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Gender comparisons of young adults' eating behavior regulation: Re-examination of the Regulation of Eating Behavior Scale (REBS)

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ABSTRACT

The aim of this study was to evaluate the psychometric properties of the Regulation of Eating Behavior Scale (REBS) in mixed-gender, American samples and to evaluate how responses differed across male and female respondents. Responses were examined in a sample of 535 undergraduate students in the Southeastern United States. A confirmatory factor analysis was used to confirm the predicted factor structure; male and female participants were analyzed in a multi-group, unconstrained configural model, with male and female participants analyzed simultaneously to allow for multi-group comparisons within the same model. Additional analyses evaluated measurement invariance, reliability of the measure in the new sample, gender differences in subscale scores, and correlations across factors. Results of confirmatory factor analysis, multi-group by gender comparisons suggested that the factor structure did not vary across genders. In addition, factor structure was consistent with the findings of the original studies examining the psychometric property of the REBS, with the exception of the 'introjected regulation' subscale, which measures regulation of eating behaviors to avoid self-enforced consequences. Consistent with expectations, female participants' ratings were higher, on average, on more autonomous forms of eating regulation; however, contrary to expectations, scores did not differ significantly between males and females on more external forms of eating regulation. Conclusions, limitations, and implications are discussed.

The study of motivation, as conceptualized by self-determination theory (Deci & Ryan, 1985, 2000, 2002) is relevant to the study of eating behavior regulation in several ways. Deci and Ryan (2000) define motivation as an interest or investment to achieve a particular goal. Reaching an identified goal requires an individual to engage in self-regulation, a process of generating "thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals" (Zimmerman, 2005, p. 14). Intrinsically motivated behaviors are those that an individual finds to be internally rewarding, interesting, or pleasurable (Deci & Ryan, 2000; Pelletier, Dion, Slovenic-D'Angelo, & Reid, 2004a,b). Prior studies have demonstrated that intrinsic motivation is associated with factors protective against obesity (Gillison, Standage, & Skevington, 2006; Mata et al., 2009) and are less likely to be disordered than externally motivated eating behaviors (Pelletier & Dion, 2007; Pelletier, Dion, & Levesque, 2004a,b; Pelletier et al., 2004a). For these reasons, assessment of motivation to regulate one's eating behaviors can enhance understanding of why some individuals are successful at regulating their eating behavior, while others may struggle (Pelletier et al., 2004a).

1. Self-determination and organismic integration theories

Self-determination theory proposes a framework for the study of motivation and personality that considers an individual, both in terms of his/her innate characteristics as well as influencing social conditions and processes (Deci & Ryan, 1985, 2000, 2002). Research grounded in self-determination theory led to the introduction of a sub-theory, organismic integration theory (OIT) which identifies these discrete types of motivation, based on environmental or cognitive features that guide an individual's behavior (Deci & Ryan, 2000). OIT stipulates that there are three general types of motivation that occur along a continuum of least-to-most self-determination: amotivation, extrinsic motivation, and intrinsic motivation (Deci & Ryan, 2000). Intrinsic motivation represents one end of the continuum and involves engaging in a certain

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behavior “for its inherent satisfactions” (Deci & Ryan, 2000, p. 72). Amotivation, which lies at the other end of the spectrum, involves a complete lack of value or identification with the purpose of a behavior (Deci & Ryan, 2000). In between lies extrinsic motivation, in which the incentive to engage in a behavior is to “prompt agreeable consequences or to avoid disagreeable ones” (Pelletier et al., 2004a, p. 248). However, OIT proposes that extrinsic motivation can be further differentiated based on the extent to which the regulation of a certain behavior is primarily external versus internal (Deci & Ryan, 2000). In order from least-to-most autonomously motivated behavior, the four types of extrinsically motivated regulation are external regulation, introjected regulation, identified regulation, and integrated regulation (Deci & Ryan, 2000).

External regulation involves behaviors that are carried out in an effort to satisfy or abide by an external standard or control mechanism, such as those that are satisfied to receive a reward or avoid punishment (Deci & Ryan, 2000; Pelletier et al., 2004a). Introjected regulation is similar to external regulation, but occurs in the absence of a tangible consequence or an external regulator such as, for example, abstaining from a behavior to avoid feelings of guilt (Deci & Ryan, 2000). Identified regulation occurs when an individual identifies with the value of a certain behavior but is not satisfied by engaging in the behavior directly (Pelletier et al., 2004a). Finally, integrated regulation encompasses behaviors that are performed because the importance of the behavior is consistent with the individual's values or beliefs (Deci & Ryan, 2000). However, integrated regulation is different from intrinsic motivation in that engaging in the behavior itself is not viewed as interesting or enjoyable (Deci & Ryan, 2000).

1.1. The Regulation of Eating Behavior Scale (REBS)

Pelletier et al. (2004a) applied the concepts of internal versus external regulators of eating behavior to develop the REBS. Respondents rate the extent to which each item corresponds to their motives for regulating their eating on a scale from 1 (“does not correspond at all”) to 7 (“corresponds exactly”; Pelletier et al., 2004a). Each of the items is a response to the stem question, “Why do you regulate what you eat?” A group of researchers with extensive knowledge of self-determination theory developed an initial pool of 48 items, with the intent of assessing each of the six regulatory styles proposed by self-determination theory. Results of an exploratory factor analysis supported a six-factor structure. In total, the six factors explained approximately 71% of the sample variance. The REBS subscales demonstrated adequate internal consistency. Chronbach's alpha of the individual subscales ranged from 0.79 to 0.91. The researchers reduced the initial pool of items from 48 to 24 by removing the items that loaded onto more than one (or an unexpected) factor, or had coefficients below 0.30. The six factors were named according to the regulatory styles proposed by self-determination theory: amotivation, external regulation, introjected regulation, identified regulation, integrated regulation, and intrinsic motivation. A subsequent confirmatory factor analysis also supported the six-factor structure for the regulation of eating behaviors.

The studies examining the validity of the REBS were conducted with female, Canadian university students (Pelletier et al., 2004a). Beyond the reporting of the participants’ ages (which averaged 21.2 and 22.5 years in the two studies), additional demographic characteristics of the sample (e.g., race/ethnicity) and additional measures of reliability (e.g., test-retest reliability) were not examined in the orignial study. Kato, Iwanaga, Roth, Hamasaki, and Greimel (2013) have since adapted the REBS into the Motivation for Healthy Eating Scale, which was designed for use with Japanese women.

The development of the REBS allows for the identification of the individuals more or less likely to persist in efforts to modify their eating behavior, even in the absence of external consequences. The contributions of these previous studies should not be understated; however, the limited diversity with respect to age, gender, and race/ethnicity in the sample used to establish the REBS’ psychometric properties presents significant limitations in the use of the measure with more heterogeneous samples. For example, prior research has demonstrated differences in terms of food consumption patterns, belief in the importance of healthy eating (Rolls, Federoff, & Guthrie, 1991; Wardle et al., 2004), and motivation to regulate eating behaviors between men and women (Gropper et al., 2014). In addition, Wardle et al. (2004) reported that women were more likely than men to engage in eating regulation in an effort to improve health, attach a higher level of importance to healthy eating, and to view improving health as a motivator for modifying eating behaviors. Thus, it is possible that the factor structure may differ among male participants.

1.2. The present study

The present study had two primary objectives: (1) to assess if and how the factor structure of the REBS differed in a gender diverse sample, and relatedly; (2) to assess how responses differed across genders on subscales. To our knowledge, no prior research has been conducted to replicate the factor structure identified by Pelletier et al. (2004a) with a more diverse sample. Thus, the first objective of the present study was to address this limitation by replicating the analyses examining the psychometric properties of the REBS with an American, mixed gender sample. We hypothesized that a six-factor structure consistent with that observed in the initial study by Pelletier et al. (2004a) would appropriately fit the data. In addition, we sought to examine measures of reliability of the scale with the new sample. We expected that the scale would demonstrate adequate test-retest reliability and internal consistency. Consistent with procedures carried out by Pelletier et al. (2004a), we sought to examine the correlations between factors. A correlational pattern such that items closer on the self-determination continuum correlate stronger than those further away (and negatively correlate with those on opposite ends) provides support for the self-determination continuum proposed by Deci and Ryan (2000; Pelletier et al., 2004a). It was anticipated that more autonomous types of self-determination (e.g., intrinsic motivation, integrated regulation, and identified regulation) would possess strong positive correlational relationships with one another. Finally, the least autonomous types of self-determination (e.g., amotivation, external regulation, and introjected regulation) were expected to show positive correlational relationships with one another.

Relatedly, we sought to examine if and how qualities of the factor structured differed across males and females in the new sample. In light of the aforementioned differences between male and female eating regulation, the factor loadings may differ among male and female participants. Specifically, given that some gender differences in these types of discrete regulatory categories had been observed previously (Gropper et al., 2014), it was expected that the factors that emerged from the male-only sample would represent more “extreme” types of motivation (e.g., amotivation, intrinsic motivation).

The second objective of the study was to assess if and how male and female participants differed across the six types of eating behavior regulation measured by the REBS. As suggested by the findings reviewed above, women are more likely than men to place importance on eating modification and are more likely to align their goals for modifying their eating patterns with health improvements (Wardle et al., 2004), which may represent greater intrinsic motivation among women to modify eating behaviors (Pelletier et al., 2004a). As a result, it was anticipated that men and women would differ significantly in REBS subscale scores. Specifically, we expected that women would have higher subscale scores than men on more autonomous forms of eating behavior regulation (e.g., intrinsic motivation and integrated regulation) and that men would have higher subscale scores on the two least autonomous forms eating behavior regulation (e.g., amotivation, external regulation).