

NUTRITIOUS OR DELICIOUS? THE EFFECT OF DESCRIPTIVE NORM INFORMATION ON FOOD CHOICE

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In two studies, we examined the effect of salient descriptive norm information on women's food choices. Undergraduate women in Study 1 were led to believe that earlier participants typically had chosen either a healthy or an unhealthy snack bar when participating in a study on taste sensations. When asked to make their own choice, participants tended to select a snack consistent with what they believed others had chosen. The findings were replicated in Study 2 when participants made multiple snack selections in a situation in which they believed that no one would know which snacks they chose. The results are consistent with the Focus Theory of Normative Conduct and suggest avenues for nutrition intervention programs.

Our daily decisions about eating—what, when, and how much to consume—are influenced by a complex set of factors, including biological, developmental, and personality sources. However, a number of investigations suggest that social factors also play an important role in how people eat. Most of this research has focused on the amount of food eaten. In particular, investigators find that individuals often rely on social norms when deciding how much to eat (Herman, Roth, & Polivy, 2003). People tend to eat more when those around them eat a lot of food, and they tend to eat less when other people eat less. Herman et al. argue that eating in the pres-

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ence of others often triggers a type of social comparison. We use the other person's level of consumption to determine how much we can eat without appearing to overeat. Women in particular often change their eating behavior after comparing themselves with other women (Bergstrom & Neighbors, 2006).

The effect of social norms also can be seen when researchers manipulate participants' perceptions of how much other people typically eat in a given situation. In one investigation, Roth, Herman, Polivy, and Pliner (2001) provided undergraduates with bogus norm data indicating that previous participants in a "tasting test" had eaten either a few or very many cookies during the test. When later given the opportunity to eat as many cookies as they wanted, participants relied on the norm information when deciding how many cookies to eat even when no one else was present. Participants ate more cookies when they thought the typical participant had eaten a lot of cookies, but they ate fewer cookies when led to believe that previous participants ate few cookies. Not surprisingly, researchers find this effect is limited to situations in which the norm information is clear and consistent (Leone, Pliner, & Herman, 2007).

Other investigations suggest that social norms may play a role in the development and maintenance of eating disorders and obesity. In one study, binge eating among sorority members was correlated with the amount of bingeing by close friends (Crandall, 1988). A 32-year longitudinal investigation found that a person's chances of becoming obese increased by 57 percent if he or she had a close friend who became obese (Christakis & Fowler, 2007). And undergraduate women in another investigation were more prone to eating disorder symptoms when they believed they were not as thin as the typical female student (Sanderson, Darley, & Messinger, 2002).

The present set of studies examined another aspect of eating behavior—food choices. Healthy eating habits are not only concerned with the amount people eat, but also with what people eat. Foods vary tremendously in terms of calories, fat, and nutrition. Although individuals often have different ideas about what it means to eat healthy, there is at least a general consensus that it is good to make healthy food choices and to eat well. Nonetheless, people often make poor choices when deciding what to eat. Poor nutrition is a widespread problem in the United States, and poor diets are associated with a wide variety of health problems (American Dietetic Association, 2008; Wright, Borrud, McDowell, Wang, Radimer, & Johnson, 2007).

Why do people sometimes select healthy foods yet other times make unhealthy food choices? Although a number of factors, including economics, play a role, one answer to this question can be derived from the Focus Theory of Normative Conduct (Cialdini, Reno, & Kallgren, 1990; Reno, Cialdini, & Kallgren, 1993). That theory identifies two types of social norms. *Injunctive norms* represent societal standards for how people should act in a given situation. Individuals are motivated to follow these norms out of a general sense that normative behaviors are rewarded and that counternormative behaviors are punished. *Descriptive norms* refer to the way people typically behave in a particular situation. People are motivated to act the way most people act out of a belief in collective wisdom. If everyone behaves a certain way, it must be an efficient or productive way to behave. In short, the injunctive norm is what people are supposed to do, and the descriptive norm is what they actually do.

In most cases, the injunctive and descriptive norms suggest the same behavior. When they do not, which—if either—norm we rely on depends on the norms' salience. According to the focus theory, neither an injunctive nor a descriptive norm is likely to affect behavior unless the individual's attention is drawn to the norm. Several studies demonstrate that when people are made aware of an injunctive norm, adherence to the norm increases (Aarts & Dijksterhuis, 2003; Cialdini, Demaine, Sagarin, Barrett, Rhoads, & Winter, 2006). When Petrified Forest visitors in one study encountered a sign indicating in strong terms that taking wood from the national park was wrong, the number of people taking wood declined (Cialdini et al., 2006). Similarly, when researchers make information about descriptive norms salient, they find changes in behavior in the direction of that norm (Schultz, Khazian, & Zaleski, 2008; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). Residents in one study who were informed that they used more energy than their neighbors lowered their rate of energy consumption over the next few months (Schultz et al., 2007). Evidence for the focus theory can also be found in correlational studies. Perceptions of descriptive norms, although often inaccurate, correlate with levels of excessive drinking (Neighbors, Oster-Aaland, Bergstrom, & Lewis, 2006) and gambling (Larimer & Neighbors, 2003). College students who believe a high percentage of students drink to excess are more likely to drink excessively themselves than students who do not share this perception. In our society, the injunctive norm for food choices is

fairly clear. People should eat healthy foods and limit the amount of unhealthy food in their diets. Thus, one strategy to improve food choices might be to draw attention to the injunctive norm to eat healthy foods. This is essentially what nutrition educators typically do when they explain the value of eating well. However, we were interested in a second strategy suggested by the focus theory; i.e., making descriptive norm information salient. The theory suggests that drawing an individual's attention to what others eat should affect his or her own food choices. If the descriptive norm information indicates that others typically make healthy choices, people should select healthier foods. However, if that information suggests that others are eating poorly, we should see an increase in unhealthy food choices. We tested these predictions in two laboratory studies.

We were particularly interested in food choices people make in the absence of self-presentation concerns. That is, researchers find eating behavior is often affected by concerns for what others will think (Herman et al., 2003; Mori, Chaiken, & Pliner, 1987; Pliner & Chaiken, 1990). In one study, the effect of descriptive norms on the amount of food eaten was completely eliminated when just one other person watched the participants eat (Roth et al., 2001). Participants in this study presumably limited how much they ate because they were concerned about the impression they were making on the observer. To eliminate these self-presentation concerns, we examined participants' food choices when no one was watching. In addition, given the composition of the student body from which we drew our participants, we limited our investigations to female participants. Using only women as participants is a common practice when researchers look at the amount of food participants consume, in part because women are more likely than men to exhibit problem eating behaviors and eating disorders (Bergstrom & Neighbors, 2006). However, there are reasons to be cautious when applying these research findings to men. For example, male and female adolescents often respond differently to social pressure to maintain appropriate body weight (Jones & Crawford, 2006; Kashubeck-West, Mintz, & Weigold, 2005), and the causes of and effective treatment for eating disorders may be different for men and women (Greenberg & Schoen, 2008). More closely related to the present set of studies, Vartanian, Herman, and Polivy (2007) found that American adults typically associate healthy eating with femininity and unhealthy eating with masculinity.

STUDY 1

We placed female undergraduates in a situation in which they were forced to choose between a healthy and an unhealthy snack. Some of the women were led to believe that earlier participants typically chose the healthy option, whereas others were led to believe the unhealthy snack was favored. We expected that women would rely on this descriptive norm information when making their own selections between the two types of snacks. Specifically, we predicted that women would select the healthy snack more often when led to believe the healthy choice was the norm than when they believed selecting the unhealthy snack was common.

METHOD

Participants

One hundred and twenty female undergraduates participated in the study in exchange for class credit. The students were enrolled in introductory psychology classes at a liberal arts university. Although specific demographic information was not collected, the vast majority of undergraduates at the university are between the ages of 18 and 22. The composition of the undergraduate student body is 38.5% White Caucasian, 18.1% Asian/Pacific Islander, 16.8% Hispanic/Latino, and 3.5% African American.

Procedure

Two female experimenters were used in each session. Experimenter 1 greeted the participant when she entered the lab room and directed her to sit at the table. Participants were randomly assigned to one of three conditions. In the healthy model condition, an empty wrapper from a Nutrigrain bar sat on the otherwise empty table in front of and just to the right of the participant. In the unhealthy model condition, the table contained only an empty Snickers candy bar wrapper in the same position. Participants in the control condition sat at an empty table. The experimenter explained that she had just finished her data collection sessions for the day, that the experimenter who would be conducting the participant's session was running a little late, and that she would set up the materials for the session while they waited. The experimenter then busied herself with materials at

another table. In the healthy model and the unhealthy model conditions, she looked up after a few seconds and acted as if she noticed for the first time the empty wrapper sitting on the participant's table. She commented that the last participant must have left the wrapper on the table and asked the participant if she would please put the wrapper in the trash can that sat on the floor a few inches from the right side of the participant's chair. The trash can was only 10 inches high and was positioned so that the participant would look down into it when she disposed of the empty wrapper. When participants in the healthy model condition dropped the wrapper into the trash can, they saw that the can already contained three Nutrigrain wrappers, presumably from earlier participants. Participants in the unhealthy model condition saw three candy bar wrappers (Snickers and Milky Way) in the trash can. We made the wrapper on the table and all three wrappers in the trash can the same to make the norm information unambiguous (Leone et al., 2007). There were no wrappers in the trash can in the control condition.

The experimenter filled two paper cups from thermos bottles, one with cold water and one with warm water. She placed the labeled cups in front of the participant. She also set four snack bars in a row on the table. The four snack bars were a Snickers candy bar, a Milky Way candy bar, and two flavors of Nutrigrain bars (from among Strawberry, Blueberry, or Cinnamon Apple). The Nutrigrain bars (130 calories, 3 grams fat) were approximately the same size as the candy bars (245-280 calories, 9.3-14 grams fat). The order in which the snack bars were placed on the table was randomly varied for each session. The experimenter then said that the other experimenter would arrive shortly and left the room. Approximately one minute later, Experimenter 2 entered. This experimenter stood where she could not see the contents of the trash can and was blind to condition.

The experimenter apologized for being late and acted pleased to find that the earlier experimenter had set up everything for her. She then explained that the study was about the effects of temperature on taste perception. She briefly presented some bogus information about why psychologists hypothesized that taste was related to temperature and explained that only women were included in the study because women had been found to have a greater sensitivity than men to the effects of temperature. In addition to bolstering the cover story, this last sentence reinforced the notion that the earlier wrappers had been left by female participants. The experimenter then explained that the participant would eat one snack bar dur-

ing the taste test, and she instructed the participant to select whichever of the four choices on the table she wanted. The experimenter stepped away from the table to get the materials for the taste test. She turned her back to the participant when the participant made her choice.

When she returned to the table, the experimenter removed the three un-chosen options. She handed the participant a questionnaire to use during the taste test. Briefly, participants were told to take alternating sips of warm and cold water before taking a bite from the snack bar. There were several questions to answer on each of the four questionnaire pages. Participants were told that they should take at least eight bites and that they should finish the entire snack bar by the time they got to the end of the questionnaire. The experimenter sat at a second table while the participant completed the bogus taste test. The experimenter turned away from the participant and did not look at the participant until the test was over.

RESULTS AND DISCUSSION

We examined the percentage of participants in each condition who selected a healthy snack bar. A comparison across the three conditions revealed an overall effect for condition, $\chi^2(2, N = 120) = 6.11$, $p = .04$, $\phi = .23$. As seen in Table 1, the data for the three conditions lined up as predicted. Subsequent cell comparisons found that participants in the healthy model condition selected the healthy snack bar significantly more often than participants in the unhealthy model condition, $\chi^2(1, N = 80) = 5.03$, $p = .02$, $\phi = .25$. Neither the healthy model condition, $\chi^2(1, N = 80) = .84$, $p = .36$, nor the unhealthy model condition, $\chi^2(1, N = 80) = 1.25$, $p = .26$, differed significantly from the control condition.

The results are consistent with our predictions and with the notion that descriptive norms affect women's food choices. Women who were led to believe that other female participants had selected a healthy snack bar for the taste test were more likely to also select a healthy snack than were women who thought earlier participants had selected an unhealthy snack. Because participants made their selection with no one looking and ate alone, the women appeared to have based their food choices on the descriptive norm informa-

TABLE 1. Percent Selecting the Healthy Snack Bar

| | Percent | Number |
|---------------------------|---------|---------|
| Unhealthy Model Condition | 40.0 | (16/40) |
| Control Condition | 55.0 | (22/40) |
| Healthy Model Condition | 67.5 | (27/40) |

tion rather than a concern for what others would think of them. This latter point is important when considering how the findings might be applied to the problem of poor food choices. Although self-presentation concerns may restrict what people eat in certain social settings, many eating decisions take place when others aren't around. Nutrition intervention programs obviously will be most effective when they change eating choices in both social and nonsocial situations.

However, it is possible that we did not entirely eliminate self-presentation concerns in our study. Although the experimenter turned away from the participants when they selected their snack bar, participants may still have been concerned about what the experimenter would think of their snack choice. Of course, because the experimenter was in the room when participants made their choices in all three conditions, her presence cannot account for the pattern of results. Nonetheless, it is not clear how concern about the experimenter may have affected the participants' choices. Thus, we conducted a second study in which the participant was the only person in the room when she made her food selection.

STUDY 2

Study 2 was designed to examine the effect of descriptive norm information on women's food choices in a situation in which the women believed no one would ever know about those choices. We also altered the dependent variable in the second study. We asked participants to make three separate eating choices so that we could examine a range of scores instead of the either/or choice used in the first study. We predicted that women would select the healthy snack more often when led to believe the healthy choice was the descriptive norm than when they believed the unhealthy choice was the norm.

METHOD

Participants

Seventy-five undergraduate women participated in the study in exchange for class credit. The students were recruited from the same pool of potential participants used in the first study.

Procedure

The procedures for the second study were identical to those used in Study 1 with four exceptions. First, one female experimenter conducted the session. Second, participants chose their snacks for the taste test from among a basket full of bite-sized snacks. The basket sat on the table throughout the study and was filled with several pieces of each of the following: Snickers candy bars, Three Musketeers candy bars, and two flavors of Zone Perfect nutrition bars (chocolate peanut butter, chocolate caramel cluster). The labels on the Zone Perfect bars identified the product as an "All Natural Nutrition Bar." The Zone Perfect bars (80 calories, 3 grams fat) and the candy bars (80 calories, 4 grams fat) were approximately the same size. In the unhealthy model condition, the participant found a Snickers wrapper on the table and three candy bar wrappers in the trash can. In the healthy model condition, the participant found a Zone Perfect wrapper on the table and three Zone Perfect wrappers in the trash can. Third, the experimenter explained that the taste test consisted of three parts. For each part, the participant was to select one of the snacks from the basket, drink a mouthful of cold water, eat half the snack bar while answering questions about the taste sensation, drink a mouthful of warm water, and then eat the second half of the snack bar while answering the remaining questions. The experimenter explained that the participant should eat three snack bars during the test, but that she could choose the same kind of snack bar or a different kind of snack bar for each of the three parts of the test. Fourth, the experimenter made sure participants understood the taste test instructions and then explained that she would be in the next room and that the participant should bring her questionnaire into that room when she completed the test. Thus, the experimenter was not present when the participant made her selections and presumably would not know which choices the participant made from the large number of snack bars in the basket.

TABLE 2. Mean Percentage of Healthy Snack Selections

| | Mean | Standard Deviation |
|---------------------------|-------|--------------------|
| Unhealthy Model Condition | 22.24 | 26.64 |
| Control Condition | 34.96 | 33.56 |
| Healthy Model Condition | 57.24 | 33.82 |

RESULTS AND DISCUSSION

We examined the number of wrappers left behind and the number of pieces remaining in the basket to determine how many healthy and unhealthy snack bars were selected by each participant. Although participants were instructed to select a different snack bar for each of the three sections of the taste test, several participants completed the test while eating fewer than three bars, and some participants ate more than three snack bars. Thus, we used the percentage of healthy snack choices as the dependent variable. For example, if a participant selected two candy bars and one Zone Perfect bar for the taste test, she received a score of 33.

The mean percentage scores for the three conditions are shown in Table 2. A one-way ANOVA found a significant effect across the three conditions, $F(2,72) = 7.90$, $p = .001$, $R^2 = .18$. A Tukey HSD test revealed that participants in the healthy model condition selected the Zone Perfect bar more often than participants in either the control condition ($p = .04$) or the unhealthy model condition ($p = .001$). The control and unhealthy model conditions did not differ significantly ($p = .33$).

The findings thus parallel those from Study 1. The women relied on what they perceived to be a descriptive norm when choosing between the healthy and unhealthy snacks. Unless they held the unlikely suspicion that the experimenter would go through the trash after they left, the women made their food choices under the impression that no one would ever know which snack bars they selected. Thus, the salient norm information altered the women's behavior in the absence of any concern for what others would think of them.

GENERAL DISCUSSION

In two studies, undergraduate women selected either healthy or unhealthy snacks in line with what they believed to be the typical choice of other female participants. Women in both studies relied on salient descriptive norm information when making their food choices. The women entered a situation in which the injunctive norm was apparent (one should eat healthy foods). However, the descriptive norm (what most women actually choose in this setting) was unknown. When the participants' attention was drawn to information indicating how other participants had acted, the women relied on this information to guide their own behavior.

The findings provide support for the Focus Theory of Normative Conduct, which maintains that people often rely on salient norm information when deciding how to act in a given situation. According to the theory, norms are unlikely to affect behavior unless individuals are made aware of the norm. In both studies, participants' attention was drawn to descriptive norm information indicating that other participants had typically chosen the healthy or the unhealthy snack. The women in our studies did not simply alter their eating behavior out of a concern for what others would think of them. Participants in the first study patterned their food choices after the perceived descriptive norm even with the experimenter in the room (although not watching the participants at the time). The same pattern was found in the second study, even though participants were led to believe that no one would ever know which snack bars they had chosen.

Our findings suggest that people sometimes rely on descriptive norm information when making food choices. However, one can also ask why people rely on social norms when making these choices. Researchers argue that we use descriptive norms because they represent the aggregated judgment of many people and thus likely indicate the most prudent course of action (Cialdini et al., 1990). In that regard, our findings may be related to recent research on expectancies and eating behavior (Annus, Smith, & Masters, 2008; Smith, Simmons, Flory, Annus, & Hill, 2007). That research suggests that eating disorders might reflect expectations that dieting and thinness will result in social rewards, such as being more attractive to members of the opposite sex. Like descriptive norms, these perceptions need not be accurate to have an impact on behavior.

Like much of the research on eating behavior, our study was limited to an examination of undergraduate women. Whether we would find similar results when examining the behavior of men or when examining women from different age groups remains an open question. Although women are more likely than men to suffer from eating disorders, problems associated with food choices, such as poor nutrition and obesity, affect both genders. In addition, questions remain as to how much individuals generalize norm information to other situations. Did our participants limit the use of the norm information to the experiment, or did they rely on this information when making food choices in other settings? Finally, we should note that other variables not examined in this research could play a role in food choices and should be considered in future studies. These variables might include body image, self-esteem, emotional state, history of eating disorders, and current tendencies toward eating disorders, among others.

Our findings also suggest a starting point for possible intervention strategies aimed at improving people's eating habits. In addition to informing individuals about what they should eat, health educators could draw attention to descriptive norm information indicating that healthy eating habits are more pervasive than most people realize. This type of strategy might be particularly effective when incorporated into programs aimed at changing eating habits in children (American Dietetic Association, 2008). For example, presenting descriptive norm information about eating behavior can be included in class lessons on health. In addition, educators can do what they can to create the impression that healthy food choices are the norm for students. This approach might include limiting the availability of unhealthy food options on campus, thus giving students the opportunity to see other students eating healthy, rather than unhealthy, foods. Students led to believe that eating fresh fruit and whole grains is more common than eating cheeseburgers and potato chips are likely to make healthier food selections. This strategy can also extend beyond the campus. A recent study found a significant increase in obesity rates among students who attended schools near fast food restaurants (Currie, DellaVigna, Moretti, & Pathania, 2009). Among the reasons for this association is the descriptive norm information suggested by the very visible presence of the restaurant.

Improved eating habits, especially among adolescents and young adults, have implications for psychological as well as physical health.

One common consequence of poor nutrition, obesity, is often seen as a stigma in younger populations and has been associated with emotional difficulties (Puhl & Latner, 2007). One longitudinal investigation found obesity among female adolescents predicted higher levels of depression when these individuals reached young adulthood, even after controlling for prior levels of depression (Merten, Wickrama, & Williams, 2008). Interestingly, the researchers failed to find a similar association for male participants.

On the other hand, research suggests that designing intervention programs based on descriptive norm information may be more complex than it first appears. First, people often have distorted perceptions of descriptive norms. College students frequently overestimate the extent to which other students engage in excessive drinking (Neighbors et al., 2006). College women typically underestimate the weight of the average female college student and overestimate the amount of time the typical female student exercises (Mutterperl & Sanderson, 2002; Sanderson et al., 2002). Thus, a first step in developing food-choice intervention strategies based on descriptive norms would be to assess what individuals currently believe those norms to be. Where those perceptions are found to be faulty, it may be effective to provide individuals with data indicating that fast food meals and eating sugary treats are not as common as portrayed in television commercials.

Second, researchers designing intervention strategies should be aware of the potential for boomerang effects (Schultz et al., 2007). Although some people make fewer nutritious food choices than the average individual, other people make food choices that are more nutritious than average. Providing a general population with descriptive norm data about food choices runs the risk of turning healthy eaters into less-healthy eaters. Imagine the reaction of a college freshman who always selects foods wisely when she learns that her classmates frequently eat pizza and chocolate chip cookies. Fortunately, research in other areas also suggests a solution to this problem. Residents who discovered they were using less energy than their neighbors did not abandon their conservation efforts when the descriptive norm data was accompanied by a message emphasizing the injunctive norm to save energy (Schultz et al., 2007). This last finding reminds us that descriptive norms represent but one weapon among many that can be used in efforts to improve poor eating habits.

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