Don't Go to the Grocery Store Hungry?

The Effect of Hunger on Food Attractiveness and Consumption

by

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ABSTRACT

Although it is commonly assumed that consumers eat more and find food to be more attractive when hungry, surprisingly little research has looked at how robust this effect might be and what could moderate it. Building on theories of hunger and self-control, this research examines which types of foods (hedonic or utilitarian) are more attractive and likely to be consumed by hungry consumers. Across a series of six experiments I find that when hungry and under reduced cognitive capacity, consumers find hedonic foods more attractive and consume them in larger quantities. However, when hungry and with high cognitive capacity, consumers have the ability to engage in counteractive self-control, thus limiting both the attractiveness and consumption of hedonic food items. Furthermore, I find that hunger is not likely to influence the attractiveness of utilitarian foods, but is likely to increase the consumption of these foods, regardless of cognitive capacity.

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Chapter 1

INTRODUCTION

"Don’t go to the grocery store hungry!"

Many consumers have heard this adage and it is often assumed in the literature that hungry shoppers are more likely to purchase and eat greater quantities of food (e.g., Kahn and McAlister 1997). But is this warning valid? Do consumers really buy and eat more food when hungry? If so, are there factors that can moderate this effect?

Prior research on hunger has examined a variety of issues, such as how it influences mood (Benton, Slater, and Donohoe 2001; Macht and Dettmer 2006) or memory (Benton and Parker 1998; Smith, Kendrick, and Maben 1994). Prior research has also examined hunger's effect on the attractiveness, variety seeking, and consumption of food (Spitzer and Rodin 1981; Hill, Magson, and Blundell 1984; Goukens et al. 2007). However, relatively little is known about how hunger interacts with self-control to influence the attractiveness and consumption of different types of food. The current research hopes to address this shortcoming, demonstrating that the process is not as simple as hunger acting as a general shopping or consumption catalyst. Instead, I show that hunger's impact is dependent on the type of food considered (hedonic or utilitarian) and the consumer's ability to engage in self-control strategies (whether the consumer has the necessary cognitive capacity).

I propose that hunger influences food attractiveness and consumption through two basic mechanisms. First, hunger is expected to increase the need to

consume calories (e.g., Mattes 1990; Wadhwa, Shiv, and Nowlis 2008). Second, hunger is expected to increase the anticipated pleasure associated with eating specific types of food (e.g., Benforado, Hanson, and Yosifon 2004; Pinel, Assanand, and Lehman 2000). I further propose that these two basic mechanisms will exert relatively different impacts on either the attractiveness or consumption of food. When consumers think about the attractiveness of food, I propose that they will be influenced by their natural inclinations to seek out sweet, salty, and fatty foods and the pleasure associated with eating these foods (see the positive incentive theory of hunger and eating; Assanand et al. 1998). This should be heightened when the consumer is hungry. When consumers think about consuming food, in addition to their preference for sweet, salty, and fatty foods, I propose they will also be influenced by their need to consume calories (see the evolutionary theory of hunger and eating; Assanand et al. 1998). These influences will result in different effects on the attractiveness and consumption of hedonic and utilitarian foods.

Hunger is expected to influence food attractiveness and consumption not only via the two basic hunger mechanisms, but also from the extent to which consumers are able to utilize self-control strategies. Without self-control mechanisms, hunger could lead to cases where the consumer is stimulated to eat much more than would be desired, which I would predict to occur more for hedonic than utilitarian foods. Furthermore, and consistent with prior work on self-control (Collins 1978; Stroebe, Papies, and Aarts 2008), I propose that hungry consumers are more likely to be able to regulate eating when cognitive

capacity is available. As a result, the attractiveness and consumption of hedonic foods should be greater for hungry consumers with a limited ability to utilize self-control strategies. However, I show that when hungry consumers have the cognitive capacity to exert self-control, they downgrade the attractiveness of hedonic food items, which enables them to manage their consumption.

I contribute to the literature in a number of ways. First, I show that only under conditions of both hunger and reduced cognitive capacity are consumers unable to manage their attraction toward and subsequent consumption of hedonic foods. It is important to note that little research has examined the conditions under which normal eaters (average consumers) utilize self-control when hungry. Instead, most prior research on self-control and consumption of foods has focused specifically on the behavior of restrained eaters. Second, I show that part of the reason why "diet" foods may fail to help normal eaters reduce caloric intake when they are hungry may be due to consumers treating "diet" foods like utilitarian foods. Third, I add to the literature on counteractive self-control by showing how a basic need, hunger, interacts with counteractive self-control to reduce food attractiveness and consumption.

Chapter 2

HOW HUNGER AND SELF-CONTROL INFLUENCE THE ATTRACTIVENESS AND CONSUMPTION OF HEDONIC AND UTILITARIAN FOODS

Prior research finds that hunger tends to influence food attractiveness and consumption through two basic mechanisms. First, hunger increases the need for more calories (see the evolutionary theory of hunger and eating; Pinel et al. 2000). In other words, when people run out of energy they begin to look for food in order to "refuel" and to store up calories to have energy in the future. Second, hunger increases the anticipated pleasure from eating (see the positive incentive theory of hunger and eating; Assanand et al. 1998). Together these two mechanisms suggest that humans have evolved to seek out sweet, salty, and fatty foods (i.e., hedonic foods) both because they taste good and because in nature these items have the most calories, vitamins, and minerals. However, in modern society, humans no longer need to seek out these high calorie foods as a future source of energy because food is now widely available for consumption. Yet, people continue to seek out and prefer hedonic foods even when energy storage is no longer a concern, thus leading to the prevalence of obesity and overeating in modern societies. As a result, some argue that in developed countries it is now the anticipated taste of the food and the increase in perceived value (Goukens et al. 2007) that primarily drives consumption (Benforado et al. 2004; Palmer 2003; Toates 1981).

Based on these theories of hunger, I expect hunger to have different effects on ratings of food attractiveness versus consumption. In particular, attractiveness should be more readily influenced by the anticipated taste of food (positive incentive theory of hunger and eating), whereas consumption is more impacted by the need to consume calories (evolutionary theory of hunger and eating).

Given that I expect different mechanisms to drive attractiveness versus consumption, hedonic and utilitarian food items should serve different purposes when associated with these two mechanisms. In terms of consumption, consumers should be driven to consume either hedonic or utilitarian food items when hungry, as both of these types of foods provide calories. In terms of attractiveness, consumers should be more likely to rate the attractiveness of hedonic foods as higher when they are hungry, as these foods are relatively more pleasurable to eat. On the other hand, hunger should not influence the attractiveness of utilitarian foods, since these foods are not as likely to provide pleasure from consumption.

Hunger can alter the attractiveness and consumption of food through an increased need for calories and an increase in the anticipated pleasure of eating certain foods. However, humans have evolved in order for these forces to be controlled so that the amount of food consumed can be managed. Without this self-control, consumers would be more likely to eat past the point of satiation, and all else being equal, they would continue to choose hedonic over utilitarian foods. In the next section, I expand on this notion and discuss how the ability to exert

self-control interacts with hunger to influence the attractiveness and consumption of hedonic and utilitarian foods.

Chapter 3

SELF-CONTROL MECHANISMS

Most consumers do not simply eat whatever they want in unlimited quantities when hungry. Instead, consumers manage their hunger with self-control by limiting the amount or type of food that is purchased and consumed. I argue that in order to counter consumers' natural inclinations to purchase and eat more hedonic foods when hungry, consumers have to utilize self-control. Recent work in the self-control literature has shown that consumers often use counteractive self-control to overcome the attractiveness of a temptation by intentionally making the temptation seem less attractive and subsequently decreasing consumption (Trope and Fishbach 2000; Zhang, Huang, and Broniarczyk 2010).

When consumers are evaluating different foods, they can employ counteractive self-control to keep themselves from overindulging and to resist temptation. The theory of counteractive self-control argues that when consumers find themselves in situations that require self-control (such as deciding which foods to eat), they will intentionally lower their evaluations of salient temptations and heighten evaluations of their long-term goals. Thus, the value of the long-term goal relative to the salient temptation is higher, increasing the likelihood of resolving the self-control dilemma in favor of the long-term goal (Myrseth, Fishbach, and Trope 2009).

For example, if a long-term goal is to save money, when consumers see an expensive pair of shoes in a department store, they should be more likely to think

of things such as how uncomfortable and impractical the shoes are. This will then lower the temptation's attractiveness in order to keep consumers from buying the shoes and maintaining their long-term goal of saving money. Similarly, I argue in the current research that when hungry, consumers confronted with hedonic foods will be more likely to employ counteractive self-control tactics in order to devalue the hedonic food (i.e., perceive it as less attractive), thereby resisting the temptation and reinforcing their long-term sensible eating or healthy lifestyle goal.

Consistent with prior work on counteractive self-control, I propose that hungry consumers are routinely able to limit their consumption of hedonic foods by consciously thinking of such foods as less appealing. However, like other forms of self-control, this process requires cognitive effort to employ (Schmeichel and Baumeister 2004; Wegner 1994). Consequently, in cases where cognitive resources are depleted, I argue that consumers will be less likely to maintain self-control and will be more likely to give in to salient temptations.

My model proposes that under conditions of reduced cognitive capacity, hungry consumers will not be as able to employ the counteractive self-control tactics that enable them to resist the salient temptation of hedonic foods. As a result, when consumers are hungry and in a state of reduced self-control, they should be more likely to give in to their natural inclinations and seek out and eat hedonic foods. However, in cases where consumers are not operating under a reduced capacity for self-control, I expect that hungry consumers will be more likely to engage in self-control tactics to control their consumption of hedonic

foods. It is important to note that my model applies to average consumers who must use self-control techniques on a daily basis with respect to their eating habits. I are not focusing only on people with specific weight loss goals (restrained eaters), but rather examine how the population as a whole utilizes counteractive self-control strategies on an ongoing bases to keep from overeating. Next I examine my proposed model, which focuses on how hunger and self-control interact to influence both food attractiveness and consumption (see table 1).

Chapter 4

FOOD ATTRACTIVENESS

I first examine how hunger and self-control can combine to influence food attractiveness. As mentioned earlier, consumers have a natural inclination to seek out sweet, salty, and fatty foods when hungry due to the anticipated pleasure associated with eating these foods. Thus, when consumers think about the attractiveness of food, I expect that foods which are more palatable (hedonic foods) will be influenced to a greater degree by changes in hunger than foods that are not as palatable (utilitarian foods). In addition, I expect consumers to employ counteractive self-control and downgrade the attractiveness of food that tastes good because it serves as a salient temptation that is in conflict with consumers' long-terms goals to eat sensibly, live a healthy lifestyle, or maintain their current weight. However, because counteractive self-control requires cognitive resources, consumers should be more likely to reduce the attractiveness of hedonic foods when they have the cognitive capacity to do so.

Taken together, this implies that hunger should increase the attractiveness of hedonic foods, but only when combined with a reduced capacity for counteractive self-control. When consumers have high cognitive capacity, they should be more likely to use counteractive self-control to make hedonic foods seem less attractive, thereby mitigating the temptation they provide. Thus, I predict that self-control will moderate the impact that hunger is expected to have on the attractiveness of hedonic foods. However, because there are fewer natural

inclinations to seek out utilitarian foods, I would expect no difference in attractiveness for these foods, regardless of hunger or capacity for self-control.

H1a: For hedonic foods, cognitive capacity moderates the relationship between hunger and attractiveness. Under reduced cognitive capacity, hedonic foods will be more attractive when consumers are hungry than not hungry. Under high cognitive capacity, the attractiveness of hedonic foods will not be influenced by hunger.

H1b: For utilitarian foods, cognitive capacity does not influence the relationship between hunger and attractiveness. The attractiveness of utilitarian foods in unaffected by hunger or cognitive capacity.

Chapter 5

FOOD CONSUMPTION

In the prior section, I examined food attractiveness. In this section, I examine how hunger and self-control interact to influence food consumption. As mentioned earlier, hunger is expected to be driven in part by the basic need to consume calories and prevent energy deficits. Because sweet, salty, and fatty foods contain more calories, consumers should be more likely to naturally seek out hedonic foods when hungry. However, if consumers do not engage in search and food is instead placed directly in front of them, I expect hungry consumers (compared to non-hungry consumers) to eat more of both hedonic and utilitarian foods, as all foods provide calories.

Moreover, just as consumers exert self-control to reduce the attractiveness of hedonic foods, I propose that consumers will use counteractive self-control to limit their consumption of hedonic foods when cognitive capacity is high but not when it is low. On the other hand, because utilitarian foods are lower in calories and do not serve as salient temptations in conflict with one's long-term goals, there is less of a need for consumers to utilize self-control. As a result, I predict that hungry consumers will eat more utilitarian food than non-hungry consumers. Thus, even though attractiveness ratings of utilitarian foods are predicted to be constant across hungry and non-hungry consumers, consumption of utilitarian foods is expected to be higher for hungry versus non-hungry consumers. This is expected to occur because utilitarian foods, though not as palatable as hedonic

foods, still provide the necessary calories that consumers likely seek when hungry.

H2a: For hedonic foods, cognitive capacity moderates the relationship between hunger and consumption. Under reduced cognitive capacity, consumption of hedonic foods will increase when consumers are hungry than not hungry. Under high cognitive capacity, there will be no differences in consumption of hedonic foods when consumers are hungry versus not hungry.

H2b: For utilitarian foods, cognitive capacity does not influence the relationship between hunger and consumption. Consumption of utilitarian foods will be greater when consumers are hungry versus not hungry, regardless of cognitive capacity.

Chapter 6

EXPERIMENT 1: ARE HEDONIC ITEMS MORE ATTRACTIVE WHEN CONSUMERS ARE HUNGRY?

Experiment 1 tests H1a and H1b, which focus on the attractiveness of hedonic and utilitarian food products. In addition, this experiment examines the effect that hunger has on hedonic and utilitarian non-food products. My conceptual model would predict that neither hunger nor cognitive load should alter the attractiveness of non-food products (either hedonic or utilitarian) since the mechanism behind the effect of hunger on attractiveness ratings should relate only to food items (the anticipated pleasure from eating), and should not be influenced by counteractive self-control (since no conflict between temptations arising from hunger and other goals are involved). I test this idea in experiment 1 by having respondents rate not only hedonic and utilitarian food items, but also by having them rate hedonic and utilitarian non-food items. Also, by testing both food and non-food items, I are able to provide more insight into my original question of how hunger influences shopping behavior, by specifying the types of products that may be more likely to be purchased.

Participants, Stimuli, and Procedure

Three hundred ninety-six undergraduate students at a large university participated in experiment 1, a 2 (hunger: hungry vs. not hungry) x 2 (cognitive capacity: high vs. reduced) x 4 (product: hedonic food vs. hedonic non-food vs. utilitarian food vs. utilitarian non-food) mixed design, for course credit. I measured the degree to which the respondents were relatively more or less

hungry. I did this by asking the following two questions: "how full is your stomach" (1 completely full; 7 could eat more) and "how hungry are you" (1 extremely hungry; 7 no desire to eat) (Herman, Ostovich, and Polivy 1999). Cognitive capacity was manipulated in the form of cognitive load during the experiment. Previous research suggests that cognitive load is a good manipulation for self-control (Dewitte et al. 2005). Prior to rating any of the items on attractiveness, participants were randomly assigned to a high cognitive capacity condition (given a two-digit number to memorize) or a reduced cognitive capacity condition (given an eight-digit number to memorize) (Muraven, Tice, and Baumeister 1998). Each participant was asked to report item attractiveness (1 not at all attractive; 7 very attractive) for twenty hedonic/utilitarian food/non-food items (five of each type). The five hedonic food items included products like ice cream and chocolate chip cookies while the five utilitarian food items included tomato juice and broccoli. The five hedonic non-food products included products like a CD by your favorite artist or a weekend trip to Las Vegas while the five utilitarian non-food products included bed sheets for a queen size bed and toilet paper. I selected these products based on a pretest, where thirty respondents were asked to classify a list of products as either hedonic, utilitarian, or neither. I included only those categories that were classified by 85% or more of the respondents as either hedonic or utilitarian (Wadhwa et al. 2008).

Results

The two hunger measures were combined to form a composite measure of hunger (r = .85). In experiments 1, 2, 3, and 4 I analyzed hunger as both a

continuous variable and as a dichotomous variable (using a median split), with the same results using either measure (in experiments 5 and 6 I manipulated hunger). Prior research on hunger has typically used a median split to report distinct findings for hungry versus not hungry consumers (Gilbert, Gill, and Wilson 2002; Seibt, Hafner, and Deutsch 2007), and thus from here forward I will report only the median split results. My analysis revealed a main effect of hunger ($F(1, 392) = 6.45$, $p = .012$) on hedonic food attractiveness ratings. Participants reported the hedonic foods as more attractive when hungry ($M_{\text{hungry}} = 5.33$) versus not hungry ($M_{\text{not-hungry}} = 5.10$; see figure 1). In support of hypothesis 1, I find a significant 2-way interaction between hunger and cognitive capacity on hedonic food attractiveness ($F(1, 392) = 4.17$, $p = .042$). Participants who were under reduced cognitive capacity (high load) rated the hedonic food items as more attractive when hungry ($M_{\text{hungry}} = 5.43$) versus not hungry ($M_{\text{not hungry}} = 5.02$, $F(1, 392) = 10.26$, $p = .002$). However, for participants who were under high cognitive capacity (low load), the difference between hungry ($M_{\text{hungry}} = 5.23$) and not hungry ($M_{\text{not hungry}} = 5.19$, $F < 1$, $p = .722$; see figure 2) was not significant. In addition, the main effect of cognitive capacity was not significant ($F < 1$).

As anticipated, the main effects and interaction between hunger and cognitive capacity on utilitarian food attractiveness were not significant ($F < 1$). In addition, there were no significant main effects or interactions for hedonic and utilitarian non-food attractiveness ($F < 1$; see figure 3).

Discussion

The results of experiment 1 indicate that hungry consumers under reduced cognitive capacity view hedonic food items as more attractive than hungry consumers with high cognitive capacity. Additionally, hunger and cognitive capacity did not influence the attractiveness of utilitarian food items or hedonic and utilitarian non-food items. This finding allows us to provide some initial insight on the question I posed at the beginning of the paper: Do consumers really buy more products when hungry or is this warning frequently repeated but largely unnecessary? The answer appears to be that consumers do not, in general, buy more food and other products when hungry versus not hungry. Instead, my results suggest that a consumer should be both hungry and under reduced cognitive capacity and even then, this only increases the attractiveness of hedonic food items (later I will examine the impact of hunger on actual consumption). Experiment 2 builds on these initial findings by testing the underlying process of counteractive self-control.

Chapter 7

EXPERIMENT 2: DOES COUNTERACTIVE SELF-CONTROL AFFECT HEDONIC FOOD ATTRACTIVENESS?

The main objective of the second experiment is to test the underlying process of counteractive self-control by examining how consumers rate hedonic foods when hungry versus not hungry. Specifically, in experiment 2 I assess whether consumers are likely to utilize counteractive self-control strategies when assessing hedonic food item attractiveness by asking them to rate M&M's under situations of reduced or high cognitive capacity in addition to being hungry or not hungry. To test the impact of counteractive self-control on participant's food item ratings, I evaluated the estimated calorie content of the M&M's (as seen in Zhang et al. 2010). If consumers have sufficient cognitive capacity to engage in counteractive self-control, I would expect the calorie estimates of the high cognitive capacity cells to be higher than the low capacity cells when respondents are hungry, as they should be more likely to consciously think about devaluing the salient food temptation when they have more cognitive capacity. As a result, consumers who are hungry and under low cognitive load should be more likely to construe the hedonic food item as having an increased number of calories than those who are under high load, since thinking about the number of calories is a way to devalue an object and maintain better self-control (and this is more likely to occur only when sufficient cognitive capacity is available). Furthermore, for those who are not hungry, I would not expect an effect of cognitive load since it is less likely that counteractive self-control would be needed in this case.

Participants, Stimuli, and Procedure

Four hundred thirty-nine undergraduate students at a large university participated in experiment 2, a 2 (hunger: hungry vs. not hungry) x 2 (cognitive capacity: reduced vs. high) between-subjects design, for extra credit. Hunger was measured, and cognitive load was manipulated, as in experiment 1. I placed M&M's in Ziploc bags that were the same size and weight (twenty-eight grams) on participants' desks (see figure 4). I instructed participants that they should not eat the M&M's. Participants were then randomly placed in either the high cognitive capacity condition or the reduced cognitive capacity condition. As with experiment 1, participants were asked to rate the attractiveness of the M&M's (1 = not at all attractive, 7 = very attractive). Then, in an attempt to gain a better understanding of the underlying processes, I included the following measure: "How many calories do you think this bag of M&M chocolates contain?" I then asked participants how hungry they were, using the two measures discussed earlier. Finally, participants wrote down the number they recalled from the beginning of the session.

Results and Discussion

The two hunger measures were combined to form a composite measure of hunger (r = .83). As with experiment 1, participants were divided based on a median split into the hungry and not hungry categories. I first examine the estimated calorie data. My analysis revealed a significant interaction between hunger and cognitive capacity on estimated calories ($F(1, 435) = 5.06$, $p = .025$). Participants who were hungry rated the hedonic food items as having more

calories when under high cognitive capacity ($M_{\text{low load}} = 202.64$) versus reduced cognitive capacity ($M_{\text{high load}} = 167.47$, $F(1, 435) = 4.65$, $p = .032$). However, for participants who were not hungry, the difference between high cognitive capacity ($M_{\text{low load}} = 185.22$) and reduced cognitive capacity ($M_{\text{high load}} = 202.39$, $F = 1$, $p = .301$) was not significant (see figure 5). In addition, the main effects of hunger and cognitive capacity were not significant ($F < 1$ and $F = 1.09$ respectively).

I next examine the attractiveness ratings. In support of hypothesis 1a, I find a significant interaction between hunger and cognitive capacity on hedonic food attractiveness ($F(1, 440) = 7.02$, $p = .008$). Participants who were under reduced cognitive capacity rated the hedonic food items as more attractive when hungry ($M_{\text{hungry}} = 5.64$) versus not hungry ($M_{\text{not hungry}} = 5.01$, $F(1, 440) = 9.16$, $p = .001$). However, for participants who were under high cognitive capacity, the difference between hungry ($M_{\text{hungry}} = 5.08$) and not hungry ($M_{\text{not hungry}} = 5.21$, $F < 1$, $p = .537$) was not significant (see figure 6). In sum, my findings provide support for the idea that when hungry and under high cognitive capacity, consumers utilize counteractive self-control to construe the hedonic food as having significantly more calories than when hungry and under low cognitive capacity.

Chapter 8

EXPERIMENT 3: HOW DOES LOW-CALORIE INFORMATION AFFECT FOOD ATTRACTIVENESS?

The main objective of the third experiment is to replicate the results of experiment 1 and to look at the effect of low-calorie "diet" foods on item attractiveness. Specifically, in experiment 3 I assess whether consumers will find hedonic food items to be more attractive than "sinless" (low calorie) food items when under different levels of hunger and cognitive capacity. I predict that the sinless foods will behave in the same manner as utilitarian foods for attractiveness ratings. In other words, low-calorie, "diet" foods, even though often positioned as tasting the same as their higher calorie counterparts, actually usually have fewer calories, sweetness, and fat than their higher-calorie, more hedonic alternatives. Therefore, the positive incentive motivation to eat should not play as large a role since most consumers tend to believe that low-calorie, "diet" foods do not taste as good and are less palatable than their higher-calorie hedonic counterparts (Bogue and Ritson 2000). In addition, in experiment 1, I manipulated whether a food item was hedonic or utilitarian by varying the product category; however, in order to ensure that the results were not due to product category differences, in experiment 3 I keep the product the same, but manipulate whether the product is described as hedonic or "sinless" (e.g., Dhar and Wertenbroch 2000). In so doing, I can determine whether it is the sweetness, saltiness, and fattiness of the foods combined with the positive incentive value provided by these foods that may be driving attractiveness or if another factor is involved.

Participants, Stimuli, and Procedure

Three hundred twenty-seven undergraduate students at a large university participated in experiment 3, a 2 (hunger: hungry vs. not hungry) x 2 (cognitive capacity: high vs. reduced) x 2 (food items: hedonic vs. sinless) between-subjects design. Hunger was measured the same way as in prior experiments, and cognitive capacity was manipulated the same way as in prior experiments. Also, as in prior experiments, respondents rated the attractiveness of the product. Each respondent evaluated three items: ice cream, potato chips, and a chocolate bar. In the "hedonic" condition, these items were simply described as such (i.e., evaluate a chocolate bar), while in the "sinless" condition, the evaluations of the products were preceded by the following information: "A major consumer packaged goods manufacturer will soon be introducing a new line of 'sinless' delights. These sinless foods are supposed to taste almost as good as the original but have almost zero calories per serving. Foods in this new line are similar to other products currently on the market but have ninety-five percent fewer calories per serving. Many consumers who signed up to test the new products were concerned about the taste of this new line given that it has fewer calories than the original."

Results

The two hunger measures were combined to form a composite measure of hunger (r = .70). Attractiveness ratings for ice cream, chocolate, and potato chips were combined to form a composite measure of food item attractiveness, as I found no significant differences across the categories. My analysis revealed a main effect of hunger ($F(1, 319) = 13.86$, $p = .0002$) on attractiveness ratings.

Participants reported the food items as more attractive when hungry (M_{hungry} = 4.86) versus not hungry ($M_{\text{not hungry}}$ = 4.34; see figure 7). Additionally, there was a main effect of cognitive capacity ($F(1, 319) = 5.67$, $p = .018$) on attractiveness ratings. Participants reported the food items as more attractive when under reduced cognitive capacity ($M_{\text{high load}}$ = 4.77) versus high cognitive capacity ($M_{\text{low load}}$ = 4.44; see figure 8). In support of hypothesis 1a, I find a significant interaction between hunger and cognitive capacity on food item attractiveness ($F(1, 319) = 4.43$, $p = .036$), for just the hedonic products. Participants who were under reduced cognitive capacity rated the food items as more attractive when hungry (M_{hungry} = 5.17) versus not hungry ($M_{\text{not hungry}}$ = 4.36, $F(1, 319) = 17.56$, $p < .0001$). However, for participants who were under high cognitive capacity, the difference between hungry (M_{hungry} = 4.55) and not hungry ($M_{\text{not hungry}}$ = 4.32, $F(1, 319) = 1.27$, $p = .261$) was not significant. Additionally, and as can be seen in figure 9, sinless food items were not significantly affected by hunger or cognitive capacity. When hungry and evaluating sinless food items the difference between low load and high load failed to reach significance ($F(1, 319) = 1.65$, p = .200); when not hungry and evaluating sinless food items the difference between low load and high load also failed to reach significance ($F < 1$). Sinless item attractiveness acted in a similar way to utilitarian food item attractiveness in experiment 1, with a significant main effect of food item ($F(1, 319) = 10.11$, $p = .002$) on attractiveness ratings. Participants reported hedonic food items more attractive (M_{hedonic} = 4.82) than sinless food items (M_{sinless} = 4.38; see figure 10).

Discussion

The results of experiment 3 indicate that hungry consumers under reduced cognitive capacity view hedonic food items as being more attractive than consumers with high cognitive capacity, replicating the results of experiment 1. Additionally, I find that "sinless" foods act in a similar manner to utilitarian foods. Because diet food items are low in calories and are often considered to taste worse than their hedonic, higher-calorie counterparts, the anticipated pleasure associated with eating diet foods should be relatively lower and thus there is not a significant increase in attractiveness when respondents are hungry and under load. Because "sinless" foods should not be expected to taste as good, there is less of a need to utilize self-control, which results in significantly lower attractiveness ratings than when a hedonic food item is evaluated. Whereas the prior experiments focused on item attractiveness, I now turn to consumption in the next experiment to test hypothesis 2a.

Chapter 9

EXPERIMENT 4: THE EFFECT OF SNACK CHOICE ON FOOD CONSUMPTION

Thus far I have only examined hedonic and utilitarian food item attractiveness. Next I consider the second part of my model – actual consumption. In this experiment, I look at an actual food choice and the effects of that choice on consumption. Additionally, I use this experiment as the first test of hypothesis 2a.

Participants, Stimuli, and Procedure

Two hundred fifty-eight undergraduate students at a large university participated in experiment 4, a 2 (hunger: hungry vs. not hungry) x 2 (cognitive capacity: high vs. reduced) x 2 (snack choice: regular lays vs. baked lays) mixed design. Hunger was measured via the following question: "Please indicate how hungry you are now (1 = not at all, 7 = extremely)," and cognitive capacity was manipulated the same way as in prior experiments.

At the beginning of the experiment, each participant was escorted, one on one, by a lab assistant into a smaller separate room, which contained a small convenience store setup with several shelves stocked with different types of potato chips. Upon arrival in the room the lab assistant informed the participant that as a thank you for participating in the lab today, they could choose a snack off the shelf to take with them. Upon returning to the lab, participants were given the second part of the survey.

In the second part of the survey participants were told "Researchers are interested in learning more about how consumers watch television shows and movies and what makes them more or less enjoyable. On the following screen, you will be asked to watch a five-minute video clip and evaluate it. In order to add to the realism of how people watch television shows and movies, you may be asked also to engage in some other tasks during your viewing experience." On the next screen participants received the cognitive load manipulation and then were told that they were welcome to eat as much of the snack they picked out in the other room, as they would like. This was followed by a five-minute video about a komodo dragon from Animal Planet. The purpose of the video was to allow subjects time to eat as much or as little of the snack food they chose prior to answering questions related to the healthiness of their lifestyle.

After watching the video, participants answered questions consistent with the cover story. Participants then answered questions related to how good the snack tastes, the quality of the snack, whether the snack met their expectations, and how much they would be willing to pay for the snack. They then answered questions related to how healthy their lifestyle currently was, and were then told that because researchers did not want food consumption to interfere with any other experiments currently being conducted in the lab, researchers would be collecting the remaining food. After participants left, the remaining food was weighed in grams to determine how much each participant consumed throughout the ten-minute survey.

Results and Discussion

As in experiment 1, participants were divided based on a median split into the hungry and not hungry categories. I begin by analyzing consumption quantities. Unless otherwise indicated, consumption is measured in the number of grams eaten.

Results indicate a main effect of hunger ($F(1, 257) = 31.55$, $p < .0001$) such that hungry participants consumed significantly more food ($M_{\text{hungry}} = 26.87$) than those who were not hungry ($M_{\text{not hungry}} = 18.12$; see figure 11). Additionally, there was a main effect for cognitive capacity ($F(1, 257) = 8.32$, $p = .0043$); those under high load ate significantly more food ($M_{\text{high load}} = 24.73$) than those under low load ($M_{\text{low load}} = 20.25$; see figure 12). This should be interpreted in light of a significant interaction between hunger and cognitive capacity on food item consumption ($F(1, 257) = 18.87$, $p < .0001$). In support of hypothesis 2a, participants who were hungry ate significantly more of their chosen snack item when under high cognitive load ($M_{\text{high load}} = 32.48$) than when under low cognitive load ($M_{\text{low load}} = 21.24$; $p < .0001$). However, when not hungry, the difference between low load ($M_{\text{low load}} = 19.26$) and high load ($M_{\text{high load}} = 16.99$) was not significant ($p = .3307$; see figure 13). There was also a marginally significant main effect of food item on food consumption ($F(1, 257) = 3.41$, $p = .0662$). When participants chose the Baked Lays, participants ate marginally less ($M_{\text{baked lays}} = 21.05$) than when Regular Lays were chosen ($M_{\text{regular lays}} = 23.92$; see figure 14). All other interactions, including the three-way interaction were not significant (all F's < 1).

Chapter 10

EXPERIMENT 5: WHEN HUNGRY, DO CONSUMERS EAT MORE HEDONIC OR UTILITARIAN FOOD ITEMS?

Although the results of Experiment 4 showed higher consumption of snack foods for hungry participants under load in a real choice context with actual consumption, it did not examine whether consumption would differ for hedonic vs. utilitarian foods or provide support for the underlying process of counteractive self-control. As such, in Experiment 5, I consider actual consumption of hedonic and utilitarian food items, examining the use of counteractive self-control as it relates to utilitarian food items. In addition, unlike the first four experiments, which measured hunger, in experiments five and six I instead manipulate hunger.

Participants, Stimuli, and Procedure

Four hundred and fifty-five undergraduate students participated in experiment 5, a 2 (hunger: hungry vs. not hungry) x 2 (cognitive capacity: high vs. reduced) x 2 (food type: hedonic vs. utilitarian) between-subjects design. Cognitive capacity was manipulated as in prior experiments. In order to manipulate hunger, I asked half of the participants to arrive having not eaten for four hours prior to the start of the experiment. The remaining participants were given no instructions prior to starting the experiment (e.g., Goldman, Herman, and Polivy 1991).

At the beginning of the experiment, I gave each participant either M&M's or carrots in Ziploc bags that were the same size and weight (twenty-eight grams; see figure 15). I instructed participants that they could eat as much as they

wanted during the experiment. The hedonic food item was M&M's and the utilitarian food item was fresh baby carrots that I cut into smaller pieces that were approximately the same size as the M&M's.

Manipulation Check

To ensure that I successfully manipulated hunger, those assigned to the hunger condition should have rated their hunger as being significantly greater compared to those in the not hungry condition (I used the same measures of hunger from the prior experiments). The two measures of hunger, "how full is your stomach" and "how hungry are you" were combined to form a composite measure of hunger ($r = .78$). There was a significant main effect of manipulated hunger ($F(1, 447) = 30.57$, $p < .0001$) on how hungry participants felt. Participants in the hungry condition reported feeling significantly more hungry ($M_{\text{hungry}} = 4.69$) than those in the not hungry condition ($M_{\text{not hungry}} = 4.34$).

Results

Unless otherwise indicated, all consumption results are reported in the number of grams eaten. Results indicate a main effect of hunger ($F(1, 447) = 25.91$, $p < .0001$) such that hungry participants consumed significantly more food ($M_{\text{hungry}} = 12.00$) than those who were not hungry ($M_{\text{not hungry}} = 8.16$; see figure 16). The main effects of food item and cognitive capacity were not significant ($F < 1$; $F = 2.75$; respectively). There was a significant interaction between hunger and cognitive capacity on food item consumption ($F(1, 447) = 5.28$, $p = .022$) and the three-way interaction was significant ($F(1, 447) = 6.12$, $p = .014$; see figure 17).

In support of hypothesis 2a, reduced cognitive capacity participants ate more M&M's when hungry ($M_{\text{hungry}} = 15.19$) versus not hungry ($M_{\text{not hungry}} = 8.76$; $F(1, 226) = 15.11$, $p < .0001$). Under high cognitive capacity the difference between hungry ($M_{\text{hungry}} = 7.63$) and not hungry ($M_{\text{not hungry}} = 8.38$) failed to reach significance ($F < 1$). Additionally, and in support of hypothesis 2b, hungry participants ate more of the carrots regardless of cognitive capacity ($M_{\text{hungry}} = 12.58$) versus not hungry ($M_{\text{not hungry}} = 7.75$; $F(1, 221) = 21.60$, $p < .0001$). In addition, the main effect of cognitive capacity was not significant ($p = .158$) and the interaction between hunger and cognitive capacity on carrot consumption was not significant ($F < 1$).

Discussion

In experiment 5, I found that hunger had a main effect on actual consumption of utilitarian foods, whereas in experiment 1 I found that hunger had no effect on attractiveness ratings of utilitarian foods. In particular, hungry consumers were more likely to actually consume more utilitarian food, regardless of cognitive load. Furthermore, consistent with my hypotheses, hunger appears to have a parallel effect on both the attractiveness and consumption of hedonic foods. These findings provide more support for my conceptual model. The last experiment examines whether the underlying process of counteractive self-control holds for consumption and also tests another boundary condition.

Chapter 11

EXPERIMENT 6: THE EFFECT OF PROVIDING CALORIE INFORMATION

The main objective of experiment 6 is to further test the underlying process of counteractive self-control. I focus on hedonic food items (M&M's) instead of utilitarian items in this experiment, because self-control is less likely to be needed to control the consumption of utilitarian foods. Prior research on counteractive self-control has found that information, which makes a temptation seem less attractive, can help reinforce self-control. In particular, Zhang et al. (2010) found that when a diet goal was made salient via advertisements, consumers experiencing a self-control conflict construed soda to contain more calories when they expected it to be available for consumption. Past research has also shown that low-fat labels on foods can lead to greater consumption of snack foods. However, when salient objective serving-size information is presented, there is a reduction in eating among normal-weight consumers (Wansink and Chandon 2006). Therefore, I predict that providing salient and objective calorie information about hedonic food would serve to reinforce self-control for hungry consumers with low cognitive capacity faced with the temptation of hedonic food. In other words, when hungry and under low cognitive capacity, participants are expected to use the salient calorie information to help decrease consumption when the M&M's are placed directly in front of them.

Participants, Stimuli, and Procedure

Three hundred and sixty undergraduate students participated in experiment 6, a 2 (hunger: hungry vs. not hungry) x 2 (cognitive capacity: high vs. reduced) x 2 (calorie: calorie information vs. no calorie information) between-subjects design. I manipulated hunger as in experiment 5, and cognitive capacity as in prior experiments. I manipulated calorie information by placing a sticker with the number of calories of the M&M's on half the bags (140 calories and 6 grams of fat) and leaving the other bags blank (see figure 18). In this experiment, I only looked at hedonic foods (M&Ms).

As in experiment 5, I placed M&M's in Ziploc bags that were the same size and weight (twenty-eight grams), and told respondents that they were free to eat as many as they wanted over the course of the one-hour session. Participants were asked about the attractiveness of the food item, were asked to estimate the number of calories in the bag of M&M's and then responded to the same two questions used in previous experiments to determine the level of hunger they were experiencing. The dependent variable of interest was the number of grams consumed and the number of calories estimated in the bags of M&M's in the conditions where the calorie information was not made salient.

Manipulation Check

To assess that I successfully manipulated hunger, those assigned to the hungry condition should have rated their hunger as being significantly higher compared to those in the not hungry condition. The two measures of hunger were combined to form a composite measure of hunger (r = .86). There was a

significant main effect of manipulated hunger ($F(1, 352) = 5.87$, $p = .016$) on how hungry participants felt. Participants in the hunger condition reported feeling significantly more hungry ($M_{\text{hungry}} = 4.98$) than those in the not hungry condition ($M_{\text{not hungry}} = 4.55$).

Results and Discussion

I first examine the consumption results. These results indicate a main effect of hunger ($F(1, 352) = 14.70$, $p = .0001$) such that hungry participants consumed more food ($M_{\text{hungry}} = 6.50$) than those who were not hungry ($M_{\text{not hungry}} = 4.60$; see figure 19). I also found a main effect of calorie information ($F(1, 352) = 16.29$, $p < .0001$), indicating that when calorie information was present, the participants ate less food ($M_{\text{calorie info}} = 4.55$) than when the calorie information was not present ($M_{\text{no calorie info}} = 6.55$; see figure 20). Additionally, I found a main effect of cognitive capacity ($F(1, 352) = 21.75$, $p < .0001$); under reduced cognitive capacity, participants ate significantly more ($M_{\text{high load}} = 6.71$) than when under high cognitive capacity ($M_{\text{low load}} = 4.39$; see figure 21). There was also a significant interaction between hunger and calorie information ($F(1, 352) = 13.25$, $p = .0003$). Planned contrasts show that hungry participants ate significantly more when the calorie information was not present ($M_{\text{no calorie info}} = 8.41$) than present ($M_{\text{calorie info}} = 4.60$, $F(1, 352) = 30.51$, $p < .0001$); there was no difference in the amount eaten when not hungry ($M_{\text{no calorie info}} = 4.70$, $M_{\text{calorie info}} = 4.50$, $F < 1$; see figure 22). I also found a significant interaction between cognitive capacity and calorie information ($F(1, 352) = 22.31$, $p < .0001$), indicating that when under reduced cognitive capacity, participants ate significantly more when no calorie

information was present ($M_{\text{no calorie info}} = 8.88$) than when calorie information was present ($M_{\text{calorie info}} = 4.53$, $F(1, 352) = 38.14$, $p < .0001$); there was no difference in the amount eaten when under high cognitive capacity ($M_{\text{no calorie info}} = 4.22$, $M_{\text{calorie info}} = 4.56$, $F < 1$; see figure 23). Finally, the three-way interaction was significant ($F(1, 352) = 19.06$, $p < .0001$).

Planned contrasts reveal that when under reduced cognitive capacity with no calorie information present, participants ate significantly more when hungry ($M_{\text{hungry}} = 12.33$) than not hungry ($M_{\text{not hungry}} = 5.44$, $F(1, 352) = 46.43$, $p < .0001$). Furthermore, when no calorie information is present and participants had high cognitive capacity, the difference between hungry ($M_{\text{hungry}} = 4.49$) and not hungry ($M_{\text{not hungry}} = 3.95$) failed to reach significance ($F < 1$, see figure 24). These results support hypothesis 2a. Also, under high cognitive capacity with calorie information present, the difference between hungry ($M_{\text{hungry}} = 5.19$) and not hungry ($M_{\text{not hungry}} = 3.93$) failed to reach significance ($F(1, 352) = 1.64$, $p = .201$). Under reduced cognitive capacity with calorie information present, the difference between hungry ($M_{\text{hungry}} = 4.00$) and not hungry ($M_{\text{not hungry}} = 5.07$) also failed to reach significance ($F(1, 352) = 1.18$, $p = .278$).

I next examine the estimated calorie content of the M&M's. My analysis focuses only on those who estimated calorie content when it was not provided on the bag of M&M's; those who provided calorie estimates when this information was explicitly stated on the package simply provided the information they had already seen. The predicted hunger by load interaction ($F(1, 166) = 5.54$, $p = .02$), for those in the conditions where calorie information was not present on the

package, was significant. Planned contrasts reveal that when hungry and with high cognitive capacity, participants estimated that the bag of M&M's contained significantly more calories ($M_{low\ load} = 222.32$) than when hungry with low cognitive capacity ($M_{high\ load} = 173.63$, $F(1, 166) = 7.22$, $p = .0008$). When not hungry the difference between high cognitive capacity ($M_{low\ load} = 172.73$) and low cognitive capacity ($M_{high\ load} = 187.43$) was not significant ($F < 1$, $p = .46$), thus lending support to the proposed underlying process of counteractive self-control (see figure 25). When hungry and with the cognitive capacity to think through their choices, participants construed their bags of M&M's to have more calories than those with reduced capacity, as a way to reduce the temptation of eating the M&M's, which thus decreased consumption. However, the provision of calorie information on the package allowed even those with reduced cognitive capacity to reduce the temptation of eating the M&M's.

Mediated moderation

The pattern of results, whereby cognitive load moderated the impact of hunger on both the proposed mediator, perceived number of calories and the dependent variable, grams of M&M's consumed, suggests a mediated moderation. I tested for mediated moderation, examining whether the perceived number of calories mediated the effect of the hunger by load interaction on the number of grams of M&M's consumed. As recommended by Zhao, Lynch and Chen (2010), I subjected the data to a mediated moderation analysis using the SAS macro and methodology put forth by Preacher and Hayes with 5,000 bootstrapped samples (2004, 2008). This analysis revealed a significant indirect-only mediation of the

effect of the hunger x load interaction on grams of M&M's eaten by perceived number of calories. The manipulated hunger by load interaction affected the number of grams of M&M's eaten (B = -0.62, t(353) = -2.06, p = .0397) and the perceived number of calories (B = 9.54, t(353) = 2.24, p = .0259). Controlling for the manipulated hunger by load interaction, the perceived number of calories was still positively associated with grams of M&M's eaten (B = 0.008, t(353) = 2.20, p = .0286). Controlling for perceived number of calories, however, the manipulated hunger by load interaction was only marginally significant (B = -0.54, t(353) = -1.81, p = .07; see figure 6). The indirect pathway had an estimated coefficient of .078 with a 95% confidence interval that did not include 0 (.0048, .1978). This analysis revealed a significant indirect-only mediation of the effect of manipulated hunger by load interaction on grams of M&M's eaten by the perceived number of calories. Thus, these findings indicate that the perceived number of calories drives the effect of hunger by load on grams of M&M's eaten.

Chapter 12

GENERAL DISCUSSION

In 2000, the average American family made ninety trips to the grocery store per year (Business Wire 2000); in 2008 that number rose to one-hundred and four (Bishop 2009). In addition to these shopping trends, smaller grocery stores that sell more ready-to-eat products are increasing in number (Getz 2009) and consumers are eating more of their meals outside the home, with 68% of Americans eating out at least two times a week (McClamma 2009). Together these changes in behavior highlight just how often consumers are making food selections and consumption decisions in environments that may be noisy and distracting, when they also may be hungry.

This research examined the effect of hunger and cognitive capacity on food attractiveness and consumption. Prior research has found that when hungry, consumers are attracted to a greater variety of food and the palatability of that food increases (Hill et al. 1984; Kahn and Isen 1993). However, I hypothesized and found that food attractiveness and consumption quantities of hungry consumers were moderated by whether or not consumers had reduced cognitive capacity, which I manipulated through cognitive load. I found that when hungry and under high cognitive load (low cognitive capacity) hedonic food items were more attractive and consumed in greater quantities, while consumers who were hungry and under low cognitive load (high cognitive capacity) were able to diminish the attractiveness of, and decrease the consumption of, the hedonic food items. I also proposed and found support for a process that explains why this

occurs. Consumers who are hungry and have high cognitive capacity are more likely to utilize counteractive self-control in order to decrease both the attractiveness and consumption of hedonic food. In other words, whether the conflict between hunger and hedonic foods has an impact on consumption behavior depends on if the consumer has the capacity for counteractive self-control. Importantly, this counteractive self-control process is not limited to dieters or restrained eaters who often utilize additional self-control tactics to reduce consumption to achieve a weight loss goal. Rather, it appears to be a common process used on a routine basis by the population as a whole to override natural inclinations resulting from hunger that may lead to seeking out and overeating hedonic foods.

When a hungry consumer considers the attractiveness of a utilitarian food item, the anticipated pleasure associated with consumption of these foods is less likely to exert a significant effect. When coupled with less of a natural desire to seek out these foods, the attractiveness of utilitarian foods is unlikely to be influenced by hunger. Additionally, given that the attractiveness of these foods is less likely to be affected by hunger, there is less of a need to utilize self-control strategies. However, when that same consumer is hungry and encounters a hedonic food item, his/her natural inclination is to seek out and consume hedonic foods. When combined with the anticipated pleasure associated with consumption of hedonic foods, the attractiveness ratings tend to increase. However when consumers have the capacity for self-control, they are more likely

to utilize counteractive self-control strategies to reduce the attractiveness of hedonic foods.

For consumption, I see the same effect as I do for attractiveness of hedonic food items. When hungry, consumers have a natural inclination to seek out sweet, salty, and fatty foods. When coupled with the anticipated pleasure associated with consumption, attractiveness is likely to increase. Additionally, when the capacity for self-control is reduced, consumption tends to increases. However, when the capacity for self-control is stronger, consumers are more likely to lower the attractiveness of the hedonic food by utilizing counteractive self-control, which in turn helps decreases consumption. For utilitarian food consumption, a slightly different effect seems to occur. Here, hunger drives a need-based consumption of food for calories. Additionally, since utilitarian food is less attractive and is generally seen as healthy, there is a decreased need to utilize self-control strategies. This gives consumers more of a license to eat regardless of their capacity for self-control.

I also find a couple of boundary conditions on these effects. When considering diet foods, hunger and reduced cognitive capacity appear to have less of an effect on the attractiveness or consumption of these foods. Given the growing obesity epidemic in the United States and many industrialized countries, the market for low-calorie, 100-calorie, and other diet foods continues to grow. Past research has shown that health halos can lead to overall higher caloric intake (Chandon and Wansink 2007b) and when coupled with the knowledge that 100-calorie packs lead to increased consumption of that food (Scott et al. 2008), it is

important to gain a better understanding of the role hunger would play in the consumption of these diet foods. In 2008, the state of New York implemented a new law in response to the increasing obesity epidemic – restaurants with more than fifteen chains nationwide now have to post the calorie count next to all of their offerings (Barron 2008). The hope was that when consumers see that a Burger King Double Whopper with Cheese has 990 calories, an Arby's Broccoli and Cheese Baked Potato has 536 calories, and a medium chocolate malt from Dairy Queen has 760 calories (Sohn 2007), they will make healthier food choices. Ideally, the goal of the policy was to get consumers to reduce intake of these higher calorie items and eat more of the items with fewer calories. Additionally, when objective calorie information is made salient, hungry consumers with reduced cognitive capacity are more able to increase their self-control. Given this change in policy that may soon be implemented nationwide, it is important to learn the impact of making objective calorie information salient for hedonic foods.

My research contributes to the literature on food attractiveness and consumption in a number of ways. First, as mentioned above, our research suggests that consumers need to be both hungry and distracted (have a reduced cognitive capacity for self-control) in order to find hedonic food items to be more attractive. This is relevant because it shows an important moderator of prior findings, since many consumers are trying to limit their hedonic food consumption. Second, I show that consumers may utilize counteractive self-control to lower the attractiveness of hedonic foods and this helps decrease

consumption of these foods. However, only consumers who are hungry and driven by their natural inclinations to seek out sweet, salty, and fatty foods have an increased need to utilize self-control techniques. I found that when consumers were not hungry, there was no difference in the attractiveness or consumption of hedonic food items regardless of cognitive capacity. Additionally, both hunger and a reduced capacity for self-control appear to be needed for hedonic food attractiveness and consumption to increase. Thus, our research also extends research on hunger/drive states (Assanand et al. 1998; Lowenstein 1996; Shiv and Fedorikhin 1999) and self-control, specifically counteractive self-control (Trope and Fishbach 2000; Zhang et al. 2010).

More importantly, our research contributes to prior research on hunger and drive specific motivation. I build on past research in nutrition (the positive incentive and evolutionary theories of hunger and eating) and psychology, showing that when hungry, the natural inclination to seek out sweet, salty, and fatty foods combines with the anticipated pleasure of eating to impact attractiveness and consumption. However, utilizing self-control techniques can help mitigate these inclinations. Additionally, I show that hunger and a drive to seek out calories alone do not affect consumption decisions. Rather, hunger has to be combined with a reduced cognitive capacity. When this occurs, consumers tend to rely on their natural inclinations activated by hunger, resulting in increased liking and consumption of hedonic foods. However, when consumers have the cognitive capacity to engage in self-control behaviors, they can limit consumption of these foods.

Additionally, my research has implications for marketers who sell hedonic foods. As mentioned earlier, many Americans are changing their shopping behaviors to make more frequent trips to the grocery store; many times stopping on their way home from work when they may not have eaten for five or six hours and thus tend to be hungry. Additionally, given the numerous factors that can lead to a state of reduced capacity for self-control, lower cognitive capacity may be the current norm for consumer behavior rather than the exception, highlighting the importance of examining its effects on consumption. Our research suggests that hungry consumers who are often distracted by what is happening at work or at home are likely to find hedonic food items such as cookies, crackers, pizza, potato chips, etc., more attractive and are more likely to purchase these items than those consumers who are not hungry while shopping at the grocery store. Therefore, marketers may need to change the way they display or feature their products during this time depending on whether their primary target audience is hungry and distracted. If the target audience is already distracted, which may often be the case in the airport, companies can create hunger (Schachter 1968) in consumers by sending the smell of fresh cookies, cinnamon rolls, pizza, etc., throughout the corridor. It is also important for consumers to be aware of the potential pitfalls associated with grocery shopping while hungry or eating in a restaurant that causes high levels of distraction during the consumption experience.

Ultimately, the current research suggests that the old adage "Don't go to the grocery store hungry" should be amended to say, "Don't go to the grocery

store hungry and distracted" (or, you are likely to end up buying more hedonic foods). Going to the grocery store hungry does not appear to be enough to change consumers' typical shopping behaviors; rather, it is only when consumers are hungry and have low cognitive capacity that I would expect to see an increase in purchase and consumption. But even then, consumers would only be likely to buy more hedonic foods. Purchases of non-food items, utilitarian foods, and diet foods should be less likely to be affected.

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APPENDIX A

EXPERIMENT 1 SURVEY

Product Evaluation

Directions: Please spend as much time as necessary committing the number below to memory, you will be asked to recall this number at the end of the experiment; we are interested in how memory capacity will interact with the other measurements taken during today's session.

Low Load: 22
High Load: 47359263

Directions: We are interested in your evaluations of various consumer products and experiences. Please indicate how attractive you find each item on the list of items presented below and how interested you would be in purchasing that item. Please circle the number that best represents your responses on the scales provided.

Ice Cream

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive

1	2	3	4	5	6	7
Not Interested in Purchasing						Very Interested in Purchasing

Bed Sheets for Queen Size Bed

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive

1	2	3	4	5	6	7
Not Interested in Purchasing						Very Interested in Purchasing

Tomato Juice

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive

1	2	3	4	5	6	7
Not Interested in Purchasing						Very Interested in Purchasing

CD from your favorite Artist

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive

1	2	3	4	5	6	7
Not Interested in Purchasing						Very Interested in Purchasing

Strawberries

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive

1	2	3	4	5	6	7
Not Interested in Purchasing						Very Interested in Purchasing

Toilet Paper

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive
1	2	3	4	5	6	7
Not Interested in Purchasing						Very Interested in Purchasing

Broccoli

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive
1	2	3	4	5	6	7
Not Interested in Purchasing						Very Interested in Purchasing

Newly Released DVD

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive
1	2	3	4	5	6	7
Not Interested in Purchasing						Very Interested in Purchasing

Chocolate Chip Cookies

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive
1	2	3	4	5	6	7
Not Interested in Purchasing						Very Interested in Purchasing

Socks

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive
1	2	3	4	5	6	7
Not Interested in Purchasing						Very Interested in Purchasing

Rice and Beans

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive
1	2	3	4	5	6	7
Not Interested in Purchasing						Very Interested in Purchasing

Weekend trip to Las Vegas

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive

1	2	3	4	5	6	7
Not Interested in Purchasing						Very Interested in Purchasing

Potato Chips

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive

1	2	3	4	5	6	7
Not Interested in Purchasing						Very Interested in Purchasing

Oil Change

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive

1	2	3	4	5	6	7
Not Interested in Purchasing						Very Interested in Purchasing

Rice Cakes

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive
1	2	3	4	5	6	7
Not Interested in Purchasing						Very Interested in Purchasing

Prime Rib

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive
1	2	3	4	5	6	7
Not Interested in Purchasing						Very Interested in Purchasing

Vacuum Cleaner

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive
1	2	3	4	5	6	7
Not Interested in Purchasing						Very Interested in Purchasing

Oatmeal

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive
1	2	3	4	5	6	7
Not Interested in Purchasing						Very Interested in Purchasing

5 Star Dinner with 4 of your Closest Friends

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive
1	2	3	4	5	6	7
Not Interested in Purchasing						Very Interested in Purchasing

iPod with 200 of your favorite songs

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive
1	2	3	4	5	6	7
Not Interested in Purchasing						Very Interested in Purchasing

Directions: Next, we are interested in how your current state affects your evaluation of products. Please answer the following questions based on your current state of hunger.

1. How full is your stomach?

1	2	3	4	5	6	7
Completely Full						Could Eat More

2. How hungry are you?

1	2	3	4	5	6	7
Extremely Hungry						No Desire to Eat

Directions: Please answer the following questions that best describe you.

1. I am good at resisting temptation.

1	2	3	4	5
Not At All	Seldom	Sometimes	Often	Very Much

2. I have a hard time breaking bad habits.

1	2	3	4	5
Not At All	Seldom	Sometimes	Often	Very Much

3. I am lazy.

1	2	3	4	5
Not At All	Seldom	Sometimes	Often	Very Much

4. I say inappropriate things.

1	2	3	4	5
Not At All	Seldom	Sometimes	Often	Very Much

5. I do certain things that are bad for me, if they are fun.

1	2	3	4	5
Not At All	Seldom	Sometimes	Often	Very Much

6. I refuse things that are bad for me.

1	2	3	4	5
Not At All	Seldom	Sometimes	Often	Very Much

7. I wish I had more self-discipline.

1	2	3	4	5
Not At All	Seldom	Sometimes	Often	Very Much

8. People would say that I have iron self-discipline.

1	2	3	4	5
Not At All	Seldom	Sometimes	Often	Very Much

9. Pleasure and fun sometimes keep me from getting work done.

1	2	3	4	5
Not At All	Seldom	Sometimes	Often	Very Much

10. I have trouble concentrating.

1	2	3	4	5
Not At All	Seldom	Sometimes	Often	Very Much

11. I am able to work effectively toward long-term goals.

1	2	3	4	5
Not At All	Seldom	Sometimes	Often	Very Much

12. Sometimes I can't stop myself from doing something, even if I know it is wrong.

1	2	3	4	5
Not At All	Seldom	Sometimes	Often	Very Much

13. I often act without thinking through all the alternatives.

1	2	3	4	5
Not At All	Seldom	Sometimes	Often	Very Much

Directions: Please answer the following questions about your typical food consumption.

1. If you have put on weight, do you eat less than you usually do?

1	2	3	4	5
Never	Seldom	Sometimes	Often	Very Often

2. Do you try to eat less at mealtimes than you would like to eat?

1	2	3	4	5
Never	Seldom	Sometimes	Often	Very Often

3. How often do you refuse food or drink offered because you are concerned about your weight?

1	2	3	4	5
Never	Seldom	Sometimes	Often	Very Often

4. Do you watch exactly what you eat?

1	2	3	4	5
Never	Seldom	Sometimes	Often	Very Often

5. Do you deliberately eat foods that are slimming?

1	2	3	4	5
Never	Seldom	Sometimes	Often	Very Often

6. What you have eaten too much, do you eat less than usual the following days?

1	2	3	4	5
Never	Seldom	Sometimes	Often	Very Often

7. Do you deliberately eat less in order not to become heavier?

1	2	3	4	5
Never	Seldom	Sometimes	Often	Very Often

8. How often do you try not to eat between meals because you are watching your weight?

1	2	3	4	5
Never	Seldom	Sometimes	Often	Very Often

9. How often in the evening do you try not to eat because you are watching your weight?

1	2	3	4	5
Never	Seldom	Sometimes	Often	Very Often

10. Do you take into account your weight with what you eat?

1	2	3	4	5
Never	Seldom	Sometimes	Often	Very Often

11. If food tastes good to you, do you eat more than usual?

1	2	3	4	5
Never	Seldom	Sometimes	Often	Very Often

12. If food smells and looks good, do you eat more than usual?

1	2	3	4	5
Never	Seldom	Sometimes	Often	Very Often

13. If you see or smell something delicious, do you have a desire to eat it?

1	2	3	4	5
Never	Seldom	Sometimes	Often	Very Often

14. If you have something delicious to eat, do you eat it straight away?

1	2	3	4	5
Never	Seldom	Sometimes	Often	Very Often

15. If you walk past the baker do you have the desire to buy something delicious?

1	2	3	4	5
Never	Seldom	Sometimes	Often	Very Often

16. If you walk past a snackbar or a café, do you have the desire to buy something delicious?

1	2	3	4	5
Never	Seldom	Sometimes	Often	Very Often

17. If you see others eating, do you also have the desire to eat?

1	2	3	4	5
Never	Seldom	Sometimes	Often	Very Often

18. Can you resist eating delicious foods?

1	2	3	4	5
Never	Seldom	Sometimes	Often	Very Often

19. Do you eat more than usual, when you see others eating?

1	2	3	4	5
Never	Seldom	Sometimes	Often	Very Often

20. When preparing a meal are you inclined to eat something?

1	2	3	4	5
Never	Seldom	Sometimes	Often	Very Often

Demographics

Age: _____

Gender: Male _____ Female _____

Directions: Please enter the number you were asked to remember in the space below.

_____

Thank You for Your Participation!

APPENDIX B

EXPERIMENT 2 SURVEY

M&M's Study

Directions: You have been provided with a bag of M&M's; please use these M&M's to answer the questions on the following pages. We are interested in gaining your opinion about the food provided and the average college student's eating habits when they have something on their mind. Please DO NOT EAT the M&M's.

Thank you for your participation!

Directions: In order to test your response while something is on your mind please spend a few moments memorizing the following number, you will be asked to recall the number towards the end of the survey.

22

72936184

Section 1: In this section you will be asked to give your feedback about the M&M's provided.

1. How would you rate the attractiveness of the M&M's?

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive

2. How would you rate the color of the M&M's?

1	2	3	4	5	6	7
Not at all Colorful						Very Colorful

3. How good do you think the M&M's would taste?

1	2	3	4	5	6	7
Very Bad						Very Good

4. How likely would you be to purchase the M&M's?

1	2	3	4	5	6	7
Very Unlikely						Very Likely

5. How many calories do you think this bag of M&M's chocolates contains?

   _____

Section 2: Please answer the following questions based on your current state of hunger.

1. How full is your stomach?

1	2	3	4	5	6	7
Completely Full						Could Eat More

2. How hungry are you?

1	2	3	4	5	6	7
Extremely Hungry						Not Desire to Eat

Section 3: Please write down the number you were asked to memorize at the start of this survey.

_____

Section 4: We are now interested in understanding more about the college student lifestyle.

Please read the following questions and select the number that represents your opinion of the following statements.

1. Having a good appearance.

1	2	3	4
Not at all Important			Very Important

2. Looking attractive to the opposite sex.

1	2	3	4
Not at all Important			Very Important

3. Having a healthy complexion.

1	2	3	4
Not at all Important			Very Important

4. Having good posture.

1	2	3	4
Not at all Important			Very Important

5. Fixing yourself up so that you like yourself.

1	2	3	4
Not at all Important			Very Important

6. Food is fattening.

1	2	3	4
Not at all Important			Very Important

7. Food has no artificial additives.

1	2	3	4
Not at all Important			Very Important

8. Food is low in cholesterol.

1	2	3	4
Not at all Important			Very Important

9. Eating raw fruits and vegetables.

1	2	3	4
Never			Often

10. Eating special health foods.

1	2	3	4
Never			Often

11. Taking vitamins and minerals.

1	2	3	4
Never			Often

12. Eating breakfast.

1	2	3	4
Never			Often

13. Take a vacation for health reasons.

1	2	3	4
Never			Often

14. Go for health treatments in a health resort.

1	2	3	4
Never			Often

15. Go for a walk.

1	2	3	4
Never			Often

16. Decide to walk instead of driving or taking the elevator.

1	2	3	4
Never			Often

17. Use the weekend for pure relaxation.

1	2	3	4
Never			Often

18. Taking a rest at noon or lay down at some other time during the day.

1	2	3	4
Never			Often

19. Have you gone on a diet at least once in the past two years?

YES NO

20. Are you a member of a fitness, racket, health, or sports club?

YES NO

21. How worried are you about getting sick?

1	2	3	4	5
Very Much				Not at All

22. Do you think you should go to the doctor more than you actually do?

YES MAYBE NO

23. Are you doing enough for your health?

1	2	3	4
Not at all Important			Very Important

24. Do you have a good feeling about your body and your health?

1	2	3	4
Not at all Important			Very Important

25. What is the average number of hours you sleep each night? _____

26. Participation in sports and exercise:

No Participation Not Very Vigorously Vigorously

27. Smoking Status:

Never Smoked Former Smoker Current Smoker

28. Average number of drinks per week:

No Alcohol Consumption 1-22 Drinks 22 Drinks or More

29. Do you have a regular check-up at least once a year?

YES NO

Section 5

1. How often are you dieting?

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

2. What is the maximum amount of weight (in pounds) that you have ever lost within one month?

0-4	5-9	10-14	15-19	20+

3. What is your maximum weight gain (in pounds) within a week?

0-1	1-2	2-3	3-5	5.1+

4. In a typical week, how much does your weight (in pounds) fluctuate?

0-1	1-2	2-3	3-5	5.1+

5. How much would a weight fluctuation of 5 pounds affect the way you live your life?

1	2	3	4
Not at all	Slightly	Moderately	Very Much

6. Do you eat sensible in front of others and splurge when you are alone?

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

7. Do you give too much time and thought to food?

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

8. Do you have feelings of guilt after overeating?

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

9. How conscious are you of what you are eating?

1	2	3	4
Not at all	Slightly	Moderately	Extremely

10. How many pounds over your desired weight were you at your maximum weight?

0-.9	1-5	6-10	11-20	21+

11. How tall are you? FEET _____ INCHES _____

12. How much do you currently weigh (in pounds)? _____

Attitudes About Yourself Questionnaire

The following questions concern your attitude about yourself. Your task is to indicate the strength of **your level of agreement with each statement,** utilizing a scale in which **1** means you **strongly disagree, 2** means you **disagree, 3** means your **slightly disagree, 4** means your **neither agree nor disagree, 5** means you **slightly agree, 6** means you **agree,** and **7** means you **strongly agree.**

1. I feel that I am a person of worth, at least on an equal basis with others.

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree

2. I feel that I have a number of good qualities.

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree

3. All in all, I am inclined to feel that I am a failure.

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree

4. I am able to do things as well as most other people.

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree

5. I feel I do not have much to be proud of.

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree

6. I take a positive attitude towards myself.

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree

7. On the whole, I am satisfied with myself.

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree

8. I wish I could have more respect for myself.

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree

9. I certainly feel useless at times.

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree

10. At times I think I am no good at all.

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree

Section 6: Please answer the following demographic questions.

Age: _____

Gender: MALE FEMALE

THANK YOU FOR YOUR PARTICIPATION!

APPENDIX C

EXPERIMENT 3 SURVEY

Consumer Products Study – Hedonic Food Items

Directions: In this study we are examining the effects of engaged memory on the attractiveness of food items in a consumer packaged goods line. The consumer packaged goods manufacturer is interested in how attractive consumers find particular hedonic food items. Hedonic food items are those items that most consumers derive more pleasure from eating. On the next page, you will be asked to memorize a number and recall it at the end of the study.

Thank you for your participation in this study!

Directions: This study is interested in looking at the effects of engaged memory on food item attractiveness. Please spend a few moments committing the following number to memory, you will be asked to recall this number at the end of the study.

88
72458157

Once you have committed this number to memory, proceed to the next page. **Do not return to this page** for any reason throughout the study.

Consumer Product 1 –Ice Cream

The consumer packaged good manufacturer produces a line of ice creams that contain a variety of different flavors, including chocolate chip cookie dough.

Please take a few moments to consider this chocolate chip cookie dough ice cream and then continue on to the first question in the study.

1. Please take a moment to list three thoughts you are currently having about the chocolate chip cookie dough ice cream.

   Thought #1:

   _____

   _____

   _____

   Thought #2:

   _____

   _____

   _____

   Thought #3:

   _____

   _____

   _____

CONTINUE TO THE NEXT PAGE

2. How attractive do you find the chocolate chip cookie dough ice cream? Circle the number that best represents your opinion.

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive

3. How likely are you to consider purchasing the chocolate chip cookie dough ice cream? Circle the number that best represents your opinion.

1	2	3	4	5	6	7
Not Interested in Purchasing						Interested in Purchasing

4. I would expect the chocolate chip cookie dough ice cream to taste creamy, sweet, and good. Please indicate your agreement with this statement.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

CONTINUE TO THE NEXT PAGE

Consumer Product 2 –Cookies

The consumer packaged good manufacturer produces a line of cookies that contain a variety of different types, including chocolate sandwich cookies that appear to be very similar to Oreos.

Please take a few moments to consider these chocolate sandwich cookies and then continue on to the first question.

1. Please take a moment to list three thoughts you are currently having about the chocolate sandwich cookies.

   Thought #1:

   _____

   _____

   _____

   Thought #2:

   _____

   _____

   _____

   Thought #3:

   _____

   _____

   _____

CONTINUE TO THE NEXT PAGE

2. How attractive do you find the chocolate sandwich cookies? Circle the number that best represents your opinion.

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive

3. How likely are you to consider purchasing the chocolate sandwich cookies? Circle the number that best represents your opinion.

1	2	3	4	5	6	7
Not Interested in Purchasing						Interested in Purchasing

4. I would expect the chocolate sandwich cookies to be crunchy, sweet, and good. Please indicate your agreement with this statement.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

CONTINUE TO THE NEXT PAGE

Consumer Product 3 –Jelly Beans

The consumer packaged good manufacturer produces a line of jelly beans that contain a variety of different flavors, including very cherry jelly beans that appear to be very similar to the same flavor from Jelly Belly.

Please take a few moments to consider these very cherry jelly beans and then continue on to the first question.

1. Please take a moment to list three thoughts you are currently having about the very cherry jelly beans.

   Thought #1:

   _____

   _____

   _____

   Thought #2:

   _____

   _____

   _____

   Thought #3:

   _____

   _____

   _____

CONTINUE TO THE NEXT PAGE

2. How attractive do you find the very cherry jelly beans? Circle the number that best represents your opinion.

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive

3. How likely are you to consider purchasing the very cherry jelly beans? Circle the number that best represents your opinion.

1	2	3	4	5	6	7
Not Interested in Purchasing						Interested in Purchasing

4. I would expect the very cherry jelly beans to taste sweet and good. Please indicate your agreement with this statement.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

CONTINUE TO THE NEXT PAGE

Consumer Product 4 –Chocolate

The consumer packaged good manufacturer produces a line of chocolate bars that contain a variety of different flavors, including chocolate toffee bars that appear to be very similar to Heath chocolate bars.

Please take a few moments to consider this chocolate toffee bar and then continue on to the first question.

1. Please take a moment to list three thoughts you are currently having about the chocolate toffee bar.

   Thought #1:

   _____

   _____

   _____

   Thought #2:

   _____

   _____

   _____

   Thought #3:

   _____

   _____

   _____

CONTINUE TO THE NEXT PAGE

2. How attractive do you find the chocolate toffee bar? Circle the number that best represents your opinion.

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive

3. How likely are you to consider purchasing the chocolate toffee bar? Circle the number that best represents your opinion.

1	2	3	4	5	6	7
Not Interested in Purchasing						Interested in Purchasing

4. I would expect the chocolate toffee bar to taste creamy, sweet, and good. Please indicate your agreement with this statement.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

CONTINUE TO THE NEXT PAGE

Consumer Product 5 – Potato Chips

The consumer packaged good manufacturer produces a line of potato chips that contain a variety of different flavors, including barbecue potato chips.

Please take a few moments to consider these barbecue potato chips and then continue on to the first question.

1. Please take a moment to list three thoughts you are currently having about the barbecue potato chips.

   Thought #1:

   _____

   _____

   _____

   Thought #2:

   _____

   _____

   _____

   Thought #3:

   _____

   _____

   _____

CONTINUE TO THE NEXT PAGE

2. How attractive do you find the barbecue potato chips? Circle the number that best represents your opinion.

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive

3. How likely are you to consider purchasing the barbecue potato chips? Circle the number that best represents your opinion.

1	2	3	4	5	6	7
Not Interested in Purchasing						Interested in Purchasing

4. I would expect the barbecue potato chips to be crunchy and good. Please indicate your agreement with this statement.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

CONTINUE TO THE NEXT PAGE

Directions: Please answer the following questions based on your current state of hunger.

1. How hungry are you?

1	2	3	4	5	6	7
No Desire to Eat						Extremely Hungry

2. How full is your stomach?

1	2	3	4	5	6	7
Completely Full						Could Eat More

3. Please write down the number you were asked to memorize at the start of this survey.

   Number: _____

Please answer the following demographic questions, remember that this is completely confidential.

4. Age: _____

5. Gender: MALE FEMALE

6. Height: _____

7. Weight: _____

Consumer Products Study – Sinless Food Items

Directions: In this study we are examining the effects of engaged memory on the attractiveness of a new consumer packaged goods line. A major consumer packaged goods manufacturer will soon be introducing a new line of *sinless* delights. **These *sinless* foods taste just as good as the original but have almost zero calories per serving**. Foods in this new line are similar to other products currently on the market but have ninety-five percent fewer calories per serving. Many consumers who signed up to test the new products were concerned about the taste of this new line given that it has fewer calories than the original, however, upon taste testing these new products the majority of consumers were unable to identify which was the original, full-calorie food and which was the new *sinless*, reduced-calorie food – **the *sinless* products tasted the same as the original**. On the next page, you will be asked to memorize a number and recall it at the end of the study.

Thank you for your participation in this study!

Directions: This study is interested in looking at the effects of engaged memory on food item attractiveness. Please spend a few moments committing the following number to memory, you will be asked to recall this number at the end of the study.

88
72458157

Once you have committed this number to memory, proceed to the next page. **Do not return to this page** for any reason throughout the study.

Consumer Product 1 – *Sinless* Ice Cream

The new line of *sinless* foods contains a variety of different ice cream flavors, including chocolate chip cookie dough. The new *sinless* chocolate chip cookie dough ice cream contains only 10 calories per serving, with taste testers indicating that this new *sinless* chocolate chip cookie dough ice cream tastes just a good as the full calorie original.

Please take a few moments to consider this new *sinless* chocolate chip cookie dough ice cream and then continue on to the first question in the study.

1. Please take a moment to list three thoughts you are currently having about the new *sinless* chocolate chip cookie dough ice cream.

   Thought #1:

   _____

   _____

   _____

   Thought #2:

   _____

   _____

   _____

   Thought #3:

   _____

   _____

   _____

CONTINUE TO THE NEXT PAGE

2. How attractive do you find the new *sinless* chocolate chip cookie dough ice cream? Circle the number that best represents your opinion.

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive

3. How likely are you to consider purchasing the new *sinless* chocolate chip cookie dough ice cream? Circle the number that best represents your opinion.

1	2	3	4	5	6	7
Not Interested in Purchasing						Interested in Purchasing

4. I would expect the new *sinless*, reduced calorie chocolate chip cookie dough ice cream to taste the same as the original, full calorie ice cream. Please indicate your agreement with this statement.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

CONTINUE TO THE NEXT PAGE

Consumer Product 2 – *Sinless* Cookies

The new line of *sinless* foods contains a variety of different cookies, including chocolate sandwich cookies that appear to be very similar to Oreos. The new *sinless* chocolate sandwich cookies contains only 3 calories per serving, with taste testers indicating that this new *sinless* chocolate sandwich cookies tastes just a good as the original full calorie Oreos.

Please take a few moments to consider these new *sinless* chocolate sandwich cookies and then continue on to the first question.

1. Please take a moment to list three thoughts you are currently having about the new *sinless* chocolate sandwich cookies.

   Thought #1:

   _____

   _____

   _____

   Thought #2:

   _____

   _____

   _____

   Thought #3:

   _____

   _____

   _____

CONTINUE TO THE NEXT PAGE

2. How attractive do you find the new *sinless* chocolate sandwich cookies? Circle the number that best represents your opinion.

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive

3. How likely are you to consider purchasing the new *sinless* chocolate sandwich cookies? Circle the number that best represents your opinion.

1	2	3	4	5	6	7
Not Interested in Purchasing						Interested in Purchasing

4. I would expect the new *sinless*, reduced calorie chocolate sandwich cookies to taste the same as the original, full calorie Oreo cookies. Please indicate your agreement with this statement.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

CONTINUE TO THE NEXT PAGE

Consumer Product 3 – *Sinless* Jelly Beans

The new line of *sinless* foods contains a variety of different jelly bean flavors, including very cherry. The new *sinless* very cherry jelly beans contain 0 calories per serving, with taste testers indicating that these new *sinless* very cherry jelly beans taste just a good as the original Jelly Belly flavor.

Please take a few moments to consider these new *sinless* very cherry jelly beans and then continue on to the first question.

1. Please take a moment to list three thoughts you are currently having about the new *sinless* very cherry jelly beans.

   Thought #1:

   _____

   _____

   _____

   Thought #2:

   _____

   _____

   _____

   Thought #3:

   _____

   _____

   _____

CONTINUE TO THE NEXT PAGE

2. How attractive do you find the new *sinless* very cherry jelly beans? Circle the number that best represents your opinion.

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive

3. How likely are you to consider purchasing the new *sinless* very cherry jelly beans? Circle the number that best represents your opinion.

1	2	3	4	5	6	7
Not Interested in Purchasing						Interested in Purchasing

4. I would expect the new *sinless*, reduced calorie very cherry jelly beans to taste the same as the original, full calorie Jelly Belly very cherry jelly beans. Please indicate your agreement with this statement.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

CONTINUE TO THE NEXT PAGE

Consumer Product 4 – *Sinless* Chocolate

The new line of *sinless* foods contains a variety of different styles of chocolate, including a chocolate toffee bar, similar to Heath bars. The new *sinless* chocolate toffee bar contains only 7 calories per serving, with taste testers indicating that this new *sinless* chocolate toffee bar tastes just a good as the original.

Please take a few moments to consider this new *sinless* chocolate toffee bar and then continue on to the first question.

1. Please take a moment to list three thoughts you are currently having about the new *sinless* chocolate toffee bar.

   Thought #1:

   _____

   _____

   _____

   Thought #2:

   _____

   _____

   _____

   Thought #3:

   _____

   _____

   _____

CONTINUE TO THE NEXT PAGE

2. How attractive do you find the new *sinless* chocolate toffee bar? Circle the number that best represents your opinion.

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive

3. How likely are you to consider purchasing the new *sinless* chocolate toffee bar? Circle the number that best represents your opinion.

1	2	3	4	5	6	7
Not Interested in Purchasing						Interested in Purchasing

4. I would expect the new *sinless*, reduced calorie chocolate toffee bar to taste the same as the original, full calorie Heath chocolate bar. Please indicate your agreement with this statement.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

CONTINUE TO THE NEXT PAGE

Consumer Product 5 – *Sinless* Potato Chips

The new line of *sinless* foods contains a variety of different potato chip flavors, including barbecue. The new *sinless* barbecue potato chips contain only 5 calories per serving, with taste testers indicating that this new *sinless* barbecue potato chips taste just a good as the original.

Please take a few moments to consider these new *sinless* barbecue potato chips and then continue on to the first question.

1. Please take a moment to list three thoughts you are currently having about the new *sinless* barbecue potato chips.

   Thought #1:

   _____

   _____

   _____

   Thought #2:

   _____

   _____

   _____

   Thought #3:

   _____

   _____

   _____

CONTINUE TO THE NEXT PAGE

2. How attractive do you find the new *sinless* barbecue potato chips? Circle the number that best represents your opinion.

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive

3. How likely are you to consider purchasing the new *sinless* barbecue potato chips? Circle the number that best represents your opinion.

1	2	3	4	5	6	7
Not Interested in Purchasing						Interested in Purchasing

4. I would expect the new *sinless*, reduced calorie barbecue potato chips to taste the same as the original, full calorie barbecue potato chips. Please indicate your agreement with this statement.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

CONTINUE TO THE NEXT PAGE

Directions: Please answer the following questions based on your current state of hunger.

1. How hungry are you?

1	2	3	4	5	6	7
No Desire to Eat						Extremely Hungry

2. How full is your stomach?

1	2	3	4	5	6	7
Completely Full						Could Eat More

3. Please write down the number you were asked to memorize at the start of this survey.

   Number: _____

Please answer the following demographic questions, remember that this is completely confidential.

4. Age: _____

5. Gender: MALE FEMALE

6. Height: _____

7. Weight: _____

APPENDIX D

EXPERIMENT 4 SURVEY

Movie and Snack Choice Study

Directions: ASU researchers are interested in learning more about how consumers watch television shows and movies and what makes them more or less enjoyable. In the following screens you will be asked to watch a five-minute video clip and evaluate that clip. In order to add to the realism of how people watch television shows and movies, you may be asked also to engage in some other tasks during you viewing experience. Please put on your headphones now.

Thank you for your participation!

Directions: In order to test how viewing experiences differ when people have a lot on their mind, please spend a few moments memorizing the following number. You will be asked to recall the number towards the end of the survey.

22

72936184

Earlier in this session, you selected a snack from another room. At this time, you may begin eating the food you selected. However, because we don't want food to interfere with the remaining studies in the session, any leftover food will be collected and disposed of at the end of this study.

YOU ARE WELCOME TO BEGIN EATING AT THIS TIME - THE VIDEO CLIP WILL BEGIN ON THE NEXT SCREEN.

Directions: Please answer the following questions about the video clip you just saw.

1. The video was fast

1	2	3	4	5	6	7
Completely Disagree						Completely Agree

2. The video was exciting

1	2	3	4	5	6	7
Completely Disagree						Completely Agree

3. The video was boring

1	2	3	4	5	6	7
Completely Disagree						Completely Agree

4. The video was predictable

1	2	3	4	5	6	7
Completely Disagree						Completely Agree

Directions: Please answer the following questions about the snack food you selected earlier in the session in the other room. If you did not choose to eat any of the snack, please answer the questions to the best of your ability.

1. Which snack did you choose? BAKED LAYS REGULAR LAYS

2. How attractive is the snack that you chose?

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive

3. Overall, how positively would you rate the snack?

1	2	3	4	5	6	7
Not Positively						Very Positively

4. How good does the snack taste?

1	2	3	4	5	6	7
Not Good						Very Good

5. How much do you like the snack?

1	2	3	4	5	6	7
Do not like at all						Like a lot

6. What is your impression of the quality of the snack?

1	2	3	4	5	6	7
Very Low Quality						Very High Quality

7. Overall, how close did the snack meet your expectations?

1	2	3	4	5	6	7
Much Poorer Than Expected						Much Better Than Expected

8. How much would you be willing to pay for the snack you selected? _____

Directions: Please answer the following questions based on your attitudes toward the snack food you chose.

1	2	3	4	5	6	7	8	9	10
Feel No Conflict at all									Feel Maximum Conflict

1	2	3	4	5	6	7	8	9	10
Feel No Indecision at all									Feel Maximum Indecision

1	2	3	4	5	6	7	8	9	10
Completely One-Sided Reactions									Completely Mixed Reactions

Directions: Please rate the extent to which you agree with the following statements:

1. I think the food I chose tastes good.

1	2	3	4	5	6	7
Completely Disagree						Completely Agree

2. I think the food I chose is enjoyable to eat.

1	2	3	4	5	6	7
Completely Disagree						Completely Agree

3. I think the food I chose is not bad for me.

1	2	3	4	5	6	7
Completely Disagree						Completely Agree

4. I wish I had a larger quantity of the food I chose.

1	2	3	4	5	6	7
Completely Disagree						Completely Agree

5. I am worried about the number of calories in the food I chose.

1	2	3	4	5	6	7
Completely Disagree						Completely Agree

6. I am worried that the food I chose is too greasy.

1	2	3	4	5	6	7
Completely Disagree						Completely Agree

7. I am worried that the food I chose is too salty.

1	2	3	4	5	6	7
Completely Disagree						Completely Agree

8. I will have to watch what I eat the rest of the day if I eat too much of the food I chose.

1	2	3	4	5	6	7
Completely Disagree						Completely Agree

9. Please write down the number you were asked to memorize at the beginning of the study.

_____

Directions: The following statements concern your perceptions about yourself in a variety of situations. Please indicate the strength of your agreement with each statement.

1. How much do you care about your overall health?

1	2	3	4	5	6	7
Not At All						Very Much

2. How important is making healthy choices to you?

1	2	3	4	5	6	7
Not At All Important						Very Important

3. I am committed to living a healthy lifestyle.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

4. How important is exercising to you?

1	2	3	4	5	6	7
Not At All Important						Very Important

5. How often do you exercise?

1	2	3	4	5	6	7
Never	Less than Once a Month	Once a Month	2-3 Times a Month	Once a Week	2-3 Times a Week	Daily

6. How healthy are Baked Lays?

1	2	3	4	5	6	7
Not At All						Extremely

7. How healthy are Regular Lays?

1	2	3	4	5	6	7
Not At All						Extremely

8. Please indicate how hungry you are.

1	2	3	4	5	6	7
Not At All						Extremely

9. Age: _____

10. Gender MALE FEMALE

11. What language is most commonly spoken in your home?

ENGLISH OTHER

Thank You for Your Participation! Please raise your hand and the experimenter will collect your food item and bring you the next study.

APPENDIX E

EXPERIMENT 5 SURVEY

Consumer Taste Test Survey

Directions: You have been provided with a food item that you will be using in order to answer the questions on the following pages. We are interested in gaining your opinion about the food provided and the average college student's eating habits when they have something on their mind. Please do not beginning eating until instructed to do so by the instructor, at that time you may begin eating the food in front of you and you have the remainder of the study to eat as much as you like in order to answer the following questions.

Thank you for your participation!

In order to test your responses while something is on your mind please spend a few moments memorizing the following number, you will be asked to recall the number towards the end of the survey.

Number: 22

Number: 47359263

TEAR OUT THIS PAGE AND RAISE YOUR HAND FOR THE INSTRUCTOR TO COLLECT

THEN CONTINUE TO THE NEXT PAGE

YOU MAY BEGIN EATING AT THIS TIME

Section 1: In this section you will be asked to give your feedback about the food item provided.

1. Please specify which food item you have been given. _____
2. How would you rate the **attractiveness** of the food item?

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive

3. How would you rate the **aroma** of the food item?

1	2	3	4	5	6	7
Very Unpleasant						Very Appealing

4. How would you rate the **taste** of the food item?

1	2	3	4	5	6	7
Very Salty						Very Sweet

5. How likely would you be to **purchase** the food item?

1	2	3	4	5	6	7
Very Unlikely						Very Likely

CONTINUE TO THE NEXT PAGE

Section 2: Please answer the following questions based on your current state of hunger.

6. How full is your stomach?

1	2	3	4	5	6	7
Completely Full						Could Eat More

7. How hungry are you?

1	2	3	4	5	6	7
Extremely Hungry						No Desire to Eat

CONTINUE TO THE NEXT PAGE

Section 3: Please read the following questions and circle the number that represents your agreement with the following statements.

8. I wanted to eat the food in front of me because it tasted **good**.

1	2	3	4	5	6	7
Disagree						Agree

9. I wanted to eat the food in front of me because it was **pleasurable**.

1	2	3	4	5	6	7
Disagree						Agree

10. I wanted to eat the food in front of me because I needed to **refuel my body**.

1	2	3	4	5	6	7
Disagree						Agree

11. I wanted to eat the food in front of me because my **blood sugar is low**.

1	2	3	4	5	6	7
Disagree						Agree

CONTINUE TO THE NEXT PAGE

Section 4: In this section we are interested in learning more about the how you **currently** feel. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way **right now**, that is, at the present moment. Use the following to record your answers.

	Very Slightly Or Not at All	A Little	Moderately	Quite a Bit	Extremely
Interested	1	2	3	4	5
Distressed	1	2	3	4	5
Excited	1	2	3	4	5
Upset	1	2	3	4	5
Strong	1	2	3	4	5
Guilty	1	2	3	4	5
Scared	1	2	3	4	5
Hostile	1	2	3	4	5
Enthusiastic	1	2	3	4	5
Proud	1	2	3	4	5
Irritable	1	2	3	4	5
Alert	1	2	3	4	5
Ashamed	1	2	3	4	5
Inspired	1	2	3	4	5
Nervous	1	2	3	4	5
Determined	1	2	3	4	5
Attentive	1	2	3	4	5
Jittery	1	2	3	4	5
Active	1	2	3	4	5
Afraid	1	2	3	4	5

CONTINUE TO THE NEXT PAGE

Section 5: Please write down the number you were asked to memorize at the start of this survey.

12. Number: _____

Section 6: Please answer the following demographic questions.

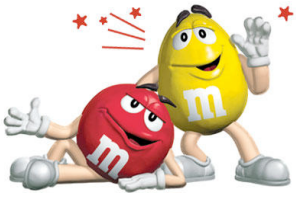
13. Age: _____

14. Gender: MALE FEMALE

THANK YOU FOR YOUR PARTICIPATION!

APPENDIX F

EXPERIMENT 6 SURVEY



M&M's Survey

Directions: You have been provided with a bag of M&M's; please use these M&M's to answer the questions on the following pages. We are interested in gaining your opinion about the M&M's provided and the average college student's eating habits when they have something on their mind. Please do not beginning eating until instructed to do in the survey, at that time you may begin eating the food in front of you and you have the remainder of the study to eat as much as you like while answering the following questions.

In order to test your responses while something is on your mind please spend a few moments memorizing the following number, you will be asked to recall the number towards the end of the survey.

Number: 44
Number: 72936184

TEAR OUT THIS PAGE AND RAISE YOUR HAND FOR THE INSTRUCTOR TO COLLECT THEN CONTINUE TO THE NEXT PAGE

YOU MAY BEGIN EATING AT THIS TIME

Section 1: In this section you will be asked to give your feedback about the M&M's provided.

1. How would you rate the **attractiveness** of the M&M's?

1	2	3	4	5	6	7
Not at all Attractive						Very Attractive

2. How would you rate the **aroma** of the food item?

1	2	3	4	5	6	7
Very Unpleasant						Very Appealing

3. How would you rate the **taste** of the food item?

1	2	3	4	5	6	7
Very Salty						Very Sweet

4. How likely would you be to **purchase** the food item?

1	2	3	4	5	6	7
Very Unlikely						Very Likely

CONTINUE TO THE NEXT PAGE

Section 2: Please answer the following questions based on your current state of hunger.

5. How full is your stomach?

1	2	3	4	5	6	7
Completely Full						Could Eat More

6. How hungry are you?

1	2	3	4	5	6	7
Extremely Hungry						No Desire to Eat

Section 3: Please read the following questions and circle the number that represents your agreement with the following statements.

7. I wanted to eat the food in front of me because it tasted **good**.

1	2	3	4	5	6	7
Disagree						Agree

8. I wanted to eat the food in front of me because it was **pleasurable**.

1	2	3	4	5	6	7
Disagree						Agree

CONTINUE TO THE NEXT PAGE

Section 4: In this section we are interested in learning more about the how you **currently** feel. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way **right now**, that is, at the present moment. Use the following to record your answers.

	Very Slightly Or Not at All	A Little	Moderately	Quite a Bit	Extremely
Interested	1	2	3	4	5
Distressed	1	2	3	4	5
Excited	1	2	3	4	5
Upset	1	2	3	4	5
Strong	1	2	3	4	5
Guilty	1	2	3	4	5
Scared	1	2	3	4	5
Hostile	1	2	3	4	5
Enthusiastic	1	2	3	4	5
Proud	1	2	3	4	5
Irritable	1	2	3	4	5
Alert	1	2	3	4	5
Ashamed	1	2	3	4	5
Inspired	1	2	3	4	5
Nervous	1	2	3	4	5
Determined	1	2	3	4	5
Attentive	1	2	3	4	5
Jittery	1	2	3	4	5
Active	1	2	3	4	5
Afraid	1	2	3	4	5

CONTINUE TO THE NEXT PAGE

Section 5: Please indicate how much each of the following statements reflects how you typically are. Circle the number that represents your opinion.

9. I am good at resisting temptation.

1	2	3	4	5	6	7
Not At All						Very Much

10. I have a hard time breaking bad habits.

1	2	3	4	5	6	7
Not At All						Very Much

11. I am lazy.

1	2	3	4	5	6	7
Not At All						Very Much

12. I say inappropriate things.

1	2	3	4	5	6	7
Not At All						Very Much

13. I never allow myself to lose control.

1	2	3	4	5	6	7
Not At All						Very Much

14. I do certain things that are bad for me, if they are fun.

1	2	3	4	5	6	7
Not At All						Very Much

15. People can count on me to keep on schedule.

1	2	3	4	5	6	7
Not At All						Very Much

16. Getting up in the morning is hard for me.

1	2	3	4	5	6	7
Not At All						Very Much

17. I have trouble saying no.

1	2	3	4	5	6	7
Not At All						Very Much

18. I change my mind fairly often.

1	2	3	4	5	6	7
Not At All						Very Much

19. I blurt out whatever is on my mind.

1	2	3	4	5	6	7
Not At All						Very Much

20. People would describe me as impulsive.

1	2	3	4	5	6	7
Not At All						Very Much

21. I refuse things that are bad for me.

1	2	3	4	5	6	7
Not At All						Very Much

22. I spend too much money.

1	2	3	4	5	6	7
Not At All						Very Much

23. I keep everything neat.

1	2	3	4	5	6	7
Not At All						Very Much

24. I am self-indulgent at times.

1	2	3	4	5	6	7
Not At All						Very Much

25. I wish I had more self-discipline.

1	2	3	4	5	6	7
Not At All						Very Much

26. I am reliable.

1	2	3	4	5	6	7
Not At All						Very Much

27. I get carried away by my feelings.

1	2	3	4	5	6	7
Not At All						Very Much

28. I do many things on the spur of the moment.

1	2	3	4	5	6	7
Not At All						Very Much

29. I don't keep secrets very well.

1	2	3	4	5	6	7
Not At All						Very Much

30. People would say that I have iron self-discipline.

1	2	3	4	5	6	7
Not At All						Very Much

31. I have worked or studied all night at the last minute.

1	2	3	4	5	6	7
Not At All						Very Much

32. I'm not easily discouraged.

1	2	3	4	5	6	7
Not At All						Very Much

33. I'd be better off if I stopped to think before acting.

1	2	3	4	5	6	7
Not At All						Very Much

34. I engage in healthy practices.

1	2	3	4	5	6	7
Not At All						Very Much

35. I eat healthy foods.

1	2	3	4	5	6	7
Not At All						Very Much

36. Pleasure and fun sometimes keep me from getting work done.

1	2	3	4	5	6	7
Not At All						Very Much

37. I have trouble concentrating.

1	2	3	4	5	6	7
Not At All						Very Much

38. I have worked effectively towards long-term goals.

1	2	3	4	5	6	7
Not At All						Very Much

39. Sometimes I can't stop myself from doing something, even if I know it is wrong.

1	2	3	4	5	6	7
Not At All						Very Much

40. I often act without thinking through all the alternatives.

1	2	3	4	5	6	7
Not At All						Very Much

41. I lose my temper too easily.

1	2	3	4	5	6	7
Not At All						Very Much

42. I often interrupt people.

1	2	3	4	5	6	7
Not At All						Very Much

43. I sometimes drink or do drugs to excess.

1	2	3	4	5	6	7
Not At All						Very Much

44. I am always on time.

1	2	3	4	5	6	7
Not At All						Very Much

Section 6: Please write down the number you were asked to memorize at the start of this survey.

45. Number: _____

46. How many calories are there in the bag of M&M's? _____

Section 7: Please answer the following demographic questions.

47. Age: _____

48. Gender: MALE FEMALE

Section 8: Please make sure you put the last four digits of your id number on the first page of the survey, then put the same last four digits on the 3x5 card in front of you as you did on the top of your survey, place the 3x5 card in the bag, seal it and raise your hand so the instructor can bring you the next study.

THANK YOU FOR YOUR PARTICIPATION!

APPENDIX G

IRB FORMS

ARIZONA STATE UNIVERSITY
RESEARCH AND ECONOMIC AFFAIRS

Office of Research Integrity and Assurance

To:	Andrea Ketcham BAC
From:	Mark Roosa, Chair Soc Beh IRB
Date:	09/21/2009
Committee Action:	**Exemption Granted**
IRB Action Date:	09/21/2009
IRB Protocol #:	0909004357
Study Title:	The Impact of Hunger on Consumer Consumption

The above-referenced protocol is considered exempt after review by the Institutional Review Board pursuant to Federal regulations, 45 CFR Part 46.101(b)(2) .

This part of the federal regulations requires that the information be recorded by investigators in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. It is necessary that the information obtained not be such that if disclosed outside the research, it could reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation.

You should retain a copy of this letter for your records.

TABLE 1: SUMMARY OF THE THEORETICAL MODEL

	Hunger	Ability to exert counteractive self-Control (high cognitive capacity)	Overall effect
Attractiveness			
Hedonic food attractiveness	+	+	=
Hedonic food attractiveness	+	-	+
Utilitarian food attractiveness	+	+	=
Utilitarian food attractiveness	+	-	=
Consumption			
Hedonic food consumption	+	+	=
Hedonic food consumption	+	-	+
Utilitarian food consumption	+	+	+
Utilitarian food consumption	+	-	+

FIGURE 1: EXPERIMENT 1 – THE EFFECT OF HUNGER ON FOOD ATTRACTIVENESS

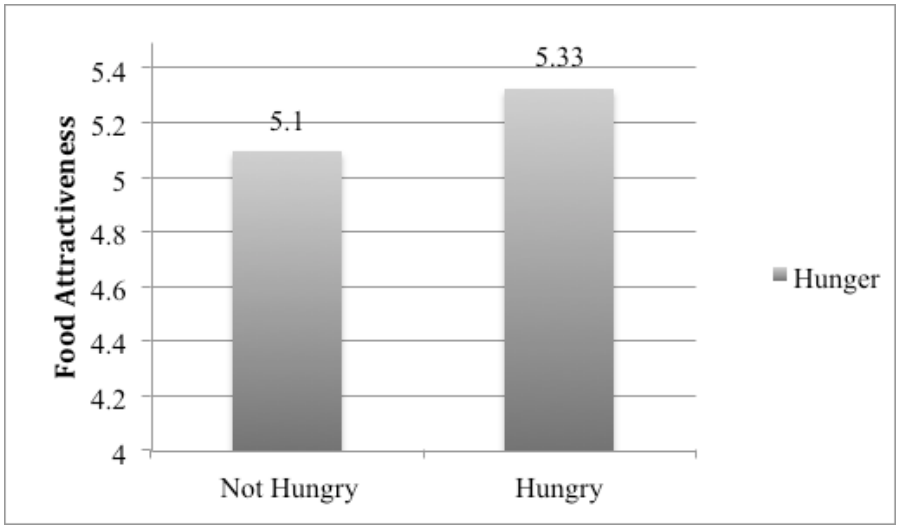
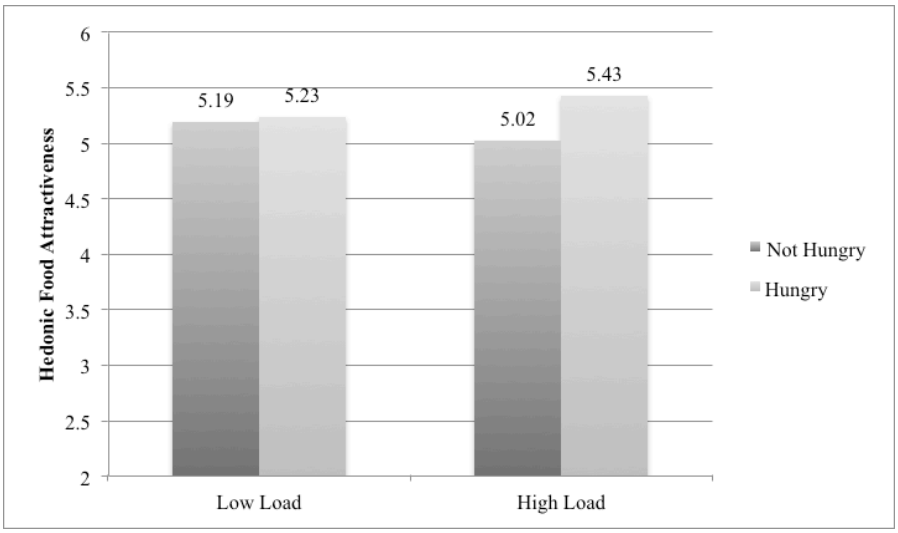


FIGURE 2: EXPERIMENT 1 – THE EFFECTS OF HUNGER AND LOADON HEDONIC AND UTILITARIAN FOOD ATTRACTIVENESS



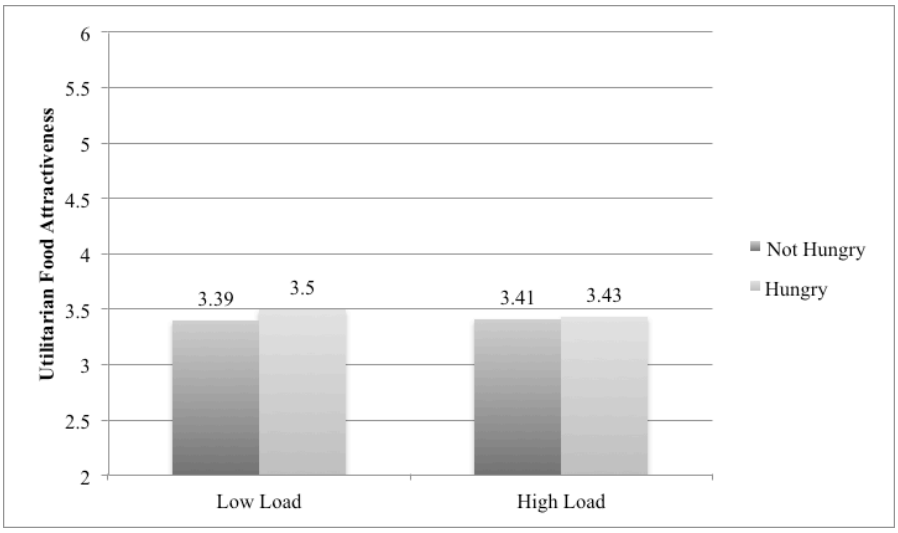
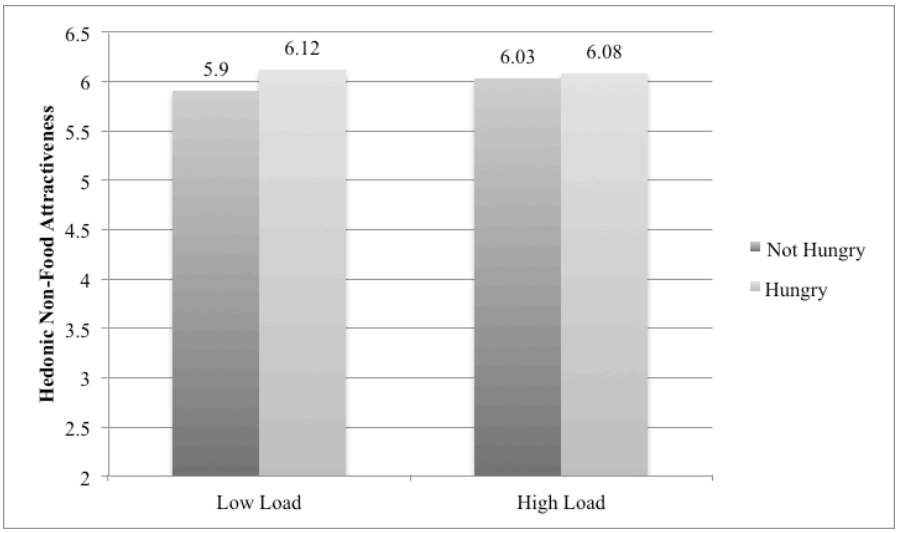


FIGURE 3: EXPERIMENT 1 – THE EFFECTS OF HUNGER AND LOAD ON HEDONIC AND UTILITARIAN NON-FOOD ATTRACTIVENESS



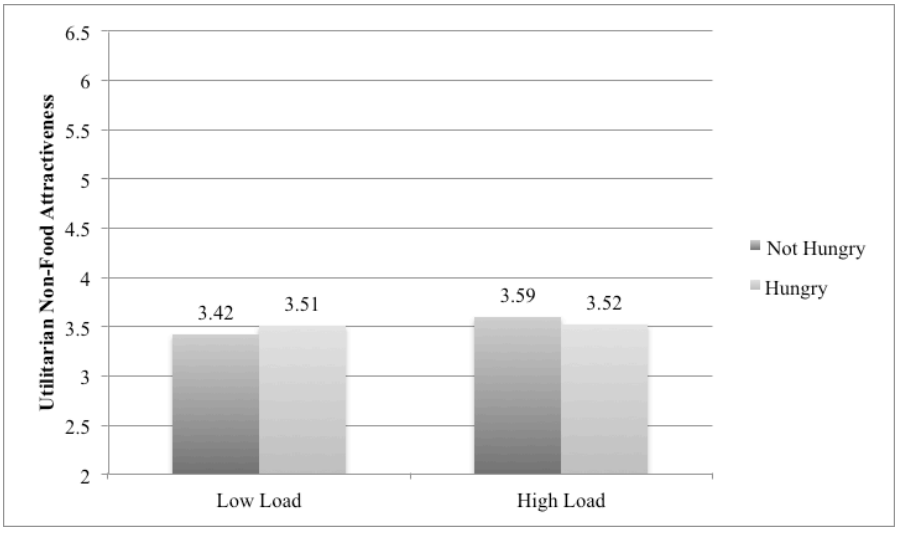


FIGURE 4: EXPERIMENT 2 – M&M'S USED FOR EVALUATION

FIGURE 5: EXPERIMENT 2 – THE EFFECTS OF HUNGER AND LOAD ON CALORIE ESTIMATION

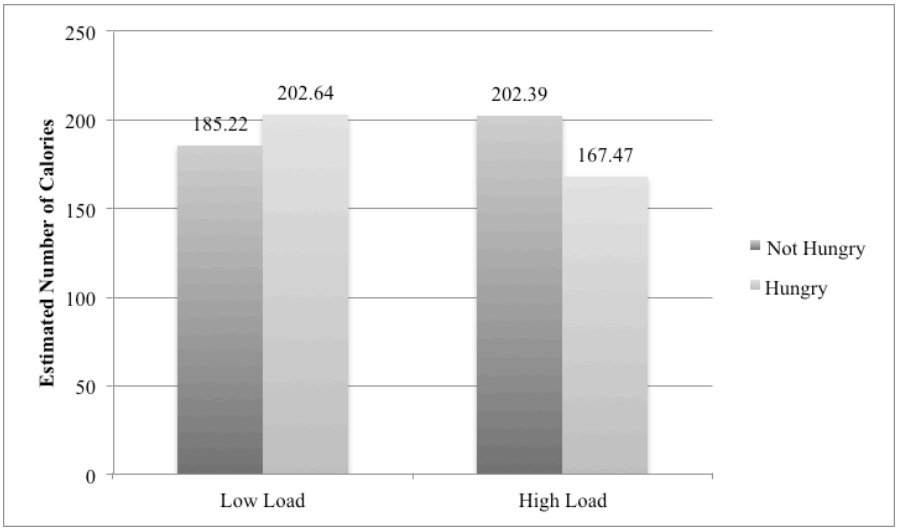


FIGURE 6: EXPERIMENT 2 – THE EFFECTS OF HUNGER AND LOAD ON HEDONIC FOOD ATTRACTIVENESS

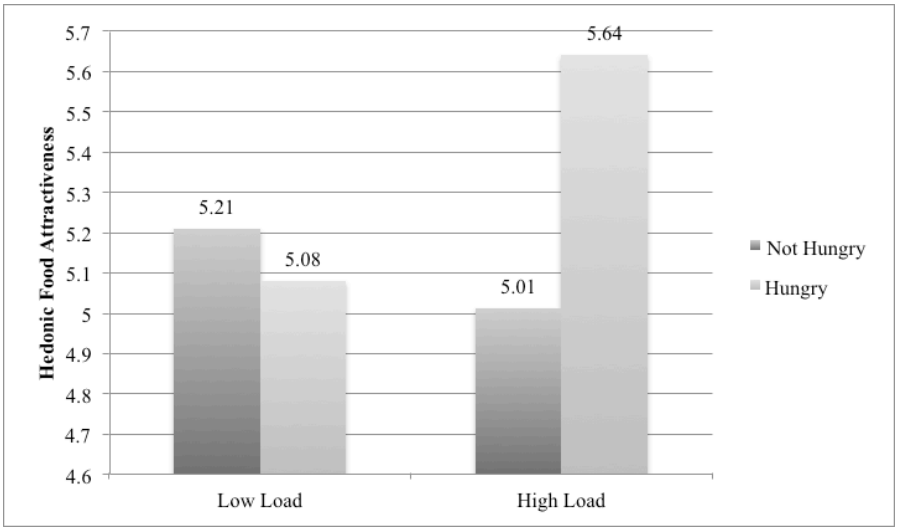


FIGURE 7: EXPERIMENT 3 – THE EFFECT OF HUNGER ON FOOD ATTRACTIVENESS

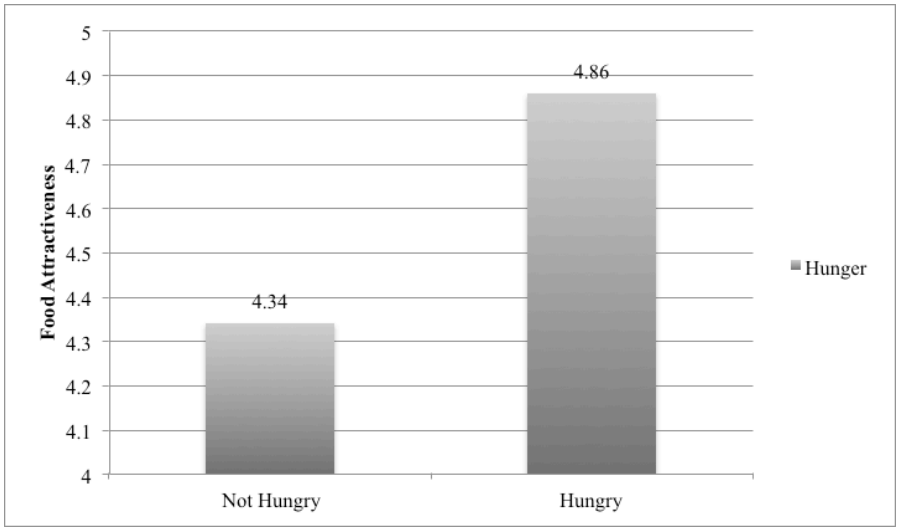


FIGURE 8: EXPERIMENT 3 – THE EFFECT OF LOAD ON FOOD ATTRACTIVENESS

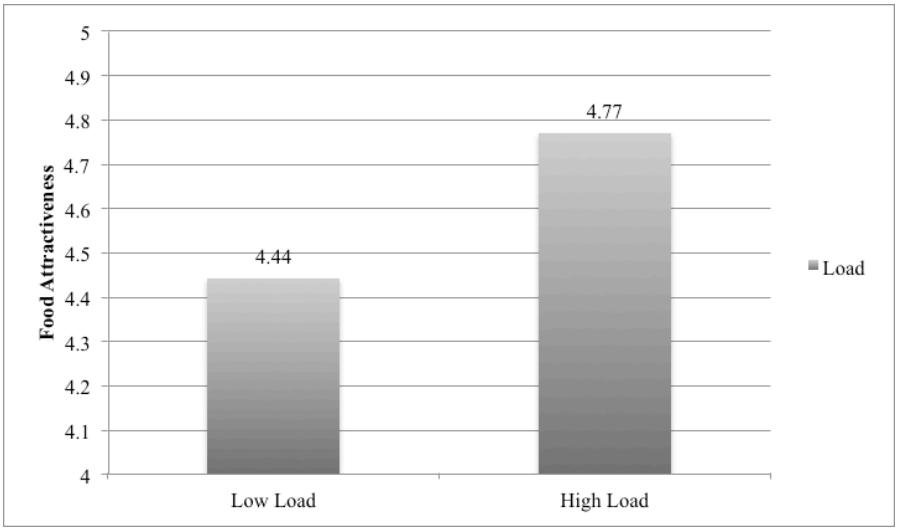


FIGURE 9: EXPERIMENT 3 – THE EFFECTS OF HUNGER AND LOAD ON HEDONIC VERSUS SINLESS FOOD ATTRACTIVENESS

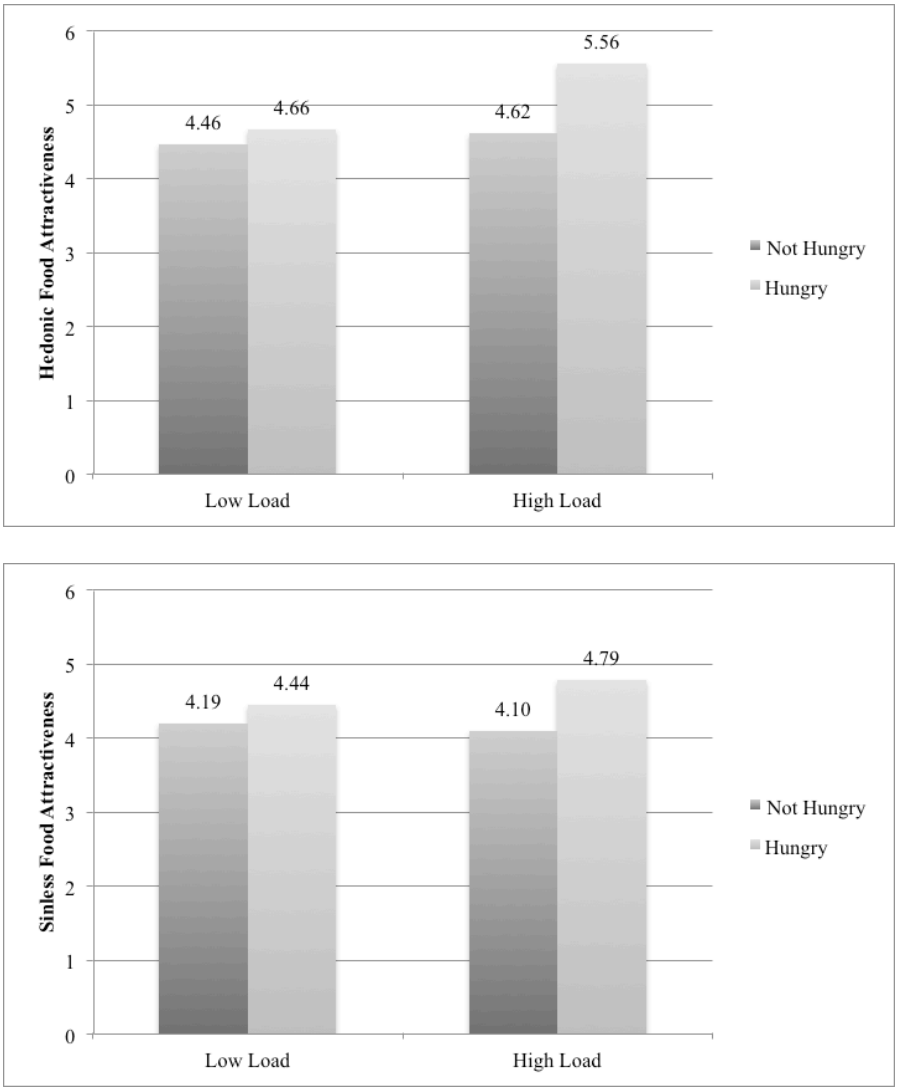


FIGURE 10: EXPERIMENT 3 – THE EFFECT OF FOOD ITEM ON FOOD ATTRACTIVENESS

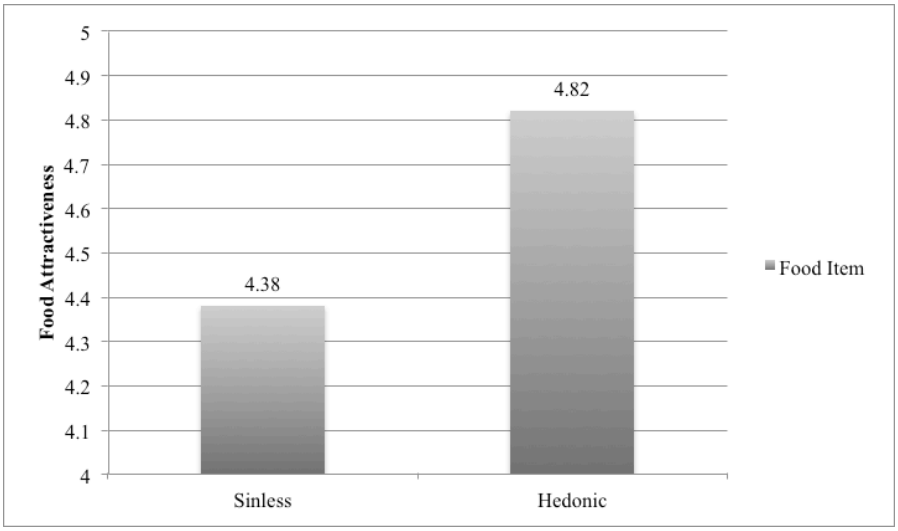


FIGURE 11: EXPERIMENT 4 – THE EFFECT OF HUNGER ON THE NUMBER OF GRAMS EATEN

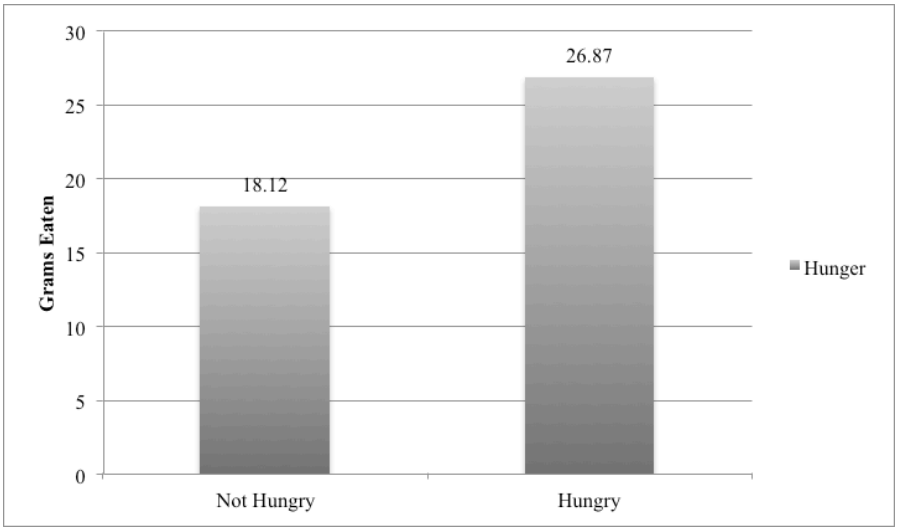


FIGURE 12: EXPERIMENT 4 – THE EFFECT OF LOAD ON THE NUMBER OF GRAMS EATEN

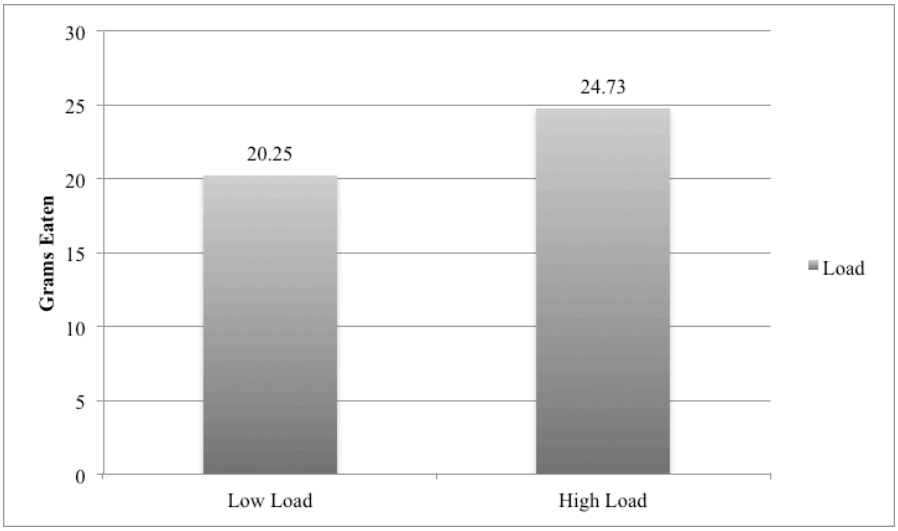


FIGURE 13: EXPERIMENT 4 – THE EFFECTS OF HUNGER AND LOAD ON THE NUMBERS OF GRAMS EATEN

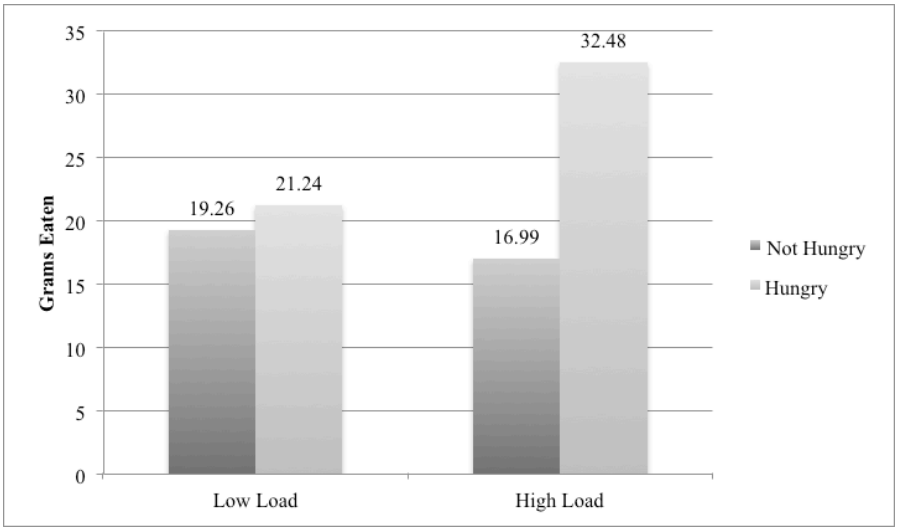


FIGURE 14: EXPERIMENT 4 – THE EFFECT OF FOOD ITEM SELECTION ON THE NUMBER OF GRAMS EATEN

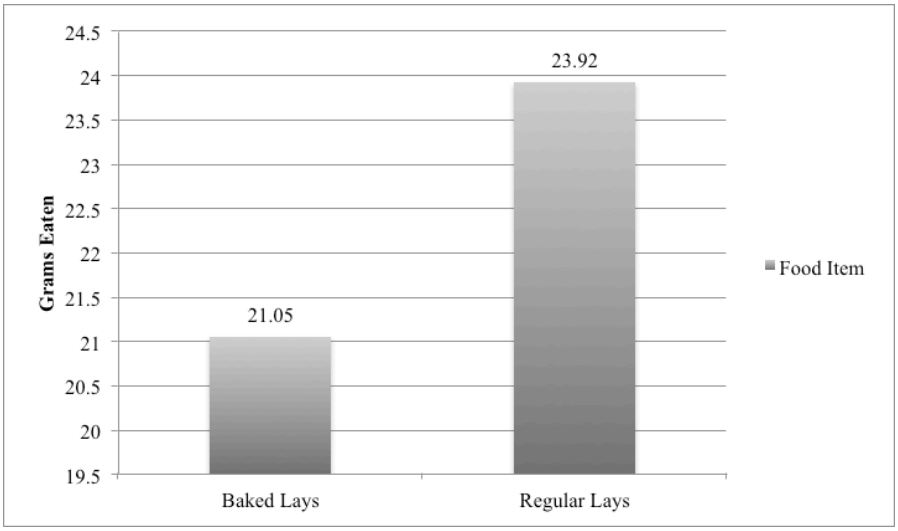


FIGURE 15: EXPERIMENT 5 – HEDONIC AND UTILITARIAN FOOD MANIPULATION

FIGURE 16: EXPERIMENT 5 – EFFECT OF HUNGER ON THE NUMBER OF GRAMS EATEN

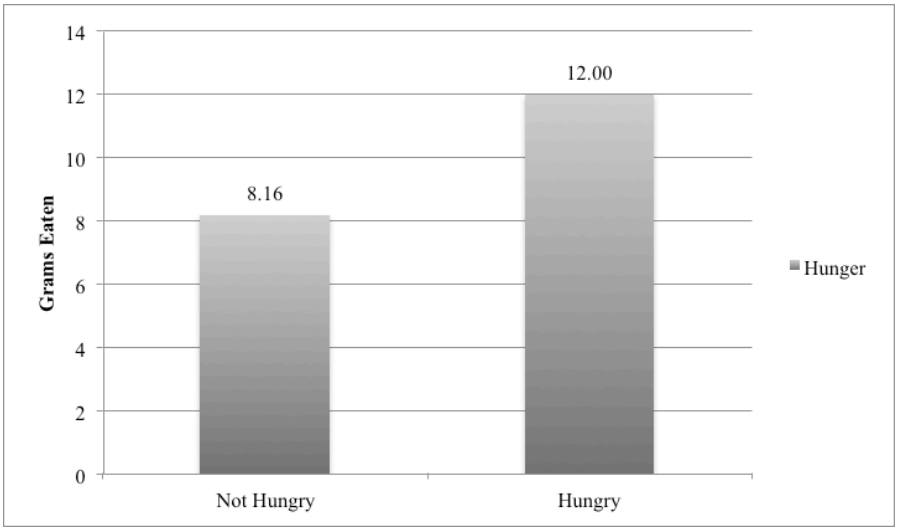


FIGURE 17: EXPERIMENT 5 – THE EFFECTS OF HUNGER AND LOAD ON THE NUMBER OF GRAMS EATEN

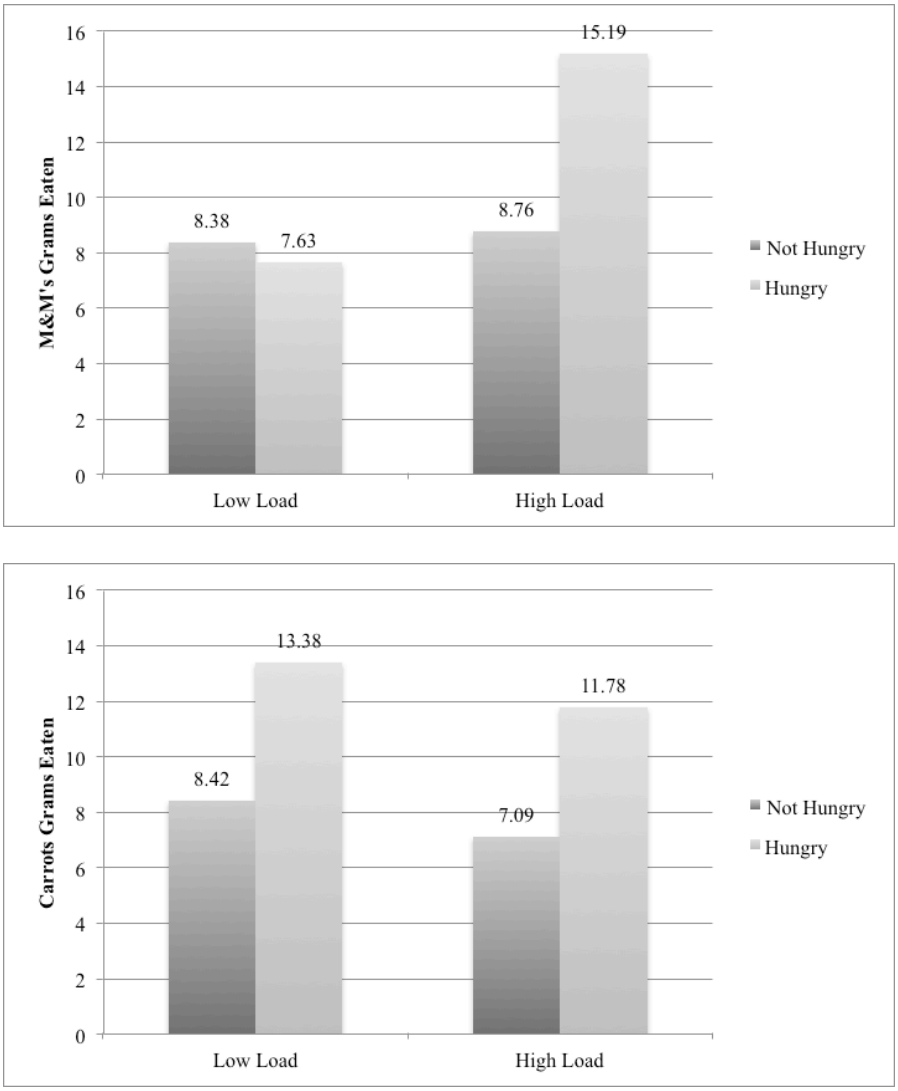


FIGURE 18: EXPERIMENT 6 – CALORIE MANIPULATION

FIGURE 19: EXPERIMENT 6 – THE EFFECT OF HUNGER ON GRAMS EATEN

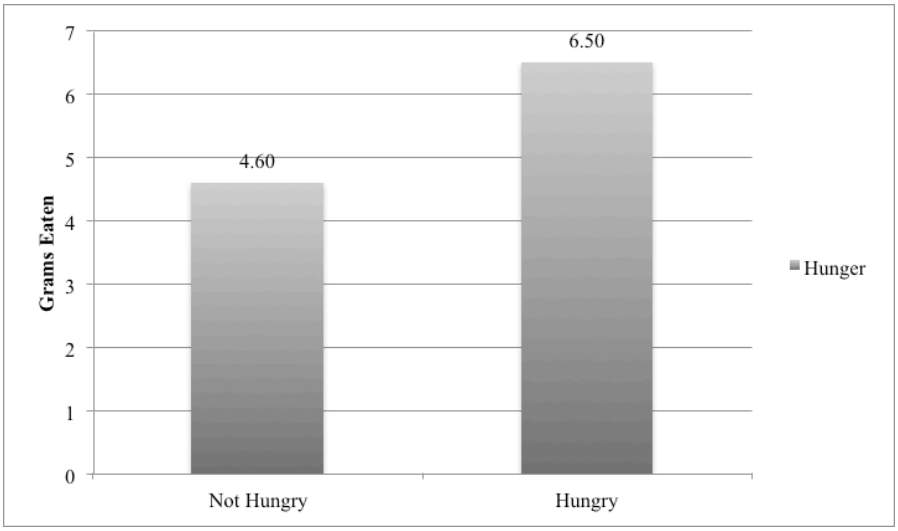


FIGURE 20: EXPERIMENT 6 – THE EFFECT OF CALORIE INFORMATION ON GRAMS EATEN

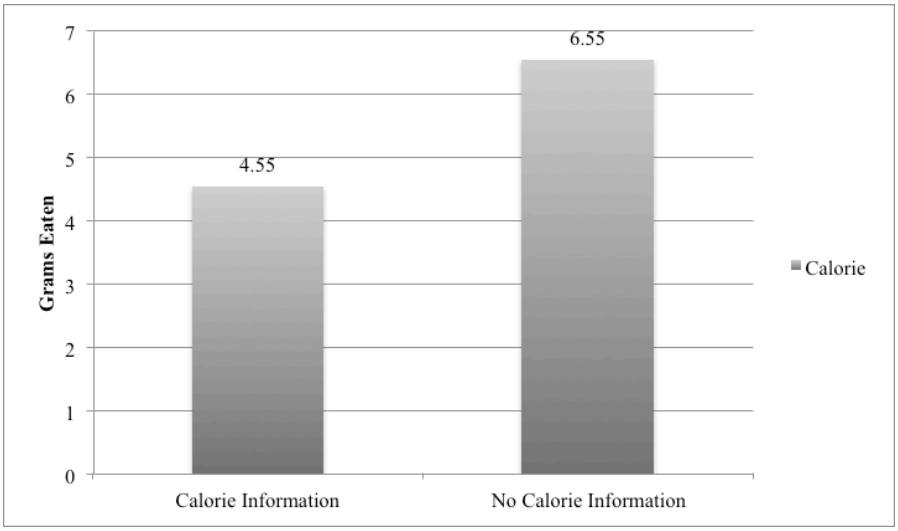


FIGURE 21: EXPERIMENT 6 – THE EFECT OF LOAD ON GRAMS EATEN

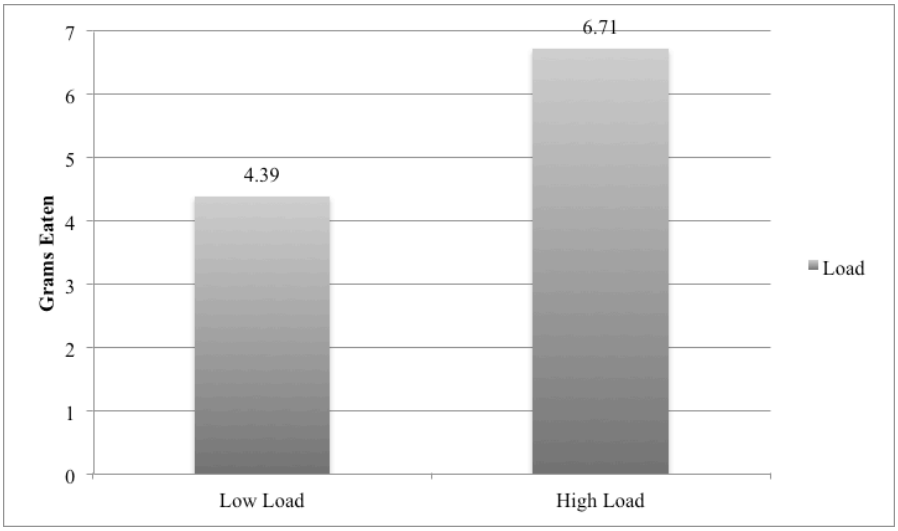


FIGURE 22: EXPERIMENT 6 – THE EFFECTS OF HUNGER AND CALORIE INFORMATION ON GRAMS EATEN

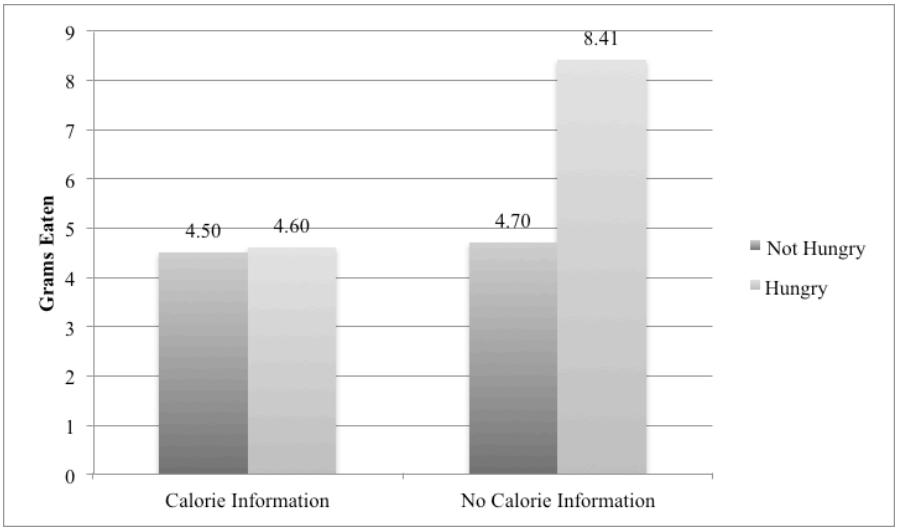


FIGURE 23: EXPERIMENT 6 – THE EFFECTS OF LOAD AND CALORIE INFORMATION ON GRAMS EATEN

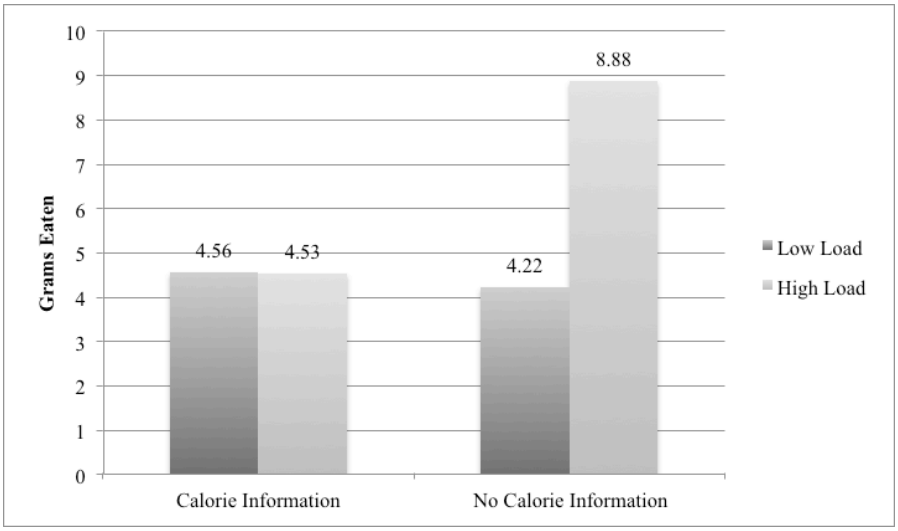


FIGURE 24: EXPERIMENT 6 – THE EFFECTS OF HUNGER BY LOAD BY CALORIE INFORMATION ON GRAMS EATEN

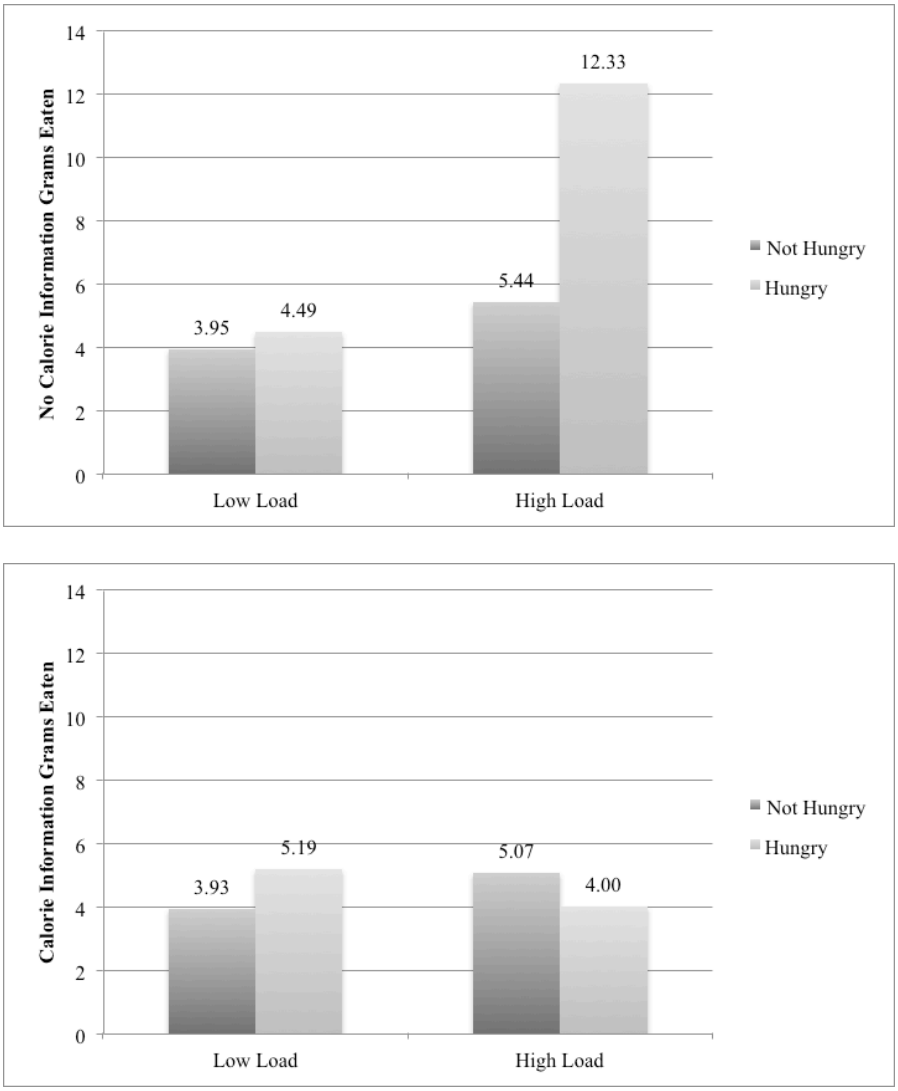


FIGURE 25: EXPERIMENT 6 – THE EFFECTS OF HUNGER AND LOAD ON PERCIEVED NUMBER OF CALORIES IN THE BAG OF M&M'S

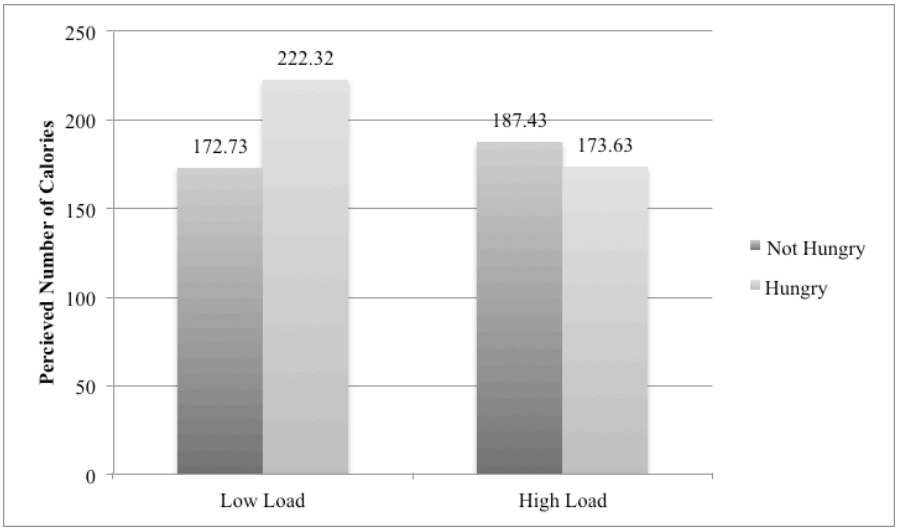


FIGURE 26: EXPERIMENT 6 – MEDIATED MODERATION