



Personality differences in the susceptibility to stress-eating: The influence of emotional control and impulsivity



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ABSTRACT

Purpose: Stress has been associated with deviations from typical eating patterns, with respect to both food choice and overall caloric intake. Both increases and decreases in dietary intake have been previously noted in response to stress. The purpose of the present study was to determine whether the affect regulation strategies of emotional control and impulsivity predict susceptibility to eating in response to stress. Specifically, it was anticipated that emotional suppression would predict decreases in caloric intake, whereas impulsivity would predict increases in caloric intake, in response to a stressor.

Method: Participants were randomly assigned to view either a video designed to elicit stress or a control video. Food was provided during the video and the amount and type of food consumed was measured.

Results: Participants' nutritional intake was greater in the stress condition than in the control condition. One aspect of affect regulation, impulsivity, moderated this relationship, with a tendency for greater impulsivity to be associated with greater caloric intake in the stress condition. The degree of negative affect that participants experienced in the stress condition predicted food choice and overall caloric intake. Both emotional control and impulsivity moderated the relationship between negative affect and both food choice and caloric intake in the stress condition.

Discussion: The present study highlights the importance of considering the personality attributes of both impulsivity and emotional suppression in understanding stress eating.

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1. Introduction

Stress is a state that arises when environmental demands exceed an individual's perceived adaptive capabilities (Cohen, Janicki-Deverts, & Miller, 2007). Stress has been associated with a number of negative health outcomes including cardiovascular disease, ulcers and hypertension (Mohd, 2008). Stress has also been associated with changes in eating patterns and behavior (Greeno & Wing, 1994; Kandiah, Yake, & Willett, 2008). The relationship between stress and eating is somewhat unclear and studies on the topic have yielded mixed results. Although some studies have found that individuals under stress consume more calories overall (Rutters, Nieuwenhuizen, Lemmens, Born, & Westerterp-Plantenga, 2009) and from high-fat foods (Zellner et al., 2006), a survey study of stress and eating found that individuals were

more likely to decrease their calorie intake while under stress, with this tendency increasing with the severity of the stressor (Stone & Brownell, 1994). Individuals more susceptible to eating under stress, or stress-eating, include individuals who are high cortisol reactors (Epel, Lapidus, McEwen, & Brownell, 2001) or high in trait anxiety and low in social support (Pollard, Steptoe, Cnaan, Davies, & Wardle, 1995). The present study considered whether affect regulation, particularly emotional control and impulsivity, contribute to a person's susceptibility to stress-eating, potentially explaining both decreases and increases in food consumption in response to stress, respectively.

Affect regulation can be defined as the conscious and unconscious practices that individuals use to regulate their emotional states in order to respond to environmental demands (Aldao, Nolen-Hoeksema, & Schweizer, 2010). Disordered eating, particularly dietary restraint and binge eating, have been proposed as strategies used by some individuals to manage negative emotional states (Polivy & Herman, 2002; Lavender & Anderson, 2010). While there are several different components of affect regulation, of particular interest to the stress-eating

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model are emotional control and impulsivity in response to negative affect (Gratz & Roemer, 2004).

Emotional control refers to the ability of an individual to inhibit their response to an emotional state (Roger & Nesselrover, 1987). While emotional control is a necessary component of normal affect regulation, individuals high in emotional control – who over-regulate their emotions – may be at greater risk for developing mental health difficulties (Southam-Gerow & Kendall, 2002). In particular, individuals who endorse emotional suppression and avoidance strategies to cope with negative emotional states are more likely to struggle with anxiety and depression (Roemer, Salters, Raffa, & Orsillo, 2005; Tull, Gratz, Salters, & Roemer, 2004). Paradoxically, avoidance and suppression of negative emotions can result in an increase in both the frequency and distress of the unwanted emotions (Gross & Levenson, 1997).

Along with anxiety and depression, it has also been proposed that individuals high in emotional control may be at a greater risk of engaging in dietary restraint as a way of coping with negative emotional states (Polivy & Herman, 2002). For example, individuals struggling with anorexia nervosa have been found to have lower levels of self-reported emotional awareness and expression (Harrison, Sullivan, Tchanturia, & Treasure, 2009; Jänsch, Harmer, & Cooper, 2009), as well as lower acceptance of emotions and greater use of maladaptive affect regulation strategies (Svaldi, Griepenstroh, TuschenCaffier, & Ehring, 2012).

Impulsivity, the tendency to engage in a behavior prematurely, without giving the situation enough consideration, often within the context of emotion, can result in engaging in behaviors that are risky, ill-conceived and inconsistent with one's goals (Fischer, Smith, & Anderson, 2003; Gratz & Roemer, 2004; Dalley, Everitt, & Robibins, 2011). Impulsivity is a multidimensional construct, of which inhibitory control, the ability to withhold an undesired response, is one aspect (Bartholdy, Dalton, O'Daly, & Campbell, 2016). A systematic review considering eating and inhibitory control concluded that inhibitory control is associated with weight (BMI) and binge eating, particularly within the context of dietary restraint (Bartholdy et al., 2016).

The present study builds on the previous literature seeking to examine the stress-eating relationship by experimentally manipulating stress levels in participants. In addition, in order to better understand individual differences related to this phenomenon, this study examines whether affect regulation plays a moderating role in the stress-eating relationship.

2. Materials and methods

2.1. Participants

Female undergraduate students ($n = 86$) between the ages of 17 and 42 ($M = 19.5$ years) were recruited from two universities to participate in this study for partial course credit. Only women were included in the present study as stress-eating has been found to affect men and women differently, with women being more likely to report stress-eating than men (Greeno & Wing, 1994).

2.2. Procedure

Participants were recruited under the guise that they would be rating films for a student film competition, while the actual purpose of the study was to examine nutritional intake in response to stress. Participants attended the study sessions individually, and were seated in a small room at a table with a laptop computer. They were informed that they would be asked about their reactions to a student film they would be viewing. Participants were randomly assigned to view one of two videos on the laptop computer, either a video about university exams (experimental condition) or travel (control condition). The experimenter provided participants with an array of food options, which they were told had been left over from an earlier meeting and was a way of thanking them for helping out with the study.

After viewing the video and completing a short film evaluation questionnaire about the quality of the film, participants were asked to speculate regarding the purpose of the study. The food was then removed, and the true objective of the study (i.e., studying eating behaviors under stress) was revealed. Participants were provided with the opportunity to consent to continue with the study given this information. If they consented to continue, they were asked to complete a series of questionnaires regarding their eating attitudes and preferences as well as their general emotional functioning, including measures related to emotional control and impulsivity. Food was then weighed in order to determine the amount consumed during the video. Participants' height and weight, as well as waist and hip measurements were also taken. It is of note that deception was necessary in order to reduce expectancy effects, which could have impacted participant nutritional intake. Participants who correctly guessed the true nature of the study were excluded from the analyses.

2.3. Videos

Both videos were approximately 30 min in duration and were comprised of facts, interviews, still frames and short dramatizations. The exam video contained interviews with students discussing university exams, and was designed to induce stress in participants. The travel video contained images of beaches and discussions of vacations, and was designed to be relaxing.

2.4. Food

Food offered to participants included fruits and vegetables as well as salty, sweet and high-fat foods. The food consisted of three servings each of cherry tomatoes, grapes, strawberries, oranges, salsa, tortilla chips, crackers, Doritos™, pretzels, M&M™ candies, Gobstopper candies™, gummy bears, and Babybel™ cheese. Serving size was determined according to nutritional information for each product and in accordance with the amount of food recommended for consumption in one sitting. These particular foods were chosen to represent a broad range of taste preferences and nutritional composition. Foods were presented in separate disposable containers, the placement of which were randomized and counterbalanced. Each food item was weighed before being presented to each participant, and then again after the study. The weight of each food consumed was also used to calculate the total calories and specific nutritional component consumed (fat, carbohydrates, sugar, and protein) based on information provided on nutritional labels (or nutritiondata.com for produce). In addition to calculating total calories consumed, a total score of calories consumed from higher calorie (over 3 cal/g) snack foods (tortilla chips, crackers, Doritos™ pretzels, M&M™ candies, Gobstopper candies, gummy bears,) was also calculated.

2.5. Measures

Questionnaires were completed immediately following the videos and included the State portion of the State-Trait Anxiety Inventory (STAI) and the Positive and Negative Affect Schedule (PANAS), selected for use as a manipulation check. The final questionnaire package completed at the conclusion of the study included the Emotion Regulation Questionnaire (ERQ) and the Difficulties in Emotion Regulation Scale (DERS), measures of affect regulation strategies.

2.5.1. Positive and Negative Affect Schedule (PANAS)

The PANAS (Watson, Clark, & Tellegen, 1988) was used as a measure of participants' positive and negative affect after watching the videos. The PANAS asks respondents to rate the degree to which they currently are experiencing an array of positive and negative emotions using a 5-point Likert scale ranging from 1 - *very slightly or not at all* to 5 - *extremely*. The PANAS is comprised of two subscales representing positive and

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