I'll Have What She's Having: Effects of Social Influence and Body Type on the Food Choices of Others

BRENT MCFERRAN
DARREN W. DAHL
GAVAN J. FITZSIMONS
ANDREA C. MORALES*

This research examines how the body type of consumers affects the food consumption of other consumers around them. We find that consumers anchor on the quantities others around them select but that these portions are adjusted according to the body type of the other consumer. We find that people choose a larger portion following another consumer who first selects a large quantity but that this portion is significantly smaller if the other is obese than if she is thin. We also find that the adjustment is more pronounced for consumers who are low in appearance self-esteem and that it is attenuated under cognitive load.

Obesity and unhealthy food consumption are major public health issues, especially in industrialized countries. In searching to identify a cause for the epidemic, while some authors point to a more sedentary lifestyle (Blair and Brodney 1999) or genetics (Comuzzi and Allison 1998), most research is pointing to a marked increase in consumption (of food and drink) as the main driver of obesity (Chandon and Wansink 2007a; Hill and Peters 1998; Young and Nestle 2002). However, given that people eat many meals in a social or public setting, it is surprising that little research has examined how our food choices are shaped by those around us. This research examines how viewing other consumers' choices affects the size of the food portions we select.

While prior research has begun to show that people's food consumption choices are shaped by social and interpersonal influences (e.g., Herman, Roth, and Polivy 2003), what has been lacking in the literature to date is an examination of how the food choices consumers make are influenced by the body types of others present. As many of our neighbors, friends, and colleagues are likely to be obese, does eating with them result in you ordering less or more food? Does seeing an obese person order a steak for lunch influence you to order more or less food yourself? What if you see a thin girl order a large chocolate parfait? What if instead of a large portion she has a very small salad for lunch?

We approach these questions by first reviewing the literature on social influence. We propose that food choice, like many other behaviors in consumption domains, is strongly subject to interpersonal influences, with people choosing larger (or smaller) portions after viewing another consumer doing likewise. According to recent research on reference groups, to the extent that consumers do not wish to emulate members of a given group, their consumption

*Brent McFerran (brent.mcferran@sauder.ubc.ca) is assistant professor of marketing, Faculty of Management, University of British Columbia, 3333 University Way, Kelowna, BC, Canada V1V 1V7. Darren W. Dahl (darren.dahl@sauder.ubc.ca) is Fred H. Siller Professor in Applied Marketing Research, Sauder School of Business, University of British Columbia, 2053 Main Mall, Vancouver, BC, Canada V6T 1Z2. Gavan J. Fitzsimons (gavan@duke.edu) is F. M. Kirby Research Fellow and professor of marketing and psychology at Fuqua School of Business, Duke University, 1 Towerview Drive, Durham, NC, USA 27708. Andrea C. Morales (acmorales@asu.edu) is associate professor of marketing at W. P. Carey School of Business, Arizona State University, P.O. Box 874106, Tempe, AZ, USA 85287. This article is based on the first author's doctoral dissertation, supervised by the second author, with the third and fourth authors serving on the committee. Financial support from the Social Sciences and Humanities Research Council of Canada awarded to Darren Dahl is gratefully acknowledged. This research won the 2008 Society for Consumer Psychology and Association for Consumer Research–Sheth (Public Purpose) Dissertation Proposal competitions, and the financial support and helpful comments received from both organizations is appreciated. The authors are indebted to Yun Li for her research assistance, Sandra Blackie and Angus Strathie for costume design and construction, and Karl Aquino and Tim Silk for serving on the dissertation committee, as well as to Jennifer Argo, Jim Bettman, Jonah Berger, Pierre Chandon, Erin Chester-McFerran, Laurette Dubé, Dale Griffin, JoAndrea Hoegg, Naomi Mandel, Ravi Mehta, Ashesh Mukherjee, Stewart Shapiro, Juliet Zhu, and the Duke consumer behavior reading group for their comments and suggestions.

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choices reflect a heightened desire to adjust away from choices made by a member of that undesirable group. Using a model of anchoring and adjustment, we propose that consumers anchor on the consumption quantity decisions made by other consumers around them. However, we argue that the body type (thin vs. obese) of this other consumer interacts with his/her quantity choice in influencing the size of the portion we choose and consume ourselves.

Results from three experiments are consistent with this framework and provide new insights into the literatures on social influence and food choice. In study 1, we propose and test a model based on anchoring and adjustment. We show that consumers anchor on the quantity choices made by other consumers but also adjust their own choice and consumption based on whether the other person is a member of an (un)desirable reference group. We find that the extent to which consumers adjust their portion downward after seeing another consumer select a large portion is moderated by the body type of this other consumer. Study 2 considers the case in which the other consumer sets up a low, rather than high, consumption anchor, and it shows that an upward adjustment based on body type can also occur. Study 3 provides further evidence into the process underlying these effects, identifying two moderators, one social (appearance self-esteem) and the other cognitive (cognitive busyness) that affect our food selections. Together, the findings of the three studies present a comprehensive examination of consumer food choice that contributes to the literature by showing when (and how) people are likely to use the behavior of others in shaping their own consumption decisions.

CONCEPTUAL BACKGROUND

Anchoring and Adjustment Processes

Models based on anchoring and adjustment have been shown to be robust in many contexts, even when people are highly motivated for accuracy (Epley and Gilovich 2006; Jackowitz and Kahneman 1995; Plous 1993). Anchors serve as reference points that are difficult for even experts to ignore, and they represent a relatively simple way to model consumers' choices of how much to purchase or consume, decisions we know are based on myriad situational factors in a consumption environment. Wansink, Kent, and Hoch (1998) present a model of purchase quantity based on anchoring and adjustment. In their model, anchors set up by a retailer regarding multiple unit prices, purchase quantity limits, and suggestive selling can increase purchase quantities. For instance, the retailer sets up an anchor (e.g., "limit 12 per person") that consumers use as diagnostic in informing their own purchase quantity decision. Consumers adjust upward from a small default anchor if a price justifies stockpiling and downward if a large anchor was set up (e.g., "buy 18 for your freezer"). Consistent with previous research on anchoring and adjustment, consumers tend to make an insufficient adjustment from the anchor and end up purchasing quantities that reflect the efficacy of the anchor.

While the anchoring and adjustment model proposed by Wansink et al. (1998) focused on anchors that retailers could set up to influence purchase quantity decisions, we know that anchors can come from a variety of sources in a consumption environment. We propose that other consumers can also set up norms of purchase that serve as anchors that consumers use in deciding how much to consume. q1

Social Influences and Food Choice

Past research has shown that consumption decisions are influenced by those who are physically present. People are sensitive to the behavior of others in a retail context (Argo and Main 2008; Bearden and Etzel 1982), even if such a person is only physically present but does not engage the consumer in any way (Argo, Dahl, and Manchanda 2005). In the domain of food consumption, studies have found that social influence can have either a facilitating or attenuating effect on eating behavior, depending on the context (see Herman, Roth, and Polivy [2003] for an excellent review). Herman et al. (2003) argue that food choice is influenced by a desire to convey a certain impression or adhere to social norms (Leary and Kowalski 1990; Roth et al. 2001). They review experiments that show that, when a confederate sets up a norm, other participants tend to eat more (or less) as the confederate does. These norm effects are particularly poignant: those who are naturally inclined to eat large portions eat less in the presence of others, and those who would normally eat very little end up eating more. As the group size increases, no one wants to stand out, and people increasingly conform to the group average (Bell and Pliner 2003). This research demonstrates how an anchor set up by fellow consumers influences others' consumption quantity decisions. Since social norms are powerful, we expect to find that people anchor on the consumption quantities of others, eating more if the other consumer sets up a high anchor versus a low anchor.

However, while this line of research demonstrates an effect on eating behavior as a function of social influence, it is agnostic with respect to who the "other" consumers are that one might be ordering or eating alongside. According to this research, it should make no difference if the people one might be sharing a meal with are thin or obese so long as they choose the same amount. However, research suggests that we do not perceive obese people the same way as we do normal-weight individuals, and thus we may not react in the same manner to their food choices.

Obesity and Consumption

Some recent research has begun to examine the impact of obese others on consumption. For example, priming people with overweight images has been shown to lead to an increase in quantity consumed (Campbell and Mohr 2008). Using assimilation/contrast as a theoretical framework, these authors reported that consumers eat more when primed with overweight but not obese consumers. In an interesting study, Christakis and Fowler (2007) found that a person's chance of becoming obese significantly increased when a close other

(e.g., friend, sibling, spouse) became obese (see Cohen-Cole and Fletcher [2008] for a rebuttal), and other research on "imitative" obesity has begun to emerge using econometric techniques (Blanchflower, Oswald, and Van Landegham 2008; Burke and Heiland 2007). These studies ignore what choices the other person has made, focusing only on their body type, and conclude that eating with those who are overweight will lead to an increase in one's food consumption; thus, people emulate others they are close to. However, obesity is something most people wish to avoid, and research has shown that we avoid the behaviors associated with undesirable outgroups (including reducing junk food consumption; see Berger and Rand 2008).

While the research outlined above has focused either on consumers' reactions to how much others eat or how the body type of others affects consumption, little work has examined the influence of the two jointly. We examine these factors simultaneously and predict that observing another consumer choose a large (or small) portion will result in you doing likewise but that this effect is moderated by the body type (thin vs. heavy) of the other consumer.

Most cultures currently place a high value on thinness, and those who are overweight or obese are often victims of stereotyping or stigmatization (Shapiro, King, and Quinones 2007). However, unlike some stigmas, blame for being obese is attributed directly to the individual, the assumption being that he or she is in full control of his or her weight (e.g., Crandall 1994; Weiner, Perry, and Magnusson 1988). Even professional dietitians (incorrectly) expect that obese people underestimate portion sizes (Chandon and Wansink 2007b).

Consumer research has begun to show that the effects of social "others" are moderated by whether the person is a member of an aspirational or dissociative group (Berger and Heath 2007, 2008; Escalas and Bettman 2005; White and Dahl 2006, 2007). Aspirational groups are circles that one wishes to be a part of; dissociative groups have the opposite effect—people wish to avoid them. White and Dahl (2006) showed that men were less likely to order a steak when it was labeled "ladies cut" than when it was named the "chef's cut." Other research has shown that people are likely to seek out products that are ingroup favored but avoid products that are associated with outgroups (Berger and Heath 2007; 2008) or even behaviors linked to an "annoying" other (Cooper and Jones 1969). Our research extends past results examining dissociative group influence on consumer choice by focusing solely on how reference groups affect the quantity selections consumers make. Focusing on quantity is important because it allows us to test our anchoring and adjustment model. Given the link between both portion sizes and obesity, and its impact on public health, we believe this warrants a closer examination.

Since the obese represent a dissociative reference group and research shows that we avoid the choices of those we do not wish to emulate, we expect the adjustment to the anchor set up by another consumer to be moderated by the body type of this other individual. If the other consumer sets up a norm of a large quantity of food chosen, we predict that a consumer will adjust the choice quantity downward to a greater degree when the other person is obese, resulting in the consumer eating significantly less when the other person is obese versus thin. However, body types of others may activate stereotypes about what foods they are likely to consume; as the obese are seen to eat poorly and to overindulge (Bacon, Scheltema, and Robinson 2001), it may be the case that this effect only exists for food categories that are congruent with these stereotypes (i.e., unhealthy, fattening foods).

Perceived Healthiness of Food Choices

While there have been several studies examining eating behavior, such studies have tended to focus on unhealthy items, such as cookies (Roth et al. 2001), ice cream (Johnston 2002), and candy (Scott et al. 2008). Consumers associate losing weight with eating the "right" food rather than with having an appropriate portion size (Antonuk and Block 2006), but ample evidence suggests that it is the latter that matters at least as much as the former in achieving a healthy body weight (Wansink 2006).

There are also theoretical reasons to examine perceived healthiness of the food. For example, obese people are perceived as eating "inappropriate" foods, such as those high in fat and sugar (Weiner, Perry, and Magnusson 1988). People stereotype the obese as supersizing their burgers and fries, not their salads. The association with obesity is not as strong, therefore, with healthy foods. In related research, Johnston (2002) found that participants did not change their ice cream intake in response to observing the quantity chosen by a consumer with a large birthmark. Although the birthmark created a stigma and made the other consumer a member of a dissociative group, it was not linked with obesity and therefore had no effect on consumption. This suggests that consumers' food selections should be affected by what the other person chooses, showing that the pairing of the stimulus (unhealthy food) with the target (an obese person) is necessary to influence behavior. Specifically, when the food is unhealthy, a consumer would take more when the other person is thin than when she is obese; however, when the food chosen by the other person is healthy, the effect of body type on consumption would be attenuated.

However, the obese are a group of consumers that people generally do not wish to emulate. Research involving dissociative reference groups would predict that the domain of consumption should not have as large of an impact as the reference group itself. For example, Berger and Rand (2008) found that when video gamers (an outgroup) were linked to high junk food consumption, participants decreased their own junk food choices even though there is nothing about video games that necessarily causes one to become obese. Based on this logic, regardless of the type of food offered, when the other consumer sets up a high consumption quantity anchor, consumers will adjust their own consumption downward to a greater degree if the other consumer is obese than if she is thin. Study 1 was designed both to test the propositions of an anchoring and adjustment process based

on body type and to examine whether the model might be bounded within unhealthy food.

STUDY 1

Participants and Procedure

The hypotheses were tested using a 2 (confederate body type: thin vs. obese) × 2 (food: healthy vs. unhealthy) + 2 (Controls: no confederate, M&Ms vs. granola) between-subjects experimental design. Participants included 95 undergraduate females from a large North American university, who completed the study in exchange for $10 remuneration. Females are more sensitive to social comparisons regarding body type (Trampe, Stapel, and Siero 2007), and given that our confederate was female and following other research in this area (e.g., Smeesters and Mandel 2006), we restrict our inquiry to females in this study. Participants who either indicated that they did not notice what the confederate took ($n = 4$) or who both took and ate more than three standard deviations over the mean ($n = 2$) were deleted from the analyses. One person had food allergies and elected not to eat anything.

Participants were invited individually into the lab between the hours of 12:00 noon and 6:00 p.m. purportedly to participate in a study examining people's experiences viewing movies. In all of the conditions (except the controls), purportedly "in order to save time," participants were told they would be run in pairs (the other participant was always a trained confederate). "To make the experience more realistic" they were offered a snack to enjoy eating while viewing the film clip. The confederate took 5 heaping tablespoons of the snack food (approximately 71 grams of granola or 108 grams of M&Ms) in view of the participant, an amount that was pretested to be a large quantity for one to take. The participant was then invited to take the amount of snack food that she wanted before watching the film. Neither the confederate nor the research assistant watched what amount the participant selected. The participant and the confederate were then led into separate rooms where a TV was located. Participants were told to watch the film, a benign 5 minute clip from the film *I, Robot*, and then to fill out a questionnaire about their experience. They then completed the questionnaire, which contained a number of dummy questions about the film (including product placement), the room (including the suitability of the lighting and chairs), a restrained eating scale, their height and weight, manipulation checks, and a suspicion probe.

Manipulations. The same confederate was used in both the thin and overweight conditions, and she was of the same ethnicity as the vast majority of the participants. To manipulate confederate body type, a professionally constructed obesity prosthesis was worn by the confederate in the overweight condition (see fig. 1). This suit was custom designed for the confederate's body by an Academy Award–winning costume studio. The confederate's natural height was 5 feet, 2 inches (157.5 centimeters), and she weighed 105 pounds (47.6 kilograms); she had a body mass index level (BMI) of 19.2 (which is on the low end of normal but not underweight), and she wore a size 00. With the suit on, she appeared to have a weight of about 180 pounds (81.8 kilograms, a BMI of approximately 33), and she wore a size 16, making her appear obese. Identical clothes were tailored in both small (to fit her natural body type) and large (over the prosthesis) sizes, and different sets of clothes were chosen randomly for each session.

The food choice offered to participants was manipulated to be perceived as either healthy or unhealthy. In a manipulation borrowed from Wansink and Chandon (2006), granola and M&Ms were used as the healthy and unhealthy foods since they are similar in caloric density but differ strongly in healthiness perception. To ensure the internal validity of this manipulation in the study population, a pretest was conducted; it validated that granola was indeed perceived to be healthier, less hedonic, and less likely to contribute to obesity than were M&Ms.

Measures

Dependent Measures. The main variables of interest were the weight of the snack food that the participant took and ate as a function of the confederate's body type. To assess how much participants took and ate, the bowl containing either M&Ms or granola was weighed both before and after the session, accounting for how much was first taken by the confederate. Because the movie clip was short in duration, not all participants ate all of what they took. However, they were not permitted to leave the room with their bowls, and thus we were able to observe the uneaten quantity to calculate a measure of actual consumption by each participant. Our measures advance prior research, as we are able to decouple the choice and consumption decisions. In our paradigm, while the participant sees how much food the confederate takes, she does not observe the confederate's actual consumption (unlike Conger et al. 1980; Johnston 2002; Polivy et al. 1979). As well, in our research the choice decision of how much to put on the plate is a one-shot decision. Unlike past research, the participant is unable to "go for seconds" or to consume more food than she put on her plate at the initial decision phase. As such, this represents a more conservative test, as the participant cannot update her choice as a result of viewing another person continuing to consume.

Other Measures. Participants' propensity for dieting or restrained eating was measured with a 10-item scale from Herman and Polivy (1980). This included such items as, "How often are you dieting?" "Do you eat sensibly in front of others and splurge alone?" and "Do you have feelings of guilt after overeating?" The reliability of this scale was $\alpha = .83$. Many studies have shown that restrained eaters behave differently than those who are not (e.g., Antonuk and Block 2006; Scott et al. 2008), and thus we include this variable as a covariate in our analysis. This measure was

FIGURE 1

THE CONFEDERATE WITHOUT THE PROSTHESIS AND WITH THE PROSTHESIS

WITHOUT THE PROSTHESIS

WITH THE PROSTHESIS

NOTE.—Color version available as an online enhancement.

assessed at least 1 week in advance of the study, using an online survey.

At the end of the questionnaire a manipulation check assessed the body type of the confederate, measured on three 7-point scales (−3 to +3): "The other subject in this experiment is . . ." (very overweight/very underweight; very obese/very thin) and "Compared to me, the other student in this experiment is . . ." (much heavier/much thinner); reliability was $\alpha = .76$.

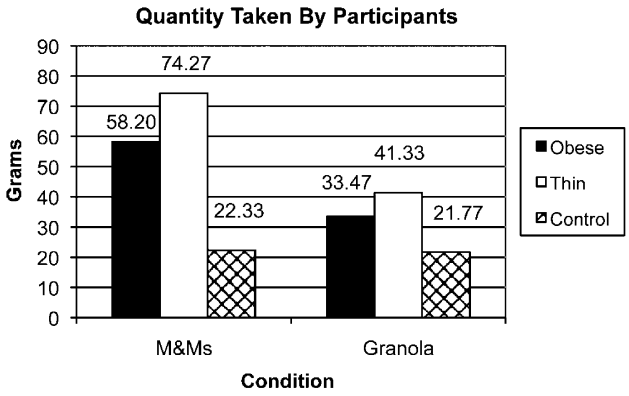
In this and subsequent studies the vast majority of our participants were of normal BMIs, and since controlling for BMI does not affect our results or moderate them, BMI as a participant variable is not discussed further. Results of the suspicion probe showed that no participants were suspicious that the confederate's obesity was not genuine, nor were any aware that she was not a fellow participant. In this study, we also record the time of day the session was run, and we control for it in the analysis.

Results

Manipulation Check. The manipulation check was successful. An analysis of covariance (ANCOVA) using the perceived weight index as the dependent variable, amount taken and confederate body type as independent variables, and participants' restrained eating orientation and time of day as covariates revealed only a significant main effect for participant size ($F(1,59) = 52.95, p < .001$). The mean pat- q4

FIGURE 2

WEIGHT OF FOOD TAKEN BY CONDITION (STUDY 1)



tern showed that participants perceived the confederate to be heavier when she was wearing the suit ($M = 0.46$) than when she was not ($M = 1.93$).

Dependent Measures. The quantities of food taken and eaten were standardized within food (granola or M&Ms) prior to analysis. To facilitate interpretation, however, unstandardized means are reported below.

An ANCOVA with quantity of food taken from the bowl as the dependent measure revealed only a main effect for confederate body type ($F(1,60) = 3.96$, $p = .05$). Participants took more food (measured in grams) when the confederate was thin ($M_{granola} = 41.33, M_{M\&Ms} = 74.27$) than when she was obese ($M_{granola} = 33.47$, $M_{M\&Ms} = 58.20$). The interaction between food type and confederate body size was nonsignificant ($F < 1$), indicating that regardless of whether the food was perceived to be healthy or unhealthy, participants showed restraint after observing an obese person taking a lot of food as compared to a thin person taking the same amount.

Compared to the control group, participants took more on average from the food bowl if there was a confederate present ($M_{granola} = 38.06, M_{M\&Ms} = 66.23$) than when there was not ($M_{granola} = 22.33$, $M_{M\&Ms} = 22.71$; $F(1,85) = 19.53$, $p < .001$). Control group participants took significantly less than those alongside an obese confederate ($F(1,85) = 9.21$, $p < .01$) and a much smaller quantity than if the confederate was thin ($F(1,72) = 20.09$, $p < .001$). Full results can be seen in figure 2.

An ANCOVA on participants' actual consumption also revealed the same pattern as their choice behavior ($F(1,60) = 5.67$, $p = .02$). Participants ate almost twice as much of both the granola and the M&Ms when the confederate was thin $M_{granola} = 21.47, M_{M\&Ms} = 33.00$) than when she was obese ($M_{granola} = 13.13, M_{M\&Ms} = 20.47$), regardless of whether the food was perceived to be healthy or unhealthy ($F < 1$).

Compared to the control group, participants ate more if there was a confederate ($M_{granola} = 18.00$, $M_{M\&Ms} = 26.73$) than when there was not ($M_{granola} = 12.44$, $M_{M\&Ms} = 11.86$; $F(1,85) = 4.40, p < .04$). Control group participants ate less than those alongside a thin confederate ($F(1,72) = 8.39$, $p < .01$) and directionally less than if the confederate was obese (see fig. 3).

Discussion

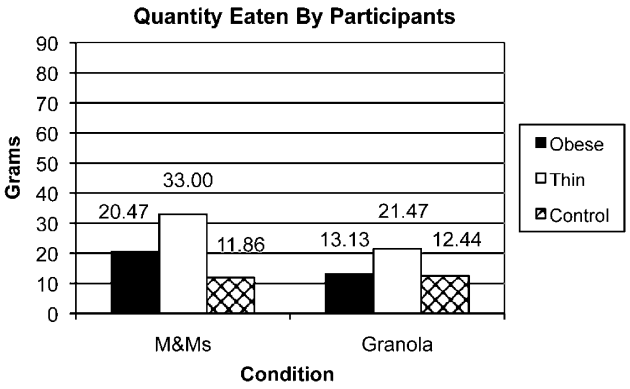
Study 1 provides evidence that people anchor on the food choices of others in their environment. Participants took significantly more when they first observed a large anchor set by another consumer versus when they made their choice in isolation. However, we showed that the extent of adjustment from the established anchor is moderated by the body type of the other consumer. Participants adjusted downward to a greater degree when the other consumer was obese than when she was thin. Interestingly, we observe nearly identical effects whether the food was perceived to be healthy or unhealthy. It seems that social influence effects involving obesity are generalized to both healthy and unhealthy foods. Our results suggest that it is portion size choice alone that drives the effect rather than pairing obesity with stereotype-consistent food choices.

We also find that food choice decisions carry over to actual eating behavior, even when participants were isolated watching a movie by themselves. Our results are inconsistent, therefore, with an impression management account. The participant was escorted into a separate room, where she watched the video unaccompanied by anyone. First, while it seems possible that participants may have chosen a portion to convey a desired impression to the confederate, it would not explain why she should also eat more while isolated. Second, social influence effects in eating behavior have been shown to persist even when the confederate is fictional or not physically present (Roth et al. 2001).

Our findings are also theoretically consistent with what has been shown recently by Berger and Rand (2008), who found that consumers ate less junk food after being told that an outgroup (vs. an ingroup) were the largest consumers of junk food on campus. However, while the link between outgroups and adjustment processes has been documented, the

FIGURE 3

WEIGHT OF FOOD CONSUMED BY CONDITION (STUDY 1)



Berger and Rand study leaves open the possibility that the effect they identify might be moderated not only by group status but also by the quantity the outgroup was purported to consume. In the Berger and Rand study, the outgroup was always linked to a high anchor of unhealthy consumption. In our second study, we set up a low anchor to examine the case where outgroups are linked to behaviors with a less severe health risk. For instance, while Berger and Rand (2008) found that people diverged away and drank less when told that graduate students (an outgroup) drank a lot, what if they had instead encoded that graduate students were light drinkers? Would people drink even less than they would if they were told that outgroup members were heavy drinkers, or would this backfire, resulting in people diverging by drinking more? According to reference group research, consumers should adjust to a greater degree away from the anchor point of dissociative groups than aspirational ones (Berger and Heath 2008; White and Dahl 2007). Based on this theorizing, we predict that consumers will adjust upward following a small anchor (Wansink et al. 1998) but that the size of this adjustment will be moderated by the group status of the other consumer. As a result, consumers will consume more after seeing an obese (vs. a thin) consumer choose a small portion. Study 2 will test this prediction and also allow us to examine whether consumers simply eat more food in the presence of others (de Castro 1994), irrespective of the anchor they set up, or they eat less when there are obese others in the environment.

STUDY 2

Method and Procedure

Study 2 employed a 2 (confederate body type: thin vs. heavy) × 2 (confederate quantity taken: little vs. lots) + 1 (no confederate control) between-subjects design. Participants included 115 undergraduate females from a large North American university, who completed the study in exchange for $10 remuneration. Two participants indicated that they did not notice what the confederate took, three ate greater than three standard deviations above the mean (all in different conditions), and two participants experienced a failed manipulation as a result of experimenter error, so data from these participants were excluded from the analyses.

The procedures of study 2 were similar to those of study 1, with the following exceptions. In study 2, the restrained eating scale was now administered at the end of the survey. Second, instead of one food choice, participants were offered their choice of snacks from seven bowls of differing small candies. Finally, rather than always indulging with a large quantity choice, we also manipulated the quantity that the confederate chose so that she took a small portion half of the time. This permitted a more direct test of our anchoring model. If participants choose a greater quantity when following another consumer who takes a large (vs. a small) portion, this would be evidence that consumers anchor on the food choices of others.

The confederate was handed a bowl first, and she chose her snacks in view of the participant. In the little food condition, the confederate randomly selected two small candies (such as Hershey's Kisses or small sour soothers) from the seven bowls. In the lots of food condition, she took approximately 30 small candies total from all seven bowls (range is 27–35; $M_{heavy} = 31.42$, SD = 1.71; $M_{thin} = 30.90$, SD = 2.10; $F < 1$).

Measures

Dependent Measures. The variables of interest were how many candies the participant took and ate as a function of the confederate's food choice and body type. To measure how many candies the participant took, the number of candies remaining after the session in each of the bowls was subtracted from the number the bowl started with and what the confederate took. Recall that, for the purposes of testing our hypotheses, we are interested in how the effect of the other consumer's choice is moderated by her body type. As such, our key contrasts examine whether there is a difference across body type within a given amount chosen by the other.

The reliability of the restrained eating scale in this sample was $\alpha = .77$, and that of the perceived body size of the confederate index (same items as study 1) was $\alpha = .84$. A second manipulation check assessing the quantity taken by the confederate was measured with the single 7-point item: "The other student took how much from the snack bar?" (no food at all/a lot of food)

Results

Manipulation Checks. The manipulation checks were successful. A 2-factor analysis of covariance (ANCOVA) using the perceived weight index as the dependent variable, amount taken and confederate body type as independent variables, and participants' restrained eating orientation and time of day as covariates revealed only a significant main effect for participant size ($F(1,81) = 115.36$, $p < .001$). The mean pattern showed that participants perceived the confederate to be heavier when she was wearing the suit ($M = 0.10$) than when she was not ($M = 1.93$).

An ANCOVA on the perceived amount taken by the confederate also revealed only a main effect ($F(1,84) = 221.71$, $p < .001$), such that participants believed the confederate took more candy when she took 30 candies ($M = 5.74$) than when she took only two ($M = 2.40$).

Dependent Measures. An ANCOVA with quantity of candies taken from the food bowls as the dependent measure revealed a main effect of quantity taken ($F(1, 84) = 71.90$, $p < .001$), such that participants took more when the confederate took 30 candies ($M = 12.62$) than when she took only two ($M = 4.72$). More importantly, the main effect was qualified by the predicted body type × quantity taken interaction ($F(1,84) = 8.87$, $p < .01$). Planned contrasts (within the high and low anchor conditions) indicated that, when the confederate took 30 candies, participants took fewer when she was obese ($M = 10.60$) than when she was thin ($M = 14.45$; $F(1,39) = 5.07$, $p = .03$). However,

when she took two candies, the opposite pattern emerged: participants took a greater quantity when the confederate was obese ($M = 5.43$) than when she was thin ($M = 4.04$; $F(1,44) = 4.22$, $p < .05$). The control group ($M = 8.50$) differed from the thin/little ($F(1,40) = 19.14$, $p < 001$), obese/little ($F(1,39) = 6.78$, $p < .01$), and thin/lots conditions ($F(1,38) = 10.40$, $p < .01$). See figure 4.

An ANCOVA on participants' actual consumption revealed an identical pattern as their choice behavior. The main effect for amount taken by the confederate was again significant ($F(1,84) = 22.18, p < .001$), such that participants ate more candies when the confederate took a lot ($M = 8.12$) than when she took only a few ($M = 3.72$). There was also a main effect on the restrained eating scale ($F(1,84) = 7.71$, $p < .01$). However, these lower order effects were again qualified by the predicted body type × quantity taken interaction ($F(1,84) = 7.90, p < .01$). Planned contrasts indicated that, when the confederate took a large quantity of candy, participants ate fewer when she was obese ($M = 6.25$) than when she was thin ($M = 9.82$; $F(1,39) = 5.11, p = .03$). In contrast, when she took very few candies, participants ate a greater quantity when the confederate was obese ($M = 4.26$) than when she was thin ($M = 3.20$; $F(1,44) = 2.76, p = .05$, one-tailed test). The control group ($M = 7.88$) differed significantly from the thin/little ($F(1,40) = 19.72, p < .001$) and obese/little conditions only ($F(1,39) = 9.94, p < .01$). See figure 5.

Discussion

The main effect of confederate's quantity on the amount participants took conceptually replicates past findings (see Herman et al. 2003) showing that the presence of others causes one to eat more (or less) depending on the pattern the others have set. We show that consumers anchor on the norms set by other consumers' consumption choices. These norms are powerful, occurring after observing only one other person making a food selection. People generally chose less than they would in isolation after seeing another consumer choose a small portion, but they chose a larger portion than they would have alone after seeing this individual take a large quantity. More importantly, the results support our hypothesized interaction. When the confederate was observed taking a large quantity of food (setting a high anchor), participants again chose and ate less when that confederate was heavy than when she was thin. However, when she was seen taking a small quantity (setting a low anchor), the opposite pattern was observed; participants chose and ate more when the confederate was heavy than when she was thin. Importantly, this work shows that divergence away from the behaviors of others does not always mean reducing the behavior. If consumers encode an outgroup as doing very little of something, they may diverge by increasing that behavior, at least relative to seeing an aspirational group member engage in the same activity. Rather than eating less after seeing a heavy person choose a small amount, participants consumed more, which is consistent with adjusting upward from a low anchor (Wansink et al. 1998).

Study 2 contributes to the literature on identity and health (e.g., Gerrard et al. 2005; Gibbons and Gerrard 1995; Gibbons et al. 1998) by pointing to the fact that the images of those not engaging in a behavior (i.e., nonsmokers, nondrinkers) may also affect the likelihood of adopting those behaviors. While prior research has examined how the image of smokers, teen parents, and reckless drivers affects people's likelihood of adopting their risky lifestyles, the impact of images of those who abstain has not been examined. According to our research, the image of an "uncool" nondrinker may actually lead to increased binge drinking as people strive to avoid an identity associated with that group. Similarly, while Oyserman, Fryberg, and Yoder (2007) examined how minority groups' health knowledge and perceived fatalism can shift as a function of identity perceptions ("How Black is it to eat fried food?"), they did not examine how food choices change as a function of seeing reference group members eating (un)healthy food, nor did they examine actual behavior.

FIGURE 4

NUMBER OF CANDIES TAKEN BY CONDITION (STUDY 2)

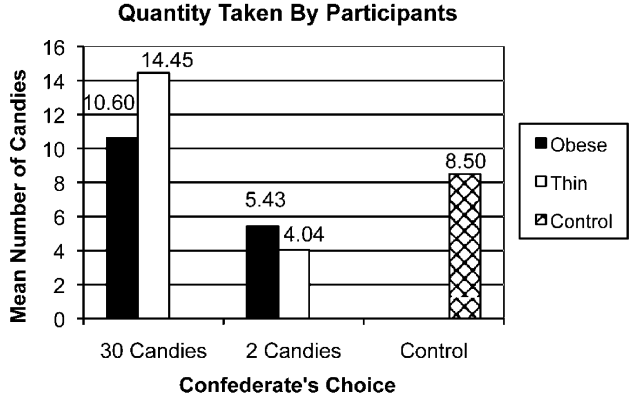
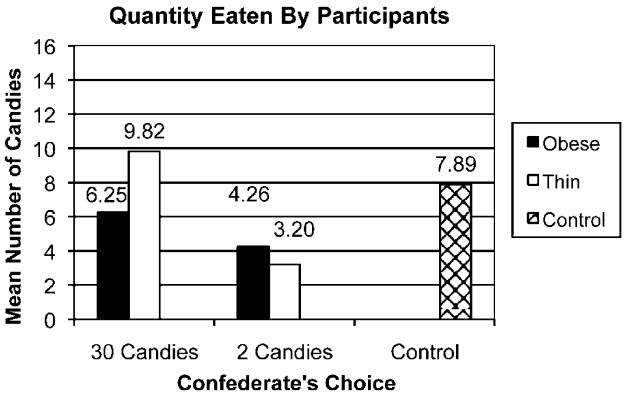


FIGURE 5

NUMBER OF CANDIES CONSUMED BY CONDITION (STUDY 2)



While the results of studies 1 and 2 provide support for the effects of social influence on food choice and how these effects are moderated by the body type of the other consumer, they are silent on when these effects are more or less likely to occur. Is eating less in the presence of an obese person a thoughtful, deliberative effect, or is it one that occurs less consciously? Are there certain individual or situational factors that enhance susceptibility to reference group effects? Research in social comparison theory (Festinger 1954; Kruglanski and Mayseless 1990; Wood 1989) argues that one's evaluation of the self is relative, meaning that people compare themselves to the behavior and relevant cues of others in forming their self-perceptions. While a basic tenet of social comparison theory is that consumers make comparisons with those who are similar to themselves, other research has found little support for this proposition (see Wood 1989). If it is similarity to the outgroup driving the effects of adjustment, we would expect those who are heavy themselves (high BMI) not to adjust to the same degree with the dissociative outgroup, but we have found no evidence for BMI affecting our results. However, people also differ in their satisfaction with their own appearance, and this may not correlate with their own BMI. For instance, persons suffering from anorexia nervosa are often objectively very thin, but they also have a very high degree of body dissatisfaction; similarly, there are consumers with a high BMI who are quite satisfied with and confident concerning their appearance.

There is reason to expect that the mechanism may be psychological rather than physiological. Miller (1984) argued that people are more likely to use dimensions important to their self-definition when engaging in social comparison. Miller found that women who were self-schematic on gender used it as a comparison point even when it was not relevant. For those dissatisfied with their body's appearance (low in appearance self esteem [ASE]), this dimension should be especially relevant and should thus be a determinant of social comparison. This tenet is supported in a recent paper in which Trampe, Stapel, and Siero (2007) found that those high in body dissatisfaction have been shown to be more sensitive to social comparison following exposure to the body types of others. Given that dissatisfaction with one's own body increases proneness to social comparison, we hypothesize that those dissatisfied with their appearance will engage in adjustment to a greater degree. However, among those confident in their appearance, less social comparison should occur, resulting in no change in behavior as a function of the body type of the other consumer. Support for this hypothesis would provide evidence that our adjustment process does indeed stem from social comparison, and it would also contribute to the reference group literature by identifying a moderator for divergence, one based on desired, rather than actual, group membership.

We also anticipate a boundary condition to the effects we have identified. While recent work has shown that consumption decisions can be driven by a divergence or adjustment away from dissociative outgroups (Berger and Heath 2007; 2008; Escalas and Bettman 2005; White and Dahl 2007), evidence of the nature of the process is still largely untested. Does divergence happen automatically, or might it be an effortful process? What would have happened if participants in studies 1 and 2 had lacked the cognitive ability to adjust their anchor? Would less restraint have been shown after seeing an obese person order a large quantity of food? In other words, while there is some evidence that the divergence shown in past studies is a social process, is it also cognitive? While others have examined how cognitive load may affect the adjustment from numerical anchors (e.g., Epley and Gilovich 2006), it remains untested whether cognitive processes are necessary to drive an adjustment based solely on the desirability of group membership. If we were to show that consumers failed to adjust for the other consumers' body type under cognitive load, this would be strong evidence in support of our anchoring and adjustment model. Research on anchoring and adjustment models has shown that the adjustment process can be attenuated by a lack of cognitive resources (Gilbert and Gill 2000; Wegener and Petty 1995). Accordingly, we hypothesize that the decision to diverge away from outgroup associations is a cognitive one (at least in the case where the focus is on quantity chosen) and that in the absence of cognitive resources, the adjustment we documented in studies 1 and 2 should be attenuated. Thus, we predict that only when ample processing resources are available should we see an adjustment effect based on body type. As in study 1, we again focus solely on the overconsumption anchor, as this poses the greater public health risk. As such, we predict a three-way interaction between the other consumer's weight, appearance self-esteem (ASE), and cognitive load. When processing resources are not constrained, we expect that those who are low in ASE will choose a smaller portion when the other person takes a large quantity. However, among those who are high in ASE, this effect should be attenuated. Without available processing resources, we expect that neither the weight of the other person nor ASE will have an effect on participants' food choice. Support for this hypothesis would identify a boundary condition to the effects of identity signaling and social comparison, namely, that the adjustment process requires conscious resources. Study 3 tests these hypotheses.

STUDY 3

Method and Procedure

The predictions were tested using a 2 (body type of person in front of you: thin vs. obese) × 2 (cognitive load: low vs. high) between-subjects experimental design, plus a measured body satisfaction variable. Similar to studies 1 and 2, a true baseline condition (low cognitive load and in the absence of a social other) was also run. Participants included 17 undergraduate students (118 males, 55 females) from a large North American university, who completed the study in exchange for partial course credit.

Participants were invited into the lab to participate in a

study that purportedly tested the effects of memory on decision making. First, cognitive load was manipulated by having participants memorize a 10 (high load) or 2 (low load) digit number that they would be asked to recall later in the experiment (Shiv and Fedorikhin 1999). Following the manipulation, participants were told that the researchers would be examining consumers' decision-making processes when they make selections among menu items and that "In order to make the study more realistic, the menu items presented to you are dishes actually offered by a retailer" (White and Dahl 2006). The menu contained four flavors of ice cream (French Vanilla, Dutch Chocolate, Cookies 'N Cream, and Strawberry), all of which were available in five sizes (x-small, 6 ounces; small, 9 ounces; medium, 12 ounces; large, 15 ounces; and x-large, 18 ounces). Participants were then asked to imagine the following scenario containing our manipulation of the other's body type:

> You are in a long line at an ice cream store. It has been a long day and you are feeling like you'd like to order a cold treat, but you are not sure exactly what you would like to order. As you wait in line, you glance over at the menu. As you get closer to the front of the line, you glance at the person in front of you. Although they are the same gender as you, you cannot help but notice them because of their weight: they are very overweight (thin). "Wow! That is one of the heaviest (thinnest) people I've ever seen," you think to yourself. You still have not made up your mind when the person in front of you is about to order. You overhear the person in front of you order their snack: an X-Large Ice Cream Cone. As the person receives their order, the clerk asks you what you would like to have.

Participants were then asked to choose a size and flavor (the latter was included to make the scenario more realistic and disguise the study's purposes) of ice cream that they would choose. Following this was the number recall, dummy questions about the menu and flavors offered, scales measuring restrained eating and appearance self-esteem, and basic demographic information.

Measures

Body dissatisfaction was measured with the 6-item appearance self-esteem (ASE) scale developed by Heatherton and Polivy (1991). This contains items such as, "I feel satisfied with the way my body looks right now," "I am dissatisfied with my weight," and "I feel unattractive." The reliability of the index in this sample was $\alpha = .87$. The reliability of the restrained eating scale (same as that used in studies 1 and 2) in this sample was $\alpha = .79$. The correlation between the restrained eating scale and the ASE scale was $-.45$ ($p < .001$), and excluding restrained eating from the analysis does not affect the results. The correlation between ASE and BMI was $-.13$ and was marginally significant in this sample ($p = .09$). Because numerous studies have shown differences between men and women in eating habits and preferences, as well as sensitivity to body image, we treat gender as a covariate in our analysis.

To assess the validity of our manipulations, we measured perceived confederate weight using a single item: "The person in line in front of me in the scenario was (−3) very overweight/(3) very underweight. Cognitive load was assessed with two 7-point scales ("I found it challenging to read the scenario while trying to remember the number" and "Remembering the number was easy," anchored by (−3) completely agree/(3) completely disagree, with the second item reverse-scored. The reliability of the cognitive load measure was $r = .63$ ($p < .001$).

Dependent Measure. Choice was assessed by having participants select a size of ice cream that they would order. Given that the sizes were labeled as ranging from 6 ounces to 18 ounces in 3 ounce increments, size choice was treated as a continuous variable ranging from 1 (x-small) to 5 (x-large).

Results

To test moderation where one of the variables is continuous, analyses were conducted using hierarchical regression (Aiken and West 1991; Dawson and Richter 2006). In the first step, main effects for cognitive load, ASE, and other's body type, along with participant gender and the restrained eating scale were included. In the second step, the three two-way interactions between the factors were entered. Finally, in the third step, the three-way ASE × Cognitive Load × Other's Weight was entered. All variables were mean centered to reduce multicollinearity and facilitate interpretation of lower order effects (Aiken and West 1991; Irwin and McClelland 2001).

Manipulation Checks. Manipulation checks showed that our manipulations were successful. Participants deemed the participant heavier when she or he was specified as heavy in the scenario than when she or he was purportedly thin ($B = .81, t = 15.62, p < .001$). Importantly, no other main or higher order interactions were present.

Our manipulation check for cognitive load showed that those under load deemed the situation more difficult to process than those not under load ($B = .59, t = 8.32, p < .001$). No other main or higher order effects were present.

Dependent Measure. Results on the size choice variable showed a simple main effect of gender ($\beta = .39$, $t = 4.79, p < .001$) and a marginally significant simple main effect for restrained eating ($\beta = -.15$, $t = 1.67$, $p < .10$), both in the expected directions. However, these effects were qualified by the predicted three-way ASE × Cognitive Load × Other's Weight interaction ($\beta = .18$, $t = 2.33$, $p = .02$; see table 1). Including gender as a factor does not moderate our results. To facilitate interpretation and exposition of the interaction, simple slopes analyses were conducted.

Regression lines were plotted for one standard deviation above and below the mean for ASE (Aiken and West 1991; Preacher, Curran, and Bauer 2006). Examining the conditions where participants were under low cognitive load (see fig. 6), low ASE participants chose significantly less when

TABLE 1

REGRESSION RESULTS: STUDY 3

	Step 1	Step 2	Step 3
Gender	.40**	.41**	.39**
Restrained eating	−.14	−.14	−.15+
Other's body	.12	.13	.13
Cognitive load	−.11	−.11	−.11
ASE	.04	.04	.07
Other × Load		−.04	−.04
Other × ASE		.03	.01
Load × ASE		−.02	−.07
Other × Load × ASE			.18*
R^2	.25	.25	.28
ΔR^2	.25**	.00	.03*
F	8.64**	5.38**	5.54**
df	5, 133	8, 130	9, 129

NOTE.—Standardized regression weights are presented.
+$p < .10$.
*$p < .05$.
**$p < .01$.

the other consumer was heavy than when she or he was thin ($b = .74, \text{SE} = .24, t = 2.16, p = .03$), but no differences emerged among those high in ASE ($b = -.06$, SE = .34, $t = -.18$, NS). Examining across levels of ASE, low ASE participants took less than those high in ASE when the other person was heavy ($b = .43$, SE = .26, $t = 1.66$, $p < .10$) but not when she or he was thin ($b = -.06$, SE = .18, $t = .33$, NS). These results strongly support our hypothesis.

Interestingly, under high load (see fig. 7), those high in ASE took marginally more when the other consumer was thin than when she was obese ($b = .52$, SE = .28, $t = 1.88$, $p = .06$), but no differences were observed among those low in ASE ($b = -.16$, SE = .27, $t = -.60$, NS). However, examining across levels of ASE, we find no differences between those high and low in ASE, regardless of whether the other consumer was heavy ($b = -.19$, SE = .18, $t = -1.07$, NS) or thin ($b = .22$, SE = .17, $t = 1.33$, NS).

Results from the control condition showed that participants primarily selected the medium size option (3 on the 1–5 scale). Importantly, based on our theorizing, given that there was no social other to compare to, there was no effect of ASE (means +/− one SD: low ASE = 3.05, high ASE = 3.02).

Discussion

Our three-way interaction between ASE, cognitive load, and confederate's weight on participants' size choice shows that conscious effort is required for participants to adjust their consumption downward following an obese person setting a high anchor. Consistent with our theorizing, under low load, participants low in ASE generally ordered a smaller choice when the other person was obese versus thin, but those high in ASE were less affected by the social presence. We predicted no differences under high cognitive load, and indeed this was consistent with our results in general.

While our results indicated that cognitive load acted as a moderator, we did not make a formal prediction on exactly how cognitive load would operate in our model. Given that it did not interact with the manipulation check assessing the other's weight, cognitive load was not inhibiting consumers' ability to notice the other's body type. Another possibility is that load was disrupting attention toward what the other chose, resulting in a fuzzy anchor. We examined this possibility and found evidence supporting this mechanism. We included in the survey a question in which participants were asked to recall the size of ice cream that the other ordered. Results of a logistic regression with correct/incorrect recall as the dependent measure showed a main effect for cognitive load (Wald = 4.87, $p = .03$), where those high in cognitive load were more likely to incorrectly recall the other's order. Since the other always chose the x-large size, all of the errors were either downward (attributed a smaller size to the other) or errors of omission (could not recall). We believe that this is evidence that the cognitive load was operating by muzzling the anchor itself rather than participants' adjustment to it.

The results of the control condition show that, in this study, a "normal" portion choice was a medium size. We also know that load disrupts attention to the anchor the other person sets rather than their body type. So, compared with the control condition, participants under load who see a heavy person have directionally less consumption. Further, those low in ASE under load who see a thin person also select a directionally smaller choice than the control (those high in ASE match the norm seen in the control condition). This pattern makes logical sense and follows from pretest data that indicated that people wanted to dissociate from the obese but also that thin people can remind those sensitive to overeating to eat healthier (smaller portions). Importantly, under low load is where the greatest adjustment takes place. With normal levels of cognitive capacity available, there is a sharp distinction between reactions to thin and obese others for those low in ASE. Consistent with our first two studies,

FIGURE 6

SIZE CHOICE LOW COGNITIVE LOAD CONDITION (STUDY 3)

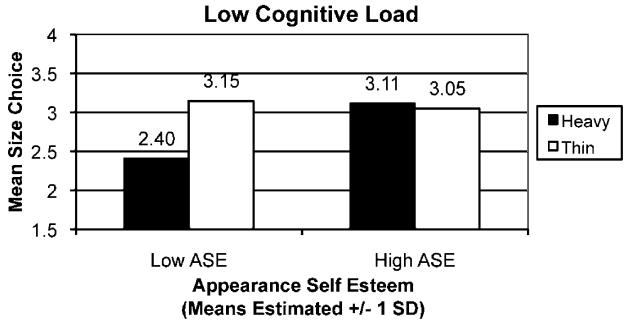
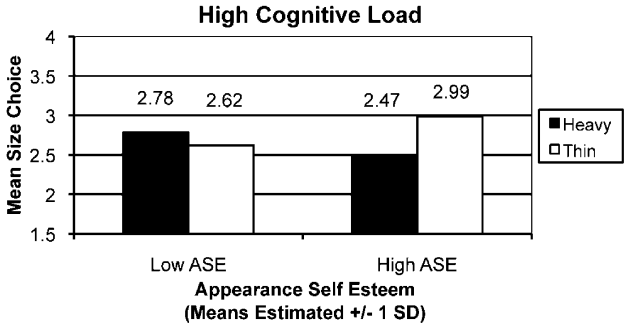


FIGURE 7

SIZE CHOICE HIGH COGNITIVE LOAD CONDITION (STUDY 3)



the largest consumption takes place when the thin other selects the large size under low load.

This is also consistent with research done by Cialdini and his colleagues on the focus theory of normative conduct (Cialdini, Kallgren, and Reno 1991; Cialdini, Reno, and Kallgren 1990; Kallgren, Reno, and Cialdini 2000). In their conceptualization, there are injunctive norms (what one should do in a particular situation) and descriptive norms (what most others do in a particular situation). In our case, in the absence of a social other, the injunctive norm is a medium, or in the case of studies 1 and 2, a "modest" amount. What the social other does is make a descriptive norm salient, which either highlights a high or low anchor, a social norm that is taken as diagnostic by participants. Focus theory also indicates that attention paid to the social norm (the "focus") moderates which norm is utilized, meaning that the more salient norm will guide behavior. What is happening in the high load condition, then, is that this descriptive norm is made less salient, and following Cialdini's et al.'s conceptualization, participants rely on their internalized injunctive norm.

Without the cognitive resources available to engage in an adjustment, neither low nor high ASE participants differed significantly as a function of the other's body type, although there was a subtle suggestion that those high in ASE may have adjusted toward the thin "other" without deliberate thought, ordering a larger size as a result. This may have occurred because those high in ASE are the least motivated to engage in correction. As well, research in assimilation and contrast has shown that people can assimilate both to those possessing desirable traits (Stapel and Winkielman 1998) and to those who resemble the self (Smeesters and Mandel 2005). Since a high ASE participant may perceive more commonality with the thin confederate, these participants may have unconsciously assimilated toward his or her choice.

GENERAL DISCUSSION

The studies reported above highlight an important person by situation interaction in the social influence of food consumption. We show that it is not simply eating with heavy people that makes you eat more (or less); it depends on what these other consumers choose. Across three studies, we show support for an anchoring and adjustment process in which consumers use a quantity anchor set up by others to determine how much they should select themselves but also adjust from this depending on who the other consumer is. Study 1 shows evidence of both an anchoring process based on what other consumers select and an adjustment that occurs based on the other's body type. Study 2 replicates and extends these findings, showing the same adjustment effect with a low anchor: when a confederate selects a small portion, participants choose and consume less food but more when the other is obese versus thin. Study 3 demonstrates that cognitive resources and ASE moderate the adjustment effect. Taken together, these results represent a comprehensive package of how social influence effects in food consumption are moderated by the body type of other consumers.

Our results replicate research that shows that people are more likely to eat greater portions when in the presence of others who do likewise; we also extend these results to show that this effect is even greater when the other person is thin rather than heavy. Thus, our findings strongly suggest, counter to other research done in the social influence literature on food consumption, that in many cases the most dangerous people to eat with are not those who are overweight but rather those who are thin but are heavy eaters. It is important to note that these results do not contradict the recommendations of those who suggest that small-portion eaters should eat by themselves but large-portion eaters should seek out a group (e.g., Wansink 2006). Our results indeed do find that, as compared to no one else present, large portions chosen by others lead to greater consumption and smaller portion choices by others are associated with eating less. However, we show that this is qualified by the weight of the other person. If a heavy-set colleague eats a lot, he or she is a better lunch partner than a thin colleague who orders the same dish. By contrast, a thin colleague who eats lightly is more likely to cause others around them to order less. Thus, from the perspective of self-regulation, recognizing situations where you are likely to be vulnerable to overconsumption is important. As a matter of maintaining a healthy body weight, such small food intake decisions have a larger impact on their body weight than people realize (Wansink 2006).

While we find that anchoring and adjustment explains our findings, others have shown that consumers can mimic those around them in a consumption setting without deliberate thought (Chartrand and Bargh 1999; Tanner et al. 2008). The design of study 2 also allowed us to examine the alternative prediction that consumers are simply mimicking the other consumer when she is thin. Tanner et al. (2008) showed that consumers do indeed mimic the consumption choices of other consumers. For example, they found that participants who observed a confederate choosing one snack food out of a set of choices chose a much higher percentage of that snack themselves, relative to a control group that

was not mimicked. A follow-up analysis on our study 2 results was performed to provide support that the type of consumption reaction to the body types of others is driven largely by an anchoring and adjustment mechanism, not by a nonconscious mimicry mechanism. Our study incorporated multiple choices of food, so participants were free to select food that the confederate does not take, as in Tanner et al. (2008). If mimicry were operating, we should have seen convergence on both variety and quantity dimensions between target and confederate, which we did not observe. Participants' choices were not influenced by which choices were made by the confederate, and they were not different when she was thin or heavy.

Future research might consider when each of the paths (anchoring and adjustment and nonconscious mimicry) is likely to guide behavior. In our data, cognitive resources were needed to observe adjustment effects. Mimicry, on the other hand, can occur below consciousness. It could be that, under high load, mimicry may be more likely to occur. In this sense, our results are conceptually similar to work on nonconscious stereotyping. While participants noticed the body type of the other regardless of cognitive load (the results of the manipulation check confirm this), the adjustment was observed under normal cognitive resources. While identifying the stigma and activating associated prejudices can occur automatically, a conscious component can direct action associated with the stereotype (Devine 1989; Fiske and Neuberg 1990). In our research, a downward adjustment based on the body type of the obese other occurred only when cognitive resources were available. As well, in our experiments, the obese other served as a strong differential cue. It could be that if consumers have a strong motive for affiliation, nonconscious mimicry may be more likely to occur. Future research might test this possibility.

One limitation of our studies is that almost all of our participants were of normal weight. While we find no effect of BMI across our studies, it remains possible that more variance would be needed to see differences, and so we cannot rule out the possibility that with higher statistical power this variable might have moderated our results. Another limitation of our research paradigm is that participants could not know the confederate, or otherwise suspicion would have arisen from seeing her in the prosthesis. There is some evidence to suggest that we may eat differently with those we know (see Herman et al. 2003). Future research should examine this distinction further, as well as other potential moderators such as age, relational distance, or cross-gender effects, factors that might moderate the psychological closeness or perceived similarity (Brown et al. 1992; Mussweiler 2001) participants would feel with the confederate.

While our results provide insight into how obesity moderates social influence effects stemming from observing or overhearing another consumer order, it seems likely that such effects could have an impact in other domains as well. Might obese servers moderate food intake as a function of whether they are serving (un)healthy foods? While this research focused on an unhealthy behavior associated with one's body type (overconsumption), future research should examine if healthy behaviors linked to body type (e.g., physical exercise) would lead to the same effects. Does observing obese people exercise make one more or less likely to engage in physical activity? Getting a clearer picture of how such cues operate would be important to understanding and moving toward the goal of an overall healthier lifestyle.

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