

**Rejecting Responsibility: Low Physical Involvement in Obtaining Food Promotes
Unhealthy Eating**

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Abstract

Five experiments show that less physical involvement in obtaining food leads to less healthy food choices. We find that when participants are given the choice of whether or not to consume snacks that they perceive as relatively unhealthy, they have a greater inclination to consume these snacks when less (versus more) physical involvement is required to help themselves to the food; this is not the case for snacks that they perceive as relatively healthy. Further, when participants are given the opportunity to choose their portion size, they select larger portions of unhealthy foods when less (versus more) physical involvement is required to help themselves to the food; again, this is not the case for healthy foods. We suggest that this behavior occurs because being less physically involved in serving one's food allows participants to reject responsibility for unhealthy eating and thus to feel better about themselves following indulgent consumption. These findings add to the research on consumers' self-serving attributions and to the growing literature on factors that nudge consumers towards healthier eating decisions.

Eating away from home has become pervasive, extending to all categories of dining establishments, including fast food places, cafeterias, and gourmet restaurants (Harris Interactive 2012), with two-thirds of Americans dining out at least every other day (Stewart, Blisard, and Jolliffe 2006). Dining out brings benefits, saving the consumer time and effort. However, research indicates that eating away from home may be costly for people's health: consumers tend to eat much more unhealthily—that is, consume more calories—when they eat out versus at home (Gregory, Smith, and Wendt 2011). This is likely at least in part due to the generally higher fat content of restaurant food (Guthrie, Lin, and Frazão 2002). However, this finding raises the question if other variables that are relatively more common when eating away from home may also be involved. One such variable is a difference in consumer physical involvement.

When eating away from home, the consumer typically has some responsibility for her eating decisions, as she makes an active choice from a menu of options. However, her sense of responsibility may be increased or decreased through her physical involvement in the act of helping herself to the food. The difference in physical involvement in out-of-home eating contexts could affect perceived responsibility in two ways. First, the consumer could discharge responsibility over the assortment or range of portion sizes that are offered in the first place. Being less physically involved in helping oneself to food often means that a consumer's choice is limited to a pre-determined portion size (e.g., a default chosen by the restaurant or party host) or a limited range of sizes (e.g., “small” or “large”), rather than her being able to determine a portion for herself from an infinite number of possible sizes (e.g., by scooping exactly as much or as little as she wishes of each item). Such a constrained choice is also present when food comes pre-packaged (e.g., snack packs of candy or nuts) or is otherwise pre-portioned (e.g., pre-cut pastries or pizza) rather than being offered from larger containers or units (e.g., at bulk

stations).

Second, the consumer also discharges responsibility over the physical act of serving a portion of the food onto her plate. Being less physically involved in serving one's own food means carrying out less motor activity to help oneself to it. This is the case when another person plates the food (e.g., in restaurants, the kitchen plates a diner's food; at dinner parties, sometimes a host serves the guest's meal) instead of the consumer serving herself. The consumer is likewise less physically involved than she would typically be at home when foods come pre-portioned or pre-packaged (e.g., in cafes, meals are boxed for the grab-and-go display; snacks come in small single-serve packs). In such situations, discharging responsibility over physically handling the food may spill over to a reduced sense of responsibility for one's eating decision in general. Here, we ask the question whether less (versus more) physical involvement in helping oneself to food facilitates the selection of relatively unhealthy foods or larger portions of unhealthy foods, all else being equal, by way of reducing people's sense of responsibility. We show evidence for affirmative answers to all aspects of this question as discussed below.

We suggest that consumers are motivated to make self-serving attributions of responsibility for their eating, that is, to reject responsibility for unhealthy eating, in order to feel good about themselves. However, the latitude for relegating responsibility to others is affected by how physically involved they are in helping themselves to the food they eat—that is, by the degree of physical agency. Critically, we predict that how healthy or unhealthy the food is interacts with physical involvement (less versus more) to affect a consumer's ascription of responsibility. As an extension of prior work on self-serving attributions, we show that the healthiness of food determines the *necessity* or motivation for self-serving attributions, as only unhealthy eating motivates consumers to reattribute responsibility. As a novel contribution to

research on motivated reasoning and consumer self-deception, we demonstrate that how physically involved consumers are in helping themselves to their food determines the *opportunity* for such attribution: being uninvolved in serving the food offers a chance to deny responsibility. Our findings also contribute to research on vice consumption and consumption guilt.

Our findings offer a suggestion for how marketers, policy makers, and consumers themselves may reduce the incidence and volume of unhealthy eating. While we know that the size of portions served in restaurants (Zlatevska, Dubelaar, and Holden 2014), the dimensions of serving bowls (Wansink and Cheney 2005), and the appearance of food servers (McFerran et al. 2010a) can all impact food consumption, the important distinction between being less (versus more) physically involved in helping oneself to a given food has not been studied.

First, we draw on theories of agency and self-serving attributions to derive our prediction that being less (versus more) physically involved in helping oneself to food increases both the incidence and the quantity of unhealthy eating by facilitating consumers declining to take responsibility. Then, five studies provide evidence that when less (versus more) physical involvement is required to help oneself to food, people are more likely to consume unhealthy foods and to select larger portions of unhealthy foods. We show that this behavior occurs because being less physically involved in helping oneself to food allows people to deflect responsibility for unhealthy eating and protect their positive self-evaluation. Lastly, we discuss some implications of our findings and suggestions for future research.

THEORETICAL BACKGROUND

Agency

People tend to assume intent and agency rather than randomness as the cause of events (Rosset 2008), and beliefs about whether or not an action was driven by agency strongly influence judgments about actors and outcomes. Abundant research demonstrates that when individuals have a sense of *self*-agency, or responsibility for their *own* actions, their emotional responses to a given event they are involved in are amplified, because people associate more strongly with its consequences (Landman 1987). For example, consumers evaluate self-selected (Brehm 1956) and self-assembled (Norton, Mochon, and Ariely 2012) products more positively.

At the same time, personal responsibility is also associated with negative emotions. For example, personal agency is a necessary condition for the emotion of guilt (Smith and Ellsworth 1985). Accordingly, individuals considering their active (versus passive) behavior as the cause of negative consequences (e.g., opting into a vaccination that causes complications versus foregoing it and falling ill) judge their decision more negatively (Baron and Ritov 1994) and experience stronger immediate regret (Gilovich and Medvec 1995; Kahneman and Tversky 1982). In sum, research suggests that a sense of personal agency and responsibility for actions and outcomes strongly affects people's thoughts and feelings.

Self-serving Attributions of Agency

People's thoughts are also heavily shaped by 'what one would like to be' (Heider 1958, p. 121); consequently, reasoning and inferences are distorted as a function of individual goals. A major instantiation of motivated reasoning is the self-serving attribution, which occurs to preserve one's self-concept—an important goal for all humans (Campbell and Sedikides 1999; Greenberg, Pyszczynski, and Solomon 1982; for a review, see Shepperd, Malone, and Sweeny 2008). As such, attributions of responsibility are biased to position the individual in a favorable light in order to make her feel good (or avoid feeling bad). For instance, a large body of research

demonstrates that individuals take credit for success, but overwhelmingly deny accountability for failures (see Fletcher and Ward 1988 for a review). Faced with favorable outcomes, people assume responsibility even for pure chance events (Langer and Roth 1975; Wohl and Enzle 2002). Conversely, faced with unfavorable outcomes, they re-assign responsibility whenever their own agency is ambiguous (Bandura 1990; Hinrichs et al. 2012).

Overall, the motivation to explain away negative outcomes tends to be stronger than that to claim positive outcomes (Bohner et al. 1988). Reactions to negative outcomes are typically more intense than to positive ones: negative information weighs more heavily in impression formation (Anderson 1965), negative events affect people longer (Sheldon, Ryan, and Reis 1996), and negative emotions receive more attention and inspire regulatory efforts (Baumeister, Heatherton, and Tice 1994; for a review see Baumeister et al. 2001).

Further, motivated reasoning, such as self-serving attributions, occurs only under motivational pressures (Kunda 1987). One domain where motivational pressures are high is eating (Chernev 2011). Food and eating behaviors are focal in today's society. A majority of Americans aim to lose weight (IFICF 2014) and try to restrict their consumption of unhealthy foods (Vohs and Heatherton 2000; for a review see Bublitz, Peracchio, and Block 2010), and many view diet control as a desirable character quality (Chaiken and Pliner 1987; Stein and Nemeroff 1995). Against this backdrop, it is not surprising that eating is closely linked with self-evaluative feelings (Ramanathan and Williams 2007); many people feel guilty about unhealthy consumption (Wansink and Chandon 2006). As in other domains of vice and emotion-laden consumption, consumers may employ strategies to make themselves feel better about their consumption choices (Khan and Dhar 2006; Mukhopadhyay and Johar 2009; Okada 2005). As detailed above, the tendency to make self-serving attributions tends to be stronger for negative

than for positive outcomes. Thus, *self-protecting* attributions (e.g., for unhealthy consumption) may be more powerful than *self-enhancing* attributions (e.g., for healthy consumption). In other words, consumers may seek to reject responsibility for unhealthy eating, to protect their positive self-evaluation, or claim responsibility for healthy eating, but this effect may be weaker.

Physical Involvement in Helping Oneself to Food and Self-serving Attributions of Agency

Research suggests that consumers cannot make themselves believe *anything* they want. People attribute responsibility in self-serving ways, but only if they can muster some credible evidence to support those claims (Kunda 1990; Schlenker, Weigold, and Hallam 1990; Weary et al. 1982). We suggest that physical involvement in procuring food functions as a potential driver of motivated reasoning. Specifically, we propose that more physical involvement presents “irrefutable” evidence of one’s agency, forestalling alternative ascriptions of responsibility. In contrast, less physical involvement allows the consumer leeway for self-serving attributions, and may even facilitate them.

Physical involvement can be defined as active participation in a process through bodily activity (cf. Merriam Webster). There are numerous ways in which consumers can be less (versus more) physically involved in helping themselves to food; we examine several. For instance, reaching for a snack pack of candy requires less physical involvement than actively scooping candy into a personal bowl; taking a container pre-filled with a snack from a shelf requires less physical involvement than taking an empty container and filling it up oneself; having a server serve food onto one’s plate and “saying when” requires less physical involvement than serving the same amount of food oneself. Each of these cases requires less physical involvement on the part of the consumer than would be typical at home, where consumers frequently serve themselves by scooping their own portion of food onto their plate.

Consumer research has found that, all else equal, physically interacting with an object impacts people's perceived relationship with it. For example, merely touching a product, such as a mug or a pencil, increases consumers' sense of ownership (Brasel and Gips 2014; Peck, Barger, and Webb 2013; Peck and Shu 2009). Similarly, the more physical activity an actor exerts to acquire an object, the more ownership is credited to her. This effect is driven by greater ascribed responsibility for the possession (Palamar, Le, and Friedman 2012). Indeed, greater effort in any activity enhances an individual's sense of self-agency (Demant et al. 2013).

We suggest that being more or less physically involved in serving food strongly affects consumers' capacity to make self-serving attributions of responsibility. The diner who seizes a serving bowl, takes hold of a serving spoon, and scoops a helping of food onto her plate incriminates herself more in helping herself to the food than one who is merely handed a plate filled by a server or who takes a pre-packaged portion of a meal from a display shelf. Actively scooping, ladling, pouring, or otherwise serving one's food may enforce attributions of responsibility to oneself, whereas being served by another person or merely picking up a pre-packaged portion of food may open up the opportunity for making the most preferable attribution of responsibility, to self or other, depending on how virtuous the food itself seems.

This is not to suggest that *choosing* one's food has no impact; we do not test the relative impact of choosing versus physical involvement in helping oneself to one's food on a consumer's ability to make favorable attributions of responsibility. Rather, we propose that in the typical circumstance in which a consumer herself chooses her own food to eat, being more or less physically involved in helping herself to the food will deny or allow her to reject responsibility, respectively, for unhealthy eating. Given the importance of the sense of agency, and the influence that physical activity appears to have on it, we predict that more actively

exercising her choice (i.e., actively serving her own food) will affect a consumer's attribution of responsibility more strongly than merely indicating the choice by vocalizing it to a server or taking a prepared plate (i.e., passively taking food). Further, the finding that verbally stating one's choice favors impulsive decisions (Klesse, Levav, and Goukens 2015) suggests that verbal choice is not necessarily associated with greater deliberation and thus the responsibility it entails.

We expect that such attributions of personal responsibility drive actual consumption behavior. Specifically, relieved of responsibility, consumers may find it more acceptable to indulge in unhealthy foods, and make their eating decisions accordingly. We propose that:

H1: People are more likely to make unhealthy eating decisions (e.g., choosing to eat foods perceived as unhealthy versus not; choosing larger portions of food perceived as unhealthy¹) when less (versus more) physical involvement is required to help oneself to the food.

To explain these unhealthy food choices, we propose an attributional account, in which the level of physical involvement affects attribution of responsibility for food consumption, in turn driving how consumers feel about themselves. As detailed above, people's sense of responsibility, and their self-appraisal after food consumption, should be a function of two factors: how healthy the food is (determining the *necessity* for attributing away responsibility) and how physically involved one is in helping herself to the food (determining the *opportunity* for attributing away responsibility). We hypothesize that when a consumer is less physically involved, she can take or relegate responsibility depending on what suits her better. When one is more physically involved, however, the margin for reassigning responsibility and alleviating negative feelings is much smaller. This motivated reasoning should drive consumers' feelings about their food decisions, so that their feelings about themselves are impacted interactively by the food's healthiness and the physical involvement required to help oneself to it. Specifically:

H2: Less (versus more) physical involvement in helping oneself to food allows people greater latitude to reject responsibility for eating (the same) foods perceived as unhealthy, and thus to feel better about themselves (e.g., more positive, less guilty) for their food consumption.

H3: Less (versus more) physical involvement in helping oneself to food has stronger effects on eating decisions when the food is perceived as unhealthy rather than healthy, because people are less likely to feel good about themselves (e.g., less positive, more guilty) after eating foods perceived as unhealthy.

H1-H3 suggest a moderated mediation model (figure 1). The model includes two sub-figures (as in Valsesia, Nunes, and Ordanini 2016) for two different types of eating situation: when consumers choose their portion size (panel A) and when portion size is held constant (panel B). The two figures are separated because we examine each process element in a separate study before testing the full model. The reason for this is as follows: for any particular portion size (i.e., people receive and consume a fixed portion of food), the level of physical involvement in helping oneself to the food and the healthiness of the food jointly determine people's sense of responsibility, which in turn impacts their self-evaluative feelings post-consumption, given this particular portion size. In other words, the lowered sense of responsibility ameliorates people's guilt from eating unhealthy food and thus elevates their positive self-evaluative feelings post-consumption (panel B). However, when people can choose their portion size, feeling less (more) responsible for their selections when they are less (versus more) physically involved in helping themselves to their food leads them to choose a larger (smaller) portion size of unhealthy food (panel A). This occurs because they can "get away with" choosing larger portions without compromising their positive self-evaluative feelings. Hence, when people choose portion sizes, their self-evaluative feelings may be no different in the condition where they are less versus

more physically involved in helping themselves to their food. This model (combining panels A and B) can be tested by statistically controlling for portion size choice.

Insert figure 1 about here

The reasoning above also implies unique mediation patterns for each panel. When consumers choose portion sizes, being less (versus more) physically involved in helping themselves to unhealthy food will result in lower perceived responsibility, and responsibility will mediate the effect of physical involvement required to help oneself to unhealthy food on portion size (panel A). When portion size is fixed, being less (versus more) physically involved in helping oneself to unhealthy food will result in lower perceived responsibility and higher self-evaluative feelings, and perceived responsibility will mediate the effect of physical involvement in helping oneself to unhealthy food on self-evaluative feelings (panel B). Combining these steps, when consumers choose their portion size, it will be selected in such a manner as to maintain self-evaluative feelings (i.e., smaller portions of unhealthy food when more physical involvement is required), and thus responsibility will mediate the effect of physical involvement in helping oneself to food on self-evaluative feelings, controlling for portion size chosen.

In the following, we first demonstrate the basic phenomenon that requiring less (versus more) physical involvement to help oneself to food increases consumers' likelihood of choosing unhealthy foods (study 1, using pre-portioned food), and also leads to choice of larger portions of unhealthy foods (study 2, using pre-packaged food). Then we show that being less (versus more) physically involved enables rejection of responsibility, which leads to more positive self-evaluative feelings when eating a given portion of unhealthy food (study 3, using an in-person server). Consolidating our previous findings, we provide evidence that requiring less (versus more) physical involvement in serving unhealthy food leads consumers to choose larger portions

because feeling less responsible permits them to do so without causing them to feel worse (study 4, using an in-person server). Finally, we provide some field evidence that being less (versus more) physically involved in serving food (using an in-person server) leads people to consume greater amounts of unhealthy food when servers serve industry-standard sizes (study 5).

The Web Appendix details four additional experiments that were conducted during the review process of this paper but were subsequently dropped. For brevity, we do not report the results of (non-significant) demographics, nor non-focal measures on which data were collected, such as questions that were asked to maintain a cover story (e.g., “How well did you like the consistency of the [food]?” for the taste test cover story in study 5).

STUDY 1: PROPENSITY TO CHOOSE (VS. FORGO) HEALTHY AND UNHEALTHY FOOD AS A FUNCTION OF PHYSICAL INVOLVEMENT REQUIRED

In a field study, we first examined the basic idea that people may be more inclined to consume unhealthy food when less (versus more) physical involvement is required to help oneself to the food (H1), and that this will be attenuated for healthy food (H3).

Method and Procedure

The setting for this study was a small lobby in the business school of a large public university in the Midwest, where students typically wait for experimental sessions. The study ran over the course of two days, during which eight groups of 21 to 25 business undergraduates (N = 189, 46% female) waited in the lobby before entering the laboratory for an unrelated management study. This setting ensured that each condition included unique individuals.

We installed an innocuous small table with a letter-sized poster reading “Mmh, Fall

Snack Bar – Have yourself a little snack.” On this table, we placed a fall-themed snack that was either healthy (mixed dried fruits) or unhealthy (Reese’s Pieces). Helping themselves to the respective snack required either more physical involvement (scooping the snack into a sampling cup) or less physical involvement (merely picking up a pre-filled sampling cup), making this a 2 (healthiness: healthy vs. unhealthy) \times 2 (physical involvement: less vs. more) between-subjects design. Each of the four conditions was run once earlier and once later in the day.

Note that the snacks were selected based on a pretest in which 34 students from the same university had rated various snacks for their healthiness and liking on 1–7 point scales. Results indicated that students viewed mixed dried fruits as healthier ($M = 5.62$, $SD = 1.39$) than Reese’s Pieces ($M = 1.44$, $SD = .61$; $t(33) = 16.85$, $p < .01$), but liked dried fruits ($M = 4.53$, $SD = 1.88$) just as well as Reese’s Pieces ($M = 4.85$, $SD = 1.76$; $t(33) = -.68$, $p > .5$). Further, the Reese’s rating was significantly below the midpoint of the healthiness scale ($t(33) = -19.60$, $p < .01$), whereas the dried fruit rating was significantly above it ($t(33) = 9.17$, $p < .01$).

In conditions that required less physical involvement, thirty 4 oz. sampling cups were set out on the table, each filled with 45 grams of the respective snack, and people just had to take a filled sampling cup. In conditions that required more physical involvement, approximately 1.7 kilograms of the snack were set out in a large bowl with a serving spoon, several stacks of ten 4 oz. sampling cups were placed next to it, and the participants had to scoop the snack into a sampling cup. Importantly, this amount filled half of the cup, allowing people in the more physical involvement conditions to serve more (or less) into their cups than the pre-filled sampling cups available in the less physical involvement, that is, making upward and downward deviations equally possible, albeit with a somewhat restricted range.

Students entered the waiting room at their own leisure, typically 5 to 10 minutes before

the scheduled start time. They remained uninstructed and unobserved until the experimenter who conducted the management study opened up the door to the laboratory room. While waiting, the students had the opportunity to take a cup of the snack food. The critical dependent measure was the total number of cups that were taken across all students in a given waiting period. Note that we did not observe any individual's specific choice, but we observed the total number taken in each wait period, and we knew the number of people in the waiting room.

Results and Discussion

A chi-square test indicated a significant relationship between condition and choice, $\chi^2(3, N = 189) = 22.83, p < .01$. For the unhealthy Reese's, 0% (0 out of 46) of the waiting students took a cup when they themselves had to scoop the snack from the bowl, but 31.9% (15 out of 47) took one when it was already filled into cups. Thus, as predicted, people were significantly more likely to take the unhealthy snack when less versus more physical involvement was required to get the snack, $\chi^2(1, N = 93) = 17.51, p < .01$. For the healthy dried fruit, however, 6.4% (3 out of 47) took the snack when they themselves had to scoop it, and 16.3% (8 out of 48) took a cup when the snack was already filled into cups. This difference was not significant; people were similarly likely to have the healthy snack regardless of how much physical involvement was required, $\chi^2(1, N = 96) = 2.34, p > .12$. Time of day did not impact this interaction pattern.

These results support the hypothesis that requiring less physical involvement to help themselves to unhealthy food encourages people to take it, compared to when more physical involvement is required. The fact that this effect operated selectively on unhealthy food suggests that it did not occur because the lower physical involvement might take less effort. Scooping the snack into a sampling cup oneself involved equal amounts of effort in both the healthy and the unhealthy food conditions, but it only shifted people's propensity to have the unhealthy snack.

These results suggest that how much physical involvement is required to help oneself to food (less versus more) may have quite a powerful effect. On the one hand, only a minority of people opted to have the snack. On the other hand, a waiting room is not a meal context; people did not enter the situation expecting to eat anything. Thus, the measurable impact in this type of situation is notable and important, as much human consumption is unplanned (Wansink 2006).

Study 1 provides initial evidence that requiring lower physical involvement in helping oneself to a given food may drive consumers towards unhealthy choices. While our design ensures that the effect does not in some way require an experimenter's social presence, one limitation of this naturalistic setting is the use of aggregate data. Further, this study examined only the choice between taking food and forgoing it as the focal outcome, but portion size may be more crucial in contributing to the obesity epidemic than specific food choice (Chandon and Wansink 2012). We now turn to a more controlled laboratory experiment in which we collect responses at the individual level and measure portion choice.

STUDY 2: ORDINAL PORTION SIZE DECISIONS FOR HEALTHY AND UNHEALTHY FOOD AS A FUNCTION OF PHYSICAL INVOLVEMENT REQUIRED

Study 1 demonstrated that requiring less (versus more) physical involvement in helping oneself to food increases people's likelihood of partaking of an unhealthy food (H1, H3). Study 2 tests whether requiring less (versus more) physical involvement in helping oneself to food leads consumers to select larger portions (H1), and if this effect is reduced for healthy food (H3).

Further, participants in all conditions choose from the same set of discrete portion sizes.

Method and Procedure

Seventy-five undergraduates at a large public university in the Midwest (40% female) participated in the study in exchange for partial course credit. The average age in the sample was 20.77 years, with ages ranging from 19 to 47 years.

Participants were randomly assigned to a 2 (healthiness: healthy vs. unhealthy) \times 2 (physical involvement: less vs. more) between-subjects design. Participants first imagined a situation in which they were about to buy a snack perceived as healthy or unhealthy from a snack bar with a specific serving set-up—pre-filled containers or a bulk station where people serve themselves, the former of which requires less physical involvement than the latter. Both types are common options on campus. The snacks, almonds and M&Ms, were selected based on a pretest in which 35 student volunteers had rated various snacks for their healthiness and liking on 1–7 point scales. They viewed almonds as healthier ($M = 6.29$, $SD = .99$) than M&Ms ($M = 1.43$, $SD = .56$; $t(34) = 24.11$, $p < .01$), but liked almonds ($M = 4.34$, $SD = 1.73$) just as well as M&Ms ($M = 4.97$, $SD = 1.89$; $t(34) = -1.34$, $p > .15$). Further, the M&M rating was significantly below the midpoint of the healthiness scale ($t(34) = -22.00$, $p < .01$), while the almonds rating was significantly above it ($t(34) = 16.69$, $p < .01$). Participants read:

Imagine you are getting a snack at a snack bar (e.g., in a cafeteria). You are really looking forward to a snack right now and you decide to go for almonds [M&Ms]. As this is the type of place where you serve yourself the snack into a container [the snack comes filled into containers] of a specified size (paid by weight), you will need to select which one of the available serving sizes you would like to take [get].

Next, participants chose a portion size from seven ordinal response options ranging from 4 oz. to 16 oz. (increasing in 2 ounce increments) and a no choice option 0=*none at all* (adapted from McFerran et al. 2010b). To ensure that students across conditions understood these size options in the same manner, they were told:

These are the available sizes of snack cups for the almonds [M&Ms].
For each size, the chart tells you the exact amount of almonds [M&Ms] that you will get

if you select it. That is, you will have no less and no more almonds [M&Ms] than the amount specified! Please select the serving size that you would like to serve yourself of the [get of the pre-filled] almonds [M&Ms]:

Lastly, participants reported demographics, food allergies, and dietary restrictions.

Results and Discussion

We conducted a 2 (healthiness: healthy vs. unhealthy) \times 2 (physical involvement: less vs. more) ANOVA on our dependent variable, portion size choice. Seven participants indicated restrictions relevant to the food in their condition (e.g., nut allergy in the almond condition, lactose intolerance in the M&M condition) and were excluded from the data set, leaving 68 data points for the analysis.

Neither the main effect for physical involvement ($F(1, 64) = 1.69, p > .15$) nor for the snack's healthiness ($F(1, 64) = .84, p > .3$) were significant. However, the predicted interaction between healthiness and physical involvement was significant ($F(1, 64) = 6.18, p < .05$).

Following up on the interaction, planned contrasts showed that when people thought about getting healthy almonds, they selected similar portions whether they had to serve themselves ($M = 6.11$ ounces, $SD = 2.87$) or the snack was already served for them ($M = 5.29$ ounces, $SD = 2.22$; $F(1, 64) = .72; p > .4$). By contrast, when people thought about having unhealthy M&Ms, they selected significantly smaller portions when they had to serve themselves ($M = 3.77$ ounces, $SD = 2.64$) than when the snack was already served for them ($M = 6.38$ ounces, $SD = 3.52$; $F(1, 64) = 6.96, p = .01$; see figure 2). This result supports H1 and H3.

Insert figure 2 about here

These results align with and complement those from studies 1. Less physical involvement in helping oneself to a snack nudged people towards unhealthy choices by encouraging them to select larger portions of an unhealthy snack. The detailed portion description in ounces across

conditions ensured unambiguous expectations of the exact amount of food associated with every given size option. Again, the effect emerged selectively for the unhealthy snack; hence, the larger portion choice for low physical involvement participants is not attributable to lower required effort or fear of being served too little.

The finding that less physical involvement in helping oneself to a snack food encouraged people to choose larger portions of candy (but not nuts) is suggestive of the idea that being less physically involved in helping oneself to food may attenuate guilt for unhealthy eating, since feeling guilty is a common response to eating unhealthy foods and is one factor that restrains consumers from overeating (Vohs and Heatherton 2000). In the next two studies, we test the hypothesized process: rejection of responsibility to maintain positive self-evaluative feelings. In study 3, we use fixed portion sizes to examine how responsibility and self-evaluative feelings vary by physical involvement in helping oneself to the food (less versus more) and the food's healthiness. In study 4, we allow people to make their own portion decision, to examine how the choices observed in study 2 will eventually influence their eating-related self-evaluative feelings.

STUDY 3: SENSE OF RESPONSIBILITY AS AN UNDERLYING PROCESS USING FIXED PORTIONS

Study 3 investigates the proposed process and tests our hypotheses that people feel more positively about themselves when they are less (versus more) physically involved in helping themselves to unhealthy food, and that this is because they attribute to themselves less responsibility for their consumption (H2). In other words, we test a moderated mediation model in which less (versus more) physical involvement leads people to reject responsibility for unhealthy (but not healthy) eating, which in turn allows them to feel more positively about

themselves (see figure 1, panel B). Unlike the first two studies, where we measured people's choice of consuming versus not consuming (study 1) or choice of portion size (study 2), here we use a fixed, equal portion of food in both conditions, to isolate the effect on self-evaluative feelings. We use the context of being served by a friend (versus by oneself) as our operationalization of less (versus more) physical involvement.

Method and Procedure

One hundred and sixty US-based participants were recruited through Amazon's Mechanical Turk platform (31.9% female) for nominal payment. The average age in the sample was 28.03 years, with ages ranging from 18 to 74 years. Participants completed the study on their personal computer and were randomly assigned to a 2 (healthiness: healthy vs. unhealthy) \times 2 (physical involvement: less vs. more) between-subjects design. First, they were instructed to imagine that friends had invited them for a meal cooked from scratch, and that they were ready to eat. Next, participants in the more [less] physical involvement conditions read:

Once you have sat down at the dinner table, you serve yourself [your friend serves you] the food onto your plate. Imagine that you fill [your friend fills] your plate with a portion of the food that they cooked. After you have helped yourself [your friend has helped you] to the food, you start eating from your plate. This is what you served yourself [what your friend served you]:

Participants were then shown a photograph of either a plate of healthy foods (grilled chicken, vegetables, wild rice, and a granola bar) or a plate of unhealthy foods (cheeseburger, French fries, baked beans, and a cookie). Portion size was held constant whether one served the food oneself or was served (see figure 3). To effectively hold portion size constant, we chose a hypothetical study for two reasons. First, it is unrealistic (and ethically problematic) to force people to consume a sizable portion of food. Second, *forcing* a portion size on participants without any choice in the matter risks impacting their sense of control in additional ways, but having them *imagine* choosing and eating any particular portion avoids these issues.

Insert figure 3 about here

Measures

Healthiness. Subsequently, participants rated on a 0–100 scale how healthy, nutritious, and wholesome they thought the food was, yielding a “healthiness index” ($\alpha = .95$). They also estimated how many calories this meal had.

Responsibility. Next, respondents rated on a 0–100 scale how much responsibility they felt for their consumption.

Positive self-evaluative feelings. Then they rated on a 0–100 scale how good as well as how justified, guilty, and shameful they would feel about themselves after eating this meal, which yielded a composite index for “positive self-evaluative feelings” ($\alpha = .91$).

Lastly, as an attention check, participants were asked to recall who had served the food in the scenario and what kind of food it had been, and they reported demographic information.

Results

We conducted 2 (healthiness: healthy vs. unhealthy) \times 2 (physical involvement: less vs. more) ANOVAs on the healthiness index, calorie estimate, positive self-evaluative feelings index, and responsibility.

Manipulation checks. For the healthiness index, the analyses yielded the predicted main effect for healthiness of the food ($F(1, 156) = 779.57, p < .01$). As anticipated, the food was perceived as significantly healthier in the healthy condition ($M = 85.61, SD = 10.02$) than in the unhealthy condition ($M = 28.45, SD = 15.41$). Neither the main effect of physical involvement ($F(1, 156) = .26, p > .6$) nor the interaction between healthiness and physical involvement ($F(1, 156) = .63, p > .4$) were significant. There was a similar significant main effect for healthiness on calorie estimation ($F(1, 154) = 78.96, p < .01$), such that people expected more calories for

the unhealthy meal ($M = 1115.12$, $SD = 417.23$) than the healthy meal ($M = 627.35$, $SD = 286.64$). Moreover, the cheeseburger rating was significantly below the midpoint of the healthiness scale ($t(76) = -12.27$, $p < .01$), while the grilled chicken rating was significantly above it ($t(82) = 32.39$, $p < .01$). Thus, the healthiness manipulation was successful.

Responsibility. For responsibility, the analysis revealed a significant main effect for physical involvement ($F(1, 156) = 6.45$, $p < .05$), such that people who imagined serving themselves assumed greater responsibility ($M = 87.32$, $SD = 14.77$) than those who imagined being served ($M = 80.80$, $SD = 18.62$). There was also a main effect of healthiness ($F(1, 156) = 4.39$, $p < .05$), such that people assumed greater responsibility for healthy chicken ($M = 86.72$, $SD = 14.70$) than for unhealthy cheeseburgers ($M = 81.02$, $SD = 19.03$). More important, these two main effects were qualified by a significant interaction ($F(1, 156) = 4.07$, $p < .05$).

Following up on this interaction, planned contrast tests showed that for healthy chicken, those who imagined being served by someone else assumed virtually as much responsibility ($M = 86.02$, $SD = 12.73$) as those who imagined serving themselves ($M = 87.44$, $SD = 16.62$; $F(1, 156) = .15$, $p > .6$). Conversely, for unhealthy cheeseburgers, those who imagined being served by another person accepted much less responsibility ($M = 75.33$, $SD = 22.12$) than those who imagined serving themselves ($M = 87.19$, $SD = 12.64$; $F(1, 156) = 9.96$, $p < .01$; see figure 4), signaling a self-serving attribution. These results are consistent with H2 and H3.

Insert figure 4 about here

Positive self-evaluative feelings. For positive self-evaluative feelings, the analysis yielded a main effect for healthiness of the food ($F(1, 155) = 176.36$, $p < .01$), such that those who imagined eating healthy chicken felt better about themselves ($M = 86.28$, $SD = 17.77$) than those who imagined eating unhealthy burgers ($M = 48.99$, $SD = 17.73$). This effect was qualified

by a significant interaction between healthiness and physical involvement ($F(1, 155) = 3.88, p = .05$). The main effect for physical involvement was not significant ($p > .2$).

Following up on the significant interaction, planned contrasts showed that for healthy chicken, people expressed similarly high positive self-evaluative feelings whether they imagined serving themselves ($M = 87.36, SD = 17.86$) or being served by someone else ($M = 85.20, SD = 17.82; F(1, 155) = .30, p > .5$). In contrast, for unhealthy cheeseburgers, they had more positive (or rather, less negative) self-evaluative feelings when they imagined being served by someone else ($M = 53.51, SD = 17.71$) versus serving themselves ($M = 44.47, SD = 17.76; F(1, 155) = 4.97, p < .05$; see figure 5). These results support H2 and H3.

Insert figure 5 about here

Test for mediation. We tested a moderated mediation model in which feelings of responsibility for one's consumption mediate the effects of physical involvement in helping oneself to the food (less versus more) on positive self-evaluative feelings, and healthiness moderates the effect of physical involvement on feelings of responsibility (figure 1, panel B). Accordingly, we submitted our data to a moderated mediation analysis employing Hayes' (2013) process macro, specifically testing a model in which path a , from independent variable to mediator, is moderated (model 7).

In line with our theory, a bootstrap analysis testing the indirect effect of physical involvement on positive self-evaluative feelings through attributions of responsibility, conditional on healthiness of the food, showed that for unhealthy food, responsibility mediated the observed effect ($b = 17.76, SE = 9.26; 95\% CI = 4.03 - 40.50$). In contrast, for healthy food, responsibility did not mediate the effect ($b = 1.84, SE = 5.08; 95\% CI = -6.49 - 13.88$).

Discussion

Study 3 shows that in order to feel better about their eating decisions, people make self-attributions of responsibility, rejecting responsibility selectively for unhealthy eating when they are less physically involved in helping themselves to the food, operationalized as being served by a friend or serving oneself.² In study 3, we held portion size constant to extract the impact of less (versus more) physical involvement on self-evaluative feelings for a given portion of food. Having established that less physical involvement in helping oneself to a given amount of unhealthy food allows people to reject responsibility and thus feel better, the next study tests the full model comprehensively. That is, we examine whether less physical involvement leads people to choose larger portions of unhealthy food because they feel less responsible and thus “can get away with it,” without feeling bad about themselves. Accordingly, in study 4, we let people choose their own portion size to test whether a lowered sense of responsibility, due to less (versus more) physical involvement in helping themselves to unhealthy food, allows them to choose larger portions without feeling any worse.

***STUDY 4: FULL TEST OF SENSE OF RESPONSIBILITY AS PROCESS USING
PORTION CHOICE AS A COVARIATE***

Study 1 showed that requiring less physical involvement to help oneself to food encourages consumers to partake of unhealthy food, and study 2 that it leads them to choose larger portion sizes of unhealthy foods. Study 3 showed that, for a fixed portion of food, being less physically involved in helping oneself to the food allows consumers to reject responsibility for unhealthy eating, and thus to feel more positively about themselves. In line with these results, we hypothesized that the choice effects in study 2 occur because when consumers are less

physical involved in helping themselves to a food, they can essentially “get away with” a larger portion without feeling any worse. Study 4 formally tests this overarching idea, unifying H1, H2, and H3 in one model, in the context of being served by a server.

Method and Procedure

One hundred and seventy-nine undergraduates at a large public university in the Midwest (61.5% female) participated in the study in exchange for partial course credit. The average age in the sample was 20.60 years, with ages ranging from 19 to 30 years.

Participants were randomly assigned to a 2 (healthiness: healthy vs. unhealthy) \times 2 (physical involvement: less vs. more) between-subjects design. They were instructed:

Imagine you are invited to a catered event. It is time to eat, so you walk up to the food station. You check out what is offered, and you decide to have some macaroni and cheese [roasted vegetables]. Then you serve yourself [a server serves you] the macaroni and cheese [roasted vegetables] onto your plate. Imagine taking the serving spoon and [the server] scooping macaroni and cheese [roasted vegetables] onto your plate.

Measures

Portion size choice. Subsequently, participants indicated which portion size they would choose in this situation by selecting one of ten images, depicting a white plate with one, two, (...), ten, scoops of a particular food (see figure 6). This visual depiction ensured that people across conditions had the same understanding of the portion sizes, and it helped us eliminate any potential uncertainty regarding portion size, inferences about servers’ motivation to over- or underserve, or personal skills with respect to being able to serve oneself a desired portion size.

Insert figure 6 about here

Responsibility. Subsequently, participants rated on a 0–100 scale how responsible they felt for their consumption and to what degree they felt in control over their consumption. These two items were combined into a “responsibility index” ($r = .41, p < .001$).

Positive self-evaluative feelings. They also rated on a 1 (not at all) – 9 (very much) scale how good, how justified, how guilty, and how shameful they would feel about themselves after eating this meal, yielding a composite index for “positive self-evaluative feelings” ($\alpha = .6$)³.

Healthiness. Lastly, participants indicated on a 0–7 scale how healthy they thought the food in the scenario was, serving as a manipulation check. Finally, they reported demographic information and any dietary restrictions and food allergies.

Results

We conducted 2 (healthiness: healthy vs. unhealthy) \times 2 (physical involvement: less vs. more) ANOVAs on our dependent variables; healthiness, portion choice, and the responsibility and positive self-evaluative feelings indices. Five participants indicated dietary restrictions pertaining to the food in their condition (e.g., gluten- or dairy-free diet in the macaroni and cheese condition) and were excluded from the data set, leaving 174 data points for the analysis.

Manipulation check. For the healthiness rating, the analyses yielded the predicted main effect for healthiness of the food ($F(1, 170) = 297.90, p < .05$). As anticipated, the food was perceived as significantly healthier in the healthy condition ($M = 5.90, SD = 1.05$) than in the unhealthy condition ($M = 2.33, SD = 1.02$). Neither the effect of physical involvement ($F(1, 170) = .21, p > .7$) nor the interaction between healthiness and physical involvement ($F(1, 170) = 1.72, p > .15$) were significant. Further, the macaroni and cheese rating was significantly below the midpoint of the scale ($t(83) = -10.46, p < .01$), while the vegetable rating was significantly above it ($t(89) = 21.69, p < .01$). Thus, the healthiness manipulation was successful.

Portion choice. For portion choice, the analyses revealed a main effect for healthiness ($F(1, 170) = 10.44, p = .001$), such that people selected larger portions of the unhealthy macaroni and cheese ($M = 4.58, SD = 2.25$) than the healthy roasted vegetables ($M = 3.71, SD = 1.38$).

The main effect of physical involvement was also significant ($F(1, 170) = 5.50, p < .05$), such that people chose larger portions when they were served by a server ($M = 4.44, SD = 2.11$) than when they were serving themselves ($M = 3.83, SD = 1.61$). More importantly, the interaction between healthiness and physical involvement was also significant ($F(1, 170) = 4.76, p < .05$).

Following up on the interaction, planned contrasts showed that for healthy vegetables, people selected similar portions regardless of whether they had to serve themselves ($M = 3.69, SD = 1.49$) or the food was served for them ($M = 3.73, SD = 1.29; F(1, 170) = .01; p > .9$). By contrast, for unhealthy macaroni and cheese, people selected a significantly larger portion when they were served by a server ($M = 5.22, SD = 2.55$) than when they had to serve themselves ($M = 3.98, SD = 1.74; F(1, 170) = 9.90, p < .01$; see figure 7). These results are consistent with study 2 and with our proposed H1 and H3.

Insert figure 7 about here

Responsibility. For responsibility, the analysis revealed a main effect of physical involvement ($F(1, 170) = 8.28, p < .01$), such that people felt less responsible when served by a server ($M = 76.63, SD = 23.91$) than when serving themselves ($M = 85.34, SD = 15.70$). The effect of healthiness was not significant ($F(1, 170) = 2.37, p > .1$), but critically, the interaction between physical involvement and healthiness was significant ($F(1, 170) = 5.51, p < .05$).

Following up on the interaction, planned contrasts showed that for healthy vegetables, people felt similarly responsible for their consumption regardless of whether they had to serve themselves the food ($M = 83.81, SD = 15.63$) or the food was served for them ($M = 82.21, SD = 20.05; F(1, 170) = .15; p > .7$). By contrast, for unhealthy macaroni and cheese they accepted significantly less responsibility when they were served by a server ($M = 70.51, SD = 26.44$), compared to when they had to serve themselves ($M = 86.24, SD = 15.85; F(1, 170) = 13.19, p <$

.001; see figure 8). These results replicate study 3 and support H2 and H3.

Insert figure 8 about here

Positive self-evaluative feelings. For positive self-evaluative feelings, there was a main effect of healthiness ($F(1, 170) = 7.72; p < .01$), such that people felt less positively about themselves when having unhealthy macaroni and cheese ($M = 6.45, SD = 1.50$) than when having healthy roasted vegetables ($M = 7.01, SD = 1.14$). However, there was no significant main effect for physical involvement ($F(1, 170) = .24, p > .6$), and no interaction between physical involvement and healthiness ($F(1, 170) = 1.4, p > .2$). This result is consistent with our theory: when people feel responsible for their consumption (as they do when they serve themselves), they should choose smaller portion sizes so that they can *maintain* positive self-evaluative feelings. This proposed process (as depicted in figure 1, panel B) is tested next.

Tests for mediation. We tested the two moderated mediation models, corresponding to panels A and B, respectively, in figure 1. First, we tested the basic model depicted in figure 1, panel A, in which portion choice is variable and up to the consumer. We tested whether feelings of responsibility mediate the effect of physical involvement on portion choice, and whether healthiness moderates the effect of physical involvement on sense of responsibility. We submitted our data to a moderated mediation analysis employing Hayes' (2013) process macro, testing a model in which path a , from independent variable to mediator, is moderated (model 7).

In line with our theory, a bootstrap analysis with 10,000 iterations testing the indirect effect of physical involvement through feelings of responsibility on portion choice, conditional on healthiness, showed that for unhealthy food, responsibility mediated the observed effect ($b = -.29, SE = .14; 95\% CI = -.66 - -.08$). In contrast, for healthy food, responsibility did not mediate the effect ($b = -.03, SE = .08; 95\% CI = -.22 - .10$). These results align with H1, H2, and H3.

Next, we tested the model depicted in figure 1, panel B, in which portion choice must be either held constant or taken into account, because according to our theory it covaries with physical involvement and the food's healthiness. That is, we tested whether feelings of responsibility mediate the effect of physical involvement in helping oneself to the food (less versus more) on positive self-evaluative feelings, contingent on the change in portion choice induced by physical involvement.⁴ We conducted a moderated mediation analysis as detailed previously (model 7), but took into account portion choice by using it as a covariate on path *b*.

In line with our theory, a bootstrap analysis with 10,000 iterations testing the indirect effect of physical involvement through feelings of responsibility on self-evaluative feelings, conditional on healthiness and using portion choice as a covariate, showed that for unhealthy food, responsibility mediated the observed effect ($b = .29$, $SE = .10$; 95% CI = .13 – .52). In contrast, for healthy food, responsibility did not mediate ($b = .03$, $SE = .07$; 95% CI = -.12 – .18). Although any mediation test relies on correlation, these results are consistent with H2 and H3.

Discussion

Study 4 provides comprehensive evidence for the full conceptual process model that we propose. Being less (versus more) physically involved in helping oneself to unhealthy (versus healthy) food caused people to reject responsibility, leading them to choose larger portions but enabling them to maintain a more positive self-evaluation. Indeed, the results of a mediation analysis were consistent with the idea that thanks to a lower sense of responsibility people may allow themselves to choose larger portions of unhealthy foods without compromising their self-evaluation. As such, study 4 supports the overall model suggested by our theory.

STUDY 5: CONTINUOUS PORTION SIZE DECISIONS FOR HEALTHY AND

UNHEALTHY FOOD AS A FUNCTION OF PHYSICAL INVOLVEMENT REQUIRED

Studies 1 and 2 demonstrated that requiring less (versus more) physical involvement in helping oneself to food increases people's likelihood of partaking of an unhealthy food and selecting larger portions, respectively. Studies 3 and 4 provided evidence that this may be driven by a reduced sense of responsibility for unhealthy decisions, protecting their self-evaluative feelings. Study 5 was designed to provide insight into how the dynamics studied in the previous experiments play out in a more externally valid setting assessing real consumption (i.e., beyond choice). We use being served by a server (versus serving oneself) to operationalize less (versus more) physical involvement, to test whether less physical involvement in helping oneself to food ultimately causes people to obtain and consume larger amounts of unhealthy food.

Method and Procedure

One hundred and eighty-four undergraduates at a Canadian university (56.8% female) participated in the study for partial course credit. The average age in the sample was 21.28 years, with ages ranging from 19 to 37 years. Participants were randomly assigned to a 2 (healthiness: healthy vs. unhealthy) \times 2 (physical involvement: less vs. more) between-subjects design. Under the guise of a taste test for a cafeteria, they read that they would have the chance to sample one of two food options. People in the healthy [unhealthy] condition could choose between multigrain and flaxseed bread [cranberry-orange and banana-chocolate cake].

Note that the foods were selected based on a pretest in which 30 students from a different university had rated various foods for their healthiness and liking on 1–7 point scales. Students viewed breads as healthier ($M = 5.20$, $SD = 1.35$) than cakes ($M = 2.03$, $SD = 1.19$; $t(29) = 8.82$, $p < .01$), but liked breads ($M = 4.63$, $SD = 1.71$) just as well as cakes ($M = 4.80$, $SD = 1.47$; $t(29) = -.39$, $p > .7$). The cakes rating was significantly below the midpoint of the healthiness scale

($t(29) = -9.06, p < .01$), while the bread rating was significantly above it ($t(29) = 4.87, p < .01$).

They read: “When you have decided, please cut and serve yourself [let the researcher serve you] a slice of the bread [cake].” They also read that they would have to leave any uneaten food in the laboratory after the session and could only try one of the two options. Next, those in the more physical involvement condition cut themselves a slice of the cake [bread] they selected. Those in the less physical involvement conditions were served a pre-cut slice of their chosen cake [bread] by a research assistant. Lastly, participants completed mock taste evaluation questions and demographics.

We measured the weight of the slice each participant served herself by recording the weight of the loaf of bread [cake] pre- and post-session. We pre-determined the weight of the other-served slice by mimicking popular café chains: 100g cake slices (based on Starbucks’ 100-126g for slices of loaf cakes), and 45g bread slices (based on Panera Bread’s 55g slices of whole grain breads). Note that the slightly lower weights for the slices served by a server make for a more conservative test: if people serve themselves an amount of cake that is even smaller than this modest pre-selected other-served size, we can be more confident about the effect.

Additionally, we measured the amount each participant actually consumed, subtracting the weight of each person’s leftovers from the amount served. The specific choice between the two healthy [unhealthy] options is irrelevant to the hypothesis and thus was not analyzed.

Results and Discussion

We conducted 2 (healthiness: healthy vs. unhealthy) \times 2 (physical involvement: less vs. more) ANOVAs on the amount (grams) served, and the amount (grams) consumed.

Amount served. For amount served, the analysis yielded a main effect for healthiness of the food ($F(1, 180) = 90.5, p < .01$), such that the portions of those tasting unhealthy cake ($M =$

73.19g, SD = 37.08) were larger than of those tasting healthy bread (M = 44.56g, SD = 16.43). There was also a main effect of physical involvement ($F(1, 180) = 96.27, p < .01$), such that the portions of those serving themselves (M = 43.46g, SD = 30.76) were smaller than of those served by the research assistant (M = 67.20g, SD = 26.72). More importantly, the predicted interaction between healthiness and physical involvement was significant ($F(1, 180) = 65.13, p < .01$).

Following up on the significant interaction, planned contrasts showed that when tasting healthy bread people's portion size were about equal, whether they served themselves (M = 41.21g, SD = 26.34) or were served by someone else (M = 46.57g, SD = 3.40; $F(1, 180) = 1.68, p = .2$). In contrast, when tasting unhealthy cake, people's portions were significantly smaller when they served themselves (M = 45.65g, SD = 34.72) than when they were served by someone else (M = 100.72g, SD = 4.82; $F(1, 180) = 145.53, p < .01$). This result supports H1 and H3.

Amount consumed. Not surprisingly, amount served and amount consumed were strongly related ($r(183) = .69, p < .01$). For amount consumed, the analysis yielded a main effect for healthiness of the food ($F(1, 180) = 62.91, p < .01$), such that those tasting unhealthy cake (M = 51.39g, SD = 39.39) ate larger amounts than those tasting healthy bread (M = 17.08g, SD = 17.83). There was also a main effect of physical involvement ($F(1, 180) = 4.72, p < .05$), such that those served by the research assistant ate larger amounts (M = 33.22g, SD = 36.55) than those serving themselves (M = 30.37g, SD = 29.80). More importantly, the predicted interaction between healthiness and physical involvement was significant ($F(1, 180) = 19.37, p < .01$).

Following up on the significant interaction, planned contrasts showed that when tasting healthy bread people ate marginally more when they served themselves (M = 22.90g, SD = 23.20) than when they were served by someone else (M = 13.58g, SD = 12.62; $F(1, 180) = 2.78, p = .1$), suggesting a slight self-enhancement effect not present in our other studies. In contrast,

when tasting unhealthy cake, they ate significantly larger amounts when served by someone else ($M = 65.13g$, $SD = 40.18$) than when serving themselves ($M = 37.65g$, $SD = 33.79$; $F(1, 180) = 19.67$, $p < .01$). This result supports H1 and H3.

Reinforcing the choice results from studies 2 and 4, these results show that consumers' portion size and eating decisions depend jointly on whether the food is healthy or unhealthy and on the level of physical involvement required to obtain it. When the food was healthy, consumers' portion and consumption amounts were less affected by who served the food (self versus other). When the food was unhealthy, both portion sizes and consumption amounts were significantly larger when participants were served by someone else than when they served themselves. This pattern emerged even though participants had chosen the food themselves. Again, the results are in line with the idea that being less physically involved in helping oneself to one's food may enable a self-serving discharge of responsibility, causing consumers to increase the amount of unhealthy food they are served and subsequently eat.

Although it is most ecologically valid to pre-determine the amounts served by a server based on actual common portions in the industry, one may be concerned that our results could depend on the (arbitrary) industry-set amounts being overly large. We fully acknowledge that the effect found here may disappear or be reversed if the pre-determined slice sizes were set considerably smaller. However, portion oversizing affects both healthy and unhealthy foods (Smiciklas-Wright et al. 2003), meaning that the focal interaction result may not be affected much. In addition, our results held similarly for portion choice and consumption, the latter of which all participants had full control over, further suggesting that the effect is not purely driven by the pre-determined portion sizes in the low physical involvement conditions.

GENERAL DISCUSSION

The findings of various studies show that eating out is associated with more extensive consumption and weight gain (Bezerra, Curioni, and Sichieri 2012; Todd, Mancino, and Lin 2010), and the complex connection between eating out and obesity has been studied from a variety of angles. In this paper, we propose that one variable that is often associated with eating away from home but has been neglected thus far can contribute to obesity: the mere circumstance of being less, rather than more, physically involved in helping oneself to one's food. We argue that two common aspects of eating away from home—being less involved in portion choice and the physical act of serving—can be associated with consumers abdicating their personal responsibility for what they eat.

Based on the literature on self-serving attributions, we made the novel prediction that lower physical involvement in the process of helping oneself to food enables people to attribute responsibility away from themselves. As a result, less (versus more) physical involvement in helping oneself to unhealthy food causes consumers to feel better about themselves. We predicted that anticipating these effects should lead consumers to adjust their consumption, including their (a) decision to consume or forego unhealthy foods and (b) portion size selection.

Five experimental laboratory studies with college student and Amazon Turk populations provide support for this model. First, we demonstrated the predicted effects: participants were indeed more likely to partake of unhealthy snacks instead of forgoing them (study 1), and they also chose larger portions of unhealthy snacks (study 2) when less (versus more) physical involvement was required to obtain those snacks. Next, we provided evidence for the hypothesized process: participants rejected responsibility when they were less (versus more) physically involved in helping themselves to a fixed portion of an unhealthy meal, and as a result

they felt more positive self-evaluative feelings (study 3). Correspondingly, our data was consistent with the theory that larger portion choices of unhealthy foods under less physical involvement occur because feeling less responsible allows them to select larger portions without feeling bad afterwards, in spite of choosing a larger portion (study 4). Although these psychological mechanisms were measured in hypothetical scenario studies, the consistent pattern across studies, including the moderation by healthiness, provides strong process evidence. One limitation may be that in studies 3 and 4, participants rated their sense of responsibility before their self-evaluative feelings, so it is not entirely clear to what degree the impact on self-evaluative feelings is spontaneous. However, the effect on portion choice emerged spontaneously when participants made their portion size choice without (studies 2 and 5) or before (study 4) rating their responsibility. This suggests that at least the ascription of responsibility, and likely the impact on self-evaluative feelings, occur extemporaneously.

Critically, these effects of lower physical involvement in helping oneself to food on food and portion size choice, attributed responsibility, and self-evaluative feelings arose independently of making a choice, emerging even when people chose food or portion size themselves. This research offers theoretical insight into consumers' eating decisions and suggests a new and actionable tool to nudge consumers towards healthier eating.

The asymmetrical nature of the findings across healthy versus unhealthy food is also consistent with the self-serving attribution. People engage in more extensive causal reasoning for negative events than positive events (see Alicke and Sedikides 2009; Bohner et al. 1988), so any motivated reasoning should be more pronounced for unhealthy than for healthy food. In addition, one might argue that claiming *just as much* responsibility for healthy eating when one is passively served as when one actively serves the food, is also a self-serving attribution.

In a recent review by Wansink and Chandon (2014), the authors argue that three major categories of factors influencing food consumption, namely sensory, emotional, and normative factors, operate chiefly by biasing our consumption monitoring. Further, it has been suggested that attention to the amount consumed is key to exerting self-control in eating (Redden and Haws 2013). Is less (versus more) physical involvement in helping oneself to food merely another way to reduce monitoring or attention? While it is possible that being less physically involved reduces people's attention to the precise amounts, there is reason to believe that this is not the primary driver underlying our findings. For instance, in studies 2 and 4, all participants selected their portion size. They all faced the same decision task in the same fashion and saw a description of the portion in ounces or as an image, respectively. Thus, their level of monitoring at this decision stage was most likely equivalent, yet one group chose larger portions. Further, if reduced monitoring was the primary driver (rather than motivated reasoning), perceived responsibility and portion sizes should be affected for unhealthy *and* healthy foods. This is not what we find. It is conceivable, however, that being less physically involved in helping themselves to food allows consumers to turn a blind eye and deliberately stop monitoring, ultimately contributing to their ability to reject responsibility. Future research from a cognitive angle could test if attention to portion size as well as to the amount consumed differs by physical involvement *and* healthiness, using techniques such as eye-tracking to quantify the role of visual monitoring.

One limitation of our approach is its focus on foods *perceived* as (un)healthy, a subjective judgment that may in itself be subject to motivated reasoning in certain circumstances. While we did not find physical involvement to impact perceptions of healthiness, future research may seek to determine when consumers are more likely to distort their subjective inferences about the food, versus when they are more likely to resort to other types of motivated reasoning (such as

retribution of responsibility or licensing). Further, our laboratory studies used fairly modest portion sizes, and it is possible that the sizes *perceived* to be “right” vary more outside of the lab. We believe this yields a stronger test of our hypothesis, but larger portions outside the lab may be influenced by additional factors, such as implicit theories linking “unhealthy” with “tasty” (Raghunathan et al. 2006) or “healthy” with “less filling” (Finkelstein and Fishbach 2011).

Our studies show that being more physically involved in helping oneself to unhealthy food leads to more negative self-evaluative feelings than being less physically involved, even if the foods are identical. Further, participants seem to anticipate this effect and adjust their consumption accordingly. What might these results mean for a person’s eating experience? How might this effect be implicated in the rise in obesity associated with the increase in eating out? First, if less physical involvement in helping oneself to a given food leads to larger portion size choices, it indirectly contributes to greater consumption, given that portion size is one of the best predictors of intake (Diliberti et al. 2004; Rozin et al. 2003). Second, if being less physically involved in helping oneself to food affords individuals the motivated reasoning necessary to protect a positive self-view, then being served a lavish meal allows them to indulge without feeling badly about it. Avoiding such negative self-evaluative feelings may then afford unhealthy eating on the next occasion. Thus, as people are usually less physically involved in helping themselves to food when eating away from home, doing so may increase, on average, the frequency and size of unhealthy choices and thereby contribute to weight gain. While our laboratory studies provide evidence for our basic premise and an underlying psychological mechanism, future research may wish to measure directly the relationship between being less physically involved in serving and caloric intake in restaurant settings.

In the long run, consumption of hedonically appealing but less healthy foods may be

chronically reinforced through low physical involvement in helping oneself to one's food. High physical involvement in serving oneself, in contrast, may discourage unhealthy eating long-term, given that retrospective regret can discourage subsequent purchases (Patrick, Lancellotti, and Hagtvedt 2009). Not least, to the extent that eating and health are identity-relevant domains, more positive self-evaluation here may boost one's overall self-esteem (Crocker et al. 2003).

This research suggests contrasting implications for restaurateurs and policy-makers. Hospitality providers may benefit from enabling consumers to savor consumption experiences more by serving indulgent vice foods to customers and discouraging self-service in any form. Public entities might combat over-indulgence and obesity by implementing serve-yourself pay-per-weight setups in certain dining environments. Likewise, consumers may leverage these insights to nudge themselves toward healthier decisions. For example, making it a rule to formally serve oneself even from a so-called single-serve package may help consumers hold themselves accountable for, and in turn curb their portions of, even small snacks that they consume during the day. Using family-style bowls so that everyone can serve their own portion may aid in reducing portions as well.

There are a number of ways our research can be extended. First, it would be valuable to conduct large-scale field experiments to test the robustness and magnitude of the effect of being served on food and portion size choice outside of the laboratory, comparing intake in restaurants based on standard being-served and family-style serve-yourself procedures. Intervention data would help generalize and quantify the impact of such serving-style manipulations on the average meal. Second, we focused on only one specific manner in which a consumer can be more or less agentic with respect to food consumption, namely how physically involved consumers are in serving the food. Food preparation is another manifestation of agency in food

consumption. Studies investigating the effect of preparing one's own food could span a range from actually cooking a whole dish from raw ingredients to combining elements of a packaged mix. This important aspect of food consumption should certainly be studied in-depth. Further, our studies suggest that consumers have an intuition of how certain consumption situations will make them feel. Lay intuitions can strongly impact consumer decisions, regardless of whether they are correct or rational (Raghunathan et al. 2006). If consumers possess a strong lay theory that being less physically involved in helping themselves to their food will reduce their consumption guilt, they may actively seek out being served for unhealthy foods, or pay up for it.

Future studies might also consider boundary conditions to the “physical involvement effect” (less versus more). For instance, when other situational factors assert or abdicate responsibility (e.g., social pressures to eat an offered food), the effect may weaken. Further, our studies were limited to food consumption, but other research has demonstrated that consumers seek justification for vice-type consumption in many domains. For example, they use their having expended effort to obtain the vice (Kivetz and Simonson 2002; Mukhopadhyay and Johar 2009) or having received a special promotion for it (Khan and Dhar 2010) to legitimize vice purchases. Our findings might extend to these and other domains involving vice/virtue conflicts, such as saving versus spending. For instance, consumers may feel equally responsible for automated versus actively authorized deposits into their savings account, but they may feel less responsible for automated versus actively made credit card payments. Future research might explore whether our physical involvement effect extends to other domains. Lastly, it may be instructive to examine the interplay of satisfaction with the *self* and satisfaction with the *product* in the consumption process. Might dissatisfaction with the self spill over to dissatisfaction with the product? These and other questions await future research.

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FOOTNOTES

¹ Note that evaluations of healthiness are subjective and relative by nature. Much work shows that it is the *perception* that a food is (un)healthy that drives behavior (e.g., Raghunathan, Naylor, and Hoyer 2006), and, moreover, that food-related information is often interpreted in self-serving ways (Chernev 2011; Wansink and Chandon 2006). Thus, this paper focuses on consumers' reactions to foods they *perceive* as healthy or unhealthy. For ease of reading, throughout the manuscript we use “healthy” and “unhealthy” to mean perceived-to-be-healthy and perceived-to-be-unhealthy, as established by pretests of the stimuli.

² One concern with the scenario used here is that participants may have had the perception that they had little choice in whether or not to take the food. It is customary not to refuse food at someone else's home. In another study, we used a catered event scenario and the results were conceptually replicated. Details of this study are available in the Web Appendix.

³ While these items are the same used with high internal consistency in study 3, here, “justified” appeared to fit less well with the other items. Without “justified” Cronbach's α is .66, and the results remain robust with a 3-item Positive Feelings index.

⁴ Note that there is no direct effect of physical involvement on portion choice, just as predicted by our model, in which the (in)ability to reject responsibility for unhealthy eating causes people to adjust their portion choices in order *to maintain and keep constant* their positive evaluation. As such, we are testing an indirect-only effect (Zhao, Lynch, and Chen 2010). For an overview of mediation without a direct effect, or “indirect-only” effects, please refer to Hayes (2009), Zhao et al. (2010), or examples such as Lee et al. (2015), Spiller (2011), and Wilcox, Block, and Eisenstein (2011).

FIGURES

FIGURE 1:

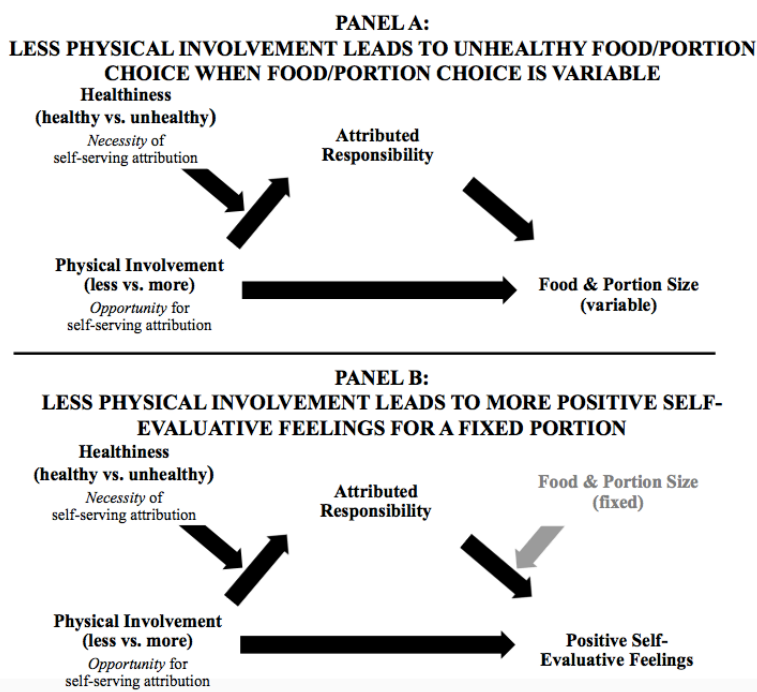


FIGURE 2:

STUDY 2: LESS PHYSICAL INVOLVEMENT IN HELPING ONESELF TO UNHEALTHY FOOD LEADS TO LARGER PORTION CHOICES

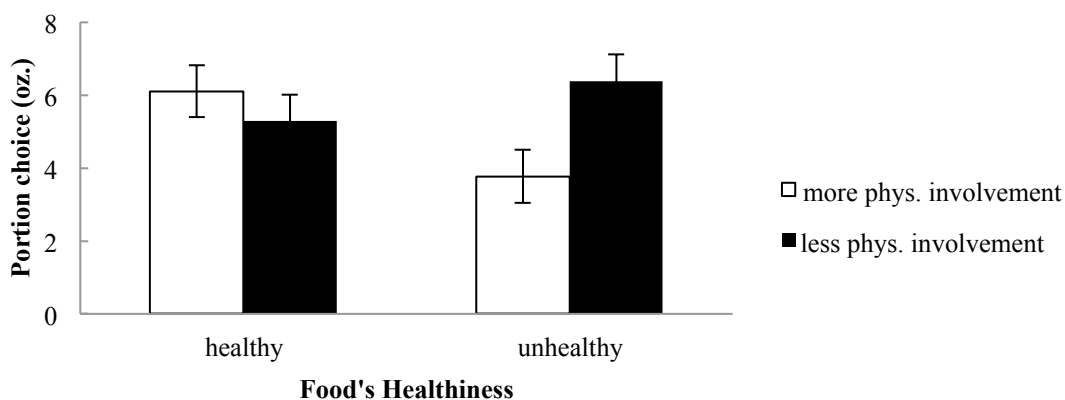


Figure 2: Portion choice as a function of both physical involvement required to help oneself to the food and food's healthiness in study 2

Note: For the healthy almonds, physical involvement had no impact on portion choice, but for the unhealthy M&Ms, less (versus more) physical involvement led people to choose larger portions.

**FIGURE 3:
FOOD IMAGES USED IN STUDY 3**



Figure 3: Stimulus material used in study 3: Plate of healthy (chicken, vegetables, wild rice) vs. unhealthy food (cheeseburger, fries, cookie)

**FIGURE 4:
STUDY 3:
LESS PHYSICAL INVOLVEMENT IN HELPING ONESELF
TO UNHEALTHY FOOD CAUSES REJECTION OF
RESPONSIBILITY**

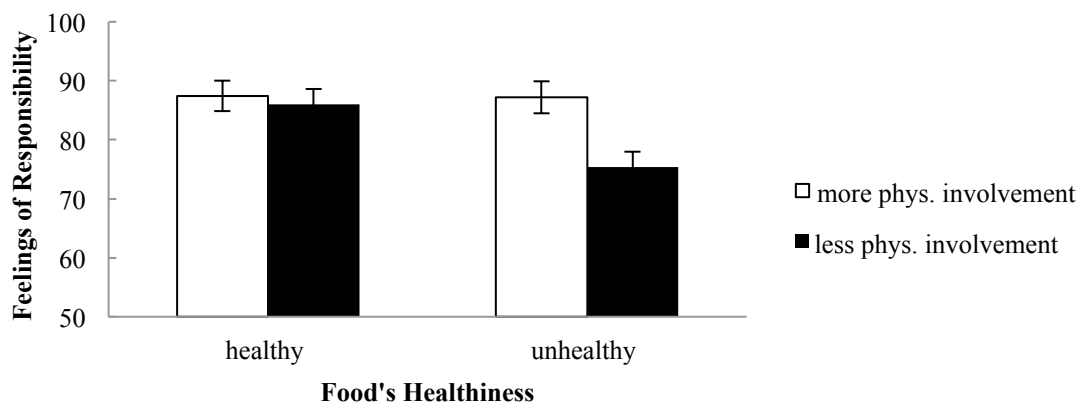


Figure 4: Perceived responsibility after eating as a function of both physical involvement in helping oneself to the food and food's healthiness in study 3

Note: For the healthy chicken, physical involvement had no impact on feelings of responsibility, but for the unhealthy cheeseburger, less (versus more) physical involvement led people to accept less responsibility.

FIGURE 5:

**STUDY 3:
LESS PHYSICAL INVOLVEMENT IN HELPING ONESELF
TO FOOD LEADS TO MORE POSITIVE SELF-EVALUATIVE
FEELINGS**

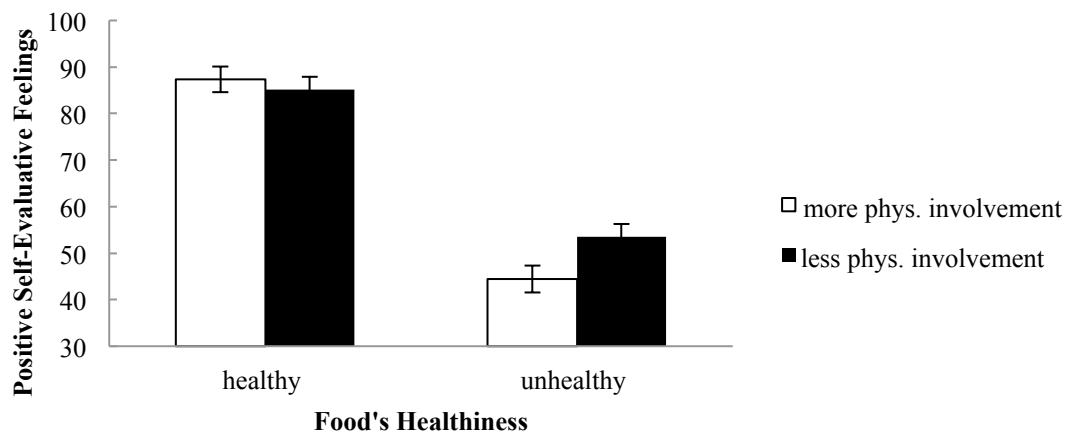


Figure 5: Positive self-evaluative feelings after eating as a function of both physical involvement in helping oneself to the food and food's healthiness in study 3

Note: For the healthy chicken, physical involvement had no impact on self-evaluative feelings, but for the unhealthy cheeseburger, less (versus more) physical involvement led people to feel better about themselves.

FIGURE 6:**FOOD IMAGES USED IN STUDY 4**

Figure 6: Food images used as part of the portion choice measure in study 4 (unhealthy condition: macaroni and cheese)

How much macaroni and cheese would you have the server scoop?



FIGURE 7:

**STUDY 4:
LESS PHYSICAL INVOLVEMENT IN HELPING ONESELF
TO UNHEALTHY FOOD LEADS TO LARGER PORTION
CHOICES**



Figure 7: Portion size choice as a function of both physical involvement required to help oneself to the food and food's healthiness in study 4

FIGURE 8:

**STUDY 4:
LESS PHYSICAL INVOLVEMENT IN HELPING ONESELF
UNHEALTHY FOOD CAUSES REJECTION OF
RESPONSIBILITY**

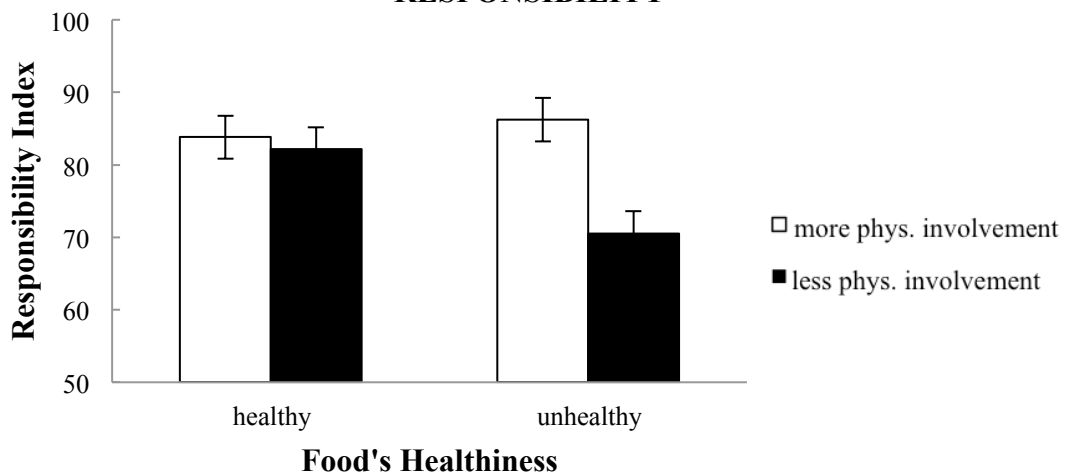


Figure 8: Perceived responsibility after eating as a function of both physical involvement required to obtain the food and food's healthiness in study 4