

THE IMPORTANCE OF MAINTAINING GUT HEALTH THROUGH NUTRITION FOR GOOD MENTAL HEALTH

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ABSTRACT

The human intestinal microbiota evolves from an immature and unstable ecosystem during infancy into a more complex and stable ecosystem in adulthood. Diet is one of the main factors contributing to the composition and diversity of the human intestinal microbiota. From birth, breast milk offers the best nutritional regime for maturation of the gut, whereas the introduction of solid food selects the most adapted bacteria, converging towards an adult-like microbiota. The gut microbiota plays an important role in host health, influencing the maturation of the immune system and regulating energy metabolism. Moreover, it has become evident that the microbiota can affect brain function and behaviour. On this bidirectional communication between intestine and the central nervous system (CNS), the so-called gut-brain axis, the gut influences brain development and biochemistry, whereas the brain affects gastrointestinal function. In this context, probiotics and prebiotics have been used as dietary strategies aimed at improving host health by modulating the gut ecosystem and, consequently, affecting host stress-responses, behaviour, and cognition.

Keywords: Junk food, Fast Food, Metabolics, Positive and Negative Effects, Life Satisfaction, Healthcare Professionals

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THE PROBLEM DEFINITION

Policies that mandate calorie labeling in fast-food and chain restaurants have had little or no observable impact on calorie consumption to date. In three field experiments, we tested an alternative approach: activating consumers' self-control by having servers ask customers if they wanted to downsize portions of three starchy side dishes at a Chinese fast-food restaurant. We consistently found that 14–33 percent of customers accepted the downsizing offer, and they did so whether or not they were given a nominal twenty-five-cent discount. Overall, those who accepted smaller portions did not compensate by ordering more calories in their entrées, and the total calories served to them were, on average, reduced by more than 200. We also found that accepting the downsizing offer did not change the amount of uneaten food left at the end of the meal, so the calorie savings during purchasing translated into calorie savings during consumption. Labeling the calorie content of food during one of the experiments had no measurable impact on ordering behavior. If anything, the downsizing offer was less effective in changing customers' ordering patterns with the calorie labeling present. These findings highlight the potential importance of portion-control interventions that specifically activate consumers' self-control.

GENERAL SYNOPSIS

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 your 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 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.

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.

CONCLUSION

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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