112) = 26.17$, $p < .001$, thus replicating the Study 1 finding

with a real-world product. Furthermore, the organic claim influenced participants'

consumption recommendations: the cookies were deemed appropriate to eat more often

when they were organic ($M = 3.68$) than when they were not ($M = 2.76$); $F(1, 112) =$

22.39, $p < .01$.

Because attributes besides inferred calorie content may account for the effect of

organic claim on consumption recommendations (e.g., lower levels of residual

pesticides), I examined whether calorie judgments mediated this effect by testing the

significance of pathway coefficients in the hypothesized mediation model (Baron &

Kenny, 1986) (Figure 3). After confirming that both consumption recommendations and

calorie judgments were significantly associated with the manipulation (see above),

consumption recommendations were regressed onto condition (organic vs. conventional)

and calorie judgments. Results revealed that calorie judgments significantly predicted

consumption recommendations ($b = -.54$, $|t|(111) = 5.35$, $p < .001$) whereas condition no

longer did so ($b = -.26$, $|t|(111) = .91$, $p = .36$), indicating that calorie judgments did

indeed mediate the effect of condition on consumption recommendations (Sobel's $z =$

-3.69, $p < .001$).[3]

Next, I examined whether these organic halos were more pronounced for highly

pro-environmental participants, as halo logic suggests. To test this, calorie judgments

were first regressed onto condition (organic $= -0.5$, conventional $= +0.5$), pro-

environmentalism (NEP score, mean-centered), and their interaction term. Results

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[3] These mediation results are interpreted with some caution, however, given that both calorie judgments and consumption recommendations may merely reflect the same underlying variable (e.g., the healthiness associated with organic foods).

revealed a significant interaction ($b = .06$, t (110) = 1.95, $p = .05$) such that the effect of organic claim on calorie judgments was larger at higher levels of pro-environmentalism (Figure 4).[4] Whereas the main effect of condition on calorie judgments again emerged ($b = -1.22$, $|t|$ (110) = 5.09, $p < .001$), there was no main effect of pro-environmentalism ($b = -.01$, $|t| < 1$, ns). A similar analysis was conducted for consumption recommendations. The interaction between pro-environmentalism and condition did not emerge for consumption recommendations ($b = -.04$, $|t| < 1$, ns). The main effect of condition on consumption recommendations again emerged ($b = -.89$, $|t|$ (110) = 3.09, $p < .01$), and there was no main effect of pro-environmentalism ($b = .02$, $t < 1$, ns). Finally, age, sex, BMI, importance of eating healthfully, and political ideology did not significantly moderate any of the effects ($ps > .20$).

Discussion

Together, Studies 1 and 2 extend the literature on health halos from relative nutrition claims (Andrews et al., 1998; Kozup, Creyer, & Burton, 2003; Wansink & Chandon, 2006a) by demonstrating that "organic," a production-related claim that is silent on nutrient content, can nevertheless elicit unwarranted nutritional inferences, here in form of reduced calorie estimates. When judging the calorie content of Oreo cookies relative to other brands, participants evaluating Oreo cookies "made with organic flour

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[4] Further diagnosis of this interaction with spotlight and simple slopes analysis following Aiken & West (1991) confirmed that the pattern is consistent with halo logic. The calorie judgments of participants at high levels of pro-environmentalism ($M+1SD$) showed a pronounced effect of organic claim ($M_{organic} = 3.69$ vs. $M_{conventional} = 5.37$; $b = 1.68$, t (110) = 4.90, $p < .001$), whereas a weaker but still significant effect emerged among participants at low levels of pro-environmentalism ($M-1SD$) ($M_{organic} = 4.23$ vs. $M_{conventional} = 5.04$; t (110) = 2.36, $p = .02$). Moreover, the association between calorie judgments and pro-environmentalism was nearly significant in the organic condition only ($b_{organic} = -.04$, $|t|$ (110) = 1.79, $p = .08$ vs. $b_{conventional} = .02$, $|t| < 1$, ns).

and sugar" provided lower calorie judgments than did participants evaluating conventional Oreos. This effect was observed even though participants' attention had just been drawn to the Nutrition Facts label that accurately conveyed that one serving of their randomly assigned cookie (organic or conventional) contained 160 calories. In addition, participants considered it appropriate to consume the cookies more frequently when they were "organic," an effect that was mediated by perceived calorie content. Finally, consistent with halo logic, the observed bias in calorie judgments was more pronounced among people scoring highly on an individual difference measure of pro-environmentalism, or those with claim-congruent values who likely feel positively toward the claim in the first place.

That the organic claim reduced calorie judgments in the face of objective calorie information suggests the use of the attribute "organic" as a heuristic cue (Batte, Hooker, Haab, & Beaverson, 2007) that guides calorie judgments. As mentioned above, calorie estimation is a cognitively demanding task and prone to numerous biases and situational influences (e.g., Livingstone & Black, 2003; see Wansink, 2004 for a discussion). If people are poor judges of calorie content, they may use organic claims as a basis for classifying foods as "good" or "natural," a heuristic that simplifies nutrition information and may reduce calorie judgments (for a discussion, see Rozin, Ashmore, & Markwith, 1996; Kahneman & Frederick, 2002). Interestingly, while most models of judgment predict that this "organic" = "healthy" heuristic would operate among those who are less equipped to provide an accurate judgment (e.g., those unfamiliar with "organic"), the fact that pro-environmentalists showed the largest organic halos suggests that those who were *better able* to accurately judge the stimuli through deliberative processing nevertheless

showed heuristic biases. This paradoxical effect may occur in domains in which positive affect and knowledge are highly correlated, presumably resulting from self-selection into valued domains and the resulting gains in objective knowledge from differential information exposure (e.g., Moorman, Diehl, Brinberg, & Kidwell, 2004). However, because it can be argued that the current study assessed self-identification (i.e., as pro-environmental) as opposed to domain knowledge (i.e., accurate understanding of the meaning of "organic"), further research should assess objective knowledge in order to establish whether affect-based heuristic processes trump knowledge-based deliberative processes in identity-relevant judgments. I return to this point in the general discussion.

Figure 2. Nutrition Facts panels for Oreo cookies "made with organic flour and sugar" and conventional Oreo cookies ("organic" label at left).

Nutrition Facts		
Serving Size 34g		
Servings per Container about 7		
Amount Per Serving		
Calories 160	Calories from Fat	60
		% Daily Value*
Total Fat 7g		**11 %**
Saturated Fat 2g		**10 %**
Trans Fat 0g		
Cholesterol 0mg		**0 %**
Sodium 190mg		**8 %**
Total Carbohydrate 24g		**8 %**
Dietary Fiber 1g		**4 %**
Sugars 13g		
Protein 2g		
Vitamin A 0 %	Calcium 0 %	
Vitamin C 0 %	Iron 10 %	

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholest	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carb		300g	375g
Fiber		25g	30g

Nutrition Facts		
Serving Size 34g		
Servings per Container about 15		
Amount Per Serving		
Calories 160	Calories from Fat	60
		% Daily Value*
Total Fat 7g		**11 %**
Saturated Fat 2g		**10 %**
Trans Fat 0g		
Cholesterol 0mg		**0 %**
Sodium 160mg		**7 %**
Total Carbohydrate 25g		**8 %**
Dietary Fiber 1g		**4 %**
Sugars 14g		
Protein 1g		
Vitamin A 0 %	Calcium 2 %	
Vitamin C 0 %	Iron 10 %	

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholest	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carb		300g	375g
Fiber		25g	30g

Figure 3. Mediating role of calorie judgments in the effect of values-based claim
("organic" vs. conventional) on consumption recommendations.

Calorie judgment

$b = 1.22^{**}$

$b = -.54^{**}$

Values-based claim

$b = -.92^{*}; b = -.26$

Consumption
recommendation

(–0.5 = "organic"; +0.5 = conventional)
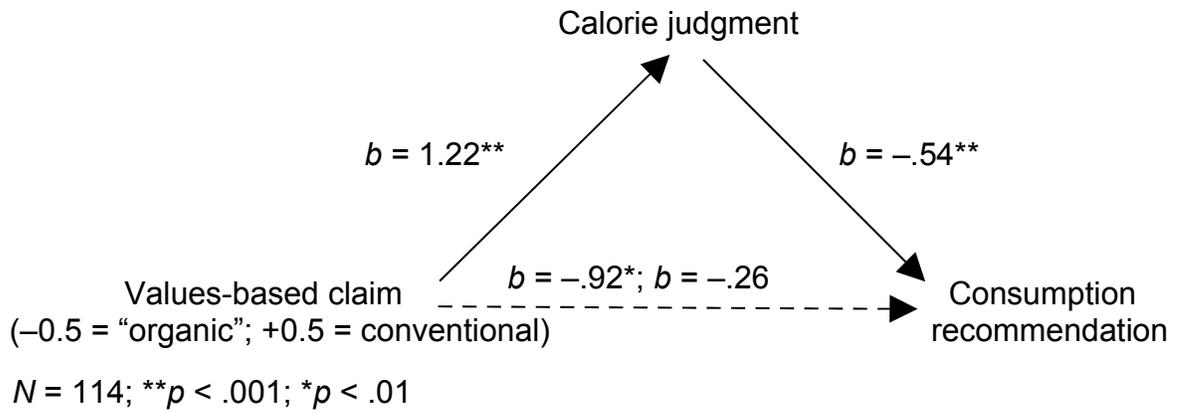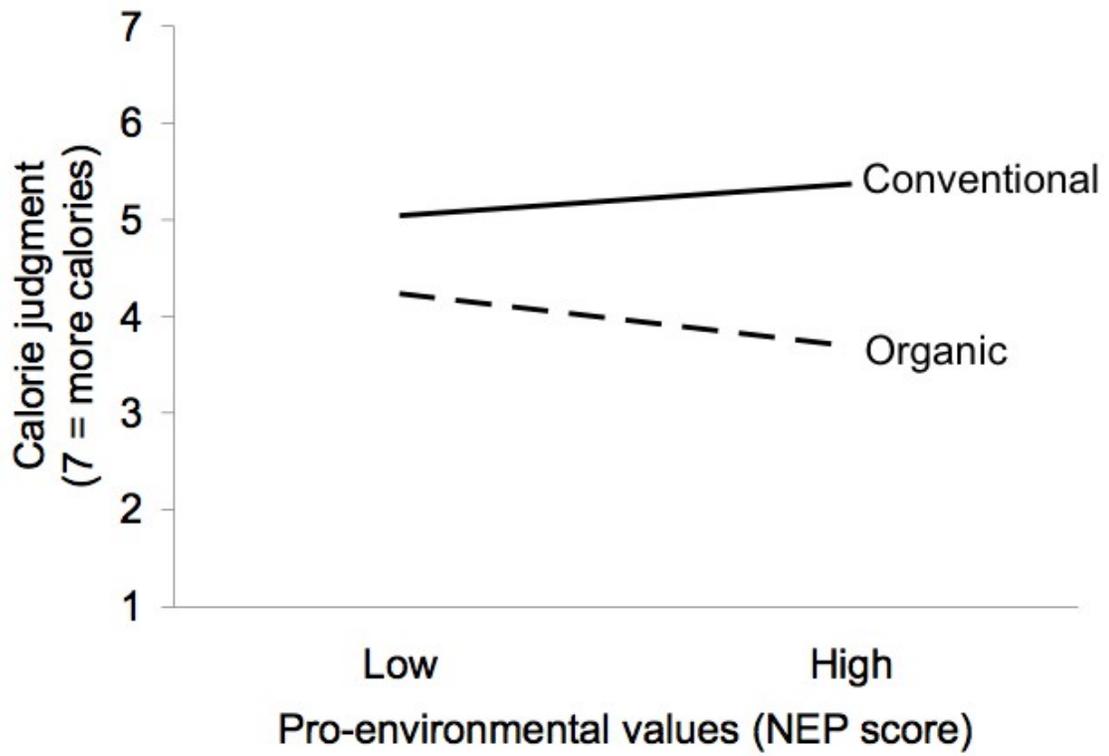
$N = 114; ^{**}p < .001; ^{*}p < .01$

Figure 4. Interaction between values-based claim ("organic" vs. conventional) and pro-environmentalism for calorie judgments (Low = M-1SD; High = M+1SD).

Chapter IV

Health halos from social-ethics labeling: "Fair-trade" chocolate is judged to contain fewer calories

The first two studies suggest that a common values-based claim conveying pro-environmental ethics (i.e., the eco-label "organic") carries a health halo capable of influencing calorie judgments and consumption recommendations. Study 3 sought to examine whether ethical claims from beyond the environmental domain can elicit similar effects.

Analogous to Study 1, which featured an "organic" claim on a fictional cookie product, Study 3 examined the effect of a "fair trade" claim on calorie judgments of a fictional brand of chocolate. From an associative network perspective (Collins & Loftus, 1975), "fair trade" might be considered even less likely than "organic" to influence nutrient-related judgments such as calorie estimates because it speaks primarily to social aspects of food production and distribution rather than to any inherent quality of the food itself. Nevertheless, consumers might infer that fair trade chocolate has fewer calories for the reasons outlined in the introduction. If so, it would provide additional evidence for values-based halo effects, given that large conceptual distance between the halo source (i.e., "fair trade") and specific evaluation dimensions (i.e., calorie content) bolsters the case for a true halo effect as opposed to an effect reflecting deliberate (though flawed) reasoning on the part of perceivers (Klein & Dawar, 2004).

Study 3

Method

Fifty-six online participants (37 females, 19 males) were recruited via Amazon.com's crowd-sourcing website, Mechanical Turk, to complete a brief (1- to 2-minute) questionnaire on "judgments about food" in exchange for a nominal fee ($0.05) (see Paolacci, Chandler, & Ipeirotis, 2010, for a validation of Mechanical Turk as a data source). Participants provided consent and were randomly assigned by computer algorithm to read a brief (one-paragraph) description of a fictional brand of chocolate ("Petersen's") that was either described as "fair-trade" ($n = 27$) or not ($n = 29$). In the fair trade condition, the claim appeared directly before the brand name each time it appeared (i.e., 3 times). Out of concern that some participants would be unfamiliar with the claim's meaning, the fair trade description further elaborated: "*Petersen's pays its cocoa farmers 50% more than the standard market price for cocoa, to ensure that the farmers receive a fair wage for their efforts.*" Otherwise, the two descriptions were identical (see Appendix B for the complete text).

Participants then judged the calorie content of their randomly assigned chocolate relative to other brands (underlining original): *Compared to other brands of chocolate, <u>how many calories</u> do you think that one serving of Petersen's [fair-trade] chocolate contains?* (*1 = Many fewer calories*; *7 = Many more calories*). Finally, participants reported on various personal background characteristics including age, gender, educational attainment, and political affiliation (Democrat, Republican, Independent, or Other/None of the above). Mean age was 38.2 years (*SD* = 14.2 years), and participants were diverse educationally (11% high school graduates, 27% with some college, 46%

college graduates, 16% post-graduate studies) as well as politically (34% Democrat, 20% Republican, 36% Independent, 11% Other).

Results and discussion

Consistent with expectations, the featured chocolate was judged as significantly lower-calorie when it was described as fair trade ($M = 4.30$, $SD = .78$) than when it was not ($M = 4.76$, $SD = .74$), $F (1, 56) = 5.22$, $p = .03$. No personal background variable significantly moderated the effect (ts < 1.81, ns)**.**

The present findings build on Studies 1 and 2 by demonstrating that in addition to the eco-label "organic," a claim primarily about social ethics can bias calorie judgments as well: web participants judged a fictional brand of chocolate as significantly lower-calorie when it was labeled "fair-trade" than when it was not. By featuring an older and more diverse participant pool (educationally and politically) compared to Studies 1 and 2, this study also suggests that values-based health halos are not restricted to young people at a predominately liberal university who might be more familiar with and thus feel more positively toward ethical food claims.

This halo interpretation is made with some caution, however, given that other processes might have contributed to the present effect. For instance, "fair-trade" may have decreased calorie judgments simply because the mere presence of an advertising claim might be construed as a persuasive appeal relevant to the focal judgment (Wänke & Reutner, 2010). This concern is attenuated, however, given that the term was explicitly defined in the fair trade condition, which should have made salient the claim's irrelevance to the focal judgment. Another possibility is that generic positive associations

of the word "fair" may have fostered the positive inferences observed here, bypassing ethics-based inferences entirely. Thus, more compelling evidence for an ethical halo effect would come from demonstrating that 1) social ethics halos are larger among perceivers who especially value food produced by socially ethical means and that 2) these halos occur in the absence of any advertising claim (including the absence of the word "fair") that could be construed as a persuasive appeal.

Study 4 sought to address these alternative explanations by testing whether learning that a food was produced in socially ethical (vs. unethical) ways can reduce calorie judgments and whether this effect is larger among perceivers who especially value socially ethical food production.[5]

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[5] Beyond the mere claim explanation, it remains possible that participants judged "organic" and "fair trade" products as lower-calorie because they are aware of the research hypothesis and cooperate accordingly. However, when asked to comment on the tasks, no participant accurately volunteered the hypothesis in any of the studies reported here.

Appendix B

"Fair trade" chocolate description

Instructions: Below you will see a picture and brief description of a food product. Simply read the information carefully and answer the question that follows.

Product name: Petersen's [fair-trade*] chocolate

Description: Petersen's [fair-trade] chocolate is a deliciously smooth chocolate from Petersen's: a small chocolate company known for high quality. The secret is in the making: this chocolate is created by hand in small batches, and each batch is thoroughly tested to ensure its quality.

[*Petersen's pays its cocoa farmers 50% more than the standard market price for cocoa, to ensure that the farmers receive a fair wage for their efforts.]

Now, please answer the following question (please do not consult any sources whatsoever; we are interested only in your best guess):

Compared to other brands of chocolate, <u>how many calories</u> do you think that one serving of Petersen's [fair-trade] chocolate contains (1 = Many fewer calories; 7 = Many more calories)?

1-------------2-------------3-------------4-------------5-------------6------------7
Many fewer calories   Many more calories

Chapter V

Beyond advertising claims: Health halos from socially ethical versus unethical food
production methods

As a conceptual replication of the "fair trade" halo found in Study 3, I sought to test whether simply learning that a food was produced by socially ethical versus unethical means could evoke health halos, and whether these halos depended on the personal values of perceivers. Moreover, moving beyond advertising claims allowed for testing whether negative production information (i.e., socially unethical production practices) can evoke "unhealthy" inferences: for example, do perceivers see unethically produced foods as higher-calorie?

Study 4

Method

One hundred and ninety-two students (125 females, 61 males, 6 did not report sex) from the University of Michigan Introductory Psychology subject pool completed this approximately 30-minute laboratory experiment on "thinking about food" in exchange for partial course credit.

Similar to the procedure from Study 3, participants provided consent and were randomly assigned by computer algorithm to read one of three brief descriptions of a fictional brand of chocolate called "Petersen's." In all conditions, participants read the same standard description of the product. The description was ostensibly taken from an

article appearing in a food magazine that was written by a journalist who was unaffiliated with the Petersen company. The purpose of including this information was to reduce the possibility that participants would construe the product description as an implicit persuasive appeal on the part of the company.

In addition to the standard product description, participants in the ethical condition read an additional paragraph detailing the company's socially ethical treatment of its cocoa suppliers in West Africa (e.g., "the company offers excellent wages and health care" and "donates far more to local charities than do other companies") (see Appendix C for the complete text) ($n = 64$). In the unethical condition, participants instead read an additional paragraph describing the company's socially unethical practices that differed only slightly from the wording of the ethical condition (e.g., "the company offers *poor* wages and *no* health care" and "donates far *less* to local charities than do other companies") (italics added here for emphasis) ($n = 64$). In the control condition, participants read only the standard description of the product ($n = 64$).[6]

Participants then completed the main dependent variables. In addition to providing a calorie judgment and consumption recommendation as did participants in Study 2, they estimated the likelihood that consuming this chocolate would contribute to chronic illness (disease-risk perception), a variable investigated in prior research on halo effects from food labeling (e.g., Garretson & Burton, 2000; Kozup et al., 2003), which allowed for testing whether ethics information can influence judgments about longer-term health outcomes: *Compared to other brands of chocolate, how likely do you think it is*

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[6] Two other conditions were originally included in this study: a "fair trade" condition and a "new and improved" condition, in which participants read the standard product description with the respective advertising claim appearing before the brand name each time it appeared. The latter claim was intended to control for the effect of a positively valenced but ethics-irrelevant claim. However, most participants (> 60%) later indicated being unfamiliar with the meaning of "fair trade," and so these conditions were dropped from the analyses.

that eating Petersen's chocolate regularly would put a person at risk for chronic

illnesses, such as heart disease and diabetes? (1 = Less likely; 7 = More likely).

Afterwards, participants completed the individual difference measures. To assess

ethical food values, participants completed the 11-item Ethical Food Choice

questionnaire (EFC; Lindeman & Vänäänen, 2000), which includes items that tap

equitable social relations and which was selected for its high face validity, an example

item being: *It is important that the food I eat on a typical day comes from a country in*

which human rights are not violated (1 = Not at all important; 4 = Very important).[7] As

in Study 2, participants also completed the New Ecological Paradigm (NEP) to measure

pro-environmentalism, which was not expected to significantly interact with condition

(i.e., ethical vs. unethical information) in the present study. In contrast, this measure was

included here in order to demonstrate that the emergence of ethical halos depends on a

close fit between personal values and the focal values/ethics quality (here, ethical food

concerns and socially ethical versus unethical production). Participants also completed an

adapted version of the General Nutrition Knowledge questionnaire (GNK) (Drichoutis,

Lazaridis, & Nayga, 2005) to control for basic nutrition knowledge (see Appendix D for

the complete text). Finally, participants provided personal background information,

including age, sex, as well as height and weight (to calculate BMI as in Study 2).

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[7] Although the Ethical Food Choice questionnaire offers high face validity, choosing one individual
difference measure over others can be problematic when predicting moderation effects. Out of this concern,
another measure was included, namely, the Social Dominance Orientation scale (SDO; Pratto, Sidanius,
Stallworth, & Malle, 1994) because it taps the opposite side of Schwartz's (1992) self-transcendence/self-
enhancement dimension (i.e., authority and wealth, as opposed to social justice and egalitarianism). While
not reported in detail here, EFC and SDO were negatively correlated ($r = -.26$, $p < .001$) and remained so
when controlling for political conservatism (significantly associated with SDO score only; $r = .36$, $p < .
001$). Although SDO did not moderate any condition effect, it was negatively and significantly associated
with calorie judgments in the unethical condition, consistent with halo logic ($t (185) = -1.99$, $p < .05$).

Results

Below, I report the results for each of the three dependent variables in turn (i.e.,

calorie judgments, consumption recommendations, disease-risk perceptions). As

expected, pro-environmentalism (i.e., NEP score) did not interact with condition for any

of these variables ($|t|$s < 1, *ns*) and is not discussed further.

Calorie judgments. As expected, participants in the ethical information condition

provided lower calorie judgments (*M* = 4.76, *SD* = 1.20) than did participants in the

unethical (*M* = 4.87, *SD* = 1.11) and control conditions (*M* = 4.92, *SD* = 1.14). However,

a one-way ANOVA testing for the effect of condition on calorie judgment—controlling

for covariates (i.e., nutrition knowledge, sex, and BMI)—was not significant (*F* < 1, *ns*),

nor was the pair-wise contrast comparing the unethical and ethical means (*t* < 1, *ns*).

Recall that the effect of ethical information on calorie judgments was expected to

vary as a function of perceivers' ethical food values as assessed by the EFC scale. To test

this, calorie judgments were regressed onto condition (dummy-coded), ethical food

values (EFC scores, mean-centered), their interaction terms, and covariates (i.e., nutrition

knowledge, sex, and BMI).[8] These analyses revealed significant interactions between

experimental condition and ethical food values,[9] such that the ethical chocolate was

judged as significantly lower-calorie (*M* = 4.53) than the unethical chocolate (*M* = 5.17)

among participants reporting high ethical food values (i.e., at *M*+1*SD*) ($|t|$(177) = 2.30, *p*

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[8] The three-level condition variable necessitated a series of multiple regressions. In the first regression, Ethical Food Choice scores were mean-centered prior to constructing the interaction terms, and dummy codes were entered for the ethical and control conditions (the unethical condition served as the reference group) which enabled testing the simple slope in the unethical condition. A similar regression was conducted treating the ethical condition as the reference group. Following Aiken & West (1991), spotlight analyses were then repeated at *M*+1*SD* and *M*-1*SD*, with ethical food values (i.e., EFC scores) centered accordingly.

[9] Ethical food values (i.e., EFC scores) significantly interacted with condition in two out of three interaction terms: unethical vs. ethical ($|t|$ (177) = 2.65, *p* < .01); unethical vs. control ($|t|$ (177) = 2.06, *p* = .04); ethical vs. control ($|t|$ < 1, *ns*).

= .04), as halo logic would predict (Figure 5). Calorie judgments in the control condition fell in-between ($M = 4.88$) and did not differ from either of the other conditions ($|t|$s < 1.30, *ns*). The condition means did not differ significantly among participants reporting low ethical food values (i.e., at M-1SD) ($M_{ethical} = 5.02$ $M_{unethical} = 4.59$, $M_{control} = 5.08$) ($|t|$s < 1.62, *ns*).

Simple slopes analysis examined whether these interactions were driven by ratings of ethical chocolate, unethical chocolate, or both. Calorie judgments showed a marginally significant and negative association with ethical food values in the ethical condition ($b = -.02$, $t (177) = -1.63$, $p = .10$) and a significant and positive association with ethical food values in the unethical condition ($b = .03$, $t (177) = 2.08$, $p = .04$). In other words, as ethical food values increased, the chocolate was judged as *lower-calorie* when it was produced *ethically* but as *higher-calorie* when it was produced *unethically*.

Consumption recommendations. Not surprisingly, an ANOVA model revealed that consumption recommendations were higher in the ethical ($M = 4.53$, $SD = 1.45$) than in the unethical condition ($M = 2.41$, $SD = 1.39$) (95% CI: 1.63 to 2.62, $p < .001$); the control condition fell in between ($M = 3.92$, $SD = 1.40$) and differed from both the ethical and unethical condition (95% CIs: -1.21 to .00, $p < .05$, and .91 to 2.12, $p < .001$, respectively) ($F (2, 180) = 36.95$, $p < .001$, controlling for covariates). Recall that this effect was expected to be larger among individuals with strong ethical food values, an interaction effect that was expected to be partially driven by calorie judgments. In other words, mediated moderation was expected (Muller, Judd, & Yzerbyt, 2005).

To test these predictions, consumption recommendations were first regressed onto condition (dummy-coded), ethical food values (EFC scores, mean-centered), and their

interaction terms. As expected, the interactions between the condition dummies and ethical food values were significant ($ts > 2.37$, $ps < .05$), such that among participants reporting high ethical food values (i.e., at $M+1SD$), the chocolate received significantly lower consumption recommendations in the unethical condition ($M = 1.82$) than in the ethical ($M = 4.53$) and control conditions ($M = 4.09$) ($ts > 6.37$, $ps < .001$); the latter two conditions did not differ ($|t|(177) = 1.28$, ns). These differences also emerged but were less pronounced among participants reporting low ethical food values (i.e., at $M-1SD$) ($M_{unethical} = 2.68$ versus $M_{ethical} = 4.18$ and $M_{control} = 3.85$) ($ts > 2.38$, $ps < .02$); the ethical versus control difference was marginally significant, $t(177) = 1.92$, $p = .06$. As it was for calorie judgments, consumption recommendations were significantly associated with ethical food values in the unethical condition only ($b = -.04$, $t(177) = -2.40$, $p = .02$).

Next, analyses tested whether calorie judgments mediated this interaction effect. Following the steps prescribed by Muller et al. (2005) for testing mediated moderation, the moderation effect was shown to be significant in both the consumption recommendation and calorie judgment regressions (described above). Next, a regression tested whether the moderation effect on consumption recommendations was attenuated when controlling for the hypothesized mediator (j.e., calorie judgment) and its moderation term (i.e., calorie judgment*ethical food values). Results revealed a significant effect of calorie judgment ($t(175) = -3.76$, $p < .001$) and a reduced moderation effect on consumption recommendations;[10] thus, it appears that the greater consumption recommendations provided by participants with strong ethical food values for the ethical chocolate were at least partly driven by calorie judgments, consistent with

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[10] Treating the unethical condition as the reference group, the ethical food values*ethical dummy interaction was reduced to non-significance, $t(175) = 1.73$, $p = .09$. The ethical food values*control dummy interaction was also attenuated but remained significant, $t(175) = 2.48$, $p = .01$.

the situated cognition framework advanced here.

Disease-risk perceptions. An ANOVA model testing for the effect of condition on disease-risk perception revealed that the ethical chocolate was judged as less likely to contribute to chronic disease ($M = 3.44$, $SD = 1.48$) than was the unethical chocolate ($M = 4.14$, $SD = 1.22$) (95% CI: -1.30 to -.11, $p = .01$) and marginally less likely than was the control chocolate ($M = 4.00$, $SD = 1.46$) (95% CI: -1.16 to .03, $p = .07$); the latter two conditions did not differ (95% CI: -.45 to .73, ns) (Bonferroni corrections for multiple comparisons) ($F (2, 180) = 3.36$, $p < .05$, controlling for covariates). However, when disease-risk estimates were regressed onto condition (dummy-coded), ethical food values (EFC scores, mean-centered), and their interaction terms (including covariates), only the effects of the condition dummies emerged ($ts > 1.96$, $ps \leq .05$)—none of the interaction terms was significant ($|t|s < 1.32$, ns).[11]

Discussion

The present results extend those from Studies 1 through 3 in various ways. First, they provide a conceptual replication of the moderation effect found in Study 2, in that ethical health halos again depended on perceivers' personal values. Second, they demonstrate that values-based halos can emerge in the absence of an explicit advertising claim such as "fair trade," which argues against implicit persuasive appeals (Wänke & Reutner, 2010) or positive associations of the word "fair" as alternative explanations for this effect. Third, these results demonstrate that *negative* information about a company's actions can lead perceivers to judge products as *less* healthy (i.e., higher-calorie), thus demonstrating negative health halos. That perceptions of the unethical chocolate

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[11] The ethical condition was treated as the reference group.

appeared to drive these effects is consistent with social cognition research showing more powerful effects of negative versus positive information on judgments (Kunda, 1999).

In contrast to the main effect of "organic" on calorie judgments in Study 2, the present results showed only the interaction effect between condition (i.e., ethical versus unethical production methods) and personal values (i.e., scores on the Ethical Food Choice questionnaire). Both results are consistent with the halo-based conceptual model. The person values model predicts larger halos among perceivers who feel strongly toward the focal values/ethics information and makes no main effect prediction per se. However, it is not surprising that organic claims in Study 2 showed a main effect in addition to the predicted interaction, given the popularity of that claim and its "healthy" associations for most Americans.

The effects on consumption recommendations were also consistent with the person values model. While the main effect of ethical versus unethical information on consumption recommendations is of little theoretical interest, the fact that individuals high on ethical food values gave especially low consumption recommendations for the unethical chocolate relative to the ethical chocolate is consistent with halo logic. Because socially unethical production is sharply incongruent with the values of these individuals, this information presumably evoked a strong negative impression that manifested as the unhealthy inferences seen here. While this interaction effect on consumption recommendation may be driven by any number of associations, the fact that it was attenuated when calorie judgments were controlled for provides further support for the person values model. More broadly, this pattern is consistent with situated cognition research emphasizing how information that is activated and applicable in the immediate
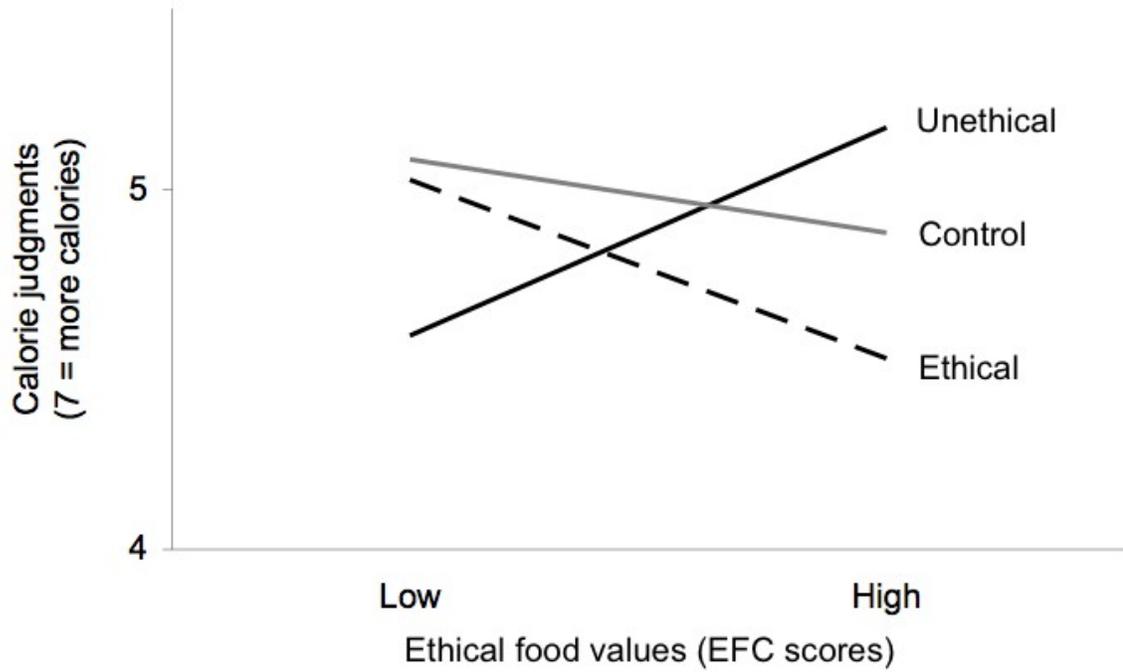
context can powerfully affect the judgments and decisions at hand (e.g., Srull & Wyer, 1979; Smith & Semin, 2004; Schwarz, 2007).

The present study also shows that chocolate is perceived as less disease-promoting when it is produced by socially ethical means. Interestingly, this effect was not moderated by personal values (toward ethical food values), in contrast to the other findings reported here. While speculative, this pattern may reflect a general belief that socially ethical companies are more trustworthy and thus less likely to allow illness-causing substances into their products. However, this explanation seems unlikely given that the disease-risk question specifically referred to common consumption-related illnesses (i.e., diabetes and heart-disease), not to diseases that are typically associated with harmful non-food substances (e.g., cancer), and that risk perception was lower in the ethical condition compared to *both* the unethical and control conditions, suggesting that participants saw the ethical chocolate as less risky and not the unethical chocolate as more so. Second, unlike calorie judgments and consumption recommendations, the risk of disease from regularly consuming indulgent foods like chocolate may be widely accepted and relatively fixed. Thus, it is possible that the halo shown for ethical chocolate instead reflects the activation of healthy concepts raised by the ethical chocolate description (which described the high quality health care provided to the company's workers), whereas chocolate may carry strong unhealthy/bad associations otherwise (Rozin et al., 1996).

Taken together, Studies 1 through 4 provide the first empirical evidence that ethics-related production qualities can bias health-related inferences, with Studies 1 and 2 demonstrating unwarranted inferences from "organic" labeling and Studies 3 and 4

demonstrating parallel effects for socially ethical production ("fair trade", favorable worker treatment). While these studies demonstrate effects on judgments of the food itself, whether values/ethics information can bias other health-related choice outcomes (e.g., exercise decisions, caloric intake) remains an open question. Study 5 was intended as a first step in this direction, by examining whether a values-based claim can influence perceivers' decisions about the importance of physical exercise, an important factor in obesity.

Figure 5. Interaction between social ethics information (ethical vs. unethical production) and ethical food values for calorie judgments (Low = *M*-1*SD*; High = *M*+1*SD*).

Appendix C

Socially ethical and unethical chocolate descriptions

<u>Instructions</u>: Below, you will see some information about a product and the company that produces it. Then, you will be asked some questions.

Note that the description is an excerpt from Food & Culture magazine. It was written by a journalist who is unaffiliated with the featured company.

Please read all of the information carefully before answering the questions that follow.

Product name: Petersen's chocolate

Description: Petersen's chocolate comes from a small company known for producing a high-quality, deliciously smooth chocolate bar. The secret is in the making: this chocolate is created by hand in small batches, and each batch is thoroughly tested to ensure superior quality. The Petersen Company has won numerous awards for the excellent taste of its chocolate.

[Ethical information condition; italics added here for emphasis]

> The Petersen Company is also known for its *ethical* business practices. For instance, the company offers *excellent wages and health care* to workers on its West Africa cocoa farms. Also, the company donates far *more* to local charities than do other companies, and as a direct result, schools in the surrounding villages offer the *highest* quality education in the area. Petersen has also strongly *supported* efforts to end forced child labor on cocoa farms, a shameful practice that treats young people much

like slaves. Strongly *praised* by human rights groups, Petersen has built a reputation as an *ethical* chocolate maker.

[Unethical information condition; italics added here for emphasis]

The Petersen Company is also known for its *unethical* business practices. For instance, the company offers *poor wages and no health care* to workers on its West Africa cocoa farms. Also, the company donates far *less* to local charities than do other companies, and as a direct result, schools in the surrounding villages offer the *lowest* quality education in the area. Petersen has also strongly *opposed* efforts to end forced child labor on cocoa farms, a shameful practice that treats young people much like slaves. Strongly *criticized* by human rights groups, Petersen has a built a reputation as an *unethical* chocolate maker.

Appendix D

Nutrition knowledge measure[12]

<u>Instructions</u>: Below are some questions related to nutrition. Please answer each to the best of your knowledge (for all comparisons, assume an equal serving size).

For each of the following pair of foods, please select the food that contains <u>more calories</u>.

1. peas or peanuts	__ peas	__ peanuts
2. coconut milk or chicken broth	__ coconut milk	__ chicken broth

For each of the following pairs of foods, please select the food that contains <u>more cholesterol</u>.

1. butter or margarine	__ butter	__ margarine
2. egg yolks or egg whites	__ egg yolks	__ egg whites

For each of the following pair of foods, please select the food that contains <u>more fat</u>.

1. sour cream or yogurt	__ sour cream	__ yogurt
2. roast chicken or boiled chicken	__ roast chicken	__ boiled chicken

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[12] This measure was adapted from the General Nutrition Knowledge questionnaire (GNK; Drichoutis et al., 2005) and taps the same content areas as the original measure (i.e., calories, cholesterol, and fat). The cholesterol and fat questions are from the original; the calorie questions were used in place of questions about recommended daily intake of fat and sodium but matched those questions in form. Scores are the total number of correct responses out of 6 (peanuts; coconut milk; butter; egg yolks; sour cream; roast chicken).

Chapter VI

Effects on downstream choice outcomes: Can "organic" claims undermine the perceived importance of exercise?

If organic foods are assumed to contain fewer calories (Studies 1 and 2), then eating organic foods might be seen as a suitable substitute for other weight-loss promoting behaviors, including exercise—an important factor in obesity. Research on goal cognition suggests that this is plausible. Perceived progress toward a weight-loss goal has been shown to reduce the likelihood of subsequent goal-consistent choice, such as choosing an apple over a chocolate bar (Fishbach & Dhar, 2005). To the extent that the act of eating organic foods is construed as progress toward a weight-loss goal, it might relax judgments about the importance of physical exercise, suggesting that values-based claims can undermine healthy choices.

Study 5

Method

As part of a 30-minute session on "thinking about food," two hundred and fifteen students (117 females, 98 males) from the University of Michigan Introductory Psychology subject pool participated in this laboratory experiment in exchange for partial course credit. Data from one participant were excluded due to a computer glitch, leaving N = 214 for analysis. Participants provided consent and then completed the same personal

background questionnaire from Study 2; afterwards, they were instructed to read about a person facing a choice and to indicate the decision they thought was best.

Participants read about a target person, Susie, described as a 20-year-old sorority member with a weight-loss goal. Participants read that Susie typically runs three miles after dinner but that today she was considering forgoing exercise to spend more time on schoolwork. Susie ate "roasted vegetables over brown rice" for dinner; the experimental manipulation was applied to her dessert choice, which was between "a small bowl of ice cream" and "a chocolate chip cookie," only one of which was described as "organic." Participants were randomly assigned by computer algorithm to one of five conditions: organic ice cream ($n = 41$), organic cookie ($n = 50$), conventional ice cream ($n = 41$), conventional cookie ($n = 47$), or a no-dessert control condition ($n = 35$).[13] Susie either chose the organic dessert, the non-organic dessert, or "no dessert at all" (neither dessert was described as "organic" in the control condition) (see Appendix E for the complete text).

Participants then answered the following question to capture leniency toward forgoing exercise: *Under the circumstances, do you think it would be okay for Susie to skip her usual 3-mile run tonight? (1 = Not at all okay; 7 = Very okay)*. Participants in the organic conditions were expected to judge exercise as less important (i.e., show greater leniency toward forgoing exercise) than were participants in the conventional conditions. Finally, participants completed the New Ecological Paradigm scale as in previous studies, which allowed for testing whether the predicted effect varied by pro-environmentalism.

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[13] Assigning more participants to the organic and conventional conditions than to the control condition afforded greater N for testing the primary hypothesis and helped ensure that any observed effect was not attributable to a particular food (i.e., cookie or ice cream).

Results

Because there were no hypotheses regarding specific dessert food (i.e., cookie vs. ice cream), this variable was collapsed after confirming that it did not interact with food claim (i.e., organic vs. conventional) ($F < 1$, *ns*).

Given the primary hypothesis that the target (Susie) would receive higher leniency ratings when she chose organic over conventional dessert, relative to the reverse, I tested the corresponding planned contrast in ANOVA (Rosenthal & Rosnow, 1985).[14] As predicted, participants were significantly more lenient toward Susie forgoing exercise when she had chosen an organic dessert ($M = 5.42$, $SD = 1.44$) rather than a conventional dessert ($M = 4.99$; $SD = 1.52$) ($F (1, 211) = 3.80$, $p = .05$) (Figure 6). Participants' leniency in the no-dessert control condition fell in-between ($M = 5.37$, $SD = 1.44$); although it was higher than when Susie chose a conventional dessert, this difference was not significant ($F (1, 211) = 1.69$, *ns*).

Given that pro-environmentalism moderated the effect of organic claim on calorie judgments in Study 2, I tested whether highly pro-environmental participants were especially lenient toward Susie forgoing exercise when she chose organic dessert. Pro-environmentalism (i.e., NEP score) did not moderate the present effect ($t < 1$, *ns*). However, closer examination revealed that pro-environmentalism was significantly associated with leniency in the organic condition only ($r = 0.22$, $p < .04$).[15] In other words, when the target person chose "organic" dessert, perceivers higher on pro-environmentalism tended to be more lenient toward her forgoing exercise, consistent with

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[14] Contrast weights: +1 (organic mean), −1 (conventional mean), 0 (no-dessert control mean).

[15] Simple slopes analysis corroborated this pattern. When leniency judgments were regressed onto condition (dummy-coded), NEP, and the interaction terms (treating the organic condition as the reference group), the association between leniency and NEP approached significance in the organic condition only, $b = .20$, $t (208) = 1.60$, $p = .11$.

halo logic. Finally, BMI, sex, importance of eating healthfully, and political ideology did not moderate the present effect ($ts < 1.6$, *ns*).
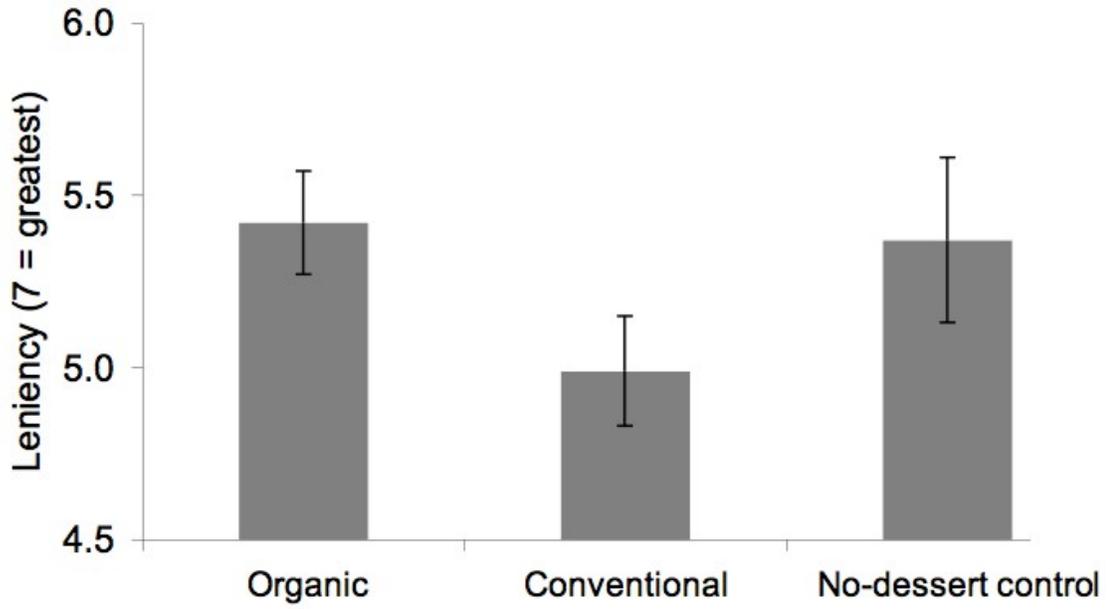
Discussion

These results demonstrate that the effect of values-based claims can extend beyond judgments of the food itself to influence downstream judgments about the need for physical exercise. Despite Susie's goal of losing weight through regular exercise, participants were more lenient toward her forgoing planned exercise when she had just chosen organic over conventional dessert. As millions of Americans attempt to lose weight, eating organic foods—even desserts—might problematically be viewed as a substitute for behaviors that actually promote weight loss, such as regular exercise.

Although leniency was higher in the no-dessert (control) condition than in the conventional dessert condition, it is somewhat surprising that the observed difference was not significant. This may be partly due to having fewer participants in the control condition, a result of intentionally assigning more participants to the organic and convention dessert conditions on which the primary hypothesis was focused. Even more surprising may be the similar leniency ratings observed in the organic and no-dessert conditions—in fact, leniency toward forgoing exercise was slightly greater when Susie chose organic dessert than when she chose to eat no dessert at all, suggesting that the organic halo may be strong enough to offset the indulgent associations characteristic of dessert in general.

Finally, it is somewhat surprising that pro-environmentalism did not significantly moderate the effect of organic claim on leniency toward forgoing exercise, although a

significant correlation between pro-environmentalism and leniency did emerge in the organic condition, consistent with halo logic. This weaker moderation effect may result from leniency judgments being mediated by processes unrelated to calorie inferences. For instance, Mazar and Zhong (2010) observed that green consumption has a moral licensing effect, allowing people to behave more unethically after consuming environmentally friendly products. If eating organic dessert is construed as an ethical act, observers may be more tolerant when the person subsequently "cheats" on a weight-loss goal by forgoing exercise, given the credentials already earned. Another possibility is that perceivers might have different naïve theories about the kinds of people who choose organic over conventional options. Perceivers might show more leniency toward targets who choose organic because they are seen as people who typically make healthy choices (e.g., likely to exercise in the near future). This possibility seems somewhat unlikely, however, given that the target was described identically and as trying to lose weight through diet and regular exercise in all conditions.

Figure 6. Mean leniency toward the target forgoing exercise by dessert condition (error bars represent standard errors of the means).

Appendix E

Exercise decision task

Name: Susie Thompson (college student, age 20)
Susie is member of Kappa Alpha Omega sorority at West Virginia University. She is currently trying to lose weight by eating healthy meals and getting regular exercise. For example, last night Susie had a spinach salad topped with chicken and walnuts for dinner, a small piece of cake for dessert. She then went on her usual 3-mile run.

Tonight, Susie has lots of homework to do and so she is a bit busier than normal. She has just finished dinner and dessert, and is trying to decide whether or not to skip her usual run in order to save time. For dinner, she had roasted vegetables over brown rice. For dessert, she was deciding between…

[conventional conditions]

> … a small bowl of organic ice cream and a chocolate chip cookie, and she chose to eat the chocolate chip cookie.
>
> ... an organic chocolate chip cookie and a small bowl of ice cream, and she chose to eat the ice cream.

[organic conditions]

> … a small bowl of ice cream and an organic chocolate chip cookie, and she chose to eat the organic chocolate chip cookie.
>
> … a chocolate chip cookie and a small bowl of organic ice cream, and she chose to eat the organic ice cream.

[no-dessert control condition]

> … a chocolate chip cookie and a small bowl of ice cream, and she chose to have no dessert at all.

Chapter VII

General Discussion

Taken together, the five experimental studies comprising this dissertation

contribute to the body of work demonstrating contextual influences on judgments and

decisions about food (see Wansink, 2004 for a review), much of which focuses on how

consumers process information presented on food packaging (e.g., Roe et al., 1999;

Garretson & Burton, 2000; Kozup et al., 2003). In particular, this dissertation extends the

literature on health halos from relative nutrition claims (e.g., "no cholesterol" and "low-

fat") by demonstrating that values-based claims such as "organic" and "fair trade"

(Barham, 2002) can bias a range of health-related inferences, despite being silent on

nutrient content. Study 1 showed that merely describing a fictional brand of cookie as

"organic" reduced calorie judgments relative to an otherwise-identical description. Study

2 replicated this effect using a real-world cookie brand (Oreo) and showed that this bias

was larger among the pro-environmental, or those with claim-congruent values who

likely feel positively toward the claim, a pattern that is consistent with the logic of halo

effects (Asch, 1946). Examining the domain of social ethics, Study 3 found that

describing chocolate as "fair-trade" reduced calorie judgments as well. Paralleling the

"organic" findings, Study 4 showed that social ethics halos were larger among

perceivers' with strong ethical food values and further demonstrated *negative* health

halos among perceivers with *incongruent* personal values (i.e., perceivers with strong

ethical food values judged unethically produced chocolate as higher-calorie). Extending

beyond judgments of the food itself, Study 5 found that values-based claims can affect

downstream choice outcomes, namely, the perceived importance of exercise: perceivers

were more lenient toward a target person forgoing exercise when she had just chosen

organic over conventional dessert, an effect that was again larger among the pro-

environmental. By demonstrating that the size and direction of these effects critically

depends on the personal values of perceivers, these studies provide initial support for the

proposed person values model, which highlights the importance of the interaction

between the focal quality and personal values in the emergence of halo effects.

Further supporting the model, these healthy and unhealthy inferences appeared to

mediate subsequent indulgent versus resistant choice outcomes. In Study 2, calorie

judgments mediated the effect of organic claim on consumption recommendations, and in

Study 4, the interaction effect of ethical production information and personal ethical food

values on consumption recommendations was attenuated when calorie judgments were

controlled for. Although there are rational reasons to endorse higher consumption for

organic and socially ethical foods, these data suggest that unwarranted healthy inferences,

here in the form of reduced calorie judgments, contributed to the effects.

True halo effects?

Although researchers have questioned whether prior halo findings represent

"true" halo effects as opposed to more deliberate reasoning on the part of perceivers

(Klein & Dawar, 2004), the present data appear to reflect genuine halo effects. First, halo

theory assumes that perceivers have a strongly valenced reaction to the focal quality that gives rise to specific evaluations of a similar valence. The fact that the present effects did not emerge uniformly but instead were dependent on perceivers' personal values, such that larger positive halos occurred among perceivers with congruent personal values who presumably feel positively toward the values/ethics information, is consistent with halo logic. Past work has typically focused on central qualities (e.g., physical beauty) that evoke positive inferences across perceivers (Dion et al., 1972). The values/ethics information studied here may be better conceived as peripheral qualities (Asch, 1946) that elicit varying reactions across perceivers—as such, values-based claims provide a useful domain for examining this often overlooked assumption of halo effects. Second, as others have noted, it is difficult to separate halo effects from nomological effects when the halo source and evaluation dimension are proximal (Klein & Dawar, 2004), as they are in prior work demonstrating that relative nutrition claims bias nutrient inferences (e.g., "low-fat" $\rightarrow$ "low-calorie"; Wansink & Chandon, 2006a); in other words, it may be rational to infer that cookies with less fat (a calorie-dense nutrient) contain fewer calories.[16] That "organic" and other *production* qualities biased inferences about *nutrient content* thus provides stronger support for a halo interpretation because it is much less rational to infer that a food contains fewer calories simply because it was organically produced. Finally, although this work was not designed to assess the extent of their influence over specific evaluations, that values-based claims influenced a wide range of health-related judgments (e.g., calorie judgments, appropriate consumption frequency, importance of exercise) is also indicative of halo effects (Kelley, 1950).

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[16] In reality, however, foods labeled "low-fat" are unlikely to contain fewer calories because snack food manufacturers typically replace calories from fat with calories from added sugars for taste enhancement (Wansink & Chandon, 2006a).

Implications for dual-process models of judgment

How do people reason about ethical foods? Throughout, I have argued that values-based halos reflect an "ethical" = "good"/"healthy" heuristic that underlies these unwarranted health-related inferences. The possibility of this heuristic is supported by survey data showing that most Americans see ethical foods as healthier (e.g., Harris Interactive, 2007) and that calorie estimation is notoriously difficult (e.g., Livingstone & Black, 2003; Berman & Lavizzo-Mourey, 2008), a situation that generally encourages the use of heuristics in judgment (Stanovich & West, 2000; Kahneman, 2003).

A large body of literature in psychology and economics has explored the conditions under which people are likely to rely on heuristics as opposed to more systematic and analytic information processing. In social psychology, research on the processing of persuasive messages (e.g., Chaiken, 1980; Cacioppo et al., 1986; see Chaiken & Trope, 1999 for a review) suggests that effects on attitudes and opinions depend on the personal relevance of messages. When messages are personally relevant, perceivers are typically influenced by central information (e.g., strong arguments) because high relevance leads to deeper and more analytic information processing. In contrast, when messages are less personally relevant, perceivers are typically more influenced by peripheral cues (e.g., likeability of the spokesperson) because low relevance evokes shallower processing and greater reliance on rules-of-thumb.

Many other models of judgment similarly posit the existence of two largely distinct systems of human reasoning: one that is relatively rapid, automatic, associative, and cognitively undemanding, and one that is relatively slow, controlled, analytic, and cognitively demanding (e.g., Evans, 1984; Epstein, Pacini, Denes-Raj, & Heier, 1996;

Sloman, 1996), termed System 1 and System 2, respectively (Stanovich & West, 2000). The present results, which show larger halos when values/ethics information is personally relevant, seemingly contradict what many dual-process theories would predict—that heuristic biases such as halo effects should be *less* pronounced among perceivers for whom they are personally relevant, because personal relevance typically invites System 2 processing rather than simple associative heuristics.

So why do heuristics seem to trump deliberative processing here? One possibility is that the domain of values-based claims differs in significant ways from those typically examined in research on dual-process models. When it comes to values-based claims, high personal relevance is likely to be correlated with both positive affect and greater knowledge in real life—in contrast with laboratory work that experimentally manipulates these variables in isolation to examine the effect of relevance on heuristic- versus deliberative processing (e.g., Chaiken, 1980). Values-based claims are also highly politicized, given that they are intended to promote progressive socioeconomic values in the marketplace (Raynolds, 2000). This politicization may increase pressure to justify one's support for these claims whenever possible, and judging "organic" foods as lower-calorie may be one way to do so. Finally, the relative calorie and consumption judgments featured here were highly ambiguous judgments. Unlike cases where judges neglect objective information such as base rates in favor of a heuristic (e.g,, how representative a target is of its class; Tversky & Kahneman, 1974), the absence of an objectively correct answer on the judgments featured here could lead perceivers with claim-relevant values to eventually abandon deeper processing, leaving favorable feelings to drive the judgment.

Related literatures

Beyond halo effects, this work is compatible with other literatures in psychology and consumer research. Research finds that corporate social responsibility similarly promotes positive inferences that may sometimes be unwarranted, such as lower attributions of blame during a subsequent product-harm crisis, that can mediate brand evaluations and purchase intentions; like the present findings, these positive inferences are generally more pronounced among consumers who value the specific domain of social responsibility (Sen & Bhattacharya, 2001; Klein & Dawar, 2004). Extending and paralleling this prior work, this dissertation suggests that corporate halos may extend beyond evaluations of the company or brand to affect judgments about the content and health consequences of its products, a point that is increasingly relevant in an age of high-profile product recalls due to public health concerns (e.g., Zhao, Lee, Ng, & Flynn, 2009; Cusumano, 2011).

More generally, these studies complement past work on the importance of identity processes in consumer preference and choice (Aaker, 1997; Belk, 1988; Kleine, Kleine, & Kernan, 1993). For instance, people prefer products that share the letters of their name (e.g., Brendl, Chattopadhyay, Pelham, & Carvallo, 2005) and that communicate in-group belonging (e.g., Berger & Health, 2007), findings that are consistent with the general tendency to prefer objects associated with the self and valued groups. According to the identity-based motivation model, these options are preferred because they feel identity-congruent, reflecting the "kind of person I am" (Oyserman, 2009); importantly, these preferences are thought to be highly context-dependent because identities themselves are dynamic and can shift in response to salient environmental cues (e.g., Shih, Pittinsky, &

Ambady, 1999; Oyserman, Sorensen, Reber, & Chen, 2009; Elmore & Oyserman, in press). Presumably, values/ethics information on food packaging functions as a context cue that triggers relevant identities, leading perceivers to judge products through a lens of identity-congruence or –incongruence, fostering favorable or unfavorable evaluations (manifesting here as healthy or unhealthy inferences, respectively).

Although the current studies operationalized personal values as chronic individual differences, temporarily accessible values may play a role in values-based halos as well. In line with an identity-based motivation perspective, personal values in the present model are conceived as a product of more stable identities and identities cued in the immediate situation (see Oyserman, 2009, for a discussion of context-sensitive identities and consumer values). Recent research demonstrates that values commonly assumed to be deeply held—such as religious values—can be activated in situ by subtle cues, both subliminal (e.g., religious words flashed on a computer screen; Pichon, Boccato, & Saroglou, 2007) and supraliminal (e.g., standing in a church; Rutchick, 2010), promoting judgments and behaviors that are consistent with these cued values (e.g., voting to ban same-sex marriage). In line with this situated cognition perspective, activating claim-relevant values in context—say, by having perceivers judge organic foods while standing in a pristine outdoor landscape or after watching a nature film—may foster positive or negative health halos as a function of their congruence or incongruence with the focal claim. Future work may fruitfully explore this possibility.

Identity-based motivation may also help explain why unwarranted positive inferences may occur in the face of superior domain knowledge as the present data suggest. According to the model, identity-based motivation involves a cognitive-

procedural readiness to engage in heuristic rather than systematic processing, consistent with the present findings. Although the current work focuses mainly on health-related judgments rather than health-related choices (Oyserman et al., 2009; McFerran, Dahl, Fitzsimmons, & Morales, 2010), it suggests that in some situations identity-based inferences may mediate healthy and unhealthy choices.

Beyond preference for identity-congruent products, these findings fit with the large social psychological literature on self-enhancement biases. Much research, particularly in the United States and other Western cultures, makes the basic assumption that people are motivated to maintain a positive view of the self (Kunda, 1999). This drive to preserve and enhance self-esteem is thought to underlie numerous cognitive biases that have been demonstrated empirically. These include overly optimistic judgments about the self, such as overconfidence in our abilities (Dunning, Johnson, Ehrlinger, & Kruger, 2003) and unrealistic optimism about our future outcomes (Kruger & Burrus, 2004). These also include motivated perceptual biases during intergroup conflict that lead us to see the ingroup—a significant source of self-esteem (Tajfel & Turner, 1979)—in an especially positive light, as when we fail to notice violations committed by a favored sports team (Hastorf & Cantril, 1954). As extensions of the self (Belk, 1988), people may be similarly motivated to view identity-congruent products through rose-colored glasses that distort by magnifying virtues and overlooking flaws. This may be especially likely when the products convey values associated with favored political movements and ingroups.

Boundary conditions

While this work illuminates some of the conditions under which these halos emerge, it leaves a number of questions unanswered. Here I focus on two questions with interesting practical and theoretical implications. The first concerns food type: would values-based claims influence judgments of fresh produce (fruits and vegetables) as they do for hedonic snack foods? The second concerns whether values-based claims would always reduce calorie judgments: could "organic" foods ever be judged as *higher-calorie* among pro-environmental perceivers?

The present work featured poor nutrition foods primarily in keeping with past research into how consumers misinterpret food labels in unhealthy ways (e.g., Wansink & Chandon, 2006a), so although not tested here, it is unlikely that fresh produce would be judged as lower-calorie when described as "organic." Foods like apples and spinach are normally considered healthy and are likely to be seen as relatively low-calorie and appropriate for frequent consumption regardless of one's personal values, rendering any incremental halo evoked by values-based claims trivial. In contrast, hedonic foods like cookies and chocolate are normally considered unhealthy, providing room for pro-environmentalists to judge these organic snacks as healthier. Moreover, people may be motivated to seek an excuse for indulging in hedonic foods, further supporting unwarranted positive inferences. In addition, conversational implicature (Grice, 1975; Schwarz, 1996) is especially applicable to man-made (versus more natural) foods: whereas consumers may infer that producers who care about the environment or the welfare of their workers probably manufacture healthier products, this logic is less applicable to more natural products like fruits and vegetables, which are perceived as

being produced with less human involvement (Rozin et al., 1996). Even if values-based halos are restricted to less nutritious processed foods, this work has practical implications by identifying additional factors that may lead well-intentioned dieters to overeat.

More theoretically relevant, could values-based claims ever evoke "unhealthy" inferences (e.g., "organic" → "high-calorie")? Halo logic would suggest yes. Whereas Western culture views calorie restriction as a generally healthy and positive attribute of foods (perhaps especially of hedonic foods) (Crawford & Krebs, 2008), this is unlikely to be the case across cultures and throughout history where dieting is not normative (Stearns, 2002). That is, "low-calorie" is not an inherently healthy or positive quality of food because the meaning of healthy is highly situated and context-dependent. Thus, in contexts where "high-calorie" is seen as healthy or positive—say in developing nations suffering from widespread malnourishment or among products intended to promote weight gain (e.g., protein shakes)—halo logic would predict calorie inferences that are opposite of those reported here. Future work demonstrating these effects would provide further support for the person values model as highly situated.

Finally, if these effects reflect heuristic processes that are rooted in identity-relevance, what does this mean for "turning off" these effects? If perceivers with claim-congruent personal values are in fact more knowledgeable about the focal values/ethics information, then it should be possible to attenuate these biases by interrupting heuristic processing and encouraging more deliberative processing. Calling attention to heuristic sources has been shown to attenuate their influence on subsequent judgments (Schwarz & Clore, 1983; Wilson & Brekke, 1994); likewise, I expect that asking perceivers to consciously reflect on whether production-related qualities like "organic" bear on nutrient

content immediately before providing a calorie judgment would diminish their effect.

Limitations and future directions

In addition to leaving some questions unanswered, this work is limited in that it focuses on judgments and does not address actual consumption. However, the present findings suggest that corresponding consumption effects would follow, given that lowered calorie estimates and increased consumption often go hand-in-hand (e.g., Wansink & Chandon, 2006a; Chandon & Wansink, 2007). Nevertheless, in order to make a strong case for relevance to the obesity crisis, future work should test whether values-based claims lead people actually overindulge in poor nutrition foods.

Beyond health-related inferences, future studies could also explore the influence of values-based halos on basic perceptual processes, such as taste. Despite having sufficient and independent information for the judgment (Nisbett & Wilson, 1977), claim-congruent values might improve subjective taste experience whereas claim-incongruent values might worsen it, processes that may increase or decrease actual consumption independent of the health-related inferences examined here. This possibility is suggested by recent findings showing strong effects of food packaging on taste preferences—for instance, children prefer the taste of carrots placed in McDonalds packaging (Robinson, Borzekowski, Matheson, & Kraemer, 2007) and the taste of snacks from packages emblazoned with familiar cartoon characters (Roberto, Baik, Harris, & Brownell, 2010). Echoing the classic "new look" perspective in perception (e.g., Bruner, 1957), these and other recent findings beyond the food domain (e.g., Balcetis & Dunning, 2010; Caruso, Mead, & Balcetis, 2009) remind us that our values can powerfully shape

our most basic sensory experiences.

Finally, although these findings imply larger halos among individuals with greater domain knowledge (who should be protected from these biases), this needs to be established empirically. It is possible that high scores on measures of pro-environmental and ethical food values primarily reflect self-identification (and positive valuation) rather than greater domain knowledge. So for instance, future work should replicate the present findings and include measures of objective domain knowledge (e.g., an assessment of meaning of "organic"), to test whether perceivers who show larger organic halos (the pro-environmental) are in fact more knowledgeable about the meaning of the claim, knowledge that in principle should buffer these individuals from unwarranted inferences.

Implications for government oversight

This work may hold relevance to the ongoing debate over government regulation of food claims (Nestle, 2002; Brownell & Horgen, 2004). In particular, the recent rise of advertising claims on the front of food packaging has fueled concerns that consumers may perceive foods as healthier than they really are. These include traditional relative nutrition claims (e.g., "low cholesterol") as well as more recent "front of package" schemes, or labels developed by companies and independent organizations to highlight healthy aspects of the product (e.g., "Smart Choices" labels on cereal boxes) (Pomeranz, 2011). Although the Food and Drug Administration (FDA) has established both voluntary and mandatory guidelines for such claims and has a mandate to enforce their accuracy, research finds that health claims commonly occur on foods with little nutritional value (Harris, Schwartz, Brownell, et al., 2009).

Despite high demand for ethical foods, there is relatively little oversight of values-based claims, "organic" being the notable exception. The National Organic Program administered by the U.S. Department of Agriculture oversees the use of organic claims on food packaging, enforcing a three-tiered labeling system stipulating when foods can be described as "made with organic ingredients," "organic," and "100% organic" (USDA, 2010). Meanwhile, other values-based labels have proliferated in the marketplace (e.g., "fair trade certified," "bird friendly," "rainforest alliance certified"), which are typically administered by independent non-profit organizations that certify producers and enforce labeling standards (e.g., Fairtrade International). However, some common claims—such as "locally produced"—currently lack certification standards (although there have been calls to change this; e.g., Hand, 2011), making it easy for unscrupulous producers to benefit from "local" labeling when their products in fact travel long distances to market. To the extent that these claims similarly bias judgments in unhealthy ways, the government might seek to regulate their appearance on poor nutrition foods as they currently do for other types of claims (Pomeranz, 2011).[17] Future work may fruitfully establish whether and under what conditions these claims evoke unwarranted healthy inferences.

Finally, the extent of values-based claims' role in the obesity crisis may seem questionable given that obesity has been shown to be more prevalent among low-SES individuals (see Sobal & Strunkard, 1989 for a review) while organic and fair trade foods are accessible mainly to those with higher incomes due to cost constraints (e.g.,

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[17] The FDA currently disqualifies producers from making explicit health claims on packages such as "Eating a bowl of whole grain cereal daily can significantly cut your risk of cancer" if the food contains high levels of unhealthy nutrients (e.g., more than 13 grams of fat per serving) (see Pomeranz, 2011 for a discussion).

Thompson, 1998; Padel, 2005). However, more recent analyses suggest that obesity rates have increased among all income, age, and racial/ethnic groups (Baskin, Ard, Franklin, & Allison, 2005) and that the SES divide on obesity has fallen precipitously over the past couple of decades (Zhang & Wang, 2004). Americans from all backgrounds are struggling to cut calories in order to lose weight and improve their health. In everyday judgments and decisions, those who can afford them may treat organic foods and other ethically produced foods as health foods that are lower-calorie when in fact this is unlikely to be the case, ultimately increasing the struggle to eat less and eat healthier.

Chapter VIII

Conclusion

In sum, this dissertation provides evidence that values-based food claims such as "organic" can lead perceivers to unwarranted inferences about nutrient content and health consequences. In contrast to previous research examining health halos from relative nutrition claims such as "low-fat" (Wansink & Chandon, 2006a), the present work demonstrates that similar inferential biases can occur between more distal concepts that lack a logical relation: whereas "low-calorie" inferences can justifiably follow from "low-fat" claims, they do not follow from values-based claims such as "organic" and "fair trade," which signal progressive production-related qualities that are silent on calorie content (Barham, 2002). Moreover, findings across multiple experiments suggest that health halos from values-based claims critically depend on personal values: positive halos (e.g., "organic" → "lower-calorie") were larger among perceivers whose personal values matched the focal quality (e.g., the pro-environmental), who likely feel positively toward the claim in the first place and who may be motivated to see those foods as virtuous. Conversely, negative halos (e.g., unethically produced → "higher-calorie") were larger among perceivers whose personal values clashed with the target quality (e.g., those reporting high ethical food values). Thus, the focal values/ethical information did not cast a uniform effect on specific evaluations across perceivers but did so as a function of perceivers' attitudes toward that information, consistent with the logic of halo effects

(Asch, 1946). These specific inferences in turn appeared to mediate downstream choice outcomes such as consumption recommendations, consistent with the situated cognition perspective that concepts activated in context are brought to bear on related judgments and decisions at hand (Smith & Semin, 2004). Thus, in the case of positive health halos, these unwarranted inferences may nudge perceivers to indulge more than they otherwise would, possibly contributing to weight gain.

By demonstrating that values-based food claims can bias health-related judgments including calorie estimation, consumption recommendations, and exercise recommendations, this dissertation research carries important theoretical and applied implications. It suggests that the virtual absence of governmental oversight of values-based claims on food packaging (besides "organic") may deserve a second look, given that consumers may misinterpret these claims in unhealthy ways. It also challenges the prevailing view that personal relevance evokes more deliberative processing and less reliance upon the heuristics in judgment (Stanovich & West, 2000), a potentially promising area for future research.

Because it focuses primarily on judgment effects, this work invites a number of open questions that can be pursued as part of an ongoing research program. Do values-based claims affect actual consumption and for whom? Are parents willing to indulge their child's request for sweet snacks if they are "organic" or "fair trade"? Does the consumption of ethical foods license unhealthy behaviors in real-world contexts? Having explored some underlying cognitive processes, this research serves as a foundation for addressing these more applied behavioral questions, which are increasingly relevant in our world of bigger bodies and expanding selections of ethical foods.

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