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# Body image flexibility moderates the association between disordered eating cognition and disordered eating behavior in a non-clinical sample of women: A cross-sectional investigation

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ABSTRACT

Body image flexibility, a regulation process of openly and freely experiencing disordered eating thoughts and body dissatisfaction, has been found to be a buffering factor against disordered eating symptomatology. The present cross-sectional study investigates whether body image flexibility accounts for disordered eating behavior above and beyond disordered eating cognition, mindfulness, and psychological inflexibility in a sample of nonclinical women, and whether body image flexibility moderates the associations between these correlates and disordered eating behavior. Participants were 421 women, age 21 ± 5.3 years old on average, who completed a web-based survey that included the self-report measures of interest. Results demonstrate the incremental effects of body image flexibility on disordered eating behavior above and beyond disordered eating cognition, mindfulness, and psychological inflexibility. Women with greater body image flexibility endorse disordered eating behavior less so than those with lower body image flexibility. Body image flexibility moderates the association between disordered eating cognition and disordered eating behavior; for women with greater body image flexibility, disordered eating cognition is not positively associated with disordered eating behavior.



## 1. Introduction

Recently, there has been a growing interest in emotion and behavior regulation processes in understanding and treating disordered eating behavior (Anestis, Selby, Fink, & Joiner, 2007). Findings in this line of research suggest that, in addition to disordered eating cognitions, the way an individual interprets, relates, and reacts to unwanted internal events (e.g., fear of gaining weight and body dissatisfaction) plays a central role in the onset and maintenance of disordered eating (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Anestis et al., 2007). Research has also shown that disordered eating behaviors, such as restricted or excessive dieting, binge eating and purging, and preoccupation with caloric intake, often function as maladaptive emotion and behavior regulation strategies (Schmidt & Treasure, 2006; Wedig & Nock, 2010).

Given these findings, some recent cognitive behavioral therapies (CBTs) for disordered eating, especially acceptance- and mindfulness-based CBTs (Hayes, Villatte, Levin, & Hildebrandt, 2011), explicitly target the reduction of maladaptive regulation strategies and the promotion of adaptive regulation strategies. Examples of these CBTs are Dialectical Behavior Therapy (DBT; Safer, Telch, & Chen, 2009), Mindfulness-Based Eating Awareness Training (MB-EAT; Kristeller & Wolever, 2011) and Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 2012). Two major emotion and behavior regulation processes that are the focus of these CBTs include mindfulness and psychological inflexibility.

### 1.1. Mindfulness

Mindfulness is often defined as an emotion and behavior regulation process of openly attending to and becoming aware of the present moment and accompanying experiences. When defined in this way, it is best captured by the Mindfulness Attention and Awareness Scale (MAAS; Brown & Ryan, 2003). From an acceptance- and mindfulness-based CBT standpoint, mindfulness has shown much promise in its role in understanding and treating disordered eating pathology (Baer, Fischer, & Huss, 2005; Kristeller & Wolever, 2011), partially because of its health-promoting effects (Brown, Ryan, & Creswell, 2007). Cross-sectional investigations with nonclinical samples of men and women have shown that, when measured by the MAAS, mindfulness is inversely related to bulimic symptoms (Lavender, Jardin, & Anderson, 2009) as well as disordered eating behavior (Masuda, Price, & Latzman, 2012).

### 1.2. Psychological inflexibility

The construct of psychological inflexibility is derived from a basic behavioral account of complex human behavior, called relational frame

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theory (RFT; Hayes, Barnes-Holmes, & Roche, 2001), and its applied extension ACT (Hayes et al., 2012). Psychological inflexibility, often measured using the Acceptance and Action Questionnaire-II (AAQ-II; Bond et al., 2011), refers to a general regulation tendency to rigidly attempt to control and down-regulate unwanted psychological experiences, combined with excessive investment in the literal content of thoughts. From an ACT perspective, the process of psychological inflexibility is at the core of diverse psychopathologies (Hayes, Luoma, Bond, Masuda, & Lillis, 2006), including disordered eating (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996; Juarascio et al., 2013). Cross-sectional investigations have shown that this rigid and inflexible regulation tendency is positively related to a range of disordered eating symptoms in nonclinical samples of men and women (Cowdrey & Park, 2012; Manlick, Cochran, & Koon, 2013; Masuda, Boone, & Timko, 2011; Merwin et al., 2011), including disordered eating behavior (Masuda et al., 2012).

Conceptually, mindfulness is often theorized to be part of psychological inflexibility (Hayes et al., 2006), as its inverse psychological flexibility is a multifaceted construct involving the dimension of open awareness of the present moment experience. Nevertheless, previous cross-sectional studies have demonstrated that mindfulness and psychological inflexibility are related, but distinct from each other especially when measured by the MAAS and AAQ, respectively (Masuda, Mandavia, & Tully, in press; Masuda & Tully, 2012). More specifically, while mindfulness as measured by the MAAS reflects present moment awareness, the construct of psychological inflexibility measured by the AAQ-II primarily reflects the maladaptive regulation of psychological distress (Latzman & Masuda, 2013).

Recent evidence also suggests that the construct of psychological inflexibility is too general to adequately capture behavior and emotion regulation patterns specific to the context of disordered eating (Sandoz, Wilson, Merwin, & Kellum, 2013). For example, preliminary cross-sectional studies have shown that the association between psychological inflexibility and disordered eating behavior is small in non-clinical samples, ranging from $r = .18$ to $r = .19$ (Cowdrey & Park, 2012; Masuda et al., 2012). Furthermore, the positive association is no longer significant when controlling for other key psychological and demographic variables, such as depression and rumination specific to eating disorder symptoms (Cowdrey & Park, 2012), or disordered eating cognitions and mindfulness (Masuda et al., 2012).

### 1.3. Body image flexibility

Body image flexibility refers to psychological flexibility specific to the context of disordered eating and body dissatisfaction (Sandoz et al., 2013). Specifically, body image flexibility is defined as the capacity to openly and freely experience body dissatisfaction and other relevant disordered eating thoughts without making efforts to avoid or change them (Sandoz et al., 2013). Several notable cross-sectional investigations have demonstrated body image flexibility to be negatively correlated to a range of disordered eating pathology, including body dissatisfaction (Hill, Masuda, & Latzman, 2013; Sandoz et al., 2013), disordered eating cognitions (Wendell, Masuda, & Le, 2012), general eating pathology (Ferreira, Pinto-Gouveia, & Duarte, 2011; Sandoz et al., 2013; Wendell et al., 2012), and disordered eating behavior (Hill et al., 2013). Studies also suggest that body image flexibility is particularly fit to capture emotion and behavioral regulation processes specific to disordered eating behavior more so than general psychological inflexibility and body dissatisfaction (Sandoz et al., 2013).

### 1.4. Moderating and protective role of body image flexibility

Literature also suggests that body image flexibility serves as a protective factor against disordered eating and attenuates the association between risk factors and disordered eating. For example, among individuals with greater body image flexibility, the strength of the positive relationship between body dissatisfaction and disordered eating symptoms is weaker, relative to that of individuals low in body image flexibility (Sandoz et al., 2013). Among women with lower body mass index (BMI), greater body image flexibility is also found to be a protective factor against disordered eating behaviors (Hill et al., 2013). As such, it seems plausible to speculate that greater body image flexibility weakens the link between emotional and cognitive risk factors (e.g., psychological inflexibility, body dissatisfaction) and disorder eating behavior.

Similarly, it is possible to speculate that body image flexibility may promote the inverse link between protective factors (e.g., mindfulness) and disordered eating behaviors. This speculation is based on pertinent literature demonstrating synergistic and interactional relationship between adaptive regulation processes on distress variables (Eisenlohr-Moul, Walsh, Charnigo, Lynam, & Baer, 2012; Peters, Eisenlohr-Moul, Upton, & Baer, 2013). For example, in a study proposed by Peters et al. (2013), the strength of the association between acting with awareness and distress variables in a non-clinical college sample depends on nonjudging, another protective and health-promoting process. More specifically, the study shows that the inverse associations between acting with awareness and distress variables are stronger among individuals with greater nonjudgmental mindsets.

Given these findings, it seems worthwhile to explore whether body image flexibility moderates previously established links between disordered eating cognition and disordered eating behavior, between psychological inflexibility and disordered eating behavior, and between mindfulness and disordered eating behavior (Masuda et al., 2012). In establishing these contributing roles of body image flexibility, we hope to gain greater understanding of how this construct best targets the underlying processes that promote and maintain disordered eating behavior.

### 1.5. Present study

Following extant findings, the present study first investigates whether body image flexibility accounts for unique variance in disordered eating behavior above and beyond disordered eating cognition, mindfulness, and psychological inflexibility in women. We focus on a nonclinical sample of women as the present research questions are based on evidence which is drawn from nonclinical female samples. The study then examines whether body image flexibility moderates the association between these potential predictors and disordered eating behaviors.

## 2. Methods

### 2.1. Participants

All participants were recruited from undergraduate psychology courses using a web-based research participant pool. The initial sample included 457 women. Those who did not provide self-report height and weight ($n = 18$), and those who represented outliers based on a BMI 34.75 ($n = 18$) were excluded from the study. The final investigated sample consisted of 421 non-clinical undergraduate college women with a mean age of 21.21 years ($SD = 5.58$). The sample presented an ethnically diverse composition with 35% ($n = 148$) identifying as "European American", 32% ($n = 134$) identifying as "African American/Black", 17% ($n = 72$) identifying as "Asian", 7% ($n = 27$) identifying as "Hispanic", 5% ($n = 20$) identifying as "Biracial", <1% ($n = 2$) identifying as "Native American", and 4% ($n = 18$) identifying as "Other". BMI scores ranged from 13.39 to 34.74, with a mean of 22.92 ($SD = 4.02$).

### 2.2. Procedure

The current study was approved by the Institutional Review Board of the participating university. Participants completed an anonymous