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Targeting acceptance in the management of food craving: The mediating roles of eating styles and thought suppression[☆]

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ABSTRACT

Food craving is now widely considered to be a cognitively motivated state. Acceptance-based treatments are effective in reducing the adverse impact of food cravings on consumption, via a hypothesized decrease in experiential avoidance. The mechanisms that drive the success of acceptance-based management of craving remain to be empirically tested. This study examined the role of eating styles and thought suppression as mediators in the relationship between experiential avoidance and craving. Participants ($n = 298$, 51.5% female) completed the Food Craving Acceptance and Awareness Questionnaire (FAAQ), the Dutch Eating Behavior Questionnaire (DEBQ), the White Bear Suppression Inventory (WBSI; a measure of thought suppression), and the reduced version of the Food Craving Questionnaire- Trait (FCQ-T-r). Scores on the FAAQ were inversely associated with scores on the FCQ-T-r, DEBQ, and WBSI; FCQ-T-r scores were positively correlated with scores on the DEBQ and WBSI (all $p < 0.001$). The total indirect effect of acceptance on craving through the hypothesized mediators was significantly different from zero. Controlling for eating styles and thought suppression, acceptance remained a significant predictor of craving. Results thus provide initial evidence that eating styles and thought suppression mediate the relationship between food-specific experiential avoidance and food craving. Findings lay the foundation for future study of the proximal antecedents of food cravings and lend preliminary support for targeting thought suppression and eating styles in acceptance-based approaches to the management of craving.

Food cravings (i.e., the intense desire to eat a specific food) have been implicated in a range of weight- and eating-related pathologies. They can act as powerful triggers for binge-eating episodes in bulimia nervosa (BN), binge eating disorder (BED), and obesity, and are widely considered obstacles to successful weight loss and maintenance (Bas, Bozan, & Cigerim, 2008; Forman et al., 2007; Polivy & Herman, 1993; Potenza & Grilo, 2014; Stice, Presnell, & Spangler, 2002; Striegel-Moore, Silberstein, & Rodin, 1986; Yanovski, 2002). Hypotheses that implicate hormonal fluctuations, nutritional deficits, or pharmacologically active ingredients in the development and maintenance of food cravings are generally lacking empirical support (Hormes, 2014; Michener & Rozin, 1994; Orloff & Hormes, 2014; Rodin, Mancuso, Granger, & Nelbach, 1991). There is now a growing body of literature that supports the view of craving as a cognitively motivated state. For example, the Elaborated Intrusion (EI) Theory of Desire views craving as involving two distinct mental processes: (a) intrusive thoughts about an appetitive target that are triggered automatically by internal (e.g., negative affect) or external cues (e.g., the smell of a well-liked food) and (b) subsequent elaboration of these thoughts (Kavanagh, Andrade,

& May, 2005). Empirical evidence supports a key role of internal and external triggers of craving-related thoughts: Food cravings have previously been linked to specific eating styles, including the tendency to eat in response to internal (e.g., affective states) and/or external cues that have become associated with the craving target (Hill, Weaver, & Blundell, 1991). For example, low mood is frequently cited as a perceived cause of craving episodes (Hill et al., 1991; Waters, Hill, & Waller, 2001).

The EI Theory of Desire attributes food craving episodes to the conscious elaboration of automatic thoughts about a desired food. Certain processes appear to increase the likelihood that elaboration takes place. For example, attempts to suppress intrusive or unwanted thoughts have been shown to paradoxically increase their salience (Wegner, 1994; Wegner, Schneider, Carter, & White, 1987). In the context of the EI Theory of Desire, thought suppression facilitates elaboration, and tendency toward chronic thought suppression has been implicated in cravings for alcohol (Garland & Roberts-Lewis, 2013; Ingjaldsson, Laberg, & Thayer, 2003), tobacco (Erskine et al., 2012), food (Erskine & Georgious, 2010), and behaviors like social media use

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(Hormes, Kearns, & Timko, 2014). Prior studies have also shown general thought suppression and food-specific thought suppression to be associated with higher frequency of binge eating, as well as various eating disorder symptoms, such as preoccupation with food, eating-related guilt, and fear of losing control over eating (Barnes, Masheb, & Grilo, 2011; Barnes & Tantleff-Dunn, 2010; Erskine & Georgious, 2010). Research also suggests an association between dietary restraint (i.e., the chronic restriction of food intake), thought suppression, and craving (Hill, 2007), such that restrained eaters report greater salience of thoughts if attempting to suppress them, crave foods more frequently than unrestrained eaters, and are also more likely to actually consume the craved food (Erskine & Georgious, 2010; Polivy, Coleman, & Herman, 2005).

Mindfulness- and acceptance-based interventions are response-focused treatments designed to counter thought suppression and reduce emotional distress (Hofmann & Asmundson, 2008). Mindfulness techniques have been defined as “a way of integrating acceptance into change-based psychotherapy” (Roemer & Orsillo, 2002) by focusing attention on present-moment experiences (Kabat-Zinn, 1990), though the terms “mindfulness” and “acceptance” are often used jointly or interchangeably in the literature. Acceptance-based treatments (ABTs) have gained growing empirical support in the treatment of weight- and eating-related disorders (Forman, Butryn, Hoffman, & Herbert, 2009; Tapper et al., 2009), and have specifically been shown to effectively reduce the adverse impact of cravings on energy intake (Alberts, Mulken, Smeets, & Thewissen, 2010; Forman et al., 2007). There is a well-established relationship between experiential avoidance and maladaptive eating behaviors such as craving and binge eating (Forman et al., 2007; Lillis, Hayes, & Levin, 2011), and ABTs specifically seek to increase psychological flexibility and reduce experiential avoidance of thoughts and internal experiences related to a desired food and emotional distress (Hofmann & Asmundson, 2008). Acceptance-based treatments target thought suppression by promoting non-judgmental awareness and emphasizing the acceptance of thoughts simply as what they are, no more and no less. Specifically, ABTs emphasize that having thoughts does not mean that one has to act on these thoughts, thereby potentially reducing the adverse impact of desires and urges on behavior. Interventions that integrate mindfulness techniques also appear to effectively target maladaptive eating styles and have been shown to reduce both emotional and external eating (Katterman, Kleinman, Nackers, & Corsica, 2014; O'Reilly, Cook, Spruijt-Metz, & Black, 2014). Acceptance-based treatments targeting food cravings were found to be especially effective in individuals high in responsiveness to food-related cues in the environment (Forman et al., 2007).

Depression, responsivity to the food environment, disinhibition, and emotional eating have been identified as moderators of the success of ABTs in targeting craving and weight (Forman et al., 2013). To date, relatively little is known about possible mediators of the relationship between experiential avoidance and craving. Current theoretical frameworks of craving etiology, such as the EI Theory of Desire, point to changes in the tendency to suppress unwanted thoughts or engage in certain maladaptive eating styles (i.e., restrained, emotional, and external eating) as potential mechanisms underlying the success of ABT. This is consistent with the focus of ABTs on reducing experiential avoidance and increasing psychological flexibility. This study was designed to begin to explore the relationship between experiential avoidance, thought suppression, maladaptive eating styles, and food cravings.

1. Aims and hypotheses

In this secondary analysis of data initially collected to validate two new measures of food craving (Hormes & Meule, 2016; Niemiec, Boswell, & Hormes, 2016), we sought to examine the relationship between experiential avoidance and food craving, with a specific focus on identifying mediators that may point to the mechanisms underlying the

success of ABTs in reducing craving frequency. We hypothesized that acceptance of food-related thoughts is inversely related to emotional, external, and restrained eating styles and thought suppression, which in turn are positively related to food craving. Findings from this study may serve to inform future longitudinal research on the proximal antecedents of food craving episodes and the mechanisms of change in ABTs targeting craving.

2. Methods

All methods were reviewed and approved by the local Institutional Review Board. Respondents were informed of the nature and purpose of the research and consented prior to participation.

2.1. Participants

Eligible participants were 585 undergraduate students at a large university in the northeast region of the United States ($n = 298$, 51.5% female, mean age = 18.85, $SD = 1.70$, range = 18–39) who self-identified (in overlapping percentages) as White (54.7%, $n = 320$), African-American/black (16.6%, $n = 97$), Asian (15.6%, $n = 91$), American Indian/Alaskan Native (0.9%, $n = 5$), and Hispanic/Latino (16.1%, $n = 94$). Participants completed an online survey while seated at individual computer stations in the lab to assure privacy. Participants were recruited via the psychology department's research pool website and received participation credit in exchange for time spent in the laboratory.

2.2. Measures

In addition to providing information on demographics, height, and weight, participants completed the following widely used and well-validated self-report measures:

2.2.1. Food Craving Questionnaire- Trait-reduced (FCQ-T-r)

Food cravings were quantified via the FCQ-T-r, a brief form of the FCQ-T, one of the most widely used measures of general food craving that assesses the behavioral, cognitive, and physiological correlates of cravings. The FCQ-T-r was adapted from the original 39-item version by selecting the 15 items with the highest item-total-correlations (Hormes & Meule, 2016; Meule, Hermann, & Kubler, 2014). The FCQ-T-r assesses perceived lack of control over eating (e.g., “If I eat what I am craving, I often lose control and eat too much.”), thoughts or preoccupation with food (e.g., “If I am craving something, thoughts of eating it consume me.”), intentions to consume food (e.g., “Whenever I have cravings, I find myself making plans to eat.”), emotions before or during cravings (e.g., “I crave foods when I feel bored, angry, or sad.”), and cues that may trigger food cravings (e.g., “It is hard for me to resist the temptation to eat appetizing foods that are in my reach.”) (Meule et al., 2014). The FCQ-T-r is scored on a Likert-type scale, ranging from 1 = “strongly disagree” to 5 = “strongly agree,” with higher scores indicating greater craving. The measure has a one-factorial structure and high internal consistency (Hormes & Meule, 2016; Meule et al., 2014). Cronbach's α in the present sample was 0.95.

2.2.2. Food Craving Acceptance and Awareness Questionnaire (FAAQ)

The FAAQ is a two-factorial measure that quantifies the acceptance of motivations to eat via two distinct constructs, namely psychological “acceptance” (Cronbach's α in this sample = 0.60) and “willingness” (Cronbach's α in this sample = 0.86) (Juarascio, Forman, Timko, Butryn, & Goodwin, 2011). “Acceptance” scores reflect respondents' acceptance of cognitive, affective, and physiological experiences associated with food and eating without attempting to avoid or alter them (e.g., “Controlling my urges to eat unhealthily is just as important as controlling my eating.”). “Willingness” refers to respondents' ability to engage in value-consistent behaviors related to weight and eating in

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