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PSYCHOLOGICAL FLEXIBILITY AND EATING DISORDER SPECTRUM PROBLEMS

by

JOHANNA WHITNEY WENDELL

Under the Direction of Akihiko Masuda, Ph.D.

ABSTRACT

Problematic levels of eating disorder (ED) spectrum problems are becoming increasingly pervasive on college campuses, especially among female college students. Research suggests that ED cognitions and a lack of body image acceptance are linked to diminished psychological flexibility (PF), which is linked to ED and other negative health symptoms. Two hundred thirty-six undergraduates completed an online survey, and mediation analyses were conducted. PF fully mediated the relation between ED cognitions and non-specific psychiatric symptoms and partially mediated the link between ED cognitions and ED symptoms. PF also partially mediated the link between body image acceptance and non-specific psychiatric symptoms, but not the relation between body image acceptance and ED symptoms. Findings suggest that clinical symptoms and one's coping style are both important factors to take into consideration in case conceptualization and treatment, and suggest that therapies such as ACT that target PF may be beneficial in treating ED spectrum problems.

INDEX WORDS: Psychological flexibility, Eating disorder

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JOHANNA WHITNEY WENDELL

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Master of Arts

College of Arts and Sciences

Georgia State University

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PSYCHOLOGICAL FLEXIBILITY AND EATING DISORDER SPECTRUM PROBLEMS

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Dedication

I would like to dedicate this thesis to all who are suffering from ED spectrum problems. My hope is to find the most effective treatment for these dangerous, destructive illnesses to alleviate the suffering of as many people as possible who are struggling with this difficult battle.

Acknowledgments

I would like to dedicate this thesis to my chair, Dr. Masuda, and committee members, Drs. Anderson,and Armistead. They taught me so much invaluable knowledge, and I would like to thank them for their support, advice, and wisdom. I am so fortunate to have such wonderful faculty who truly care about the well-being and success of their students.

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Introduction

Eating disorder (ED) behaviors appear to exist on a continuum ranging from subclinical levels of ED symptoms, such as chronic dieting, body dissatisfaction, excessive exercising to control weight, bingeing, and purging to more severe clinical symptoms (Gleaves, Lowe, Green, Cororve, & Williams, 2000; Mintz & Betz, 1988; Stice, Killen, Hayward, & Taylor, 1998). Research has shown that the ED-related problems throughout the entire continuum are becoming increasingly pervasive in today's weight conscious society. The continuum of ED spectrum problems progresses into diagnoses of anorexia nervosa (AN), bulimia nervosa (BN), binge-eating disorder (BED), and eating disorder not otherwise specified (EDNOS). AN is characterized by a refusal to maintain a minimally normal body weight, intense fear of gaining weight, and significant disturbance in the perception of body shape and/or size (American Psychiatric Association, 2000). BN is characterized by repeated episodes of binge eating followed by inappropriate compensatory behaviors such as self-induced vomiting, misuse of laxatives, diuretics, fasting, or excessive exercise (American Psychiatric Association). Another ED with shared features of BN is BED, which involves bingeing, but in the absence of the regular use of inappropriate compensatory behaviors characteristic of BN (American Psychiatric Association).

The typical age of onset for these EDs is late adolescence to early adulthood (American Psychiatric Association, 2000). The DSM-IV reveals lifetime estimates of AN, BN, and BED as .9%, 1.5%, and 3.5% among women, and .3% .5%, and 2.0% among men (Hudson, Hiripi, Pope, & Kessler, 2007). Finally, the most prevalent category of diagnostic EDs is EDNOS, which includes EDs that do not meet criteria for AN, BN, or BED (American Psychiatric Association).

Research has shown that 20 to 60% of individuals presenting for evaluation are diagnosed with EDNOS (Anderson, Bowers, & Watson, 2001).

The prevalence of EDs among males is approximately one-tenth that among females (American Psychiatric Association, 2000). Also, current literature suggests that although prevalence rates differ, ED symptoms do not differ significantly across ethnic groups (Franko, Becker, Thomas, & Herzog, 2007; Gentile, Raghavan, Rajah, & Gates, 2007; Petrie, Greenleaf, Reel, & Carter, 2008).

ED symptoms rarely exist in seclusion. Rather, they usually co-occur with other mental disorders, such as obsessive compulsive, personality, mood, depressive, anxiety, and/or substance abuse disorders (American Psychiatric Association, 2000). Common features of ED spectrum problems are social withdrawal, insomnia, irritability, impulse-control difficulties, alcohol or other drug abuse, mood lability, and a history of suicide attempts.

In addition to the number of individuals who meet clinical criteria for diagnostic EDs is a disconcerting concerning number of those who exhibit subthreshold ED symptoms. The majority (61%) of individuals in the population endorse some degree of ED behavior (e.g., counting calories, strict dieting, bingeing, purging, etc.) (Mintz & Betz, 1988). Also, in particular, body dissatisfaction is so prevalent among women that it appears normative (Mazzeo, 1999; Striegel-Moore, Silberstein, & Rodin, 1986).

While these nonclinical and subclinical cases have received less attention, they are just as important as clinical cases of EDs because the symptoms associated with subthreshold cases can be very deleterious, both physically and mentally. They also often go unnoticed, while quickly progressing into full blown ED diagnoses (London, 2008). Because treatment for EDs can be

extremely challenging, it is preferable to prevent the development into ED cases, if possible (London, 2008).

Subclinical but problematic levels of ED spectrum problems appear to be particularly pervasive on college campuses, especially among female college students (Vohs, Heatherton, & Herrin, 2001). Prevalence rates of ED spectrum problems are higher in college students than in other samples (Fairburn, & Beglin, 1990), identifying college as an environmental risk factor for the development or exacerbation of disordered eating patterns. College is associated with correlates of disordered eating, such as high stress levels, achievement orientation, and role and identity changes (Rosen, Compas, & Tacy, 1993; Striegel-Moore, Silberstein, & Rodin, 1986), which may partially explain the greater prevalence of these symptoms. Also, other correlates of ED symptoms including body dissatisfaction, dieting, and problematic eating are highly endorsed by college students (Heatherton, Mahamedi, Striepe, Field, & Keel, 1997; Heatherton, Nichols, Mahamedi, & Keel, 1995). Thus, college students appear to be a vulnerable population with regard to ED spectrum problems.

Factors related to Eating Disorder Spectrum Problems

Numerous studies have examined correlates of ED symptoms to gain a better understanding of the development, course, and maintenance of ED spectrum problems. Risk factors associated with ED symptoms include negative affect, decreased self efficacy, decreased self-esteem, negative body image or body dissatisfaction, neuroticism, impulsiveness, perfectionism, depression, and psychological distress (Elfhag & Morey, 2008; Fairburn, Cooper, & Shafran, 2003; Peck & Lightsey, 2008; Pells, 2006). Additionally, approximately 50% of people with EDs suffer from obsessive compulsive spectrum disorders (Woodside & Halmi, 2003).

Theories related to Eating Disorder Spectrum Problems

A few theories involving these risk factors have proposed the processes that account for the maintenance of ED symptoms. A cognitive behavioral theory (CBT) of BN asserts that the over-evaluation of eating, shape, weight and control is the core maintaining mechanism of BN (Fairburn, 1981; Fairburn, 1985; Fairburn, Cooper, & Cooper, 1986). Similarly, a prominent cognitive behavioral model of AN posits that bulimic and anorexic symptoms are maintained by a persistent over-evaluation of the personal implications of body shape and weight (Garner & Bermis, 1982, 1985; Vitousek, 1996). This over-evaluation coupled with body dissatisfaction, evidenced by their common endorsement of constantly feeling overweight or being excessively critical of certain parts of their bodies that are "too fat" (American Psychiatric Association, 2000, p. 584) is found to be related to higher levels of emotional eating, maladaptive beliefs about eating and weight, bulimic symptomatology, depression, low self-esteem, and stress (Johnson & Wardle, 2005).

An extension of the CBT models of BN and AN is the transdiagnostic theory of EDs, a theory proposing that all ED spectrum problems are maintained by the interaction among *common processes*, including the over-evaluation of body shape and weight, clinical perfectionism, core low self-esteem, mood intolerance, and interpersonal difficulties (Fairburn et al., 2003, p. 517). Clinical perfectionism is described as the obsession-like over-evaluation of reaching personally demanding standards on weight, shape, appearance, and approval from others, despite negative consequences (Fairburn et al., 2003; Schmidt & Treasure, 2006). These rigid all-or-nothing thoughts are found to be inversely related to self-esteem (Mizes et al., 2000) because individuals with ED spectrum problems negatively evaluate themselves when failing to meet impossible goals (Fairburn et al., 2003). This pattern of negative self-evaluation can

develop into a more pervasive, global negative view of themselves, or "core low self-esteem" which involves negative, autonomous self-judgments that can create a sense of hopelessness about their ability to recover (Fairburn et al., 2003). There is also the tendency for individuals with ED spectrum problems to engage in "dysfunctional mood modulatory behaviors," in order to modify how they feel, rather than allowing changes in mood and appropriately coping with them (Fairburn et al., 2003, p. 517). According to Fairburn et al., these avoidance behaviors serve as defense mechanisms and may take the form of self-starvation, binge eating, self-induced vomiting, and intense exercising, among other strategies. Finally, interpersonal difficulties, such as family stressors, environmental settings that place an emphasis on personal appearance and thinness, abusive relationships, etc. may cause individuals to feel the need for a sense of control, which they exhibit by restricting, bingeing, or other eating disordered behaviors (Fairburn et al., 2003). In summary, the transdiagnostic theory proffers that the interaction of these five processes are at the core of ED spectrum problems regardless of the specific ED diagnosis. These claims are consistent with a recently developed cognitive-interpersonal maintenance model of AN (Schmidt & Treasure, 2006) and the theory of psychological flexibility (PF).

Psychological Flexibility and Eating Disorder Spectrum Problems

The model of PF is a contemporary behavioral account of psychological health (Hayes, Luoma, Bond, Masuda, & Lillis, 2006) that has been widely integrated into recent acceptance- and mindfulness-based CBTs. The model conceptualizes psychological well-being as a person's overall behavior pattern of purposeful acts that is flexible and sensitive to the environment where a person resides. More specifically, such a flexible act is characterized as the ability to experience whatever one is experiencing as it is openly so that the person can act according to his or her own personal values (Hayes et al., 2006). The model of PF also suggests that

diminished PF is at the core of human psychopathology and suffering. While PF is marked by cognitive defusion known as deliteralization or separating oneself from the literal meaning of thoughts and feelings, which can reduce their impact (O'Donohue, Fisher, & Hayes, 2003), acceptance, and value-committed action, diminished PF is comprised of experiential avoidance (EA), cognitive fusion, and a lack of value-committed action. EA refers to a behavioral pattern of unwillingness to experience negative private events and acting in ways to control and avoid those experiences (Hayes et al., 1996). Maladaptive and inflexible behavior patterns emerge when individuals attempt to avoid and fix their negative private events (e.g., thoughts, feelings, bodily sensations) excessively and exclusively (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Literature suggests that EA, while providing short-term relief, consequentially leads to maintaining and often exacerbating psychological problems in the long term (Hayes & Gifford, 1997). Cognitive fusion involves rigid rules or expectations, self-limiting beliefs, criticisms and judgments, and reason-giving. This combined with EA and a lack of value-committed action constitute diminished PF, which plays a major role in the development and maintenance of a wide range of psychological problems, including depression, anxiety, substance abuse, obsessive compulsive disorder, panic disorder and suicide (Andrew, & Dulin, 2007; Hayes et al., 2006; Hayes et al., 2004; Hayes et al., 1996).

Existing evidence suggests that diminished PF is likely to play a major role in ED spectrum problems (Heffner & Eifert, 2004) via cognitive fusion manifested as ED cognitions and critical evaluation, and EA exhibited by bingeing, compensatory behaviors, other ED behaviors (e.g., fasting, food intake restriction), self-injury (e.g., cutting), abusing drugs, and drinking alcohol excessively, among others (Claes, Vandereycken, & Vertommen, 2001;

Fairburn et al., 2003; Heatherton & Baumeister, 1991; Paul, Schroeter, Dahme, & Nutzinger, 2002). Diminished PF seems to be pervasive in ED spectrum problems.

Many studies have supported the notion that diminished PF is related to AN. Patients with AN have high levels of harm avoidance (Fassino et al., 2002; Klump et al., 2000; Price Foundation, 2001) with a greater rate of co-occurrence with avoidant personality disorder than individuals without ED spectrum problems (Diaz-Marsa et al., 2000). They are also found to focus predominantly on "avoidance of emotions, emotional memories, and intimate relationships" (Schmidt & Treasure, 2006, p. 350). Furthermore, individuals with AN are prone to suppress or avoid intense negative emotions (Geller, Cockell, & Goldner, 2000; Troop & Treasure, 1997). In patients with BN and BED, there are positive links between bulimic attitudes and the use of avoidance strategies (Spranger, Waller, & Bryant-Waugh, 2001). College and community volunteers with BED who reported greater negative emotions were less willing to experience negative emotions than their control counterparts (Pells, 2006). Literature on emotional eating has suggested emotional eating, defined as eating in response to negative emotions, particularly anxiety, anger, frustration, and depression (Stice, Presnell, & Spangler, 2002) is a predictor of the onset of binge eating (Stice et al.). Finally, eating episodes associated with an intense emotional experience, such as a strong sense of loss of control, were suggested to be a facet of EA, which is followed by emotional numbing (Pinaquy, Chabrol, Simon, Louvet, & Barbe, 2003; Tanofsy-Kraff et al., 2007). In summary, a body of evidence suggests that diminished PF, is linked to various ED symptoms across all levels of ED spectrum problems.

Psychological Flexibility as a Mediator

Prior literature suggests that individuals with ED spectrum problems pervasively place an over-evaluation on body shape and weight (Fairburn et al., 2003; Garner & Bermis, 1982, 1985;

Vitousek, 1996), which can lead to difficult thoughts and feelings due to symptoms such as body dissatisfaction, low self-esteem, depression, and stress (American Psychiatric Association, 2000; Fairburn et al., 2003; Johnson & Wardle, 2005; Mizes et al., 2000). These negative cognitions and emotions coupled with the perceived inability to effectively cope with them (Fairburn et al., 2003) cause individuals to engage in dysfunctional mood modulatory behaviors (e.g., self-starvation, binge eating, vomiting) in order to avoid their difficult thoughts and feelings (Fairburn et al., 2003). Engaging in these EA behaviors represents having low PF, which has been shown to lead to a number of psychiatric problems including anxiety, depression, substance abuse, obsessive compulsive disorder, panic disorder and suicide (Andrew, & Dulin, 2007; Hayes et al., 2006; Hayes et al., 2004; Hayes et al., 1996). Thus, it appears that individuals with ED spectrum problems experience difficult ED cognitions and emotions, which leads to EA or lower PF, which in turn maintains ED symptoms and other psychiatric problems.

While no study to date has revealed that PF mediates the relationship between ED cognitions and body image acceptance and ED and other non-specific psychiatric symptoms, several studies have found PF to be a mediator of the relationship between negative cognitions/mental distress and psychiatric symptoms (e.g., Gold, Dickstein, Marx, & Lexington, 2009; Gratz, Tull, & Gunderson, 2008; Kashdan and Breen, 2007; Norberg, Wetterneck, Woods, & Conelea, 2007; Tull, & Gratz, 2008). These studies suggest that individuals experiencing many forms of maladaptive thoughts/feelings attempt to control or avoid them via EA as part of low PF, which in turn leads to negative health outcomes, thereby providing preliminary support for the hypothesis that PF mediates the relationship between body image acceptance and ED cognitions and ED and other non-specific psychiatric symptoms.

For example, PF was found to mediate the relationship between materialistic values and diminished psychological well-being in a study conducted by Kashdan and Breen (2007). It is suggested that materialistic values parallel ED cognitions because both cases present the over reliance on external goals (e.g. materialistic gains or ideal body shape and weight) and associated social approval as the basis for self-worth, which causes individuals to be vulnerable to uncontrollable factors, leading to decreased self-esteem and affective instability (Crocker & Wolfe, 2001; Kernis, Cornell, Sun, Berry, & Harlow, 1993). These individuals often fall short of meeting their often unobtainable goals and consequently attempt to escape their thoughts and feelings of failure and disappointment (Kashdan & Breen). These attempts to avoid their unwanted, negative self-directed thoughts and feelings lead to negative well-being outcomes, such as anxiety and depressive symptoms, decreased self-efficacy, and a lack of satisfying relationships (Kashdan & Breen).

Another study found PF to mediate the relationship between internalized homophobia and posttraumatic stress disorder (PTSD) symptom severity. Once again, internalized homophobia, low body image acceptance, and ED cognitions are comparable because they are all sets of negative attitudes associated with depression, substance use and alcohol consumption, unstable self-concept, and low self-esteem (Gold et al., 2009). More so, internalized homophobia has been linked to poor body image and psychological distress among women (Forbes, Doroszewicz, Card, & Adams-Curtis, 2004; Szymanski & Kashubeck-West, 2008). Consequently, these maladaptive schemas are theorized to influence individuals to engage in EA to counter their negative affect, causing their avoidant strategies to become negatively reinforced because they transiently reduce the unwanted symptoms (Gold et al., 2009). While temporarily

effective, long term consequences of these avoidant attempts can include increased psychological distress and depressive symptoms.

Further research with clinical populations has shown that PF mediates the relations between dysfunctional beliefs about appearance, shameful cognitions, and fear of negative evaluation and hair-pulling severity (Norberg et al., 2007) and anxiety sensitivity (AS) and borderline personality disorder (BPD) (Gratz et al., 2008). Additionally research with a nonclinical college sample has found that PF mediates the relationships between sexual victimization and distress as well as depressive symptoms (Polusny, Rosenthal, Aban, & Follette, 2004), childhood psychological abuse and current mental health symptoms (Reddy, Pickett, & Orcutt, 2006), interpersonal trauma exposure and PTSD symptoms (Orcutt, Pickett, & Pope, 2005), maladaptive perfectionism and worry (Santanello, & Gardner, 2007), and AS and depressive symptom severity (Tull, & Gratz, 2008).

While no study to date has revealed that PF mediates the relationship between ED cognitions and body image acceptance and ED and non-specific psychiatric symptoms, one can pose the argument that the nature of one's negative affect (e.g., internalized homophobia, materialistic values, ED cognitions, trauma, etc.) may not necessarily lead to psychopathology. Empirical research with both clinical and nonclinical populations has provided support for a broad theory, proposing that many forms of negative affect or mental distress are attempted to be managed by way of EA behaviors due to low PF, thereby leading to negative health outcomes (e.g., diminished well-being, greater PTSD symptom severity, ED symptoms, etc.).

Proposed Study

Regarding a larger clinical context, if PF is found to play a major role in ED spectrum problems, a psychosocial treatment should target the reduction of EA and the increase in

alternative actions, such as psychological acceptance and mindfulness (i.e., nonjudgmental experience of private events). In fact, recently acceptance- and mindfulness-based CBTs, such as Acceptance Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999), that concur with this line of reasoning, have been applied to individuals with ED spectrum problems (Hayes et al., 1999). Preliminary evidence has shown that mindfulness-based CBTs, such as ACT, are effective in reducing patients' ED related behaviors (Baer, Fischer, & Huss, 2005; Heffner & Eifert, 2004; Safer, Telch, & Agras, 2001; Telch, Agras, & Linehan, 2001). Despite these findings mentioned above, no study has clearly investigated the link between PF and ED symptoms, and it is essential to investigate whether the processes targeted by these therapies are in fact present and related to ED symptoms in systematic ways.

Further, while vast literature has supported the correlations between body dissatisfaction, ED cognitions, PF, ED symptoms, and non-specific psychiatric symptoms (e.g., Masuda, Price, Anderson, & Wendell, 2010), no study has clearly demonstrated *how* these factors are related to one another. Because body dissatisfaction, in particular, is very prevalent among women (Mazzeo, 1999; Striegel-Moore, Silberstein, & Rodin, 1986), whereas clinical EDs are relatively rare (Striegel-Moore & Cachelin, 2001), it appears that additional variables are interacting with body dissatisfaction to produce ED symptomatology (Tylka, 2004). Identification of these additional variables, which may include EA, will help to explain why only a subset of the large number of women with high levels of body dissatisfaction demonstrate eating disordered symptoms, as well as provide an opportunity to manipulate the mediating variables, thereby enabling prevention and/or treatment of eating disordered symptoms.

Also, the majority of studies have focused predominantly on Caucasian, middle-upper class women with clinical diagnoses of AN and BN, thereby excluding ethnically and

economically diverse women and men who meet subclinical ranges of EDs (Gentile, Raghavan, Rajah, & Gates, 2007). Based upon the overwhelming number of individuals excluded from research who experience subthreshold symptoms of EDs, it is difficult to pinpoint additional variables that may induce the onset of EDs.

Specific Hypotheses

To address these limitations, this study intends to investigate specific processes that may be associated with an array of ED symptoms. A nonclinical, GSU college sample will be recruited as research participants to permit examination of relations among a range of measures and a continuum of eating disordered behaviors in a diverse population. At preliminary levels of analysis with development of theory as the focus of study, the use of highly selective clinical samples can be problematic particularly in the areas of disordered eating.

The objective of this study is to examine whether PF is mediating the relationship between the over-evaluation of body shape and weight, and ED and non-specific psychiatric symptoms. Because the over-evaluation of body shape and weight seems to involve both ED cognitions and body dissatisfaction or lack of body image acceptance (American Psychiatric Association, 2000; Fairburn et al., 2003; Sandoz, Wilson, & Merwin, under review), both of these distinct constructs were examined separately as predictor variables representing crucial aspects of the overall construct of over-evaluation of body shape and weight. Also, because PF has been linked to ED as well as other psychiatric symptoms (e.g., Andrew, & Dulin, 2007; Claes et al., 2001; Fairburn et al., 2003; Hayes et al., 2006; Hayes et al., 2004; Hayes et al., 1996; Paul et al., 2002; Spranger et al., 2001; Stice et al., 2002), both ED symptomatology and non-specific psychiatric symptoms were assessed as separate outcome variables. Thus, the four specific hypotheses for this study were: 1) PF will mediate the relationship between ED

cognitions and ED symptoms, 2) PF will mediate the relationship between ED cognitions and non-specific psychiatric symptoms, 3) PF will mediate the relationship between body image acceptance and ED symptoms, and 4) PF will mediate the relationship between body image acceptance and non-specific psychiatric symptoms.

Study Design and Methods

Participants

The study was conducted at a large public 4-year university in Georgia. Participants were recruited from undergraduate psychology courses through a web-based research participant pool. Four hundred participants completed the survey, and the mean completion time for the instrument was 24.36 minutes (*SD* = 9.69). Those who failed one or more of the consistency checks or who did not provide information for the variables of interest in this study were removed from the sample because of the validity of their responses and the inability to use their data in the data analyses, respectively. The sample used in the current study consisted of 236 participants (80%, n_{Female} = 186). The age of the participants ranged from 16-56 (*M* = 19.92, *SD* = 5.17). The ethnic composition of the sample was representative of the city of Atlanta with 39% (*n* = 90) identifying as "European American," 36% (*n* = 83) identifying as "African American," 13% (*n* = 31) identifying as "Asian American/Pacific Islander," 6% (*n* = 14) identifying as "Hispanic American," and 7% (*n* = 15) identifying as "bicultural" or "other."

Measures

Participants initially completed a demographic questionnaire assessing age, year in college, gender, sexual identity, ethnicity, SES, and history of psychiatric illness. Then, participants completed the Eating Disorder Spectrum Problems Assessment Package, which

consisted of five measures targeting ED cognitions, body image acceptance, PF, the frequency of disordered eating behaviors, and non-specific psychiatric symptoms.

Eating Disorder Cognitions. The *Mizes Anorectic Cognitions Questionnaire-Revised (MAC-R)* is a revision of the original MAC, a 33-item self-report questionnaire that measures three dimensions of ED cognitions: strict weight regulation and fear of weight gain (RWFW, 8 items), self-control as the basis of self-esteem (SCSE, 8 items), and weight and eating behavior as the basis of approval from others (WAFO, 8 items) (Mizes et al., 2000). These dimensions are based on the three areas of cognitive distortions that are believed to make up the central, underlying feature of ED spectrum problems as described by Garner and Bemis (1982). The 24 items on the MAC-R are rated on a 5-point Likert scale with responses ranging from 'strongly disagree' to 'strongly agree.' Examples of items are, "No one likes fat people; therefore, I must be (or remain) thin to be liked by others," and "I rarely criticize myself if I have let my weight go up a few pounds." Total scores range from 24 to 120, with higher scores indicating greater ED-related dysfunctional cognitions.

The MAC-R appears to uniquely measure the cognitive component of AN and BN, unlike other measures such as the Eating Attitudes Test (EAT) and Attention to Body Shape scale (ABS), which measure other components such as physiological and behavioral symptoms, in addition to the cognitive component (Osman, Chiros, Gutierrez, Kopper, & Barrios, 2001). Also, this measure of ED cognitions is the only one that has had extensive validation of its psychometric properties (Mizes & Christiano, 1995). In a large clinical population, high Cronbach's coefficients on the three MAC-R subscales were obtained: SCSE, $\alpha = .84$; RWFW, $\alpha = .82$, and WAFO, $\alpha = .85$; and the total MAC-R scale obtained a high α coefficient of .90, indicating high internal consistency (Mizes et al., 2000). Also, similarly high Cronbach's

coefficients on the three MAC-R subscales were obtained in an undergraduate population at a Midwestern state university: SCSE, α = .89; RWFW, α = .75, and WAFO, α = .72; and the α coefficient for the total MAC-R scale was .90 (Osman, et al.). In addition to good internal consistency, the MAC-R has been shown to have good concurrent, criterion-related, and discriminant validity in a large clinical population (Mizes et al.). Findings also suggest that the MAC-R is actually an improvement over the original MAC, based upon improved internal consistency, time efficiency, equal contribution of subscales to the total score, and sensitivity evidenced by its unique discrimination between bulimics and anorectics on the total score and on the approval and self-control subscales (Mizes et al.). It is important to note, that while this measure has been validated in one large undergraduate population (97 males, 193 females), the participants in the sample were predominantly Caucasian, thereby limiting generalizability to other ethnic minority groups and other geographic locations (Osman, et al.). Also, only reliability estimates were psychometrically evaluated in the college population.

Body Image Acceptance. The *Body Image- Acceptance and Action Questionnaire (BI-AAQ)* was specifically designed to assess a potential change process in acceptance-based treatments of negative body image and ED symptoms (Sandoz et al., under review). It is the only established measure of body image acceptance, and because negative body image is a common associated feature of ED spectrum problems and seems to be even more important in predicting eating pathology than body image distress (Sandoz et al.), its significance is evident.

In the present study, due to the contents of the BI-AAQ, the measure was initially theorized as a measure of body dissatisfaction, not necessarily as one's acceptance-based response to body dissatisfaction. The 29 items on the BI-AAQ are rated on a 7-point Likert scale with responses ranging from 'never true' to 'always true' regarding feelings about body image,

shape, and weight. Examples of items are, “My thoughts and feelings about my body weight and shape must change before I can take important steps in my life,” and “I don’t do things that might make me feel fat.” All items are reverse-scored to yield a total score for body image acceptance ranging from 29 to 203, with higher scores representative of higher body-image acceptance. The BI-AAQ has shown good internal consistency, as well as concurrent, criterion-related, and incremental validity in a large undergraduate population (n = 183) (Sandoz et al.). It should be noted, however, that neither information regarding the ethnic and gender composition of this population, nor the location of the university is provided, therefore generalizability is unknown. Research has shown that while the BI-AAQ is a new measure with restricted information, it is also a useful, as well as psychometrically sound instrument that warrants further validation.

Psychological Flexibility. The *Acceptance and Action Questionnaire Revised (AAQ-R)* is a 16-item self-report measure that assesses people’s willingness to accept their undesirable thoughts and feelings while acting in a way that is congruent with their values and goals. This is the only measure specifically designed to target the theory of EA (Hayes, Barnes-Holmes, & Roche, 2001; Hayes et al., 1996). It is important to note that while the AAQ does evaluate EA, it also contains items targeting processes delineated in the model of psychological flexibility (PF) including value-directed action and cognitive defusion. Thus, while several studies have referred to the AAQ solely as a measure of EA, it is actually a more comprehensive measure of PF, of which EA is a part (Hayes et al., 2006). Responses are rated on a 7-point Likert scale, ranging from 1 (never true) to 7 (always true). Total scores range from 16 to 112, with higher scores indicating greater PF and lower scores indicating greater EA. In a study conducted by Bond and Bunce (2003) in which a large nonclinical sample provided data on two occasions, alpha

coefficients for the AAQ-R were found to be .79 and .72 at the initial assessment and at the one-year follow-up, respectively. The AAQ-R has also shown sufficient construct and criterion validity (Bond & Bunce). In a large sample (n = 290) of undergraduate participants, the obtained four-month test-retest reliability was .64 (Hayes et al., 2004). While the AAQ-R is a fairly new measure, research has shown that it has good psychometric properties in both clinical and undergraduate student samples (Hayes et al., 2006). However, it should be noted that validation of psychometric properties in undergraduate populations is limited, thereby restricting generalizability.

Eating Disorder Symptoms. The Eating Disorder Examination-Questionnaire (EDE-Q) is a 36-item self-report measure designed to mirror the Eating Disorder Examination, a semi-structured, investigator-based clinical interview that comprehensively assesses severity of dietary restraint and concerns about eating, shape, and weight of the preceding 28 days (Fairburn & Beglin, 1994; Fairburn & Cooper, 1993). Frequencies of disordered eating behavior are measured in terms of the number of days (ranging from 'no days' to 'every day') on which particular forms of behavior occur instead of the number of individual episodes, based upon evidence that this may be more accurate with respect to binge eating (Rossiter, Agras, Telch, & Bruce, 1992). Questions are rated on a 7-point Likert scale with higher scores representing more ED psychopathology. The EDE-Q contains four subscales (Dietary Restraint, Eating Concern, Shape Concern, and Weight Concern) in addition to frequency measures of binge eating and compensatory behaviors. Total scores are derived for each of the subscales, in addition to the Global score, which is the average of the four subscale scores (Luce, Crowther, & Pole, 2008).

There are several other established measures of ED symptoms, such as the Eating Disorder Inventory (EDI), Eating Attitudes Test (EAT), and the College Oriented Eating

Disorders Screen (COEDS). The EDI has good psychometric properties, but did not seem suitable for this study because of the large number of scales included in the measure, including measures that tap into body dissatisfaction (Body Dissatisfaction scale) and experiential avoidance (Interpersonal Distrust, Interoceptive Awareness and Ineffectiveness scales) (Klemchuk, Hutchinson, & Frank, 1990) that will be separately evaluated as predictor variables in this study. Furthermore, this measure included a Perfectionism scale, but from our conceptual framework (e.g. transdiagnostic theory of ED symptoms), perfectionism is a predictor rather than outcome variable (Fairburn et al., 2003). Similarly, the EAT includes a scale that taps into another domain reflecting social pressures and expectations towards eating behavior and body image (Others' Perceptions scale), which is considered a factor that contributes to the development and maintenance of ED spectrum problems rather than a factor associated with the measurement domain (Engelsen, & Hagtvet, 1999, Fairburn et al., 2003). Additionally, while appearing psychometrically sound, the brevity of the 7-item COEDS warrants concern for the purpose of this study (Bucceri, Roberson-Nay, Strong, Nowak, & Lejuez, 2005). To allow the examination of a large continuum of eating disordered behaviors, this measure was considered inappropriate.

Administration of the EDE-Q is fully supported by internal consistency and test-retest reliability (Luce & Crowther, 1999), as well as concurrent (Black & Wilson, 1996; Fairburn & Beglin, 1994) and discriminant (Wilson, Nonas, & Rosenblum, 1993) validity estimates. The EDE-Q has strong psychometric properties in both clinical and community samples and has been shown to differentiate between controls and individuals with EDs (Cooper, Cooper, & Fairburn, 1989) as well as between restrained eaters and individuals with BN (Rosen, Vara, Wendt, & Leitenberg, 1990). It has also shown excellent internal consistency and two-week test-retest

reliability for the four subscales of the EDE-Q in a sample (n = 139) of female undergraduates at a large Midwestern university (Luce, & Crowther, 1999). While validated in an undergraduate population, it should be noted that the sample consisted of predominantly Caucasian female students at one university, thereby limiting generalizability to males and other ethnic minority groups in other geographic locations.

Non-specific Psychiatric Symptoms. The *General Health Questionnaire-12 (GHQ-12)* is a readily used, 12-item shortened self-report form of the originally developed 60-item instrument (Goldberg & Williams, 1988). Participants are asked to rate the frequency with which they experience common behavioral and psychological stressors in order to measure overall, general psychological health. The GHQ-12 consists of 12 questions regarding changes in one's symptoms over the last four weeks. Questions ask participants to indicate any change between their current mental states and how they usually feel by responding on a 4-point Likert-style scale 'Better than usual,' 'Same as usual,' 'Less than usual,' or 'Much less than usual.' Total scores range from 0 to 36 with higher scores indicating poorer psychological health and greater mental distress. The GHQ-12 was chosen for this study due to its brevity and ease of completion, as well as its well-documented application in research settings. Research supports that the GHQ-12 is a consistent and reliable instrument used in the general population (Pevalin, 2000). Its good internal consistency is evidenced by alphas of .79 (Quek, Low, Razack, & Loh, 2001) to .88 (Tait, French, & Hulse, 2003). The GHQ-12 has also been deemed a valid and reliable screening tool in university settings, receiving a Cronbach alpha of .86 in a large sample of Arabic university students (Daradkeh, Ghubash, & El-Rufaie, 2001). However, because participants were exclusively Arabic students from one university and additional information regarding the composition of the sample is limited, generalizability is restricted.

Procedure

The study entitled *Body Image and Health Concerns in a College Population* was uploaded to the Sona-Systems' Research Participation Pool available to GSU undergraduate students enrolled in psychology courses. All participants who signed up for the study were asked to complete the anonymous web-based survey. Before participants began the survey, information was presented on a computer screen explaining that the current study was examining body image and health concerns in a college population. Participants were informed that because of the sensitive nature of particular questions, they may want to complete the survey at home or a private location. The duration time (approximately 30 minutes) and instructions regarding how to respond to the survey were presented on the computer screen prior to beginning the survey. Participants then read a page entitled *Informed Consent*, which explained that their participation was completely voluntary. They also read that there were only minimal risks involved, including discomfort with answering personal questions and fatigue. Participants were informed that upon completion of the anonymous survey, they would earn credit for one hour of research participation in their psychology course. Additionally, they were ensured that refusal to participate would result in no penalty; however, they would not receive credit for one hour of research participation. Participants were informed that to ensure anonymity, all of the data would be de-identified. After reading all of the information on the *Informed Consent* page, participants were able to anonymously provide demographic information and complete the six measures of the ED Spectrum Problems Assessment Package. Upon the completion of the survey, information appeared on the screen thanking participations for their participation and informing them who to contact with questions and/or concerns. They were then awarded credit for one hour of research participation in their psychology course. This study was monitored by GSU's

University Institutional Review Board and the Principal Investigator (PI). The PI performed biweekly checks to ensure proper data encryption.

There were advantages and disadvantages of conducting web-based survey research. On the positive side, it was an extremely time and cost efficient strategy that is considered the instrument of choice when aspiring to easily and quickly sample a large college population (Daley, McDermott, McCormack Brown, & Kittleson, 2003). Also, it allowed participants to complete the survey at an opportune time and under preferable conditions that may have been more conducive for thoughtful responses (Daley et al.). This helped to ensure "ecological" validity because participants usually complete web-based surveys in familiar settings (Reips, 2002, p. 247). Therefore, any effects could not be attributed to being in an unfamiliar setting (Reips, 2002). Furthermore, participants may have perceived a sense of distance associated with responding on the Internet versus in person, thereby making them less likely to respond in a socially desirable way (Erdman, Klein, & Greist, 1995; Walsh, Kiesler, Sproull, & Hess, 1992). Additionally with web-based surveys, there is a high degree of voluntariness, or voluntary motivational nature of a person's participation, because less control is exerted on the decisions to participate and to continue participation (Reips, 2000). This voluntariness is related to reduced psychological reactance (e.g. careless responding, deliberately false answers, and ceasing participation), in addition to more authentic responses that are generalizable to a larger set of situations (Reips, 1997, 2000). Along with decreased demand characteristics, the reduction of experimenter effects is evident because the experimenter was blind to the participants (Reips, 2002). On the down side, with web-based surveys, the data-collection environment could not be controlled or monitored (Daley et al.). Thus, factors such as random events that may have influenced the respondents, or who actually completed the survey, were unknown. Further, the

participants' comprehension of the directions and/or questions, in addition to the accuracy of their responses was unknown. Even though psychological reactance was unforeseen, "consistency-checks" were in place to address selective or erroneous reporting, to which self-report measures are susceptible (Tylka, 2004). There were a total of five "consistency-checks," one for each of the measures in the study. The "consistency-check" was a randomly placed statement within each measure that instructed the respondent to choose a particular answer. This statement was disguised within the measure with answer choices that mirrored those of the corresponding measure. For example, the GHQ-12 rates responses on a 4-point Likert scale from 'Better than usual,' 'Same as usual,' 'Less than usual,' to 'Much less than usual.' The randomly placed statement within this measure informed the respondent to choose one of the answer choices, such as 'Much less than usual.' If one or more of the responses for the "consistency-checks" was discrepant from the instructed response, the data was deemed invalid and consequentially excluded from data analysis.

Results

Given a significant body of evidence showing that being a female is associated with greater ED symptoms, the present study initially examined whether gender (categorized as 0 = female, 1 = male) was a predictor of ED symptoms and other study variables. As seen in Table 1, being a female was associated with greater ED symptoms.

Table 1 also presents descriptive statistics and correlations among study variables. ED cognitions (MAC-R) were positively related to non-specific psychiatric symptoms (GHQ-12; $r = .14$, $p < .05$) and ED symptoms (EDE-Q; $r = .41$, $p < .01$), indicating that greater conviction of ED cognitions is associated with poorer psychological outcomes and greater ED symptom severity. Also, body image acceptance (BI-AAQ) was negatively related to non-specific

psychiatric symptoms (GHQ-12; $r = -.37$, $p < .01$) and ED symptoms (EDE-Q; $r = -.72$, $p < .01$), indicating that greater body image acceptance is associated with fewer non-specific psychiatric symptoms and lower ED symptom severity. In addition, scores on the conviction of ED cognitions were negatively related to PF (AAQ-R; $r = -.29$, $p < .01$) and body image acceptance (BI-AAQ; $r = -.44$, $p < .01$), meaning that having ED cognitions is associated with lower PF and lower body image acceptance. Also, body image acceptance was positively related to PF ($r = .49$, $p < .01$). Further, PF was inversely related to non-specific psychiatric symptoms (GHQ-12; $r = -.44$, $p < .01$) and ED symptoms (EDE-Q; $r = -.31$, $p < .01$), indicating that lower PF is associated with more non-specific psychiatric and ED symptoms. General psychological ill health was positively related to ED symptoms ($r = .34$, $p < .01$), indicating that ED symptoms are associated with other non-specific psychiatric symptoms.

Table 1

Means, Standard Deviations, Coefficient Alphas, and Zero-Order Relations between all Variables

	1	2	3	4	5	6
1. MAC-R	--	-.44**	-.29**	.41**	.14*	-.07
2. BI-AAQ		--	-.49**	-.72**	-.37**	.12
3. AAQ-R			--	-.31**	-.45**	.05
4. EDE-Q				--	.34**	-.23**
5. GHQ-12					--	-.12
6. Gender						--

M	72.88	149.97	70.22	2.13	11.02
SD	7.18	32.18	10.28	.98	6.15
α	.91	.95	.68	.93	.88

Note: $N = 237$, $*p < .05$, $**p < .01$, MAC-R = Mizes Anorectic Cognition Questionnaire-Revised, BI-AAQ = Body Image- Acceptance and Action Questionnaire Revised, AAQ-R = Acceptance and Action Questionnaire, EDE-Q = Eating Disorder Examination-Questionnaire, GHQ = General Health Questionnaire.

Psychological Flexibility as a Mediator of the Relation between Eating Disorder Cognitions and Eating Disorder Symptoms

All research hypotheses were investigated using the guidelines of Baron and Kenny (1986)'s mediation analysis. With respect to the first hypothesis that PF mediates the relation between ED cognitions and ED symptoms, a series of linear regressions were conducted while controlling for gender. Consistent with the previously discussed correlations, analyses revealed a significant A path between ED cognitions and PF, a significant B path between PF and ED symptoms, and a significant C path between ED cognitions and ED symptoms. As seen in Table 2, the final step of the test of mediation suggests that PF partially mediated the link between ED cognitions and ED symptoms (initial $\beta = .39$, final $\beta = .33$). The conservative Sobel tests of mediation suggest that PF accounted for significant relations between ED cognitions and the ED symptoms.

Psychological Flexibility as a Mediator of the Relation between Eating Disorder Cognitions and Non-specific Psychiatric Symptoms

Regarding the second hypothesis, the previously discussed correlations established a significant A path, between ED cognitions and PF, a significant B path between PF and non-specific psychiatric symptoms, and a significant C path between ED cognitions and non-specific psychiatric symptoms (see Table 1). As seen in Table 2, the final step of the test of mediation revealed that PF fully mediated the relation between ED cognitions and non-specific psychiatric symptoms.

Psychological Flexibility as a Mediator of the Relation between Body Image Acceptance and Eating Disorder Symptoms

With respect to the third hypothesis, the first three conditions suggested by Baron and Kenny (1986) were supported by a series regression analyses, while controlling for gender. However, the final step of mediation analysis did not show that PF was a mediator of the relation between body image acceptance and ED symptoms.

Psychological Flexibility as a Mediator of the Relation between Body Image Acceptance and Non-specific Psychiatric Symptoms

Regarding the fourth hypothesis that PF mediates the relation between body image acceptance and non-specific psychiatric symptoms, the first three conditions of mediation analysis were supported by correlational results. The final step of mediation analysis revealed that PF partially mediated the link between body image acceptance and non-specific psychiatric symptoms (initial β = -.37, final β = -.20). The conservative Sobel test of mediation suggested that PF accounted for significant relations between body image acceptance and non-specific psychiatric symptoms.

Table 2

Linear Regression Analysis for Testing the Final Step of Psychological Flexibility as Mediator

Variables	*β*	*B*	*SE B*	*t*	*Sobel z*
Eating Disorder Symptoms (EDE-Q)					
Gender	-.20**	-.47	.14	-3.38	
ED Cognitions (MAC-R)	.33**	.05	.01	5.40	
Psychological Flexibility (AAQ-R)	-.20**	-.02	.01	-3.34	3.34**
Non-specific Psychiatric Symptoms (GHQ-12)					
ED Cognitions (MAC-R)	.01	.01	.05	.16	
Psychological Flexibility (AAQ-R)	-.44**	-.26	.04	-7.20	
Eating Disorder Symptoms (EDE-Q)					
Gender	-.15**	-.35	.11	-3.21	
Body Image Acceptance (BI-AAQ)	-.72**	-.02	.00	-13.94	
Psychological Flexibility (AAQ-R)	.05	.01	.01	1.05	
Non-specific Psychiatric Symptoms (GHQ-12)					
Body Image Acceptance (BI-AAQ)	-.20**	.-04	.01	-3.02	
Psychological Flexibility (AAQ-R)	-.35**	-.21	.04	-5.25	5.71**

Note: $N = 237$, *$p < .05$, **$p < .01$, MAC-R = Mizes Anorectic Cognition Questionnaire-Revised, BI-AAQ = Body Image- Acceptance and Action Questionnaire Revised, AAQ-R = Acceptance and Action Questionnaire, EDE-Q = Eating Disorder Examination-Questionnaire, GHQ = General Health Questionnaire.

Exploratory Analysis of Body Image Acceptance as a Mediator of the link between Eating Disorder Cognitions & ED-specific and Non-specific Symptoms

Observation of the high correlations between body image acceptance and the other variables warranted further mediation analyses. A first set of regression analyses were conducted to determine whether body image acceptance accounts for the relation between ED cognitions and non-specific psychiatric symptoms. Correlations established a significant A path, between ED cognitions and body image acceptance, a significant B path between body image acceptance and non-specific psychiatric symptoms, and a significant C path between ED cognitions and non-specific psychiatric symptoms. As seen in Table 3, the final step of the test of mediation revealed that body image acceptance fully mediated the relation between ED cognitions and non-specific psychiatric symptoms.

Subsequently, additional regression analyses were conducted while controlling for gender to determine whether body image acceptance mediates the relation between ED cognitions and ED symptoms. The first three conditions of mediation analysis were supported by correlational results. As seen in Table 3, the final step of the test of mediation suggests that body image acceptance partially mediated the link between ED cognitions and ED symptoms (initial $\beta = .39$, final $\beta = .10$). The conservative Sobel tests of mediation suggest that body image acceptance accounted for significant relations between ED cognitions and the ED symptoms.

Table 3

Linear Regression Analysis for Testing the Final Step of Body Image Acceptance as Mediator

Variables	*β*	*B*	*SE B*	*t*	*Sobel z*
Eating Disorder Symptoms (EDE-Q)					
Gender	-.14**	-.35	.11	6.52	
ED Cognitions (MAC-R)	.10*	.01	.01	2.07	
Body Image Acceptance (BI-AAQ)	-.65**	-.02	.00	-13.05	-1.93
Non-specific Psychiatric Symptoms (GHQ-12)					
ED Cognitions (MAC-R)	-.03	- .03	.06	-.45	
Body Image Acceptance (BI-AAQ)	-.38**	-.07	.01	-5.64	

Discussion

ED spectrum problems have been becoming more pervasive, especially among female college students. Clinical practice and research has focused on ED symptoms and other associated non-specific psychiatric symptoms that accompany established correlates of ED spectrum problems, such as ED cognitions. Recently, there has been a focus on developing measures of eating disorder symptomatology (Bohn et al., 2008; Fairburn, 2008) and health-related quality of life in relation to ED spectrum problems (e.g., Engel et al., 2006; Masuda et al., 2010). Also, clinical psychology has shown recent advances in the forms of acceptance- and mindfulness-based theories, which propose that in order to understand and treat human psychopathology, it is necessary to observe and understand how an individual responds or relates

to difficult private events such as psychological symptoms, in addition to the presence of symptoms themselves (Hayes et al., 1996; Segal et al., 2004; Masuda et al.).

Recently, acceptance- and mindfulness-based CBTs, such as Acceptance Commitment Therapy (ACT; Hayes et al., 1999), that support this line of reasoning, have been applied to individuals with ED spectrum problems (Hayes et al., 1999) and have been shown to effectively reduce patients' ED related behaviors (Baer, Fischer, & Huss, 2005; Heffner & Eifert, 2004; Safer, Telch, & Agras, 2001; Telch, Agras, & Linehan, 2001). While demonstrating efficacy, these studies have been outcome-focused, rather than process-orientated, thereby not revealing which variable(s) are being systematically manipulated by these therapies to reduce symptomatology.

Findings

Employing an ethnically diverse sample of college students, the present study investigated the mediating role of PF in relation to ED cognitions, body image acceptance, ED symptoms, and other non-specific psychiatric symptoms. The present study reveals that PF fully mediated the relation between ED cognitions and non-specific psychiatric symptoms and partially mediated the link between ED cognitions and ED symptoms. These findings suggest that the links between ED cognitions and psychiatric symptoms both specific and non-specific to EDs are established in part through an inflexible and avoidant coping style.

PF also partially mediated the link between body image acceptance and non-specific psychiatric symptoms, but not the relation between body image acceptance and ED symptoms. The second set of findings suggests that body image acceptance plays a unique and important role in the area of ED symptoms. As suggested by Santos et al. (under review), this may be in part because the construct of body image acceptance involves an acceptance-based response to

body dissatisfaction, in addition to body dissatisfaction itself. In the present exploratory investigation, body image acceptance was conceptualized as a behavioral process of how a person responds to negative body image, rather than as a degree of negative body image. The present results revealed that body image acceptance fully mediated the relation between ED cognitions and non-specific psychiatric symptoms and partially mediated the link between ED cognitions and ED symptoms.

These findings suggest that it is worthwhile continuing to investigate the role of PF and body image acceptance in the relation between ED cognitions, ED symptoms, and non-specific psychiatric symptoms. The present study also conceptually highlights the significance of revealing a process-based explanation of ED spectrum problems. How a person relates or responds to negative private events is often ignored in clinical case conceptualizations (e.g., Hayes et al., 1996). It is speculated that inflexible and avoidant ways of interacting with ED cognitions and associated private events consequentially maintains ED spectrum problems and other non-specific psychiatric symptoms (Masuda et al., 2010). This is supported by research conducted by Fairburn and colleagues (Fairburn, 2008; Fairburn et al., 2003), which emphasizes psychological and behavioral processes (e.g., avoidance behaviors, distress intolerance) in the maintenance of ED spectrum problems and associated psychiatric symptoms.

These findings also are relevant for the prevention and treatment of ED spectrum problems. Consistent with the recent acceptance- and mindfulness-based theories, the present findings suggest that it is critical to target PF and body image acceptance in addition to ED cognitions to prevent and/or treat ED and other associated negative psychological symptoms (e.g., Hayes, Follette, & Linehan, 2004; Masuda et al., 2010). Typically, psychosocial interventions focus on *eliminating or changing* targeted private events without considering how

these attitudes, beliefs, thoughts, feelings, memories, and so forth influence an individual's behavioral patterns. In other words, these interventions neglect actualizing the process or function of the targeted private events. Recent empirical literature proposes that just noticing and experiencing these private events without judgment or avoidance is a more effective and beneficial response style than attempting to eliminate or change them, which has been shown to be ineffective and not necessary to attain psychological health (e.g., Masuda et al.; Segal et al., 2004; Teasdale et al., 2002). Present results regard acceptance- and mindfulness-based behavioral interventions as a promising route for individuals suffering from EDs or ED spectrum problems (e.g., Baer, Fischer, & Huss, 2005; Safer, Telch, & Agras, 2001; Telch, Agras, & Linehan, 2001). Acceptance- and mindfulness-based behavioral interventions would help to reduce ED and other associated psychological symptoms by focusing on increasing PF and promoting acceptance, particularly body image acceptance, while also practically teaching individuals how to adopt positive coping strategies in the face of negative thoughts and feelings, instead of maladaptive behaviors that serve the function of escaping or avoiding one's private events.

Limitations

The present investigation has several noteworthy weaknesses, so the present data should be interpreted in the light of these limitations. It should be noted that the number of variables included in the study was intentionally limited in order to gain a preliminary understanding of the relations among ED cognitions, body image acceptance, PF, ED symptoms, and non-specific psychiatric symptoms. Thus, the study purposely covered only a facet of ED spectrum problems, instead of examining an exhaustive model of all pertinent factors. The given complex nature of EDs and ED spectrum problems (Fairburn, 2008; Tylka & Subich, 2004), presupposes that other

variables, such as neuroticism and social perfectionism, also account for the variance of ED and other non-specific psychiatric symptoms (Masuda et al., 2010). Also, body image acceptance was examined as a risk factor and as a mediator, which warrants clarification of the conceptualization of this variable. For these reasons, the data should be considered preliminary, and results should be interpreted with extra caution.

Also, the sample population in the present study is limited to college students in an urban area of Georgia, although, regarding ED spectrum problems, college samples are one of the most vulnerable populations. It also should be noted that the age range for the participants may have been too broad because of the large number of non-traditional college students. This may have potentially impacted the findings.

From a socio-cultural perspective, some demographic factors, such as gender role, ethnicity, regional context, and university culture, are likely to shape ED cognitions, poor psychological outcomes, and/or PF in systematic ways (e.g., Hayes et al., 2004; Joiner, Katz, & Heatherton, 2000; Masuda et al.; Perez & Joiner, 2003; Striegel-Moore & Bulik, 2007). Given a relatively small number of participants, the present study was not able to conduct the *comprehensive* examination of the relations among these variables and ED cognitions, body image acceptance, PF, ED and other non-specific psychiatric symptoms.

Possibly the largest limitation was the reliance on a cross-sectional and correlational design, which did not allow for causal inferences to be derived. Although the present study proposes PF and body image acceptance as potential mediators of the relationship between ED cognitions and psychiatric symptoms both specific and non-specific to EDs, any causal and temporal inferences should be avoided. Also, the study does not examine competing hypotheses; for example, it is possible that ED cognitions may mediate the link between PF and ED

symptoms and non-specific psychiatric symptoms. It is suggested that future research entail a large-scale, longitudinal or ED treatment study, in order to reveal causal links among these variables.

Strengths

Despite these limitations, the present study has several noteworthy strengths. It was innovative in that it moved beyond examining independent correlates of disordered eating toward exploring how variables are related to predict ED symptoms. Also, PF was tested as a mediator of the relationships between ED cognitions and body image acceptance and ED and non-specific psychiatric symptoms, as no other study has done. It also realized the mediating influence of body image acceptance in the relations between ED cognitions and ED and non-specific psychiatric symptoms, Further, the recruited sample was comprised of ethnically diverse women and men, some of whom were experiencing subclinical ranges of EDs, unlike the majority of studies which have focused predominantly on Caucasian, middle-upper class women with clinical diagnoses of AN and BN. Another strength of the study was the stringent exclusion criteria. Participants who failed one or more consistency checks or did not provide data for every variable of interest were excluded from the data analyses to increase internal validity.

This study demonstrates the predictive values of ED cognitions, body image acceptance, and PF on ED and non-specific psychiatric symptoms. The present investigation also suggests that it is beneficial to consider not only ED cognitions, but also body image acceptance and PF in understanding general psychological functioning among college students who are particularly vulnerable to ED spectrum problems. This study also suggests that in order to fully comprehend the nature of EDs and ED spectrum problems, it may be essential to investigate the roles of body image acceptance and PF.

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Appendix

ED Assessment Package

Participant's ID: _____

BACKGROUND INFORMATION

I would like to ask you a few questions about yourself. This information will assist me in this study. Please answer all the questions as completely as possible.

1 Age: _____

2 Gender (please circle one): 1 = female 2 = male

3 Marital Status (please circle one):
1 = Single 4 = Separated
2 = Married 5 = Remarried
3 = Divorced 6 = Widowed

4 Highest grade of school you completed?

High School:	9	10	11	12	GED
Post High School (vocational/technical):	1	2	3	4	
College:	1	2	3	4	degree? _____
Graduate/Professional:	5	6	7	8	degree? _____

5 Nationality:
1 = U.S. Citizen.
2 = Non U.S. Citizen (Please specify your nationality _____)

6 Ethnicity/Race:
1 = Native American 5 = White (non-Hispanic)
2 = Hispanic 6 = Black (non-Hispanic)
3 = Asian 7 = Other: _____ (please specify)
4 = Pacific Islander 8 = Bi-cultural: _____ (please specify)

7 Sexual Orientation:
1 = Heterosexual 3 =Bisexual
2 = Homosexual 4 = Other: _____ (please specify)

8 Family & Household Income (please circle one):
1 = less than $20,000
2 = more than $20,000 and less than $30,000
3 = more than $30,000 and less than $40,000
4 = more than $40,000 and less than $50,000
5 = more than $50,000 and less than $60,000
6 = more than $60,000

9 Have you ever sought professional psychological services (e.g., psychotherapy, counseling, medication treatment) for your psychological problems (e.g., depression, anxiety, eating disorder, etc)?

1 = Yes 2 = No

10 If yes, what is the service for

a. _____

b. _____

11 Have you ever been diagnosed with any psychological disorders? If yes please list.

a. _____

b. _____

c. _____

12. What is your height? _____

13. What is your weight? _____

EDEQ

The following questions are concerned with the PAST FOUR WEEKS ONLY (28 days). Please read each question carefully and circle the appropriate number on the right. Please answer all the questions.

ON HOW MANY DAYS OUT OF THE PAST 28 DAYS…	No Days	1-5 Days	6-12 Days	13-15 Days	16-22 Days	22-27 Days	Every -day
1. Have you been deliberately trying to limit the amount of food you eat to influence your shape or weight?	0	1	2	3	4	5	6
2. Have you gone for long periods of time (8 hours or more) without eating anything in order to influence your shape or weight?	0	1	2	3	4	5	6
3. Have you *tried* to avoid eating any foods which you like in order to influence your shape or weight?	0	1	2	3	4	5	6
4. Have you tried to follow definite rules regarding your eating in order to influence your shape or weight; for example, a calorie limit, a set amount of food, or rules about what or when you should eat?	0	1	2	3	4	5	6
5. Have you wanted your stomach to be	0	1	2	3	4	5	6

empty?

6.	Has thinking about food or its calorie content made it much more difficult to concentrate on things you are interested in; for example, read, watch TV, or follow a conversation?	0	1	2	3	4	5	6
7.	Have you been afraid of losing control over eating?	0	1	2	3	4	5	6
8.	Have you had episodes of binge eating?	0	1	2	3	4	5	6
9.	Have you eaten in secret? (Do not count binges)	0	1	2	3	4	5	6
10.	Have you definitely wanted your stomach to be flat?	0	1	2	3	4	5	6

	ON HOW MANY DAYS OUT OF THE PAST 28 DAYS…	**No Days**	**1-5 Days**	**6-12 Days**	**13-15 Days**	**16-22 Days**	**22-27 Days**	**Every -day**
11.	Has thinking about shape or weight made it more difficult to concentrate on things you are interested in; for example, read, watch TV, or follow conversation?	0	1	2	3	4	5	6
12.	Have you had a definite fear that you might gain weight or become fat?	0	1	2	3	4	5	6
13.	Have you felt fat?	0	1	2	3	4	5	6
14.	Have you had a strong desire to lose weight?	0	1	2	3	4	5	6
15.	Over the past 4 weeks (28 days), on what proportion of times that you have eaten have you felt guilty because of the effect on your shape or weight? (Do not count binges.) (Please circle the number which applies.)	0- None of the times 1- A few of the times 2- Less than half of the times 3- Half of the times 4- More than half of the times 5- Most of the times 6- Every time						
16.	Over the past 4 weeks (28 days), have there been any times when you have felt that you have eaten what other people would regard as *an*	0- No 1- Yes						

	unusually large amount of food given the circumstances?	
17.	How many such episodes have you had over the past 4 weeks? Please put an approximate number.	_____ (# of episodes)
18.	How many of these episodes of overeating did you have a sense of having lost control over your eating?	_____ (# of episodes)
19.	Have you had other episodes of eating in which you have had a sense of having lost control and eaten too much, but have not eaten an unusually large amount of food given the circumstances?	0- No 1- Yes
20.	How many such episodes have you had over the past 4 weeks? Please write down an approximate number.	_____ (# of episodes)
21.	Over the past 4 weeks, have you made yourself sick (vomit) as a means of controlling your shape or weight?	0- No 1- Yes
22.	How many times have you done this over the past 4 weeks?	_____ (# of episodes)

23.	How you take laxatives as a means of controlling your shape or weight?	0- No 1- Yes
24.	How many times have you done this over the past 4 weeks?	_____ (# of episodes)
25.	Have you take diuretics (water tablets) as a means of controlling your shape or weight?	0- No 1- Yes
26.	How many times have you done this over the past 4 weeks?	_____ (# of episodes)
27.	Have you exercised hard as a means of controlling your shape or weight?	0- No 1- Yes
28.	How many times you have done this over the past 4 weeks?	_____ (# of episodes)

Please use the following scale for answering to items 29 through 36

0	1	2	3	4	5	6

Not at all		Slightly		Moderately		Markedly

Over THE PAST 4 WEEKS (28 DAYS)								
29.	Has your weight influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
30.	Has your shape influence how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
31.	Have much would it upset you if you had to weigh yourself once a week for the next four weeks?	0	1	2	3	4	5	6
32.	How dissatisfied have you felt about your weight?	0	1	2	3	4	5	6
33.	How dissatisfied have you felt about your shape?	0	1	2	3	4	5	6
34.	How concerned have you been about other people seeing you eat?	0	1	2	3	4	5	6
35.	How uncomfortable have you felt seeing your body; for example, in the mirror, in shop window reflection, while undressing or taking a bath or shower?	0	1	2	3	4	5	6
36.	How uncomfortable have you felt about others seeing your body; for example, in communal changing rooms, when swimming or wearing tight clothes?	0	1	2	3	4	5	6

AAQ-R

Below you will find a list of statements. Please rate the truth of each statement as it applies to you. Use the following scale to make your choice.

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true

_____ 1. I am able to take action on a problem even if I am uncertain what is the right thing to do.

_____ 2. When I feel depressed or anxious, I am unable to take care of my responsibilities.

_____ 3. I try to suppress thoughts and feelings that I don't like by just not thinking about them.

_____ 4. It's OK to feel depressed or anxious.

_____ 5. I rarely worry about getting my anxieties, worries, and feelings under control.

_____ 6. In order for me to do something important, I have to have all my doubts worked out.

_____ 7. I'm not afraid of my feelings.

_____ 8. I try hard to avoid feeling depressed or anxious.

_____ 9. Anxiety is bad.

_____ 10. Despite doubts, I feel as though I can set a course in my life and then stick to it.

_____ 11. If I could magically remove all the painful experiences I've had in my life, I would do so.

_____ 12. I am in control of my life.

_____ 13. If I get bored of a task, I can still complete it.

_____ 14. Worries can get in the way of my success.

_____ 15. I should act according to my feelings at the time.

_____ 16. If I promised to do something, I'll do it, even if I later don't feel like it.

_____ 17. I often catch myself daydreaming about things I've done and what I would do differently next time.

_____ 18. When I evaluate something negatively, I usually recognize that this is just a reaction, not an objective fact.

_____ 19. When I compare myself to other people, it seems that most of them are handling their lives better than I do.

MAC-R

After reading each of the following statements, circle the number that best reflects how much you agree or disagree with the statement. There are no right or wrong answers, so please don't think about your answers for very long. You should mark your answer quickly and then go on to the next statement. Be sure to mark how you actually feel, not how you think you "should" feel. Try to avoid the "neither agree nor disagree" and only select "neither agree nor disagree" if you truly can't decide whether you agree or disagree.

1. I feel victorious over my hunger when I am able to refuse sweets.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

2. No matter how much I weigh, fats, sweets, breads, rice, and cereals are bad food because they always turn into fat.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

3. No one likes fat people; therefore, I must be (or remain) thin to be liked by others.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

4. I am proud of myself when I control my urge to eat.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

5. When I eat desserts, I get fat. Therefore, I must never eat desserts so I won't be fat.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

6. How much I weigh has little to do with how popular I am.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

7. If I don't establish a daily routine, everything will be chaotic and I won't accomplish anything.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

8. My friends will like me regardless of how much I weigh.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

9. When I am overweight, I am not happy with my appearance. Gaining weight will take away the happiness I have with myself.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

10. People like you because of your personality, not whether you are overweight or not.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

11. When I eat something fattening, it doesn't bother me that I have temporarily let myself eat something I'm not supposed to.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

12. If I eat sweet, it will be converted instantly into stomach fat.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

13. If my weight goes up, my self-esteem goes down.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

14. I can't enjoy anything because it will be taken away.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

15. It is more important to be a good person than it is to be thin.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

16. When I see someone who is overweight, I worry that I will be like him/her.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

17. All members of the opposite sex want a mate who has a perfect, thin body.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

18. Having a second serving of a high calorie food I really like doesn't make me feel guilty.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

19. If I can cut out all carbohydrates, I will never be fat.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

20. When I overeat, it has no effect on whether or not I feel like a strong person.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

21. Members of the opposite sex are more interested in "who" you are, rather than whether or not you are thin.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

22. If I gain one pound, I'll go on and gain a hundred pounds, so I must keep precise control of my weight, food, and exercise.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

23. I rarely criticize myself if I have let my weight go up a few pounds.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

24. I try to attract members of the opposite sex through my personality rather than by being thin.

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree Nor Disagree	Moderately Agree	Strongly Agree

BI-AAQ

Directions: Below you will find a list of statements. Please rate the truth of each statement as it applies to you. Use the following rating scale to make your choices. For instance, if you believe a statement is 'Always True,' you would write a 7 next to that statement.

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true

1. I get on with my life even when I feel bad about my body	1	2	3	4	5	6	7
2. Worry about my weight makes it difficult for me to live a life that I value.	1	2	3	4	5	6	7
3. I would gladly sacrifice important things in my life to be able to stop worry about my weight.	1	2	3	4	5	6	7
4. I care too much about my weight and body shape.	1	2	3	4	5	6	7
5. How I feel about my body has very little to do with the daily choices I make.	1	2	3	4	5	6	7
6. Many things are more important to me than feeling better about my weight.	1	2	3	4	5	6	7
7. There are many things I do to try and stop feeling bad about my body weight and shape.	1	2	3	4	5	6	7
8. I worry about not being able to control bad feelings about my body.	1	2	3	4	5	6	7
9. I do not need to feel better about my body before doing things that are important to me.	1	2	3	4	5	6	7
10. I don't do things that might make me feel fat.	1	2	3	4	5	6	7
11. I shut down when I feel bad about my body shape and weight.	1	2	3	4	5	6	7
12. My worries about my weight do NOT get in the way of my success.	1	2	3	4	5	6	7
13. I can move toward important goals, even when feeling bad about my body.	1	2	3	4	5	6	7
14. There are things I do to distract myself from thinking about my body shape or size.	1	2	3	4	5	6	7

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true

15. My thoughts and feelings about my body weight and shape must change before I can take important steps in my life.	1	2	3	4	5	6	7
16. My thoughts about my body shape and weight do not interfere with the way I want to live.	1	2	3	4	5	6	7
17. I cannot stand feeling fat.	1	2	3	4	5	6	7
18. Worrying about my body takes up too much of my time.	1	2	3	4	5	6	7
19. If I start to feel fat, I try to think about something else.	1	2	3	4	5	6	7
20. Worrying about my weight does not get in my way.	1	2	3	4	5	6	7
21. Before I can make any serious plans, I have to feel better about my body.	1	2	3	4	5	6	7
22. I will have better control over my life if I can control my negative thoughts about my body.	1	2	3	4	5	6	7
23. I avoid putting myself in situations where I might feel bad about my body.	1	2	3	4	5	6	7
24. To control my life, I need to control my weight.	1	2	3	4	5	6	7
25. My worries and fears about my weights are true.	1	2	3	4	5	6	7
26. Feeling fat causes problems in my life.	1	2	3	4	5	6	7
27. I do things to control my weights so I can stop worrying about the way my body looks.	1	2	3	4	5	6	7
28. When I start thinking about the size and shape of my body, it is hard to do anything else.	1	2	3	4	5	6	7
29. My relationships would be better if my body weight and/or shape did not bother me.	1	2	3	4	5	6	7

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GHQ

We would like to know if you have had any medical complaints, and how your heath has been in general, *over the past few weeks*. Please answer ALL questions by circling the answer which you think most nearly applied to you. Remember that we want to know about present and recent complaints, not those that had in the past.

Have you recently:

1.	been able to concentrate on whatever you're doing?	better than usual	same as usual	less than usual	much less than usual
2.	lost much sleep over worry?	not at all	no more than usual	rather more than usual	much more than usual
3.	felt that you are playing a useful part in things?	more so than usual	same as usual	less useful than usual	much less useful
4.	felt capable of making decision about things?	more so than usual	same as usual	less so than usual	much less capable
5.	felt constantly under strain?	not at all	no more than usual	rather more than usual	much more than usual
6.	felt you couldn't overcome your difficulties?	not at all	no more than usual	rather more than usual	much more than usual
7.	been able to enjoy your normal day-to-day activities?	more so than usual	same as usual	less so than usual	much less than usual
8.	been able to face up to your problem?	more so than usual	same as usual	less able than usual	much less able
9.	been feeling unhappy and depressed?	not at all	no more than usual	rather more than usual	much more than usual
10.	been losing confidence in yourself?	not at all	no more than usual	rather more than usual	much more than usual
11.	been thinking of yourself as a worthless person?	not at all	no more than usual	rather more than usual	much more than usual
12.	been feeling reasonably happy, all things considered?	more so than usual	about same as usual	less so than usual	much less than usual

You have just completed the survey! You will receive credit for one hour of research participation. We really appreciate your time and honesty in answering the questions. Your answers may be able to help individuals who are at risk for, or suffer from, eating related problems. Once again, if you have any questions or concerns regarding your participation in this study, please contact Johanna Wendell, B.A. at jwendell1@student.gsu.edu or Akihiko (Aki) Masuda, Ph.D. at 404-413-6298 or psyaxm@langate.gsu.edu.