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I Know I Shouldn't Eat That But I'm Going to Anyway: The Role of Mood and Cognitive Depletion in Food Consumption

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Those looking for explanations for the current obesity epidemic often point to the rise of the fast food drive-through, saturation of unhealthy, overly processed foods on grocery store shelves, and the existence of food “engineered” by corporations to engender addiction as key culprits. While such factors undoubtedly contribute to a nutritional climate that can be perilous and confusing, individual health outcomes largely remain the sum of daily choices that individuals make regarding food. While individuals will naturally vary in respect to taste preferences and vulnerability to certain food stimuli, an individual's mood state has consistently been shown to be a determinant of food choice and consumption (Kostek & Ashrafioun, 2013; Richards, French, Johnson, Naparstek, & Williams, 1992). For instance, inducing a negative mood typically leads dieting individuals to eat greater quantities of food (e.g., Heatherton, Striipe & Wittenberg, 1998), and foods with poorer nutritional value (Torres & Nowson, 2007). This is one mechanism linking stress and other negative mood states to obesity. However, current research suggests that individuals can mitigate the effects of stressors and negative mood on eating behavior by reasserting control over their mood or utilizing non-food based coping mechanisms. That is, negative mood effects on eating behavior can be over-ridden by use of behavioral and cognitive strategies (Martyn-Nemeth et al., 2009; Poelman et al., 2013).

However, cognitive depletion presents an additional challenge to an individual struggling to control the effect of mood – a compromise in self-regulatory resources. Halali, Bereby-Meyer, and Meiran (2013) defined cognitive depletion as occurring when the limited supply of self-regulatory resources that a person has begins to exhaust, thus compromising attributes such as self-control. Previous research has suggested that individuals who are cognitively depleted have difficulty inhibiting behaviors that could be inherently self-destructive or against their best self-interest (Alberts, Martijn, Greb, Merckelbach, & de Vries, 2007). This tendency, when examined in conjunction with frequent changes in mood, present an interesting interaction: individuals may have the capability to make rationale, calculated decisions even when in a positive or negative mood, but this ability may decrease when cognitive resources are limited.

The implications of this theory are particularly applicable regarding the nutritional choices that individuals make on a daily basis. If an individual's mood changes as a function of exposure to some external stimuli, they may still possess the regulatory capabilities to be able to avoid taking a slice of cake or piece of candy that they know they do not need. But when these changes in mood are combined with limited cognitive resources as a consequence of a mentally draining task, outcomes become less clear; do individuals still have the ability to make decisions consciously, and in what they believe is their best interest?

The goal of the present study was to examine the intersection of mood and levels of cognitive depletion in determining the circumstances in which individuals make specific food choices. While prior research has identified eating patterns under conditions

of stress or negative mood, eating patterns in response to elevated or positive mood are not as well documented. This, in combination with a greater understanding of the intersection of mood and cognitive depletion, would represent important contributions to our understanding of self-regulation of eating behavior. In addition to the role of mood and cognitive depletion, self-esteem and ability to self-regulate mood, as assessed via questionnaires, were examined as possible moderators of outcome.

In the present study, participants were recruited through the use of signs put up around the University of Puget Sound, as well as advertisements that were posted on the social networking website Facebook. Potential participants were told that they would receive \$5.00 and snacks as compensation. After completing informed consent procedures, participants completed a questionnaire packet that includes a 12-item mood measure (derived from the State-Trait Personality Inventory; Spielberger, 1980), the emotional regulation scale (Gratz & Roemer, 2004), a measure of self-esteem (Rosenberg, 1965), demographic questions, and questions related to baseline cognitive depletion. Participants then experienced a mood manipulation exercise adapted from Richards et al. (1992) designed to induce either a negative or positive mood. In this exercise, participants were randomized to view photographs of either negative current events (negative mood condition), or animals and children engaging in humorous or appealing behavior (positive mood condition). They were asked to rate these photos on artistic value and personal likability, to ensure that they adequately attend to the images. Participants mood was verified through the same mood measure completed before the manipulation.

Participants then completed an exercise adapted from Kostak and Ashrafioun (2013) designed to induce either a high or low level of cognitive depletion. In this exercise, participants were instructed to write about a recent vacation that they took. Participants who were in the “high” cognitive depletion condition were instructed to not use any words that contain the letter “a” or “n”, while participants in the “low” cognitive depletion condition had no restrictions regarding their usage of words. After completing their assigned exercise, participants completed a short questionnaire that included the same mood assessment they had previously completed, and items that assessed their level of cognitive depletion. Finally, they were taken to an adjacent room to await debriefing, and while they waited, they were presented with an array of 6 different types of foods; participants were told that this food represented part of their compensation for participation in the study. Three of the foods presented were highly caloric and palatable “junk foods” (M & M’s, Skittles, and assorted potato chips), while the other three were nutritionally dense and minimally commercially processed (carrots, blueberries, and sugar snap peas). In addition to participant food choice, eating behavior was noted through the total caloric intake of each participant; individual bowls that contain each food were weighed both before and after participants had access to food to determine how many calories each participant consumed. Participants had a total of 6 minutes to consume food of their choice before the experimenter entered the room for debriefing.

Participant caloric intake and food choice across each of the four conditions was then compared using statistical analysis (i.e., ANOVA) to assess for significant differences. It was predicted that those who were in the cognitive depletion, negative mood condition would consume more food overall and choose more caloric and highly palatable food choices compared with the other conditions. Previous research from

Loxton, Dawe, and Cahill (2011) suggests that individuals are more likely to eat highly palatable foods when exposed to negative mood cues, while Kostek and Ashrafioun (2013) found that individuals who were cognitively depleted were more likely to act impulsively and spontaneously. Therefore, it was predicted that participants who had a negative mood induced and are cognitively depleted would not be equipped with the necessary neurological resources to consciously resist the allure of the highly caloric, palatable foods.

While the study is ongoing, preliminary results suggest that the proposed hypothesis may not be supported. A two-way ANOVA revealed that there was no significant interaction between either the mood manipulation that participants experienced or the nature of the writing exercise in regards to both total calories and total unhealthy calories that participants consumed. Additionally, there was no statistically significant interaction between participants BMI (Body Mass Index) and their total caloric intake. Preliminary results actually indicated that participants who experienced the negative mood induction and completed the writing exercise designed to not induce cognitive depletion consumed both the most total calories and the most calories of unhealthy food.

In addition, results also suggest that a strong negative correlation exists between participant self-esteem, as measured by Rosenberg (1965) and ability to self-regulate, as assessed by Gratz and Roemer (2004). When scoring the measure designed to assess self-esteem (Rosenberg, 1965), a higher score indicates greater self-esteem, while when scoring the measure designed to assess self-regulatory ability (Gratz & Roemer, 2004), a lower score indicates greater self-regulatory ability. For males, the Pearson's r between the two variables was $-.698$, while it was $-.634$ for females; this strong negative correlation indicates that as participants who reported high levels of self-esteem also had a high ability to self-regulate and that participants who reported low levels of self-esteem had a low ability to self-regulate. This suggests that the two traits may be linked in some way; further research on this correlation is warranted.

Which preliminary results suggest findings not in line with the hypothesis of the present study, it is possible that a greater sample size and more diverse sample will yield new insights. Continuation of the present study will allow more definitive conclusions, as well as a greater understanding of the mechanisms underlying these results.

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