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Research report

Profiling motives behind hedonic eating. Preliminary validation of the Palatable Eating Motives Scale ☆

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ABSTRACT

The purpose of this study was to validate a new scale designed to measure individual motives for eating tasty foods and determine if any specific motive(s) are associated with obesity. The "Palatable Eating Motives Scale" (PEMS) is a self-report measure adapted from the Drinking Motives Questionnaire Revised (DMQ-R). $N = 150$ racially-diverse college students (mean age: 24.4, BMI: 16–51 kg/m^2) were administered the PEMS along with the Binge-Eating Scale (BES) and the Yale Food Addiction Scale (YFAS) to test for convergent and incremental validity and the Sensitivity to Punishment and Reward Questionnaire (SPSRQ) for discriminant validity. The PEMS identified four motives for eating tasty food, the same ones found with the DMQ-R for alcohol intake: Social, Conformity, Enhancement, and Coping motives. The scales had good convergent validity with BES and YFAS scores but discriminated from the broader motivational constructs of inhibition and activation measured by the SPSRQ. Of the PEMS motives, Coping (eating tasty food to deal with problems and negative feelings) accounted for unique variance in BMI, and added to variance in BMI contributed by BES scores, showing incremental validity. YFAS scores did not contribute to BMI after controlling for binge-eating. Coping subscale scores were also significantly higher ($p < 0.001$) among the severely obese (BMI > 40). Motives behind palatable food intake are not homogenous and should be considered in personalized weight-loss strategies in future studies. In normal weight individuals, knowing one's dominant motive for eating tasty foods may help promote healthier food choices in times and places where they are most vulnerable to do otherwise.

Introduction

While progress has been made in our understanding of the environmental, genetic, and physiological contributors of obesity, the U.S. and global rates of this chronic condition remain high and are projected to escalate (Nguyen & El-Serag, 2010). Even when weight loss has been achieved, maintenance is a frequent problem (Douketis, Macie, Thabane, & Williamson, 2005). The role of hedonic- vs. metabolic- or homeostatic-driven eating in the development and maintenance of obesity has gained attention in the research literature. Hedonic eating generally describes eating that occurs in the absence of hunger or metabolic need and recruits neuroendocrine systems linked to reward vs. hunger and satiety (Berthoud, 2011; Ely, Winter, & Lowe, 2013; Glass, Billington, & Levine, 1999). Hedonic eating is satisfied by the intake of highly palatable foods-foods that are typically made tasty by their higher fat, sugar, and salt content and hence also tend to be dense in calories. These properties and the great variety, abundance, and easy access to them in the current environment have rendered hedonic eating a significant contributor to overweight and obesity (Berthoud, 2011; Blundell & Finlayson, 2004; Erlanson-Albertsson, 2005; Johnson, 2013; Lowe & Butryn, 2007; Lutter & Nestler, 2009; Yeomans, Blundell, & Leshem, 2004).

However, not everyone exposed to this ubiquitous palatable food environment has developed obesity. Animal models of individual differences in palatable food intake are available and clinical studies have suggested genetic and physiological markers that underlie individual differences in palatable food intake that may ultimately render some prone or resistant to obesity (Boggiano et al., 2007; Chandler, Viana, Oswald, Wauford, & Boggiano, 2005; Cornier et al., 2013; Davis et al., 2011; Felsted, Ren, Chouinard-Decorte, & Small, 2010; Fortuna, 2010; Lange, Kampov-Polevoy, & Garbutt, 2010; Wang et al., 2001). However, surprisingly little research has focused on individual reasons or motives for why people eat highly palatable foods.

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Studies have linked common personality traits, behavioral responses, and neural mechanisms between hedonic eating and substance abuse (Benjamin & Wulfert, 2005; Davis et al., 2008; Fortuna, 2010; Holtz & Carroll, 2013; Jansen, 1998; Kolotkin, Revis, Kirkley, & Janick, 1987; Lange et al., 2010; Lowe & Butryn, 2007; Sobik, Hutchison, & Craighead, 2005; Stice, Figlewicz, Gosnell, Levine, & Pratt, 2012; Volkow, Wang, Fowler, & Telang, 2008). Hence, there may be common motives behind drinking alcohol and eating tasty foods. Indeed, individuals consume alcoholic beverages for various reasons from normative ones (e.g., to socialize) to less normative and even harmful ones (e.g., to cope with negative affect, which has been linked to the development of alcoholism) (Cooper, 1994). Similarly, some may eat tasty foods for normal or adaptive reasons (e.g., to celebrate an occasion) or for less adaptive ones (e.g., to cope with negative feelings and stress). It was the goal of this study to examine whether certain motives behind eating tasty foods are linked with obesity, similar to the link observed in the alcohol literature between certain drinking motives and alcohol abuse/dependence.

Knowing what various motives drive eating tasty food intake among individuals could lead to more personally tailored treatment strategies for the individual struggling with obesity. Furthermore, social psychology research has indicated that motives are integral in shaping behavior (Köpetz, Lejuez, Wiers, & Kruglanski, 2013). Therefore, the purpose of this study was to develop and validate a tool to identify individual motivations for eating tasty foods and to determine if certain motives would be associated with body mass index (BMI). To do this, we developed an original self-report scale adapted from the Drinking Motives Questionnaire Revised (DMQ-R) (Cooper, 1994; Cooper, Russell, Skinner, & Windle, 1992) by substituting "drinking alcohol" with "eating tasty foods and drinks". We named this new scale the "Palatable Eating Motives Scale" (PEMS) and used it to identify unique motives for eating tasty foods and their effects on BMI.

The PEMS specifically instructed participants to think of times they have eaten *tasty* foods and drinks such as desserts, salty snacks, and fast food (see Appendix A). We chose to specifically measure motives behind consumption of these type of foods because (a) they are typical of foods chosen when eating for non-metabolic reasons (in the absence of hunger) or passively eating (Hill & Peters, 1998), (b) they are difficult to limit due to their greater palatability (Thomas, Doshi, Crosby, & Lowe, 2011), and (c) they are typically energy dense (Drewnowski, 1998), all factors that can facilitate weight gain (Astrup & Brand-Miller, 2012). Additionally, we chose to instruct participants to think of times they had "eaten" these foods instead of instructing them to think of times they had "overeaten" these foods. This was intended to avoid subjective definitions of overeating and to avoid excluding anyone who ate these foods in moderation. This way we could assess if certain eating motives were more associated with healthy body weight and others with overweight or obesity. Several other scales exist that measure aspects of food and food intake (Arnow, Kenardy, & Agras, 1995; Gearhardt, Corbin, & Brownell, 2009; Steptoe, Pollard, & Wardle, 1995; van Strien, Frijters, Bergers, & Defares, 1986). However the PEMS is unique from existing scales in that it probes motivations for consuming palatable foods (i.e., as a means to meet a certain end) rather than probing for "addiction" traits per se (Yale Food Addiction Scale; YFAS (Gearhardt et al., 2009) or the extent to which various emotions and cues trigger food intake, e.g., Emotional Eating Scale (Arnow et al., 1995), Dutch Eating Behavior Questionnaire (van Strien et al., 1986), or motives for consuming food in general, e.g., Food Choice Questionnaire (Steptoe et al., 1995) vs. palatable food specifically.

Binge-eating and the concept of food dependence or "food addiction" may be similar but distinct constructs from the motives measured by the PEMS. Therefore, we chose to also administer the YFAS and Binge Eating Scale or BES (Gormally, Black, Daston, & Rardin, 1982) to assess convergent and incremental validity of the PEMS. Tasty foods are often consumed for non-homeostatic reasons. The same is true of binge-eating as occurs in bulimia nervosa and binge eating disorder (APA, 2000; Hetherington & Rolls, 1991; Waters, Hill, & Waller, 2001). However, binge-eating is also accompanied by feelings of loss of control and eating specifically large quantities of food, not just palatable food, in a discrete period of time (APA, 2000). The concept of "food addiction" is purported to be characterized specifically by intake of palatable food, also for non-homoeostatic reasons, but is proposed to take on properties akin to those of substance abuse (Gearhardt et al., 2009). While the concept of food dependence shares some overlap with binge-eating symptoms such as loss of control, eating in large quantities, and experiencing distress, it is unique in its incorporation of tolerance and withdrawal symptoms (Gearhardt et al., 2009). Both binge-eating and food dependence have also been linked to increased risk of obesity (Bruce & Agras, 1992; Grucza, Przybeck, & Cloninger, 2007; Meule, Heckel, & Kübler, 2012; Stice, Presnell, & Spangler, 2002). Therefore, in testing the association of the PEMS to BMI, it was additionally important to include the YFAS and BES in the study. Finally, the Sensitivity to Punishment Sensitivity to Reward Questionnaire or SPSRQ (Torrubia, Ávila, Moltó, & Caseras, 2001) was also administered to probe broader motivational constructs of approach (via the Behavioral Activation System subscale or BAS) and avoidance (via the Behavioral Inhibition System subscale or BIS) and was used here to test for discriminant validity of the PEMS.

Materials and methods

Participants

A total of 150 participants, $n = 106$ female, $n = 44$ male, college undergraduates were recruited from the Introductory Psychology course participant pool and were offered research participation credits or extra credit. Psychology students in more advanced courses could participate as one of several options for extra credit. Flyers were also posted on the UAB campus that offered a $10 Visa gift card for undergraduate students with a BMI > 24.9. This was done to boost the number of overweight students to match the greater number of healthy-weight students in this sample. Pregnancy was the only exclusionary criteria for this study. This study obtained Informed Consent from all participants and was approved by the UAB Internal Review Board.

Measures

The Palatable Eating Motives Scale (PEMS)

As provided in Appendix A, the PEMS comprised 20 Likert-like five-choice frequency response items that probed various motives for "eating tasty food and drinks". The number of items and the language of the items was exactly the same as in the DMQ-R except that "eating tasty foods and drinks" was substituted for "drinking alcoholic beverages" in the instructions. The instructions include a list of examples of these kinds of foods and sugary drinks. The list of tasty foods was adopted from the YFAS (Gearhardt et al., 2009) with slight modifications.

The PEMS subscales

These included the Social, Coping, Enhancement, and Conformity motives subscales. Social motives pertain to eating tasty food or beverages for social reasons (e.g., to enjoy a party, to be more sociable, to enjoy gatherings, parties, or celebrations with friends). Coping motives involve consuming tasty items in an effort to deal