

A PROSPECTIVE INVESTIGATION OF THE RELATION BETWEEN  
EMOTION AWARENESS AND DISORDERED EATING:  
MODERATING AND MEDIATING FACTORS

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by  
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## ABSTRACT

A Prospective Investigation of the Relation between Emotion Awareness and Disordered Eating:

Moderating and Mediating Factors

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Although research has shown that poor emotion awareness is significantly related to disordered eating, the majority of studies that have examined this relation have significant limitations. These limitations include lack of longitudinal data, little focus on the specificity of emotion awareness in predicting disordered eating versus general emotional distress, little focus on the roles of other emotional deficits, such as emotional avoidance and fear of emotions, an over-reliance on self-report data, a lack of research with sub-clinical populations, and a failure to examine possible interactions between emotion awareness and other known risk factors for disordered eating.

The current study addressed some of these limitations by using a two-time point, prospective design to examine a variety of emotional processes, stress, dysfunctional appearance beliefs, and disordered eating in undergraduate females. At Time 1, participants ( $N = 187$ ), ages 18-22, completed measures of emotion awareness, emotional avoidance, fear of emotions, depression, anxiety, dysfunctional appearance beliefs, life events/stress, and disordered eating. Three months later, at Time 2, participants ( $N = 158$ ) repeated many of the Time 1 measures, in addition to completing a measure that assessed the frequency and subjective negative impact of

life events experienced during the prospective period.

Six main hypotheses were tested. As expected, emotion awareness was stable over time and was related to disordered eating cross-sectionally. Contrary to expectations, emotion awareness did not predict disordered eating prospectively, emotion awareness related more to depression and anxiety than to disordered eating, emotion awareness did not relate to disordered eating cross-sectionally or prospectively once emotional avoidance and fear of emotions were controlled, emotion awareness did not interact with life events/stress and dysfunctional appearance beliefs to predict disordered eating cross-sectionally or prospectively, and the ability to repair mood did not mediate the relation between emotion awareness and disordered eating. A notable finding involved the lack of specificity of emotion awareness to disordered eating versus depression and anxiety. In fact, depression and anxiety fully mediated the relation between poor emotion awareness and disordered eating.

Following a review of the results, strengths and limitations, as well as clinical implications and potential future research directions are discussed.

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## CHAPTER 1

### INTRODUCTION

#### Specific Aims

Although past research has shown that poor emotion awareness is significantly related to disordered eating, the majority of studies that have examined this relation have significant limitations. These limitations include lack of longitudinal data, little focus on the specificity of emotion awareness in predicting disordered eating versus depression and anxiety, an over-reliance on self-report data, a lack of research with sub-clinical populations, and a failure to examine possible interactions between emotion awareness and other known risk factors for disordered eating. The current study therefore used a prospective design to examine the relation between emotion awareness and disordered eating in a large sample of late adolescent and young adult undergraduate females. In doing so, this study examined: 1) the stability of emotion awareness over time, 2) whether emotion awareness predicted disordered eating prospectively, 3) whether emotion awareness related specifically to disordered eating, or rather, to emotional distress in general (e.g., depression and anxiety), 4) whether emotion awareness was a unique construct from other emotion dysfunctions, such as fear of emotions or emotional avoidance, 5) whether emotion awareness interacted with life events/stress and/or dysfunctional appearance beliefs to predict disordered eating, and 6) whether the relation between emotion awareness and disordered eating was mediated by the ability to repair one's mood. Knowledge gained from this study has the potential to contribute to a better understanding of the relation between emotion awareness and disordered eating, improved etiological models, and more importantly, enhanced prevention and intervention efforts. Given the substantial psychological distress and potential

medical problems, chronic course, and high treatment costs associated with disordered eating, these possible contributions cannot be overstated.

## Background and Significance

### *An Overview of Disordered Eating*

Disordered eating, defined as clinical or sub-clinical eating pathology, is prevalent in adolescents and young adults and is associated with psychological distress and medical problems. The most commonly recognized clinical eating disorders are anorexia nervosa and bulimia nervosa (Klein & Walsh, 2003). Whereas anorexia nervosa is defined primarily by a refusal to maintain a minimally normal body weight, and is found in approximately 0.5 -1% of the population, bulimia nervosa is defined primarily by recurrent episodes of binge eating, followed by dangerous behaviors to avoid weight gain, and is found in approximately 1-3% of the population (APA, 2000). Both of these disorders typically begin in the late adolescent and early adulthood years and are significantly more prevalent in females than in males. In fact, bulimia is up to ten times more prevalent in females (APA, 2000).

Anorexia and bulimia are considered discrete diagnoses; however, researchers have argued that disordered eating may be better understood utilizing a dimensional framework, whereby anorexia and bulimia are seen as extreme forms of eating pathology. In line with this dimensional or “continuum” framework, many researchers have examined the prevalence and psychological correlates associated with less severe disordered eating, commonly referred to as partial eating disorders, sub-clinical eating disorders, or sub-threshold eating disorders (*see* Shisslak, Crago, & Estes, 1995 for a review). This research has found that less severe forms of disordered eating are more prevalent than anorexia and bulimia, with prevalence estimates

ranging from 3-5% of adult women and from 1.8-13% of adolescents (Shisslak et al., 1995). Research has also helped illuminate the nature of sub-clinical disordered eating. Specifically, individuals who engage in less severe forms of disordered eating usually engage in the same behaviors as those with clinical eating disorders, but they do so at a relatively lower frequency. Further, they are at an increased risk for developing more severe disordered eating over time (Shisslak et al., 1995).

Both severe and milder forms of disordered eating are associated with psychological distress and medical problems. For instance, across the spectrum, disordered eating is often comorbid with depression, anxiety, lower self-esteem, social withdrawal, substance abuse or dependence, and suicidal ideation or attempts. Disordered eating may also cause heart, hematological, liver, electrolyte, hormonal, and gastrointestinal disturbances, among many others. In the most serious instance, disordered eating, especially in the case of anorexia, is associated with an increased risk for premature death due to medical problems (Bunnell, Shenker, Nussbaum, Jacobson, & Cooper, 1990; Shisslak et al., 1995).

Given previous empirical support for the continuum conceptualization of disordered eating, the potential negative psychological and medical consequences associated with sub-clinical eating disorders, and the increased risk of developing a clinical eating disorder from sub-clinical symptoms, continued research examining disordered eating within a dimensional framework is warranted. Taking this perspective, the remainder of this review will use the term disordered eating to refer to both clinical and sub-clinical eating pathology.

*Emotion Awareness, Negative Life Events/Stress, Dysfunctional Appearance Beliefs,  
and Disordered Eating*

Researchers have examined a variety of individual risk factors for disordered eating (*see* Klein & Walsh, 2003 and Polivy & Herman, 2002 for more thorough reviews; Dobbmeyer & Stein, 2003; Tyrka, Waldron, Graber, & Brooks-Gunn, 2002). Some of these include personality traits, self-esteem, affective disturbances, childhood trauma, maladaptive cognitive style, and biological factors (e.g., genes, neuroendocrine influences), among many others (Dobbmeyer & Stein, 2003; Klein & Walsh, 2003; Polivy & Herman, 2002; Tyrka, Waldron, Graber, & Brooks-Gunn, 2002). This review primarily discusses research that has examined the relation between emotion awareness and disordered eating, as this is the main focus of this study. However, it also briefly discusses the research on two other individual risk factors for disordered eating- negative life events/stress and dysfunctional appearance beliefs- as the present study also assesses these constructs and how they interact with emotion awareness.

*Emotion Awareness and Disordered Eating*

*Definition of emotion awareness and theoretical link to disordered eating.* The construct of emotion awareness typically falls within three areas of research- research on alexithymia, emotional intelligence, and emotion regulation. Across these areas, emotion awareness is primarily defined as the ability to recognize, label, or differentiate one's emotions and/or one's ability to describe her/his emotions to others. Researchers have hypothesized that poor emotion awareness relates to lower psychological functioning because lacking the ability to recognize and understand emotions impairs problem solving or coping abilities, and difficulty communicating emotions to others limits opportunities for gaining social support. Consistent with this, numerous

researchers who have examined the relation between alexithymia, emotional intelligence, emotion regulation and mental health have found a relation between emotion awareness and poorer functioning (Cloitre, Miranda, Stovall-McClough, & Han, 2005; Fox, Axelrod, & Paliwal, 2007; Gratz & Roemer, 2004; Gratz, Rosenthal, Tull, Lejuez, & Gunderson, 2006; Linehan, 1993; Salters-Pedneault, Roemer, & Tull, 2006; Schutte, Malouff, Thorsteinsson, Bhullar, & Rooke, 2007; Taylor, Bagby, & Parker, 1997b).

Building upon clinical observations and research linking negative affect (e.g., depression and/or anxiety; Cooley & Toray, 2001; Johnson, Cohen, Kotler, Kasen, & Brook, 2002; Killen et al., 1996; Stice, 2001; Stice & Agras, 1998; Stice, Presnell, & Spangler, 2002; Werthheim, Koerner, & Paxton, 2001) and ineffective coping skills (Blok, Spinhoven, Callewaert, Willemse-Koning, & Turksma, 2001; Christiano, & Mizes, 1997; Janzen, Kelly, & Saklofske, 1992; Nagata, Matsuyama, Kiriike, Iketani, & Oshima, 2000; Neckowitz & Morrison, 1991; Soukop, Beiler, & Terrell, 1990; Troop, Holbrey, & Treasure, 1998; Troop, Holbrey, Trowler, & Treasure, 1994; Yager, Rorty, & Rossotto, 1995) to disordered eating, researchers have theorized that poor emotion awareness may have a unique relation to disordered eating. In particular, researchers have suggested that individuals who engage in disordered eating do so as a means to manage unclear or unidentified emotions (Barth, 1994; Bruch, 1962, 1973; Goodsitt, 1983; Selvini-Palazzoli, 1971, 1973). To understand why individuals with a poor understanding of their emotions would be more likely to engage in disordered eating specifically, Taylor (1997) posited that these individuals, lacking a strong sense of self and adequate coping skills, may be especially influenced by external factors, including current standards of beauty that emphasize an underweight ideal physique. This position is consistent with the results of numerous studies

linking maladaptive beliefs about the importance of attaining a slender appearance with disordered eating (for a more thorough review on this, see section titled “Dysfunctional Appearance Beliefs and Disordered Eating”).

*Results of research on the relation between emotion awareness and disordered eating.*

Within cross-sectional studies using clinical samples, cross-sectional studies using non-clinical samples, and pre-post intervention studies with clinical and non-clinical samples, researchers have found consistent zero order relations between emotion awareness and disordered eating. They have found less consistent relations between emotion awareness and disordered eating, however, when taking into account the influence of depression and/or anxiety, with some finding the relation to persist and others finding it to disappear.

Cross sectional studies have found that both individuals with anorexia nervosa (Espina Eizaguirre, Ortego Saenz de Cabezón, Ochoa de Alda, Joaristi Olariaga, & Juaniz, 2004; Gilboa-Schechtman, Avnon, Zubery, & Jeczmién, 2006; Guttman & Laporte, 2002; Kessler, Schwarze, Filipic, Traue, Wietersheim, 2006; Montebanocci, Codispoti, Surcinelli, Franzoni, Baldaro, Rossi, 2006; Nandrino, Doba, Lesne, Christophe, & Pezard, 2006; Schmidt, Jiwany, & Treasure, 1993; Sexton, Sunday, Hurt, & Halmi, 1998; Speranza et al., 2005; Speranza et al., 2004; Taylor, Parker, Bagby, & Bourke, 1996; Troop, Schmidt, & Treasure, 1995; Zonneville-Bender, Goozen, Cohen-Kettenis, Elburg, & Engeland, 2002; Zonneville-Bender, Goozen, Cohen-Kettenis, Elburg, & Engeland, 2004) and individuals with bulimia nervosa (Espina Eizaguirre et al. 2004; Gilboa-Schechtman et al., 2006; Jimerson, Wolfe, Franko, Covino, & Sifneos, 1994; Kessler et al., 2006; Montebanocci et al., 2006; Schmidt et al., 1993; Sexton et al., 1998; Speranza et al., 2005; Speranza et al., 2004; Sureda et al., 1999; Troop et al., 1995; Zonneville-

Bender et al., 2002) have deficits in emotion awareness when compared to normal control individuals. Additionally, researchers have found combined eating disorder groups (e.g., anorexia nervosa and bulimia nervosa) to have deficits in emotion awareness compared to normal control individuals (Bydlowski et al., 2005; Chinet, Bolognini, Plancherel, Stéphan, & Halfon, 1998; Cochrane, Brewerton, Wilson, & Hodge, 1993; Sim & Zeman, 2004).

Cross sectional studies using non-clinical samples have also found a relation between emotion awareness and disordered eating. In particular, within female undergraduate samples, researchers have found relations between emotion awareness and disordered eating, measured dimensionally (De Berardis et al., 2007; Kiyotaki & Yokoyama, 2006, Laquatra & Clopton, 1994), although one study did not find consistent support for this relation (Quinton & Wagner, 2005). Additionally, researchers have also found a relation between emotion awareness and disordered eating within an adolescent sample (Sim & Zeman, 2006).

Further, researchers have found some support for the relation between emotion awareness and disordered eating in intervention studies. They found that more time intensive interventions (e.g., inpatient hospitalization programs; Becker-Stoll & Gerlinghoff, 2004; De Groot, Rodin, & Olmsted, 1995; Subic-Wrana, Bruder, Thomas, Lane, & Köhle, 2005) are associated with changes in emotion awareness in those with eating disorders, but that less time intensive forms of treatment (e.g., outpatient group therapy, medication treatment; Iancu, Cohen, Yehuda, & Kotler, 2006; Schmidt et al., 1993; Shiina et al., 2005) are not. On the other hand, they found that using dissonance based group therapy with undergraduate females may lead to decreases in eating pathology and improvement in emotion awareness (Mitchell, Mazzeo, Rausch, & Cooke, 2007).

Given the established link between disordered eating and negative affect (Cooley &

Toray, 2001; Johnson, et al., 2002; Killen et al., 1996; Stice, 2001; Stice & Agras, 1998; Stice, Presnell, & Spangler, 2002; Werthheim et al., 2001), as well as between emotion awareness and negative affect (Schutte et al., 2007; Taylor, Bagby, & Parker, 1997b), researchers in some of the previously mentioned studies examined whether the relation between emotion awareness and disordered eating persisted after taking into account the effects of depression and anxiety. The results of these analyses were mixed relative to those from tests of zero order correlations. For example, in clinical samples comparing emotion awareness between groups with eating disorders and normal control groups, when controlling for depression alone, two studies found group differences on emotion awareness completely disappeared (Bydlowski et al., 2005; Chinet et al., 1998), whereas three found some group differences persisted (Espina Eizaguirre et al., 2004; Sexton et al., 1998; Speranza et al., 2005); when controlling for anxiety alone, two studies found most group differences in emotion awareness persisted (Bydlowski et al., 2005; Espina Eizaguirre et al., 2004); and when controlling for both depression and anxiety simultaneously, one study found all group differences persisted (Zonneville-Bender et al., 2004a), two studies found some group differences persisted (Jimerson et al., 1994; Montebanocci et al., 2006), and one study found no group differences persisted (Gilboa-Schechtman et al., 2006). The results from studies with non-clinical samples, however, were more consistent. When De Berardis et al. (2007) controlled for depression alone, they found the relation between emotion awareness and disordered eating persisted across all measures of emotion awareness administered. Similarly, when Sim and Zeman (2006) controlled for depression and anxiety, they also found emotion awareness continued to relate to disordered eating. Finally, the results from studies that examined relations between depression, anxiety, emotion awareness, and disordered eating

before and after interventions were inconsistent. Specifically, after controlling for changes in depression (Sexton et al., 1998) and anxiety and general distress (Subic-Wrana et al., 2005), some researchers found pre/post changes in emotion awareness were no longer significant whereas others found emotion awareness significantly predicted treatment outcome over time independent of the effects of depression (Speranza, Loas, Wallier, & Corcos, 2007). Taken together, the results across these different types of studies examining the influence of depression and/or anxiety on the relation between emotion awareness and disordered eating are mixed.

*Limitations of research on the relation between emotion awareness and disordered eating.* The studies reviewed here have contributed to illuminating the relation between emotion awareness and disordered eating, nonetheless, the current research is limited in many ways. The most striking limitation in the research is the lack of longitudinal research designs. With the exception of seven pre/post intervention studies, no researchers have examined the relation between emotion awareness and disordered eating over time. As a result, researchers cannot decipher whether poor emotion awareness is a cause of disordered eating, a consequence of disordered eating, or an epiphenomenal correlate of disordered eating. Another striking limitation in the current research concerns the lack of evidence for specificity. In other words, the current research has not yet established whether emotion awareness has some unique relation to disordered eating or whether it is instead a general vulnerability factor in various psychological disorders, such as depression and anxiety. A third major limitation in the current research concerns the unclear nature of emotion dysfunction in disordered eating. Specifically, it is unclear whether the dysfunction relates to problems with distinguishing emotions from other physiological states, problems recognizing one's own emotions specifically or emotions in others

as well, problems with expressing emotions, a reluctance to express emotions, a tendency to avoid emotions, or a fear of emotions. A fourth major limitation in the current research is the over-reliance on self-report measures of emotion awareness, and self-report measures of alexithymia in particular. It may be that individuals with disordered eating believe themselves to be less competent in understanding and expressing emotions. By using less subjective measures of emotion awareness, such as the Levels of Emotion Awareness Scale (Lane, 1991) or interview based measures, in future studies, researchers may better differentiate between perceptual biases of poor emotion awareness and actual difficulties in this area. A fifth major limitation in the current research is relative lack of focus on sub-clinical eating pathology. Given that individuals with sub-clinical eating pathology often experience some of the same psychological distress associated with clinical eating disorders, as well as the demonstrated risk for these individuals to develop full-blown eating disorders over time, it is important to better understand emotion awareness in this population, as well as whether poor emotion awareness contributes to developing more severe eating disorders in individuals with sub-clinical eating pathology. Finally, a sixth major limitation of the current research concerns researchers' failure to investigate possible interactions between emotion awareness and other risk factors for disordered eating.

#### *Additional Risk Factors for Disordered Eating*

*Negative life events, perceived stress, and disordered eating.* Past studies examining the effect of the frequency of negative life events, the subjective negative impact of negative life events, and global perceived stress in relation to disordered eating have found medium to large effects. Cross-sectional studies that have assessed concurrent stress and eating pathology have

found that adolescents and women with disordered eating often report experiencing more stress associated with negative life events and higher perceived stress in general, than those without disordered eating (Amiè, Sabourin, & Rattè, 2006; Bittenger & Smith, 2003; Fryer, Waller, & Kroese, 1997; Soukup, Beiler, & Terrell, 1990). Additionally, they sometimes report actually having experienced more negative life events when compared to adolescents and women without disordered eating (Soukup et al., 1990; Sharp e, Ryst, Hinshaw, & Steiner, 1997). Similar findings have emerged in studies that have used a cross-sectional design to inquire about negative life events and stress occurring prior to the onset of disordered eating. Specifically, these studies have found that compared to control groups, adolescents and women with disordered eating have experienced more negative life events and chronic stressors 6 months to 2 years prior to the onset of disordered eating, as well as higher levels of current perceived stress (Blaase & Elklit, 2001; Horesh et al., 1995; Rojo, Conesa, Bermudez, & Livianos, 2006; Schmidt, Tiller, Blachard, Andrews, & Treasure, 1997; Welch, Doll, & Fairburn, 1997). These results are limited, however, in that retrospective recall of negative life events may be less reliable given potential participant memory biases. Indeed, prospective studies examining the frequency and impact of negative life events have produced somewhat mixed results. Rosen, Compas, and Tacy (1993) found that over a prospective period of 4 months, disordered eating and the perceived negative impact of negative life events had a reciprocal relation in adolescence. Recent stress was associated with changes in eating behaviors, but disordered eating also predicted the occurrence of psychological stress. In contrast, Striegel-Moore, Silberstein, Frensch, and Rodin (1989) found that among college freshmen, high perceived stress was clearly associated with increases in disordered eating over time. Finally, in a

3 year prospective study assessing women with eating disorders, negative life events did not predict worsening self-reported disordered eating symptoms over the first year, but did during the 2<sup>nd</sup> and 3<sup>rd</sup> year of follow up (Sohlberg, Norring, & Rosmark, 1992).

*Dysfunctional appearance beliefs and disordered eating.* Dysfunctional attitudes about physical appearance, such as believing appearance is critical for relationships, achievement, self-concept, and one's feelings, are thought to be central and unique to disordered eating. They are believed to underlie assumptions about eating and to influence how one generates, attends to, processes, and recalls appearance related information (Vitousek & Hollon, 1990). Results from both cross-sectional and longitudinal studies examining the relation between dysfunctional appearance beliefs and disordered eating, using both clinical and sub-clinical adolescent and adult samples, have shown large to very large effects. Goldfein, Walsh, and Midlarsky (2000), Mizes (1988), and Wildes, Simons, and Marcus (2005) found that, when compared with healthy controls, women with bulimia or bulimic spectrum disorder hold more dysfunctional beliefs about appearance. Similarly, using undergraduate samples, O'Connor, Simmons, and Cooper (2002) found that participants' beliefs about the importance of physical appearance for gaining acceptance by others predicted disordered eating, and Putterman and Linden (2006) found that dysfunctional beliefs about appearance and body image predicted dietary restraint and cortisol levels. Dysfunctional appearance beliefs have also been found to relate to disordered eating in two prospective studies using adolescent samples. Spangler (2002) found that dysfunctional appearance beliefs were both concurrently related to and predictive of future dietary restriction, body dissatisfaction, self-esteem, and thin-ideal internalization in a sample of female high school students assessed 3 times over 1.67 years. Additionally, Spangler and Stice (2001) found that

dysfunctional appearance beliefs were predictive of disordered eating in a sample of female high school students assessed 2 times over a 10 month period.

## The Current Study

### *Aims*

Using a prospective two time point design, this study examined the relation between emotion awareness and disordered eating in a large sample of late adolescent and young adult undergraduate females. In doing so, it tested six main hypotheses. First, because emotion awareness is believed to be a relatively stable, trait-like construct (Martinez-Sanchez, Ato-Garcia, Adam, Medina, & España, 1998; Mikolajczak & Luminet, 2006; Parker & Taylor, 1997; Pinard, Negrete, Annable, & Audet, 1996; Saarijärvi, Salminen, & Toikka, 2001; Salminen, Saarijärvi, Aäirelä, & Tamminen, 1994; Salovey et al., 1995), it was hypothesized that emotion awareness would be relatively stable over time. Second, it was hypothesized that poor emotion awareness would relate to higher levels of disordered eating concurrently and over time. Third, it was hypothesized that emotion awareness would relate more specifically to disordered eating than to general distress (e.g., depression and/or anxiety). Fourth, it was hypothesized that emotion awareness would uniquely relate to disordered eating, after controlling for other potential emotional dysfunctions (e.g., fear of emotions or emotional avoidance). Fifth, it was hypothesized that life events/stress and dysfunctional appearance beliefs would moderate the relation between emotion awareness and disordered eating. Finally, it was hypothesized that poor mood management would mediate the relation between emotion awareness and disordered eating. In other words, I hypothesized that when a girl is under high stress, her psychological resources are tested, and the need to engage in emotion regulation is heightened. If her ability to

engage in emotion regulation is limited due to poor emotion awareness, and she holds dysfunctional appearance beliefs, she should be more likely to misattribute negative affect to appearance (versus the actual stressor), and thus engage in disordered eating.

### *Importance of the Study*

This study built upon the existing research literature in several ways. Other than seven pre/post intervention studies, no researchers have examined whether emotion awareness relates to disordered eating in a prospective fashion. This study addressed a serious weakness in the literature by helping to discern whether emotion awareness relates to disordered eating prospectively. Another way in which this study added to the literature was by examining the relations between emotion awareness and other constructs, such as emotional avoidance and emotional distress. By measuring these other factors concurrently, this study differentiated whether there is a unique relation between emotion awareness and disordered eating. This study also examined emotion awareness in the context of other known risk factors for disordered eating. By examining some of these risk factors in conjunction with emotion awareness, both concurrently and over time, this study could better elucidate etiological pathways for disordered eating. Finally, this study built upon the existing research by examining emotion awareness with both a self-report and behavioral task measure. The majority of past studies have solely used self-report scales, which may fail to measure important aspects of the construct or may produce results related more to biases in self-reporting than to variation in emotion awareness.

In addition to building upon the existing research literature, the knowledge gained in this study may help advance the areas of prevention and treatment of disordered eating. The importance of potentially improving prevention and treatment response for disordered eating

cannot be overestimated. Disordered eating is associated with a relatively chronic course and, in the case of clinical eating disorders, is associated with very high treatment costs (Agras, 2001). Additionally, anorexia nervosa has the highest mortality rate of any psychological disorder, with both high suicide rates and premature death due to medical complications. Relevant to this study, many treatment models of disordered eating have advanced the role of mood in eating pathology (Barth, 1994; Clyne & Blampied, 2004; Cooper, Wells, & Todd, 2004; Deaver et al., 2003; Fairburn, Cooper, & Shafran, 2003; Rosen & Leitenberg, 1982; Telch, Agras, & Linehan, 2001). It may be, however, that the ability to clearly differentiate emotions is more important than simply recognizing global negative affect. Integrating this concept into current treatment approaches, as well as prevention designs may improve positive responses to interventions.

## CHAPTER 2

### METHODS

#### Participants and Procedure

A conservative power analysis using the smaller range of effect sizes found in previous studies for the relation between the proposed risk factors- emotion awareness, life events/stress, and dysfunctional appearance beliefs- and disordered eating, revealed that the sample size needed to obtain power of 0.80 was 127 participants. To account for the possibility of attrition across the prospective period and smaller effect sizes due to the prospective design, this study attempted to include 180 young undergraduate females. Assessing disordered eating within a young undergraduate female sample was appropriate for several reasons. First, given that eating disorders are ten times more prevalent in women than in men (APA, 2000), only women were eligible to participate. Second, women, ages 18-22, were recruited because disordered eating typically begins in the late adolescent and early adulthood period (APA, 2000). Finally, past research has reported a high prevalence of eating pathology on college campuses (Striegel-Moore, Silberstein, Grunberg, & Rodin, 1990).

Participants were recruited from psychology courses at Temple University during the Summer, 2008 and Fall, 2008 semesters through the use of an on-line research program and flyers. At the end of the Time 1 assessment period, participants were asked if they were willing to be contacted to participate in the second part of the study. If they agreed to this, they were contacted 10 weeks later and asked to sign up for the second part of the study, which took place approximately 12 weeks after Time 1. At each time point, eligible participants (women, ages 18-22) were compensated with 1.5 research credits to be used toward course requirements, extra

credit, or \$10 in cash.

Upon arrival at the laboratory, participants were consented and directed to complete hard copies of the questionnaires. At Time 1, participants were administered a contact information form, a demographics questionnaire, the Body Mass Index (BMI) questionnaire, the Affective Control Scale (ACS), the Acceptance and Action Questionnaire (AAQ-II), the Beliefs About Appearance Scale (BAAS), the Perceived Stress Scale (PSS), the Trait Meta-Mood Scale (TMMS), the Levels of Emotional Awareness Scale (LEAS), the Beck Depression Inventory (BDI-II), the Beck Anxiety Inventory (BAI), and the Eating Attitudes Test (EAT-26). At Time 2, participants were administered the BMI questionnaire, the ACS, the AAQ-II, the PSS, the Life Events Scale (LES), the TMMS, the BDI-II, the BAI, and the EAT-26. The study took participants 40-75 minutes to complete. At the end of Time 2, participants received a debriefing statement and, if desired, a list of community resources.

A total of 187 female undergraduates participated in Time 1 of the study, and 158 of these participants returned to participate in Time 2 of the study (see Table 1 for demographic information). The mean prospective period was 84 days ( $SD = 7$  days).

## Measures

### *Contact Information*

At Time 1, participants were asked to provide their contact information, including telephone number(s), email address(s), and mailing address(s). This information aided in recruitment to Time 2 of the study.

### *Demographic Information*

At Time 1, participants were administered a demographics questionnaire, inquiring about

Table 1. Sample Demographics

	Initial Sample ( <i>N</i> = 187)	Completers ( <i>N</i> = 158)
Time 1 Age	<i>M</i> = 19.90, <i>SD</i> = 1.43	<i>M</i> = 19.89, <i>SD</i> = 1.35
Ethnicity ( <i>n</i> , %)		
White	101 (54.0%)	86 (54.4%)
African-American	43 (23.0%)	36 (22.8%)
Asian and Pacific Islander	25 (13.4%)	18 (11.4%)
East Asian	11 (5.9%)	8 (5.1%)
South Asian	13 (7.0%)	9 (5.7%)
Pacific Islander	1 (.50%)	1 (.60%)
Hispanic American	9 (4.8%)	9 (5.7%)
Other	9 (4.8%)	9 (5.7%)
Time 1 Year in School ( <i>n</i> , %)		
Freshman	36 (19.3%)	31 (19.6%)
Sophomore	42 (22.5%)	37 (23.4%)
Junior	49 (26.2%)	38 (24.1%)
Senior	60 (32.1%)	52 (32.9%)

Table 1. (continued)

	Initial Sample ( <i>N</i> = 187)	Completers ( <i>N</i> = 158)
Time 1 Highest Parental Education ( <i>n</i> , %)		
Graduate School Training	59 (31.6%)	46 (29.1%)
College Graduate	69 (36.9%)	60 (38.0%)
Partial College Training	27 (14.4%)	24 (15.2%)
High School Graduate	31 (16.6%)	27 (17.1%)
Unreported	1 (.50%)	1 (.60%)
Time 1 Household Income ( <i>n</i> , %)		
\$0-\$49,000	65 (34.8%)	55 (34.8%)
\$50,000-\$79,000	63 (33.7%)	53 (33.5%)
Over \$80,000	58 (31.0%)	49 (31.0%)
Unreported	1 (.50%)	1 (.60%)

their age, ethnicity, socio-economic background, and native language. Using self-reported ethnicity information, participants were placed in 1 of 4 ethnic categories: White, African American, Asian American and Pacific Islander, and Hispanic American and Other. Hispanic Americans were combined with Other due to low sample sizes for these groups. Thus, due to the heterogeneous nature of this group, any significant results within this group were interpreted with caution. There was little variability within the sample on income and/or parental education, with most participants coming from middle to upper income backgrounds. Given this, it would be inappropriate to categorize participants according to low, middle, or high income using population standards. The sample was therefore broken down into three relatively equal groups based on income levels within the sample (\$0-\$49,000, \$50,000-\$79,000, and Over \$80,000). Parental education level was not used because it provided nearly identical information to the income level information (see Table 1 for information on Sample Demographics.)

#### *Body Mass Index (BMI)*

Participants' Body Mass Index (BMI) was calculated for Time 1 and Time 2 using participants' self-reported weight and height and the accepted formula for BMI ( $BMI = [(Weight-lbs) / (Height-inches)^2] \times 703$ ). Body mass index has been shown to have a high correlation with body fat (Keys, Findanza, Karvonen, Kimura, & Taylor, 1972). BMI was calculated using self-reported weight and height because past studies have found actual and self-reported weight to be highly correlated (e.g., Charney, Goodman, McBride, Lyon, & Pratt, 1976; Coates, Jeffrey, & Wing, 1978). According to the guidelines of the Centers of Disease Control and Prevention (CDC, 2009), the mean BMI values at Time 1 ( $M = 23.95, SD = 5.47$ ) and Time 2 ( $M = 23.69, SD = 4.81$ ) were in the normal range. Time 1 BMI scores were significantly

correlated with Time 2 BMI scores ( $r = .97, p = .00$ ).

### *Depression*

The Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996), a 21-item self-report measure, was used at Time 1 and Time 2 to assess symptoms of depression. As reviewed by Steer and Beck (2000), the psychometric properties of the BDI-II have been investigated in a number of studies. Studies with college students have revealed moderate to strong convergent validity with other self-report and clinical ratings scales of depression ( $r$ 's  $> .50$ ), as well as high internal consistency ( $\alpha$ 's  $> .90$ ). In the current study, similarly high internal consistency was demonstrated for the BDI-II at Time 1 ( $\alpha = .92$ ) and at Time 2 ( $\alpha = .94$ ). Time 1 scores were positively correlated with Time 2 scores ( $r = .64, p = .00$ )

### *Anxiety*

The Beck Anxiety Inventory (BAI; Beck & Steer, 1993), a 21-item self-report measure, was used at Time 1 and Time 2 to assess symptoms of anxiety. The BAI has demonstrated high internal consistency ( $\alpha = .92$ ) and good test-retest reliability over a one-week period ( $r = .75$ ; Beck, Epstein, Brown, & Steer, 1988). Additionally, the BAI has demonstrated moderate convergent validity with other measures of anxiety and discriminant validity with measures of depression (Beck et al., 1988; Beck & Steer, 1993). In the current study, the BAI demonstrated high internal consistency at Time 1 ( $\alpha = .91$ ) and Time 2 ( $\alpha = .94$ ), and BAI scores at Time 1 were positively correlated with BAI scores at Time 2 ( $r = .63, p = .00$ ).

### *Stress Measures*

The Life Events Scale and the Perceived Stress Scale were used to assess participants' objective and subjective stress levels, respectively.

A modified version of the Life Events Scale (LES; Alloy & Clements, 1992; Needles & Abramson, 1990; Safford, Alloy, Abramson & Crossfield, 2007) was used at Time 2 to assess episodic events (both major events and minor hassles), as well as more chronic stressors. LES items cover a wide range of domains that are relevant to the lives of college students, including romantic relations, roommates, finances, family relations, and school. The LES has demonstrated adequate reliability and validity (Alloy & Clements, 1992; Alloy, Reilly-Harrington, Fresco, Whitehouse, & Zechmeister, 1999; Needles & Abramson, 1990; Safford et al., 2007). More specifically, it was found to have test-retest reliability over two weeks of .82, and its validity was supported by the finding that LES scores were positively correlated with scores on the BDI (Needles & Abramson, 1990). This modified version of the LES included 130 negative events and 45 positive events. Respondents were asked to indicate whether or not each event occurred during the prospective time period (approximately 3 months) and, if so, the number of times it occurred. Additionally, participants were asked to rate the subjective negative impact on a 5 point Likert scale (1 = no negative impact to 5 = extreme negative impact) for each event endorsed. Positive impact was not assessed. Frequencies of positive minor and major events and negative minor and major events, a sum total of all events, and the sum of subjective negative impact scores were calculated for each participant. Chronic events (events occurring one or more times per week) were coded as single events.

The Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983), a 14-item self-report measure, was used at Time 1 and Time 2 to assess the extent to which participants perceived their lives as unpredictable, uncontrollable, and overloading. The scale possesses good internal consistency. It also has good predictive validity in that it is more predictive of measures

of health and health-related outcomes than scales that assess the number of stressful life events (Cohen et al., 1983). In the current study, the PSS demonstrated high internal consistency at Time 1 ( $\alpha = .87$ ) and Time 2 ( $\alpha = .87$ ), and Time 1 PSS scores were positively correlated with Time 2 PSS scores ( $r = .75, p = .00$ ).

### *Dysfunctional Appearance Beliefs*

The Beliefs about Appearance Scale (BAAS; Spangler & Stice, 2001), a 20-item self-report measure, was used at Time 1 to assess dysfunctional attitudes regarding the perceived consequences of appearance for relationships, achievement, self-view, and one's feelings. These beliefs are thought to underlie the desire to restrict eating, criticize the body, and focus on appearance-related stimuli. Degree of endorsement of statements such as "I would enjoy my life more if I looked the way I wished" are rated on a 5-point scale, with a higher overall score suggesting more dysfunctional beliefs. The BAAS is not correlated with BMI and has been found to predict dietary restraint over and above the effects of BMI, body dissatisfaction, and thin-ideal internalization. Additionally, it has demonstrated good internal consistency and test-retest reliability in both high school and college aged samples (Liechty, Freeman, & Zabriskie, 2006; Spangler & Stice, 2001). In the current study, the BAAS demonstrated high internal consistency ( $\alpha = .95$ ).

### *Emotion Awareness*

The Trait Meta-Mood Scale and the Levels of Emotion Awareness Scale were used to assess participants' emotion awareness.

The Trait Meta-Mood Scale (TMMS; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995), a 30-item self-report measure consisting of three subscales, was used at Time 1 and Time

2 to assess participants' attention to emotions, clarity of emotions, and mood repair or efficiency of mood regulation. The three subscales, clarity of emotions (e.g., "I almost always know exactly how I am feeling"), attention to emotions (e.g., "I pay attention to how I feel"), and mood repair (e.g., "The best way for me to handle my feelings is to experience them to the fullest") have demonstrated good internal consistency and are related to other measures of mood and mood management (Salovey et al., 1995). In this study, the clarity subscale was used to measure emotion awareness as it is most consistent with the ability to differentiate one's emotions and the repair subscale was used to measure one's ability to repair her mood. In the current study, the clarity and repair subscales both demonstrated good internal consistency at Time 1 (clarity  $\alpha = .87$ ; attention  $\alpha = .72$ ; repair  $\alpha = .81$ ) and Time 2 (clarity  $\alpha = .73$ ; attention  $\alpha = .82$ ; repair  $\alpha = .82$ ), and good test-retest reliability (clarity,  $r = .72, p = .00$ ; attention,  $r = .66, p = .00$ ; repair:  $r = .82, p = .00$ ).

The Levels of Emotional Awareness Scale (LEAS; Lane, 1991), an independently coded, self-report questionnaire, was used at Time 1 to assess level of emotional awareness, based on a cognitive-developmental model of emotional experience. The version of the LEAS used in this study consisted of 10 hypothetical scenes involving two people. Each scene is described in two to four sentences. The scenes are intended to elicit four types of emotions (anger, fear, happiness, and sadness) at five levels of increasing complexity. On each page of the measure, one scene is presented and at the top of each page, two questions are presented, "How would you feel?" and "How would the other person feel?" Participants were given one page to write on and were directed to use as much or little space on the page as needed to answer the question. The LEAS has demonstrated high inter-rater reliability across studies ( $r = 0.91-0.98$ ), and good internal

consistency ( $\alpha = 0.83-0.88$ ; Barrett et al., 2000; Lane et al., 1990, 1995, 1996). The test-retest reliability of the LEAS has not yet been examined. The LEAS has also shown good discriminant validity as it does not correlate with other emotion measures assessing different constructs, including the Differential Emotions Scale (DES; Izard, 1972) which assesses the intensity of 64 emotions experienced on a typical day (Lane et al., 1990). Thus, the LEAS likely taps levels of emotion awareness and not the specific quality of the emotion. Scores on the LEAS do not correlate with the number of words per response, which suggests that the scale assesses emotion complexity and not verbal productivity (Lane et al., 1990). Additionally, studies have found that the LEAS relates to better global emotion recognition (Lane, Sechrest, Riedel, Shapiro, & Kaszniak, 2000; Lane et al., 1996), right hemisphere dominance in the perception of faces (Lane, Kivley, Du Bois, Shamasundara, & Schwartz, 1995), increased activity in the anterior cingulate gyrus (Lane et al., 1998), and better affective priming (Suslow, Donges, Kersting, & Arolt, 2000).

In the current study, an advanced doctoral level student and one research assistant independently scored the responses using the guidelines in the LEAS Scoring Manual and Glossary (Lane, 1991). Responses were scored separately for each scene (Total score) as well as for each question (Self and Other scores). Scores were based entirely on structure and no evaluation of the appropriateness of the response occurred. A comparison of a random subset of 30% of the data revealed 99% inter-rater agreement. Both subscales and the LEAS total score demonstrated adequate internal consistency (Self  $\alpha = .64$ ; Other  $\alpha = .70$ ; Total  $\alpha = .75$ ).

#### *Avoidance and Fear of Emotions*

In order to further clarify the nature of emotion dysfunction in disordered eating, the

Acceptance and Action Questionnaire and the Affective Control Scale were used to assess participants' tendency to avoid emotions and their fear of emotions, respectively.

The Acceptance and Action Questionnaire (AAQ-II; Hayes, Wilson, Gifford, Follette, & Strosahl, 1996; Bond, Hayes, Baer, Carpenter, Orcutt, & Zettle, 2009) is a 10-item self-report inventory that was used at Time 1 and Time 2 to measure emotional avoidance. Participants rated the degree to which each statement applied to them on a Likert scale (1 = never true to 7 = always true). Items on the AAQ-II include, "It's ok to remember something unpleasant," and, "Emotions cause problems in my life." Across several samples, including undergraduates, people receiving treatment for substance misuse, and financial service workers, the AAQ-II has demonstrated good internal consistency ( $\alpha$ 's ranging from .76-.87) and 3 and 12 month test-retest reliability of .80 and .78, respectively. The AAQ-II has shown good concurrent validity in terms of its ability to predict higher levels of depression, anxiety, and overall psychological distress (Bond et al., 2009). In the current study, the AAQ-II demonstrated high internal consistency at Time 1 ( $\alpha = .86$ ) and Time 2 ( $\alpha = .89$ ) and good test-retest reliability ( $r = .81, p = .00$ ).

The Affective Control Scale (ACS; Williams, Chambless, & Ahrens, 1997), a 42 item self-report inventory, was used at Time 1 and Time 2 to measure fear of emotional responses. The ACS consists of 4 emotional domains (anger, anxiety, positive emotions, and depression). Items include, "Depression is scary to me – I am afraid that I could get depressed and never recover," and, "I think my judgment suffers when I get really happy." Participants rated the degree to which each statement applied using a Likert scale ranging from 1, "very strongly disagree" to 7, "very strongly agree." The ACS has demonstrated good internal consistency for both the full scale ( $\alpha = .92$ ) and subscales ( $\alpha$ 's range from .72-.91). In an undergraduate sample,

the test-retest reliability was high ( $r = .77$ ; Williams et al., 1997). Each of the ACS subscales has been shown to predict panic symptoms in the laboratory, suggesting that each subscale is a valid indicator of fear of emotion (Williams, et al., 1997). In the current study, the ACS total score and subscales demonstrated high internal consistency at Time 1 (ACS Total,  $\alpha = .93$ ; ACS Anger subscale,  $\alpha = .73$ ; ACS Positive Affect subscale,  $\alpha = .87$ ; ACS Depressed Mood subscale,  $\alpha = .92$ ; ACS Anxiety subscale,  $\alpha = .86$ ) and Time 2 (ACS Total,  $\alpha = .95$ ; ACS Anger subscale,  $\alpha = .81$ ; ACS Positive Affect subscale,  $\alpha = .89$ ; ACS Depressed Mood subscale,  $\alpha = .92$ ; ACS Anxiety subscale,  $\alpha = .91$ ). Additionally, the ACS total score and subscale scores demonstrated good test-retest reliability (ACS Total,  $r = .85, p = .00$ ; ACS Anger subscale,  $r = .74, p = .00$ ; ACS Positive Affect subscale,  $r = .81, p = .00$ ; ACS Depressed Mood subscale,  $r = .84, p = .00$ ; ACS Anxiety subscale,  $r = .76, p = .00$ ).

### *Disordered Eating*

The Eating Attitudes Test (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982), a 26-item self-report measure, was used to assess attitudes and behaviors associated with disordered eating. Some of these attitudes and behaviors include: the desire to lose weight, fear of fatness, avoidance of eating, binge eating, guilt associated with eating, purging, and preoccupation with eating and weight, in general. The EAT-26 is comprised of three factors. Factor I, named “dieting”, reflects the avoidance of food and preoccupation with one’s shape. Factor II, named “bulimia and food preoccupation”, contains items related to bingeing and vomiting. Factor III, named “oral control”, reflects perceived social pressure to lose weight. Participants were instructed to rate the frequency of the occurrence of the 26 items on a 6-point Likert style scale. A sum of the ratings across all of the items provided an overall score of disordered eating.

Because the purpose of this study was to assess disordered eating more broadly, the EAT-26 overall score was used as a continuous measure of disordered eating, with higher scores indicative of more disturbed eating attitudes and behaviors. The EAT-26 has demonstrated good internal consistency ( $\alpha$ 's ranging from .79 to .94; Garner et al., 1982). The validity of the EAT-26 has also been established using both clinical and non-clinical samples of adolescents and adults (Garner et al., 1982; Rosen, Silberg, & Gross, 1988). In the current study, the EAT-26 demonstrated high internal consistency at Time 1 ( $\alpha = .89$ ) and Time 2 ( $\alpha = .86$ ) and good test-retest reliability ( $r = .82, p = .00$ ).

## CHAPTER 3

### RESULTS

#### Preliminary analyses

##### *Descriptive Statistics*

Means and standard deviations were calculated for each variable (see Table 2), zero order correlations were calculated between each of the measures (see Tables 3 and 4 for Time 1 and Time 2 correlations, respectively, and Table 5 for prospective correlations between key study variables), and the internal consistency of all the measures was examined by calculating Cronbach's  $\alpha$  coefficients.

##### *Diagnostics for Assumptions of Analysis of Variance*

Exploratory data analyses (tests of normality and box plots) were conducted on Time 1 and Time 2 data to test the assumptions necessary to run Pearson correlations and analysis of variance. Many variables (Time 1: EAT-26, BMI, BDI-II, BAI, BAAS, ACS Anger Subscale, ACS Positive Affect Subscale, ACS Depressed Mood Subscale, ACS Anxiety Subscale, AAQ-II, TMMS Repair Subscale, and LEAS; Time 2: EAT-26, BMI, BDI-II, BAI, AAQ-II, TMMS Repair Subscale, LES- sum of negative events, sum of subjective negative impact, sum of negative major events, sum of negative minor events, and sum of positive major events) did not meet the assumption of normality for Pearson correlation tests and analysis of variance due to significant levels of skewness and/or kurtosis. Thus, the data were transformed using square root, log, and inverse transformations and rechecked for normality. If the transformed data still did not meet assumptions of normality, non-parametric tests were conducted. Analyses were run using both transformed and raw data. Given that the results generated from these two sets of analyses were virtually identical, unless noted otherwise, only the latter results based on untransformed

Table 2. Means and Standard Deviations for Study Variables

Variable	Mean	Std. Dev.	Min	Max
Time 1 (N = 187)				
Level of Emotional Awareness Scale (LEAS), Total	32.84	4.73	14	43
Level of Emotional Awareness Scale (LEAS), Self	29.52	4.60	13	39
Level of Emotional Awareness Scale (LEAS), Other	27.11	5.15	2	39
Eating Attitudes Test (EAT-26)	9.92	10.60	0	51
Beck Depression Inventory (BDI-II)	12.12	9.68	0	61
Beck Anxiety Inventory (BAI)	11.58	9.88	0	49
Beliefs About Appearance Scale (BAAS)	26.68	17.18	0	80
Perceived Stress Scale (PSS)	26.87	8.08	10	48
Affective Control Scale (ACS) Mean Score	3.34	.76	1.69	5.83
Acceptance and Action Questionnaire (AAQ)	48.89	9.93	19	67
Trait Meta-Mood Scale (TMMS), Clarity Subscale Mean Score	3.42	.72	1.09	4.73
Trait Meta-Mood Scale (TMMS), Attention Subscale Mean Score	3.73	.45	2.23	4.62
Trait Meta-Mood Scale (TMMS), Repair Subscale Mean Score	3.69	.84	1	5
Body Mass Index (BMI)	23.95	5.47	16.24	56.51

Table 2. (continued)

Variable	Mean	Std. Dev.	Min	Max
Time 2 (N = 158)				
Eating Attitudes Test (EAT-26)	8.11	8.77	0	46
Beck Depression Inventory (BDI-II)	10.61	8.98	0	35
Beck Anxiety Inventory (BAI)	10.86	10.94	0	60
Perceived Stress Scale (PSS)	25.64	7.75	5	42
Affective Control Scale (ACS) Mean Score	3.23	.80	1.24	4.98
Acceptance and Action Questionnaire (AAQ)	50.25	10.50	12	69
Trait Meta-Mood Scale (TMMS), Clarity Subscale Mean Score	3.40	.70	1.18	4.91
Trait Meta-Mood Scale (TMMS), Attention Subscale Mean Score	3.92	.58	2.15	5.00
Trait Meta-Mood Scale (TMMS), Repair Subscale Mean Score	3.66	.82	1.33	5.0
Body Mass Index (BMI)	23.69	4.81	16.72	46.80
Life Events Scale (LES)				
Sum Negative Events	12.45	7.49	0	40
Sum Positive Events	8.06	3.27	0	16
Sum Major Events	3.92	2.86	0	14
Sum Minor Events	16.56	7.53	0	41
Sum Negative Major Events	2.67	2.25	0	11
Sum Negative Minor Events	9.75	6.02	0	32

Table 2. (continued)

Variable	Mean	Std. Dev.	Min	Max
Time 2 ( <i>N</i> = 158)				
Life Events Scale (LES)				
Sum Positive Major Events	1.25	1.40	0	6
Sum Positive Minor Events	6.81	2.57	0	14
Total Events Reported	21.08	9.49	0	56
Sum Negative Impact	51.58	31.66	0	198

Table 3. Correlations between Study Variables at Time 1

Variables	1	2	3	4	5	6	7	8	9	10
1. BMI	-									
2. LEAS_S	.07	-								
3. LEAS_O	.10	.63**	-							
4. LEAS_T	.08	.09**	.78**	-						
5. EAT-26	.11	.02	-.03	.01	-					
6. BDI-II	.02	.07	-.03	.08	.27**	-				
7. BAI	-.03	.10	-.00	.07	.31**	.65**	-			
8. BAAS	.08	.10	-.01	.08	.49**	.42**	.23**	-		
9. PSS	.05	-.02	-.01	.01	.27**	.69**	.52**	.37**	-	
10. ACS_TOT	.04	-.03	-.03	-.02	.25**	.61**	.52**	.39**	.61**	-
11. ACS_ANG	.06	-.05	-.10	-.06	.03	.46**	.31**	.26**	.42**	.71**
12. ACS_POS	.06	-.15*	-.11	-.13	.20**	.35**	.27**	.24**	.41**	.75**
13. ACS_DEP	-.01	.01	-.00	.03	.23**	.55**	.43**	.35**	.53**	.80**
14. ACS_ANX	.03	.08	.08	.08	.27**	.54**	.59**	.36**	.54**	.84**
15. AAQ-II	.01	.00	.05	.00	-.27**	-.70**	-.53**	-.50**	-.70**	-.70**
16. TMMS_C	.04	.04	.09	.07	-.19**	-.51**	-.40**	-.32**	-.44**	-.54**
17. TMMS_A	.02	.06	.10	.09	.16**	-.07	-.07	.09	-.08	-.14
18. TMMS_R	-.01	-.01	.14*	.01	-.16*	-.59**	-.45**	-.32**	-.57**	-.60**

\*\* $p < .01$ , \* $p < .05$ , BMI = Body mass Index; LEAS\_S = Levels of Emotion Awareness, Self subscale; LEAS\_O = Levels of Emotion Awareness, Other subscale; LEAS\_T = Levels of Emotion Awareness, Total subscale; EAT-26 = Eating Attitudes Test, 26-item version; BDI-II = Beck Depression Inventory; BAI = Beck Anxiety Inventory; BAAS = Beliefs About Appearance Scale; PSS = Perceived Stress Scale; ACS = Affective Control Scale: Total = Total Score, ANG = Anger Subscale, POS = Positive Mood Subscale, DEP = Depressed Mood Subscale, ANX = Anxiety Subscale; AAQ-II = Acceptance and Action Questionnaire, II; TMMS = Trait Meta-Mood Scale: C = Clarity Subscale, A = Attention Subscale, R = Repair Subscale

Table 3. (continued)

Variables	11	12	13	14	15	16	17	18
11. ACS_ANG	-							
12. ACS_POS	.50**	-						
13. ACS_DEP	.50**	.35**	-					
14. ACS_ANX	.41**	.46**	.64**	-				
15. AAQ-II	-.47**	-.38**	-.68**	-.65**	-			
16. TMMS_C	-.39**	-.43**	-.42**	-.45**	.55**	-		
17. TMMS_A	-.23**	-.16*	-.03	-.07	.11	.19**	-	
18. TMMS_R	-.41**	-.29**	-.57**	-.50**	.62**	.44**	.27**	-

\*\* $p < .01$ , \* $p < .05$ , ACS = Affective Control Scale: ANG = Anger Subscale, POS = Positive Mood Subscale, DEP = Depressed Mood Subscale, ANX = Anxiety Subscale; AAQ-II = Acceptance and Action Questionnaire, II; TMMS = Trait Meta-Mood Scale: C = Clarity Subscale, A = Attention Subscale, R = Repair Subscale

Table 4. Correlations between Study Variables at Time 2

Variables	1	2	3	4	5	6	7	8	9	10
1. BMI	-									
2. EAT-26	.03	-								
3. BDI-II	-.12	.35**	-							
4. BAI	-.19*	.29**	.64**	-						
5. PSS	-.02	.28**	.69**	.49**	-					
6. ACS_TOT	-.03	.18*	.50**	.46**	.67**	-				
7. ACS_ANG	.09	.10*	.39**	.15	.51**	.75**	-			
8. ACS_POS	-.07	.06	.27**	.23**	.45**	.77**	.53**	-		
9. ACS_DEP	.01	.16*	.46**	.40**	.61**	.80**	.54**	.39**	-	
10. ACS_ANX	-.08	.23**	.48**	.58**	.58**	.86**	.46**	.52**	.64**	-
11. AAQ-II	.00	-.28**	-.60**	-.47**	-.73**	-.76**	-.58**	-.50**	-.66**	-.68**
12. TMMS_C	.05	-.29**	-.39**	-.32**	-.50**	-.49**	-.37**	-.41**	-.32**	-.45**
13. TMMS_A	-.04	.09	-.20*	-.10	-.20*	-.32**	-.25**	-.34**	-.28**	-.16*
14. TMMS_R	.04	-.13	-.55**	-.47**	-.59**	-.63**	-.52**	-.36**	-.57**	-.57**
15. LES_T	-.03	.23**	.42**	.27**	.32**	.21**	.21*	-.02	.38**	.15
16. LES_Pma	-.01	-.06	.02	-.10	-.07	-.13	-.01	-.08	-.09	-.20*
17. LES_Pmi	-.11	.20*	.11	.14	.06	.01	.04	-.10	.17*	-.04
18. LES_Nma	.08	.09	.31**	.14	.34**	.20*	.21**	.04	.28**	.14
19. LES_Nmi	-.02	.25**	.50**	.33**	.37**	.29**	.24**	.02	.43**	.26**
20. LES_Sneg	-.03	.31**	.55**	.39**	.48**	.36**	.30**	.10	.46**	.31**

\*\* $p < .01$ , \* $p < .05$ , BMI = Body mass Index; EAT-26 = Eating Attitudes Test, BDI-II= Beck Depression Inventory; BAI = Beck Anxiety Inventory; PSS = Perceived Stress Scale; ACS = Affective Control Scale: Total = Total Score, ANG = Anger Subscale, POS = Positive Mood Subscale, DEP = Depressed Mood Subscale, ANX = Anxiety Subscale; AAQ-II = Acceptance and Action Questionnaire, II; TMMS = Trait Meta-Mood Scale: C = Clarity Subscale, A = Attention Subscale, R = Repair Subscale; LES = Life Events Scale: T = Total Events Reported; Pma = Total Positive Major Events, Pmi = Total Positive Minor Events, Nma = Total Negative Major Events, Nmi = Total Negative Minor Events; Sneg = Sum Subjective Negative Impact

Table 4. (continued)

Variables	11	12	13	14	15	16	17	18	19	20
11. AAQ-II	-									
12. TMMS_C	.50**	-								
13. TMMS_A	.22**	.26**	-							
14. TMMS_R	.58**	.43**	.47**	-						
15. LES_T	-.31**	-.15	.12	-.13	-					
16. LES_Pma	.05	.07	.01	.00	.38**	-				
17. LES_Pmi	-.06	-.10	.19*	.08	.68**	.29**	-			
18. LES_Nma	-.23**	-.14	.04	-.15	.68**	.19*	.27**	-		
19. LES_Nmi	-.40**	-.16*	.07	-.19*	.92**	.16	.45**	.53**	-	
20. LES_Sneg	-.44**	-.24**	.05	-.27**	.91**	.18*	.47**	.73**	.90**	-

\*\* $p < .01$ , \* $p < .05$ , AAQ-II = Acceptance and Action Questionnaire, II; TMMS = Trait Meta-Mood Scale: C = Clarity Subscale, A = Attention Subscale, R = Repair Subscale; LES = Life Events Scale: T = Total Events Reported; Pma = Total Positive Major Events, Pmi = Total Positive Minor Events, Nma = Total Negative Major Events, Nmi = Total Negative Minor Events; Sneg = Sum Subjective Negative Impact

Table 5. Correlations between Time 1 and Time 2 Key Study Variables

	Time 1 Variables									
	BMI	LEAS_T	EAT-26	BDI-II	BAI	BAAS	PSS	ACS_T	AAQ-II	TMMS_C
Time 2 Variables										
BMI	.98**	.06	.01	.03	-.02	-.01	.01	.01	.02	.07
EAT-26	.01	.03	.82**	.23**	.19*	.46**	.29**	.22**	-.22**	-.14
BDI-II	-.10	.10	.28**	.64**	.51**	.27**	.60**	.44**	-.47**	-.29**
BAI	-.16*	.00	.24**	.39**	.63**	.09	.39**	.37**	-.34**	-.24**
PSS	-.01	.06	.21*	.61**	.44**	.34**	.75**	.62**	-.62**	-.43**
ACS_T	-.03	.02	.16*	.56**	.47**	.37**	.61**	.85**	-.68**	-.52**
AAQ-II	.04	-.03	-.25**	-.66**	-.49**	-.41**	-.66**	-.71**	.81**	.49**
TMMS_C	.07	.10	-.28**	-.49**	-.35**	-.32**	-.46**	-.47**	.44**	.72**
LES_T	-.03	.09	.22**	.33**	.24**	.13	.29**	.26**	-.25**	-.13
LES_Sneg	-.02	.09	.30**	.46**	.33**	.23**	.41**	.37**	-.36**	-.20*

\*\* $p < .01$ , \* $p < .05$ , BMI = Body mass Index; LEAS\_T = Levels of Emotion Awareness, Total subscale; EAT-26 = Eating Attitudes Test, 26-item version; BDI-II= Beck Depression Inventory; BAI = Beck Anxiety Inventory; BAAS = Beliefs About Appearance Scale; PSS = Perceived Stress Scale; ACS\_T = Affective Control Scale, Total Score; AAQ-II = Acceptance and Action Questionnaire, II; TMMS\_C = Trait Meta-Mood Scale, Clarity Subscale; LES\_T = Life Events Scale, Total Events Reported; LES\_Sneg = Life Events Scale, Sum Subjective Negative Impact

data are presented in order to allow for clearer interpretation of the findings.

#### *Diagnostics for Assumptions of Linear Multiple Regression*

Diagnostics were performed on data from Time 1 and Time 2 to check the assumptions necessary for linear multiple regression analysis. Using guidelines outlined by Field (2005), this study examined distributions of residuals for normality and homoscedasticity, the influence of residuals on the predicted model, multicollinearity, and whether the data fit a linear model. All assumptions necessary for regression were met.

#### *Relation between Demographics, BMI, and Study Variables*

The relations between ethnicity, age, SES, and BMI and all Time 1 and Time 2 measures were examined. When significant omnibus tests emerged, planned comparisons based on previous research findings were conducted or bonferroni corrected post hoc tests were performed. The results were not reported if a significant omnibus test was followed up with non-significant, bonferroni corrected post hoc tests.

#### *Relation between Ethnicity and Study Measures*

Ethnicity was significantly related to several variables. First, ethnicity was related to both Time 1 EAT-26 scores,  $F(3, 76.49) = 3.57, p = .02$  (equal variances not assumed) and Time 2 EAT-26 scores,  $F(3, 64.05) = 3.75, p = .02$  (equal variances not assumed). Based on results from previous research examining the relation between ethnicity and disordered eating (Wildes, Emery, & Simons, 2001), planned comparisons were conducted predicting that White and Asian American participants would have higher EAT-26 scores than African Americans, but would not differ from one another. Consistent with this prediction, White participants had higher Time 1 EAT-26 scores,  $t(141.13) = 3.96, p = .00$  (equal variances not assumed), and higher Time 2 EAT-26 scores,  $t(118.47) = 3.67, p = .00$  (equal variances not assumed), than African American

participants, Asian American participants had higher Time 1 EAT-26 scores,  $t(30.59) = 2.45, p = .02$  (equal variances not assumed), and higher Time 2 EAT-26 scores,  $t(20.91) = 2.55, p = .02$  (equal variances not assumed), than African American participants, and White participants and Asian American participants did not differ from one another. Second, ethnicity was related to Time 2 BAI scores,  $F(3, 95.39) = 12.15, p = .00$  (equal variances not assumed). Bonferroni corrected post hoc tests revealed that White participants had higher BAI scores than African American participants ( $p = .00$ ). Third, ethnicity was related to Time 2 AAQ-II scores,  $\chi^2(3, N = 158) = 12.04, p = .007$ <sup>1</sup>. Bonferroni corrected post hoc Mann-Whitney tests found that Asian American participants had lower Time 2 AAQ-II scores than African American participants,  $U = 167.00, p = .004$ , than White participants,  $U = 430.50, p = .003$ , and than participants in the Hispanic/Other group,  $U = 73.00, p = .004$ . Fourth, ethnicity was related to Time 2 ACS Total scores,  $F(3, 154) = 5.88, p = .001$ , as well as scores on Time 2 ACS Anger Subscale,  $F(3, 154) = 4.35, p = .006$ , Positive Affect Subscale,  $F(3, 60.59) = 4.71, p = .005$  (equal variances not assumed), and Anxiety Subscale,  $F(3, 154) = 7.05, p = .000$ . Bonferroni corrected post hoc analyses revealed that Asian American participants had higher Time 2 ACS Total scores than African American participants ( $p = .000$ ), Asian American participants had higher Time 2 ACS Anger Subscale scores than White participants ( $p = .004$ ), Asian American participants had higher Time 2 ACS Positive Affect Subscale scores than White participants ( $p = .003$ ) and African American participants ( $p = .002$ ), and Asian American and White participants had higher Time 2 ACS Anxiety Subscale scores than African American participants ( $p = .000, p = .004$ , respectively). Finally, ethnicity was related to Time 1 TMMS Attention subscale scores,  $F(3,$

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<sup>1</sup> The AAQ-II variable did not have a normal distribution at Time 2, and it could not be normalized through data transformation. Thus, analyses testing for demographic differences were done using non-parametric tests (reported above). Results using a standard, parametric ANOVA also showed a relation between ethnicity and Time 2 AAQ-II,  $F(3, 154) = 3.10, p = .03$ ; however bonferroni corrected post hoc tests revealed no significant group differences.

183) = 6.69,  $p = .000$ . Bonferroni corrected post hoc tests revealed that Asian American participants had lower Time 1 TMMS Attention subscale scores compared to White participants ( $p = .004$ ).

To further explore the relation between ethnicity and the study variables, zero order correlations between the variables were computed for each ethnic group separately. A review of these correlations revealed that there were few differences between ethnic groups on the correlations between the majority of measures. However, there were some instances when correlations were significant in one group and not another. Although there are conceptual problems with controlling for ethnicity in research (see Steinberg & Fletcher, 1998), this study chose to do so for the main hypothesis-testing analyses in order to better clarify the relations between the study variables. No assumptions regarding the constructs underlying ethnic differences were made. Dummy coding was used to control for ethnic differences, with White participants as the main reference group.

#### *Relation between Income Level and Study Measures*

Income only related to one variable. There was a significant relation between income and the number of positive minor events experienced between Time 1 and Time 2,  $F(2, 154) = 4.35$ ,  $p = .016$ . Bonferroni corrected post hoc tests revealed that high income participants experienced more positive minor life events than low income participants ( $p = .014$ ). Income was not related to ethnicity.

#### *Relation between Age and Study Measures*

Time 1 age was positively correlated with the length of the prospective time period ( $r = .244$ ,  $p = .002$ ) and it was positively correlated with the number of positive major life events experienced between Time 1 and Time 2 ( $r = .176$ ,  $p = .028$ ).

### *Relation between BMI and Study Measures*

A Pearson correlation using transformed BMI and EAT-26 data from Time 2 revealed a positive correlation between Time 2 BMI scores and Time 2 EAT-26 scores,  $r = -.18, p = .026$ <sup>2,3</sup>. Similarly, using raw data, Spearman's rank order correlation revealed a positive correlation between Time 2 BMI scores and Time 2 EAT-26 scores,  $r_s = .19, p = .016$ . Additionally, Time 2 BMI was negatively correlated with Time 2 BAI scores,  $r = .19, p = .015$ . BMI was not controlled in the main analyses for two reasons: 1) it was expected that BMI may be part of the phenomenon of disordered eating and thus, controlling for it was not conceptually sound, and 2) BMI did not relate to any of this study's key predictors of emotion awareness, stress, and appearance beliefs.<sup>4</sup>

### *Relation between Length of Prospective Time Period and Study Measures*

The length of the prospective period was positively correlated with Time 1 age ( $r = .244, p = .002$ ). It was not related to any other study variables, including the frequency of life events reported on the LES.

### *Differences between Completers and Non-Completers*

There were no differences between participants who completed both Time 1 and Time 2 and those who dropped out after Time 1 on any demographic or study variables.

### *Distribution of Disordered Eating*

Given the importance of examining disordered eating using a dimensional perspective,

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<sup>2</sup> A Pearson correlation test using raw data showed no significant relation between Time 2 BMI and Time 2 EAT scores; this is most likely due to violation of the normality assumption.

<sup>3</sup> Despite the negative sign, the correlation was actually positive because Time 2 BMI was transformed using an inverse function.

<sup>4</sup> When BMI was controlled, the results of the main analyses were virtually identical.

the distributions of EAT-26 scores at Time 1 and Time 2 were reviewed. The EAT-26 measure produces scores that range from 0 to 78 and a score of 20 or above suggests clinically significant disordered eating (Garner, Olmsted, Bohr, & Garfinkel, 1982). In the current study, at Time 1, 120 participants (64.2%) indicated no disordered eating or very minor levels of disordered eating (scores = 0-9), 34 participants (18.2%) indicated moderate levels of disordered eating (scores = 10-19), and 33 participants (17.6%) indicated clinically significant levels of disordered eating (scores  $\geq$  20). At Time 2, 107 participants (67.7%) indicated no disordered eating or very minor levels of disordered eating (scores = 0-9), 33 participants (20.9%) indicated moderate levels of disordered eating (scores = 10-19), and 18 participants (11.4%) indicated clinically significant disordered eating (scores  $\geq$  20). These distributions suggest that a full range of disordered eating was assessed at both Time 1 and Time 2.

#### Tests of Hypotheses

##### *Hypothesis #1*

It was hypothesized that emotion awareness would be stable over time; specifically, emotion awareness measured at Time 1 would be positively correlated with emotion awareness measured at Time 2. To test this hypothesis, a zero order Pearson correlation was computed to examine the correlation between Time 1 and Time 2 TMMS-clarity scores,  $r = .723$ ,  $p = .000$ . Additionally, a partial correlation was run to examine the relation between Time 1 and Time 2 TMMS-clarity scores after controlling for Time 1 and Time 2 BDI-II and BAI scores,  $r = .65$ ,  $p = .00$ . These results suggest that emotion awareness is stable over time and its stability is independent of the effects of depression and anxiety.

##### *Hypothesis #2*

It was hypothesized that poor emotion awareness would relate to higher levels of

disordered eating concurrently and over time.

*Hypothesis #2a: Time 1 Emotion Awareness (TMMS-clarity and LEAS-total) would be Negatively Correlated with Time 1 Disordered Eating (EAT-26)*

Zero order Pearson correlations showed that Time 1 TMMS-clarity scores were negatively correlated with Time 1 EAT-26 scores,  $r = -.19, p = .01$ , but Time 1 LEAS-total scores were not related to Time 1 EAT-26 scores,  $r = .01, p = .92$ . However, a hierarchical linear regression analysis, controlling for ethnicity and depression (BDI-II) and anxiety (BAI), revealed no relation between Time 1 TMMS-clarity scores and Time 1 EAT-26 scores and no relation between Time 1 LEAS- total scores and Time 1 EAT-26 scores (see Table 6). In the final model, the only significant predictors were ethnicity and BAI. White participants had higher disordered eating scores compared to African American participants and anxiety was positively correlated with disordered eating.

*Hypothesis #2b: Time 2 Emotion Awareness (TMMS-clarity) would be Negatively Correlated with Time 2 Disordered Eating (EAT-26)*

A zero order Pearson correlation showed that Time 2 TMMS-clarity scores were negatively correlated with Time 2 EAT-26 scores,  $r = -.29, p = .00$ . However, a hierarchical linear regression analysis, controlling for ethnicity and symptoms of depression (BDI-II) and anxiety (BAI), revealed only a non-significant trend ( $p < .10$ ) for Time 2 TMMS-clarity scores to negatively correlate with Time 2 EAT-26 scores (see Table 7). In the final model, the only significant predictors were ethnicity and depression; White participants had higher disordered eating scores compared to African American participants and depression was positively correlated with disordered eating.

Table 6. Hypothesis #2a. Summary of Hierarchical Regression Analysis Testing Relation between Time 1 Emotion Awareness and Time 1 Disordered Eating (EAT-26) After Controlling for Ethnicity and Time 1 Depression and Anxiety

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	<i>R</i> <sup>2</sup>	$\Delta R^2$	$\Delta F$
Step 1				.14	.12	6.10**
Time 1 BDI	.16	.10	.14			
Time 1 BAI	.21	.10	.20*			
Ethnicity						
White vs. African American	-4.97	1.85	-.20**			
White vs. Asian American	.23	2.24	.01			
White vs. Hispanic American/Other	-1.19	2.56	-.03			
Step 2				.15	.00	.11
Time 1 BDI	.15	.11	.14			
Time 1 BAI	.21	.10	.19*			
Ethnicity						
White vs. African American	-5.01	1.88	-.20**			
White vs. Asian American	.02	2.33	.00			
White vs. Hispanic American/Other	-1.23	2.58	-.03			
Time 1 LEAS_T	-.06	.16	-.03			
Time 1 TMMS_C	-.30	1.21	-.02			

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , BDI= Beck Depression Inventory; BAI = Beck Anxiety Inventory; EAT = Eating Attitudes Test, 26-item version; LEAS\_T = Levels of Emotion Awareness, Total subscale; TMMS\_C = Trait Meta-Mood Scale, Clarity subscale score

Table 7. Hypothesis #2b. Summary of Hierarchical Regression Analysis Testing Relation between Time 2 Emotion Awareness and Time 2 Disordered Eating (EAT-26) After Controlling for Ethnicity and Time 2 Depression and Anxiety

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	$R^2$	$\Delta R^2$	$\Delta F$
Step 1				.16	.16	5.94***
Time 2 BDI-II	.30	.10	.30**			
Time 2 BAI	.03	.09	.03			
Ethnicity						
White vs. African American	-4.06	1.74	-.20*			
White vs. Asian American	1.00	2.14	.04			
White vs. Hispanic American/Other	-1.21	2.19	-.04			
Step 2				.18	.02	3.33 <sup>†</sup>
Time 2 BDI-II	.25	.10	.25*			
Time 2 BAI	.02	.08	.02			
Ethnicity						
White vs. African American	-3.70	1.74	-.18*			
White vs. Asian American	.92	2.13	.03			
White vs. Hispanic American/Other	-1.43	2.18	-.05			
Time 2 TMMS_C	-1.86	1.02	-.15 <sup>†</sup>			

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , <sup>†</sup> $p = .07$ , BDI-II= Beck Depression Inventory; BAI = Beck Anxiety Inventory; EAT-26 = Eating Attitudes Test, 26-item version; TMMS\_C = Trait Meta-Mood Scale, Clarity subscale score

*Hypothesis #2c: Time 1 Emotion Awareness (TMMS-clarity and LEAS-total) would predict Time 2 Disordered Eating (EAT-26)*

Zero order Pearson correlations showed a non-significant trend for Time 1 TMMS-clarity scores to negatively correlate with Time 2 EAT-26 scores,  $r = -.14$ ,  $p = .07$ , and no correlation between Time 1 LEAS-total scores and Time 2 EAT-26 scores,  $r = .03$ ,  $p = .68$ . A hierarchical linear regression analysis, controlling for ethnicity, Time 1 depression (BDI-II), anxiety (BAI), and disordered eating (EAT-26), revealed no relation between Time 1 TMMS-clarity scores and Time 2 EAT-26 scores and no relation between Time 1 LEAS-total scores and Time 2 EAT-26 scores (see Table 8). In the final model, the only significant predictor was Time 1 EAT-26 scores. Specifically, Time 1 disordered eating scores were positively correlated with Time 2 disordered eating scores.

*Hypothesis #3*

It was hypothesized that emotion awareness (TMMS-clarity) would relate more specifically to disordered eating than to depression and anxiety (BDI-II and BAI, respectively). Pearson correlations showed that at both Time 1 and Time 2, BDI-II and BAI had larger negative correlations with TMMS-clarity than TMMS-clarity did with EAT-26 (see Tables 3 and 4). A comparison of the Time 1 correlations revealed that both BDI-II and BAI had significantly larger negative correlations with TMMS-clarity than did EAT-26 with TMMS-clarity,  $t = -2.99$ ,  $p = .002$ ;  $t = -1.80$ ,  $p = .037$ , respectively.

*Hypothesis #4*

It was hypothesized that emotion awareness would uniquely relate to disordered eating (EAT-26) both concurrently and over time, after controlling for emotional avoidance (AAQ-II) and fear of emotions (ACS).

Table 8. Hypothesis #2c. Summary of Hierarchical Regression Analysis Testing Relation between Time 1 Emotion Awareness and Time 2 Disordered Eating (EAT-26) After Controlling for Ethnicity and Time 1 Depression, Anxiety, and Disordered Eating

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	<i>R</i> <sup>2</sup>	$\Delta R^2$	$\Delta F$
Step 1				.69	.69	54.66***
Time 1 EAT-26	.71	.04	.83***			
Time 1 BDI-II	.02	.06	.02			
Time 1 BAI	-.09	.06	-.10			
Ethnicity						
White vs. African American	-1.70	1.04	-.08			
White vs. Asian American	-1.31	1.32	-.05			
White vs. Hispanic American/Other	-1.49	1.32	-.05			
Step 2				.69	.01	1.57
Time 1 EAT-26	.71	.04	.84***			
Time 1 BDI-II	.01	.06	.01			
Time 1 BAI	-.08	.06	-.09			
Ethnicity						
White vs. African American	-1.43	1.07	-.07			
White vs. Asian American	-.98	1.33	-.04			
White vs. Hispanic American/Other	-1.38	1.31	-.05			
Time 1 TMMS_C	.17	.68	.01			
Time 1 LEAS_T	.16	.10	.08			

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . BDI-II= Beck Depression Inventory; BAI = Beck Anxiety Inventory; EAT-26 = Eating Attitudes Test, 26-item version; LEAS\_T = Levels of Emotion Awareness, Total subscale; TMMS\_C = Trait Meta-Mood Scale, Clarity subscale score

*Hypothesis #4a: At Time 1, Emotion Awareness (TMMS-clarity and LEAS-total) would Relate to Disordered Eating (EAT-26) After Controlling for Emotional Avoidance (AAQ-II) and Fear of Emotions (ACS-total)*

A hierarchical linear regression analysis revealed that Time 1 TMMS-clarity and LEAS-total scores were not related to Time 1 EAT-26 scores after controlling for ethnicity and Time 1 ACS-total and AAQ-II (see Table 9). The only significant variables in the final model were AAQ-II and ethnicity. Specifically, emotional avoidance was related to higher disordered eating and White participants had higher disordered eating compared to African American participants.

*Hypothesis #4b: Time 1 Emotion Awareness (TMMS-clarity and LEAS-total) would Predict to Time 2 Disordered Eating (EAT-26) After Controlling for Time 1 Emotional Avoidance (AAQ-II) and Fear of Emotions (ACS-total)*

A hierarchical linear regression analysis revealed that Time 1 TMMS-clarity and LEAS-total scores were not related to Time 2 EAT-26 scores after controlling for ethnicity and Time 1 ACS-total and AAQ-II (see Table 10). The only significant variable in the final model was ethnicity. Specifically, White participants had higher disordered eating compared to African American participants.

*Follow-Up Analysis: Do Emotional Avoidance (AAQ-II) and Fear of Emotions (ACS-total) Relate to Disordered Eating After Controlling for Depression (BDI-II) and Anxiety (BAI)*

To examine the relation between emotional avoidance and fear of emotions and disordered eating, independent of emotion awareness, hierarchical regression analyses were run at both Time 1 and Time 2. At both time points, after controlling for depression (BDI-II) and anxiety (BAI), neither emotional avoidance nor fear of emotions predicted disordered eating (see Tables 11 and 12). In the final model at Time 1, the only significant predictor was ethnicity;

Table 9. Hypothesis #4a. Summary of Hierarchical Regression Analysis Testing Relation between Time 1 Emotion Awareness and Disordered Eating (EAT-26), Controlling for Ethnicity, Emotional Avoidance, and Fear of Emotions

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	$R^2$	$\Delta R^2$	$\Delta F$
Step 1				.13	.13	5.28***
Ethnicity						
White vs. African American	-5.80	1.85	-.23**			
White vs. Asian American	-1.33	2.28	-.04			
White vs. Hispanic American/Other	-2.14	2.57	-.06			
Time 1 AAQ-II	-.23	.11	-.21*			
Time 1 ACS	1.21	1.38	.09			
Step 2				.13	.00	.02
Ethnicity						
White vs. African American	-5.80	1.89	-.23**			
White vs. Asian American	-1.44	2.39	-.05			
White vs. Hispanic American/Other	-2.15	2.59	-.06			
Time 1 AAQ-II	-.23	.11	-.21*			
Time 1 ACS_TOT	1.20	1.43	.09			
Time 1 TMMS_C	-.04	1.30	-.00			
Time 1 LEAS_T	-.03	.16	-.01			

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , ACS\_TOT = Affective Control Scale, Total score; AAQ-II = Acceptance and Action Questionnaire, II; BDI-II = Beck Depression Inventory; BAI = Beck Anxiety Inventory; EAT-26 = Eating Attitudes Test, 26-item version; LEAS\_T = Levels of Emotion Awareness, Total subscale; TMMS\_C = Trait Meta-Mood Scale, Clarity subscale score

Table 10. Hypothesis #4b. Summary of Hierarchical Regression Analysis Testing Relation between Time 1 Emotion Awareness and Time 2 Disordered Eating (EAT-26), Controlling for Ethnicity, and Time 1 Emotional Avoidance, and Fear of Emotions

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	<i>R</i> <sup>2</sup>	$\Delta R^2$	$\Delta F$
Step 1				.10	.10	3.47**
Ethnicity						
White vs. African American	-4.60	1.70	-.22**			
White vs. Asian American	.10	2.24	.00			
White vs. Hispanic American/Other	-2.01	2.19	-.07			
Time 1 AAQ-II	-.13	.10	-.14			
Time 1 ACS	.94	1.31	.08			
Step 2				.10	.00	.10
Ethnicity						
White vs. African American	-4.65	1.75	-.22**			
White vs. Asian American	.07	2.29	.00			
White vs. Hispanic American/Other	-2.01	2.21	-.07			
Time 1 AAQ-II	-.14	.11	-.16			
Time 1 ACS_TOT	1.06	1.35	.09			
Time 1 TMMS_C	.44	1.24	.04			
Time 1 LEAS_T	.04	.16	.02			

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , ACS\_TOT = Affective Control Scale, Total score; AAQ-II = Acceptance and Action Questionnaire, II; BDI-II = Beck Depression Inventory; BAI = Beck Anxiety Inventory; EAT-26 = Eating Attitudes Test, 26-item version; LEAS\_T = Levels of Emotion Awareness, Total subscale; TMMS\_C = Trait Meta-Mood Scale, Clarity subscale score

Table 11. Hypothesis #4- Follow-up Analysis. Summary of Hierarchical Regression Analysis Testing Relation between Time 1 Emotional Avoidance and Fear of Emotions and Disordered Eating (EAT-26), Controlling for Ethnicity, Depression, and Anxiety

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	$R^2$	$\Delta R^2$	$\Delta F$
Step 1				.14	.14	6.10***
Time 1 BDI-II	.16	.10	.14			
Time 1 BAI	.21	.10	.20*			
Ethnicity						
White vs. African American	-4.97	1.85	-.20**			
White vs. Asian American	.23	2.24	.01			
White vs. Hispanic American/Other	-1.19	2.56	-.03			
Step 2				.15	.01	.92
Time 1 BDI-II	.07	.12	.06			
Time 1 BAI	.18	.10	.17			
Ethnicity						
White vs. African American	-5.17	1.86	-.21**			
White vs. Asian American	-.38	2.29	-.01			
White vs. Hispanic American/Other	-1.34	2.57	-.04			
Time 1 AAQ	-.13	.12	-.12			
Time 1 ACS	.30	1.43	.02			

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , ACS\_TOT = Affective Control Scale, Total score; AAQ-II = Acceptance and Action Questionnaire, II; BDI-II = Beck Depression Inventory; BAI = Beck Anxiety Inventory; EAT-26 = Eating Attitudes Test, 26-item version

Table 12. Hypothesis #4- Follow-up Analysis. Summary of Hierarchical Regression Analysis Testing Relation between Time 2 Emotional Avoidance and Fear of Emotions and Disordered Eating (EAT-26), Controlling for Ethnicity, Depression, and Anxiety

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	$R^2$	$\Delta R^2$	$\Delta F$
Step 1				.16	.16	5.94***
Time 2 BDI-II	.30	.10	.30**			
Time 2 BAI	.03	.09	.03			
Ethnicity						
White vs. African American	-4.06	1.74	-.20*			
White vs. Asian American	-1.21	2.19	-.04			
White vs. Hispanic American/Other	-1.21	2.19	-.04			
Step 2				.18	.02	1.37
Time 2 BDI-II	.26	.11	.27*			
Time 2 BAI	.03	.09	.04			
Ethnicity						
White vs. African American	-4.26	1.75	-.20*			
White vs. Asian American	1.19	2.24	.04			
White vs. Hispanic American/Other	-1.09	2.19	-.04			
Time 2 AAQ	-.16	.10	-.19			
Time 2 ACS	-1.88	1.31	-.17			

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , ACS\_TOT = Affective Control Scale, Total score; AAQ-II = Acceptance and Action Questionnaire, II; BDI-II = Beck Depression Inventory; BAI = Beck Anxiety Inventory; EAT-26 = Eating Attitudes Test, 26-item version

specifically, White participants had higher disordered eating relative to African American participants. In the final model at Time 2, the only significant predictors were BDI-II and ethnicity; specifically, higher depression scores related to higher disordered eating scores, and White participants had higher disordered eating scores relative to African American participants.

#### *Hypothesis #5*

It was hypothesized that life events/stress and dysfunctional appearance beliefs would moderate the relation between emotion awareness<sup>5</sup> and disordered eating, both concurrently and over time.

*Hypothesis #5a: At Time 1, Perceived Stress (PSS) and Dysfunctional Appearance Beliefs (BAAS) would Interact with Emotion Awareness (TMMS-clarity) to Predict Disordered Eating (EAT-26)*

A hierarchical linear regression analysis revealed that Time 1 TMMS-clarity, BAAS, and PSS did not interact to predict Time 1 EAT-26 scores, after controlling for ethnicity, depression (BDI-II), and anxiety (BAI), as well as main effects and all two-way interactions (see Table 13). In the final model, the only significant predictors were ethnicity and BAI. White participants had higher disordered eating compared to African American participants and anxiety was positively correlated with disordered eating.

*Hypothesis #5b: At Time 2, Perceived Stress (PSS) and Dysfunctional Appearance Beliefs (BAAS) would Interact with Emotion Awareness (TMMS-clarity) to Predict Disordered Eating (EAT-26)*

A hierarchical linear regression analysis revealed that Time 2 TMMS-clarity, BAAS, and

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<sup>5</sup> Because the LEAS measure did not correlate with disordered eating at Time 1 or Time 2, the TMMS-clarity subscale was used as a measure of emotion awareness for all subsequent analyses.

Table 13. Hypothesis #5a. Summary of Hierarchical Regression Analysis Testing the Interaction Between Time 1 Perceived Stress, Dysfunctional Appearance Beliefs, and Emotion Awareness Predicting to Time 1 Disordered Eating (EAT-26)

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	<i>R</i> <sup>2</sup>	$\Delta R^2$	$\Delta F$
Step 1				.14	.14	6.10***
BDI-II	.16	.10	.14			
BAI	.21	.10	.20*			
Ethnicity						
White vs. African American	-4.97	1.85	-.20**			
White vs. Asian American	.23	2.24	.01			
White vs. Hispanic American/Other	-1.19	2.56	-.03			
Step 2				.31	.17	14.51***
BDI-II	-.09	.11	-.08			
BAI	.24	.09	.23**			
Ethnicity						
White vs. African American	-3.81	1.68	-.15*			
White vs. Asian American	-1.76	2.05	-.06			
White vs. Hispanic American/Other	-.74	2.32	-.02			
BAAS	.28	.04	.46***			
TMMS_C	.68	1.10	.05			
PSS	.08	.12	.06			
Step 3				.31	.00	.08
BDI-II	-.09	.12	-.08			
BAI	.24	.09	.22*			
Ethnicity						
White vs. African American	-3.81	1.70	-.15*			
White vs. Asian American	-1.64	2.09	-.05			
White vs. Hispanic American/Other	-.71	2.35	-.02			
BAAS	.25	.28	.40			
TMMS_C	1.98	3.60	.13			
PSS	.32	.52	.24			
TMMS_C x BAAS	.02	.06	.09			
TMMS_C x PSS	-.07	.13	-.16			
PSS x BAAS	-.00	.01	-.04			

\**p* < .05, \*\**p* < .01, \*\*\**p* < .001, BAI = Beck Anxiety Inventory; BAAS = Belief About Appearance Scale; BDI-II = Beck Depression Inventory; EAT-26 = Eating Attitudes Test, 26-item version; PSS = Perceived Stress Scale; TMMS\_C = Trait Meta-Mood Scale, Clarity subscale score

Table 13. (continued)

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	$R^2$	$\Delta R^2$	$\Delta F$
Step 4				.31	.00	.00
BDI-II	-.09	.12	-.08			
BAI	.24	.09	.22*			
Ethnicity						
White vs. African American	-3.81	1.70	-.15*			
White vs. Asian American	-1.63	2.10	-.05			
White vs. Hispanic American/Other	-.72	2.35	-.02			
BAAS	.21	.67	.35			
TMMS_C	1.70	6.04	.12			
PSS	.29	.77	.22			
TMMS_C x BAAS	.03	.19	.15			
TMMS_C x PSS	-.05	.21	-.14			
PSS x BAAS	.00	.02	.02			
TMMS_C x PSS x BAAS	.00	.01	-.06			

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , BAI = Beck Anxiety Inventory; BAAS = Belief About Appearance Scale; BDI-II = Beck Depression Inventory; EAT = Eating Attitudes Test, 26-item version; PSS = Perceived Stress Scale; TMMS\_C = Trait Meta-Mood Scale, Clarity subscale score

PSS did not interact to predict Time 2 EAT-26 scores, after controlling for ethnicity, depression (BDI-II), and anxiety (BAI), as well as main effects and all two-way interactions (see Table 14). In step 3, after controlling for all main effects and two-way interactions, BAAS was positively correlated with Time 2 EAT-26 scores. However, in the final model, with all main effects, two way interactions, and the hypothesized three-way interaction entered, there were no significant predictors.

*Hypothesis #5c: Time 1 Emotion Awareness (TMMS-clarity) and Dysfunctional Appearance Beliefs (BAAS) would Interact with Time 2 Life Events/Stress (reported number of life events, LES-num- and subjective level of stress associated with life events- LES-sub- between Time 1 and Time 2) to predict Time 2 disordered eating (EAT-26).*

Two hierarchical regression analyses were run to test the interaction between Time 1 TMMS-clarity and BAAS, and the number of life events and subjective stress reported to have occurred during the prospective period. In the first analysis, LES-num was used as a predictor and in the second analysis, LES-sub was used as a predictor.

The first analysis (see Table 15) revealed that Time 1 TMMS-clarity did not interact with BAAS and LES-num to predict Time 2 EAT-26, after controlling for ethnicity, Time 1 depression (BDI-II), anxiety (BAI), disordered eating, and perceived stress (PSS), as well as all main effects and two-way interactions between TMMS-clarity, BAAS, and LES-num. A review of the models from each of the four steps showed that no other model is significantly better at predicting Time 2 EAT-26 than the model associated with step 1. In other words, based on the predictors in this analysis, the significant model that best predicted Time 2 EAT-26 included Time 1 EAT-26, Time 1 BDI-II, Time 1 BAI, Time 1 PSS, and ethnicity as predictors.

The second analysis (see Table 16) revealed that Time 1 TMMS-clarity did not interact

Table 14. Hypothesis #5b. Summary of Hierarchical Regression Analysis Testing the Interaction Between Time 2 Perceived Stress, Dysfunctional Appearance Beliefs, and Emotion Awareness Predicting to Time 2 Disordered Eating (EAT-26)

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	<i>R</i> <sup>2</sup>	$\Delta R^2$	$\Delta F$
Step 1				.16	.16	5.94***
BDI-II	.30	.10	.30**			
BAI	.03	.09	.03			
Ethnicity						
White vs. African American	-4.06	1.74	-.20*			
White vs. Asian American	1.00	2.14	.04			
White vs. Hispanic American/Other	-1.21	2.19	-.04			
Step 2				.31	.14	10.12***
BDI-II	.19	.11	.19			
BAI	.08	.08	.10			
Ethnicity						
White vs. African American	-2.89	1.63	-.14			
White vs. Asian American	-1.76	2.04	-.06			
White vs. Hispanic American/Other	-.77	2.05	-.03			
BAAS	.22	.04	.40***			
TMMS_C	-.87	1.02	-.07			
PSS	-.09	.12	-.08			
Step 3				.33	.02	1.54
BDI-II	.21	.11	.22			
BAI	.09	.08	.11			
Ethnicity						
White vs. African American	-2.69	1.64	-.13			
White vs. Asian American	-1.01	2.07	-.04			
White vs. Hispanic American/Other	-.73	2.04	-.03			
BAAS	.72	.33	1.34*			
TMMS_C	5.09	3.41	.41			
PSS	.45	.52	.93			
TMMS_C x BAAS	-.10	.06	-.59			
TMMS_C x PSS	-.12	.12	-.32			
PSS x BAAS	-.01	.01	-.42			

\**p* < .05, \*\**p* < .01, \*\*\**p* < .001, BAI = Beck Anxiety Inventory; BAAS = Belief About Appearance Scale; BDI-II = Beck Depression Inventory; EAT-26 = Eating Attitudes Test, 26-item version; PSS = Perceived Stress Scale; TMMS\_C = Trait Meta-Mood Scale, Clarity subscale score

Table 14. (continued)

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	$R^2$	$\Delta R^2$	$\Delta F$
Step 4				.33	.00	.53
BDI-II	.20	.11	.21			
BAI	.08	.08	.10			
Ethnicity						
White vs. African American	-2.80	1.65	-.13			
White vs. Asian American	-1.23	2.09	-.05			
White vs. Hispanic American/Other	-.54	2.06	-.02			
BAAS	1.19	.72	2.22			
TMMS_C	8.45	5.76	.68			
PSS	.88	.79	.78			
TMMS_C x BAAS	-.24	.20	-1.44			
TMMS_C x PSS	-.24	.21	-.66			
PSS x BAAS	-.02	.02	-1.41			
TMMS_C x PSS x BAAS	.01	.01	.92			

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , BAI = Beck Anxiety Inventory; BAAS = Belief About Appearance Scale; BDI-II = Beck Depression Inventory; EAT = Eating Attitudes Test, 26-item version; PSS = Perceived Stress Scale; TMMS\_C = Trait Meta-Mood Scale, Clarity subscale score

Table 15. Hypothesis #5c. Summary of Hierarchical Regression Analysis Testing the Interaction Between Time 1 Emotion Awareness, Dysfunctional Appearance Beliefs, and Number of Life Events Reported Between Time 1 and Time 2 Predicting to Time 2 Disordered Eating (EAT-26)

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	<i>R</i> <sup>2</sup>	$\Delta R^2$	$\Delta F$
Step 1				.69	.69	48.59***
Time 1 BDI-II	-.06	.07	-.07			
Time 1 BAI	-.11	.06	-.12*			
Time 1 PSS	.16	.07	.14*			
Time 1 EAT-26	.70	.04	.83***			
Ethnicity						
White vs. African American	-1.70	1.03	-.08			
White vs. Asian American	-1.43	1.31	-.05			
White vs. Hispanic American/Other	-1.65	1.30	-.06			
Step 2				.70	.01	1.70
Time 1 BDI-II	-.09	.07	-.10			
Time 1 BAI	-.09	.06	-.10			
Time 1 PSS	.16	.07	.14*			
Time 1 EAT-26	.66	.05	.78***			
Ethnicity						
White vs. African American	-1.74	1.04	-.08			
White vs. Asian American	-1.78	1.35	-.07			
White vs. Hispanic American/Other	-1.53	1.30	-.06			
Time 1 BAAS	.06	.03	.10			
Time 1 TMMS_C	.76	.69	.06			
LES_num	.05	.05	.06			
Step 3				.71	.00	.48
Time 1 BDI-II	-.08	.08	-.08			
Time 1 BAI	-.09	.06	-.10			
Time 1 PSS	.14	.08	.13			
Time 1 EAT-26	.65	.05	.77***			
Ethnicity						
White vs. African American	-2.07	1.08	-.10			
White vs. Asian American	-1.97	1.37	-.07			
White vs. Hispanic American/Other	-1.39	1.31	-.05			
Time 1 BAAS	-.04	.14	-.08			
Time 1 TMMS_C	1.41	1.83	.12			
LES_num	.24	.29	.26			
Time 1 BAAS X Time 1 TMMS_C	.03	.04	.14			
Time 1 BAAS X LES_num	.00	.00	.05			
Time 1 TMMS_C X LES_num	-.06	.07	-.24			

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , BAI = Beck Anxiety Inventory; BAAS = Belief About Appearance Scale; BDI-II = Beck Depression Inventory; EAT-26 = Eating Attitudes Test, 26-item version; LES\_num = Number of Life Events Reported Between Time 1 and Time 2; PSS = Perceived Stress Scale; TMMS\_C = Trait Meta-Mood Scale, Clarity subscale score

Table 15. (continued)

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	$R^2$	$\Delta R^2$	$\Delta F$
Step 4				.71	.00	.00
Time 1 BDI-II	-.08	.08	-.08			
Time 1 BAI	-.09	.06	-.10			
Time 1 PSS	.14	.08	.13			
Time 1 EAT-26	.65	.05	.77***			
Ethnicity						
White vs. African American	-2.07	1.09	-.10			
White vs. Asian American	-1.98	1.38	-.07			
White vs. Hispanic American/Other	-1.39	1.32	-.05			
Time 1 BAAS	-.04	.31	-.07			
Time 1 TMMS_C	1.45	2.70	.12			
LES_num	.25	.44	.27			
Time 1 BAAS X Time 1 TMMS_C	.02	.09	.13			
Time 1 BAAS X LES_num	.00	.01	.04			
Time 1 TMMS_C X LES_num	-.06	.12	-.25			
Time 1 BAAS X Time 1 TMMS_C X LES_num	.00	.00	.01			

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , BAI = Beck Anxiety Inventory; BAAS = Belief About Appearance Scale; BDI-II = Beck Depression Inventory; EAT-26 = Eating Attitudes Test, 26-item version; LES\_num = Number of Life Events Reported Between Time 1 and Time 2; PSS = Perceived Stress Scale; TMMS\_C = Trait Meta-Mood Scale, Clarity subscale score

Table 16. Hypothesis #5c. Summary of Hierarchical Regression Analysis Testing the Interaction Between Time 1 Emotion Awareness, Dysfunctional Appearance Beliefs, and Subjective Negative Impact Associated with Life Events Reported Between Time 1 and Time 2 Predicting to Time 2 Disordered Eating (EAT-26), Controlling for Number of Life Events

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	<i>R</i> <sup>2</sup>	$\Delta R^2$	$\Delta F$
Step 1				.70	.70	42.81***
Time 1 BDI-II	-.08	.07	-.08			
Time 1 BAI	-.11	.06	-.12*			
Time 1 PSS	.15	.07	.14*			
Time 1 EAT-26	.69	.04	.82***			
LES_num	.05	.05	.06			
Ethnicity						
White vs. African American	-1.65	1.03	-.08			
White vs. Asian American	-1.19	1.32	-.04			
White vs. Hispanic American/Other	-1.56	1.31	-.06			
Step 2				.71	.01	2.39
Time 1 BDI-II	-.10	.07	-.12			
Time 1 BAI	-.09	.06	-.10			
Time 1 PSS	.14	.07	.13			
Time 1 EAT-26	.65	.05	.77***			
LES_num	-.12	.10	-.13			
Ethnicity						
White vs. African American	-1.90	1.03	-.09			
White vs. Asian American	-2.23	1.36	-.08			
White vs. Hispanic American/Other	-1.72	1.29	-.06			
Time 1 BAAS	.05	.03	.10			
Time 1 TMMS_C	.70	.68	.06			
LES_sub	.06	.03	.22			

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , BAI = Beck Anxiety Inventory; BAAS = Belief About Appearance Scale; BDI-II = Beck Depression Inventory; EAT-26 = Eating Attitudes Test, 26-item; LES\_num = Number of Life Events; LES\_sub = Subjective Negative Impact of Life Events; PSS = Perceived Stress Scale; TMMS\_C = Trait Meta-Mood Scale, Clarity subscale score

Table 16. (continued)

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	<i>R</i> <sup>2</sup>	$\Delta R^2$	$\Delta F$
Step 3				.71	.00	.20
Time 1 BDI-II	-.10	.08	-.11			
Time 1 BAI	-.10	.06	-.11			
Time 1 PSS	.13	.08	.12			
Time 1 EAT-26	.64	.05	.76***			
LES_num	-.12	.11	-.13			
Ethnicity						
White vs. African American	-2.04	1.07	-.10			
White vs. Asian American	-2.25	1.38	-.08			
White vs. Hispanic American/Other	-1.65	1.31	-.06			
Time 1 BAAS	-.02	.14	-.03			
Time 1 TMMS_C	.72	1.47	.06			
LES_sub	.11	.09	.40			
Time 1 BAAS X Time 1 TMMS_C	.02	.04	.14			
Time 1 BAAS X LES_sub	.00	.00	-.02			
Time 1 TMMS_C X LES_sub	-.01	.02	-.16			
Step 4				.71	.00	.18
Time 1 BDI-II	-.10	.08	-.11			
Time 1 BAI	-.10	.06	-.11			
Time 1 PSS	.13	.08	.12			
Time 1 EAT	.65	.05	.76***			
LES_num	-.13	.11	-.14			
Ethnicity						
White vs. African American	-2.00	1.07	-.10			
White vs. Asian American	-2.13	1.41	-.08			
White vs. Hispanic American/Other	-1.63	1.31	-.06			
Time 1 BAAS	-.12	.28	-.22			
Time 1 TMMS_C	.01	2.25	.00			
LES_sub	.07	.14	.23			
Time 1 BAAS X Time 1 TMMS_C	.05	.08	.31			
Time 1 BAAS X LES_sub	.00	.00	.28			
Time 1 TMMS_C X LES_sub	.00	.04	.00			
Time 1 BAAS X Time 1 TMMS_C X LES_sub	.00	.00	-.27			

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , BAI = Beck Anxiety Inventory; BAAS = Belief About Appearance Scale; BDI-II = Beck Depression Inventory; EAT = Eating Attitudes Test, 26-item version; LES\_num = Number of Life Events; LES\_sub = Subjective Negative Impact of Life Events; PSS = Perceived Stress Scale; TMMS\_C = Trait Meta-Mood Scale, Clarity subscale score

with BAAS and LES-sub to predict Time 2 EAT-26, after controlling for ethnicity, Time 1 depression, anxiety, disordered eating, and perceived stress, the number of life events reported during the prospective period, and all main effects and two-way interactions between TMMS-clarity, BAAS, and LES-sub. A review of the models from each of the four steps showed that no other model was significantly better at predicting Time 2 EAT-26 than the model associated with step 1. In other words, based on the predictors in this analysis, the significant model that best predicted Time 2 EAT-26 included Time 1 EAT-26, Time 1 BAI, Time 1 PSS, LES-num, and ethnicity.

*Hypothesis #5d: If life events/stress (LES-num and/or LES-sub) and dysfunctional appearance beliefs (BAAS) did moderate the relation between emotion awareness (TMMS-clarity) and disordered eating (EAT-26; i.e. hypothesis 5c is supported), the interaction tested in 5c would be specific to disordered eating versus general emotional distress.*

It was hypothesized that the interaction between LES-num and sub, dysfunctional appearance beliefs, and emotion awareness would be more strongly related to disordered eating than to depression (BDI-II) and/or anxiety (BAI). Therefore, this study planned to repeat analyses used in 5c with BDI-II and BAI scores as the dependent variables and to compare the results with those from analyses using EAT-26 as the dependent variable. Given that the interaction between life events/stress, dysfunctional appearance beliefs, and emotion awareness did not predict disordered eating, the analyses for BDI-II and BAI were run, but no comparisons with results using EAT-26 as a dependent variable were made.

*Depression (BDI-II) as dependent variable.* Two hierarchical regression analyses were run to test the interaction between Time 1 TMMS-clarity and BAAS, and LES-num and LES-sub. In the first analysis, LES-num was used as a predictor and in the second analysis, LES-sub

was used as a predictor.

The first analysis (see Table 17) revealed that Time 1 TMMS-clarity did not interact with BAAS and LES-num to predict Time 2 BDI-II, after controlling for ethnicity, Time 1 BDI-II, anxiety (BAI), disordered eating, and perceived stress (PSS), as well as all main effects and two-way interactions between TMMS-clarity, BAAS, and LES-num. A review of the models from each of the four steps showed that the significant model associated with step 3 predicted the most amount of variance in Time 2 BDI-II. In other words, based on the predictors in this analysis, the significant model that best predicted Time 2 BDI-II included Time 1 EAT-26, Time 1 BDI-II, Time 1 BAI, Time 1 PSS, ethnicity, TMMS-clarity, BAAS, LES-num, and all two-way interactions between TMMS-clarity, BAAS, LES-num. Within this model, there were main effects for Time 1 BDI-II, BAAS, and LES-num, and there were two-way interactions for TMMS-clarity X LES-num (Figure 1) and BAAS X TMMS-clarity (Figure 2). Time 1 BDI-II was positively correlated with Time 2 BDI-II. The direction of main effects for BAAS and LES-num will not be reported here because these should not be interpreted in light of the evidence of their roles in two-way interactions. TMMS-clarity interacted with LES-num such that low clarity and elevated life events prospectively predicted higher levels of depression. Additionally, TMMS-clarity interacted with BAAS such that high clarity and high BAAS predicted higher levels of depression.

The second analysis (see Table 18) revealed that Time 1 TMMS-clarity did not interact with BAAS and LES-sub to predict Time 2 BDI-II, after controlling for ethnicity, Time 1 BDI-II, anxiety (BAI), disordered eating, perceived stress (PSS), and the number of life events reported to have occurred during the prospective period (LES-num), as well as all main effects and two-way interactions between TMMS-clarity, BAAS, and LES-sub. A review of the models from

Table 17. Hypothesis #5d. Summary of Hierarchical Regression Analysis Testing the Interaction Between Time 1 Emotion Awareness, Dysfunctional Appearance Beliefs, and Number of Life Events Reported Between Time 1 and Time 2 Predicting to Time 2 Depression (BDI-II)

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	<i>R</i> <sup>2</sup>	$\Delta R^2$	$\Delta F$
Step 1				.46	.46	18.42***
Time 1 BDI-II	.35	.09	.37***			
Time 1 BAI	.10	.08	.11			
Time 1 PSS	.29	.10	.26**			
Time 1 EAT-26	.03	.06	.03			
Ethnicity						
White vs. African American	-.73	1.40	-.03			
White vs. Asian American	-.02	1.77	-.00			
White vs. Hispanic American/Other	-1.03	1.80	-.04			
Step 2				.51	.05	5.12**
Time 1 BDI-II	.35	.09	.37***			
Time 1 BAI	.11	.07	.12			
Time 1 PSS	.29	.10	.26**			
Time 1 EAT-26	.01	.06	.01			
Ethnicity						
White vs. African American	-.91	1.36	-.04			
White vs. Asian American	.93	1.77	.03			
White vs. Hispanic American/Other	-.63	1.70	-.02			
Time 1 BAAS	-.01	.04	-.01			
Time 1 TMMS_C	1.55	.91	.12			
LES_num	.20	.06	.21**			
Step 3				.58	.06	7.28***
Time 1 BDI-II	.44	.09	.46***			
Time 1 BAI	.09	.07	.09			
Time 1 PSS	.20	.09	.18*			
Time 1 EAT-26	-.04	.06	-.04			
Ethnicity						
White vs. African American	-2.22	1.33	-.10			
White vs. Asian American	.03	1.68	.00			
White vs. Hispanic American/Other	.02	1.61	.00			
Time 1 BAAS	-.56	.18	-1.02**			
Time 1 TMMS_C	2.66	2.25	.21			
LES_num	1.11	.36	1.18**			
Time 1 BAAS X Time 1 TMMS_C	.17	.04	.96***			
Time 1 BAAS X LES_num	.00	.00	.03			
Time 1 TMMS_C X LES_num	-.27	.09	-1.05**			

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , BAI = Beck Anxiety Inventory; BAAS = Belief About Appearance Scale; BDI-II = Beck Depression Inventory; EAT-26 = Eating Attitudes Test, 26-item version; LES\_num = Number of Life Events Reported Between Time 1 and Time 2; PSS = Perceived Stress Scale; TMMS\_C = Trait Meta-Mood Scale, Clarity subscale score

Table 17. (continued)

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	$R^2$	$\Delta R^2$	$\Delta F$
Step 4				.58	.00	.15
Time 1 BDI-II	.44	.09	.46***			
Time 1 BAI	.09	.07	.09			
Time 1 PSS	.21	.09	.19*			
Time 1 EAT	-.04	.06	-.05			
Ethnicity						
White vs. African American	-2.19	1.33	-.10			
White vs. Asian American	.10	1.70	.00			
White vs. Hispanic American/Other	.08	1.63	.00			
Time 1 BAAS	-.69	.38	-1.26			
Time 1 TMMS_C	1.74	3.31	.14			
LES_num	.96	.55	1.01			
Time 1 BAAS X Time 1 TMMS_C	.21	.11	1.18			
Time 1 BAAS X LES_num	.01	.02	.35			
Time 1 TMMS_C X LES_num	-.23	.15	-.88			
Time 1 BAAS X Time 1 TMMS_C X LES_num	-.00	.01	-.29			

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , BAI = Beck Anxiety Inventory; BAAS = Belief About Appearance Scale; BDI-II = Beck Depression Inventory; EAT = Eating Attitudes Test, 26-item version; LES\_num = Number of Life Events Reported Between Time 1 and Time 2; PSS = Perceived Stress Scale; TMMS\_C = Trait Meta-Mood Scale, Clarity subscale score

Figure 1. Hypothesis #5d (Analysis 1). Interaction Between Time 1 Emotion Awareness (TMMS-clarity) and Number of Life Events Reported Between Time 1 and Time 2 (LES-num) Predicts Time 2 Depression (BDI-II)

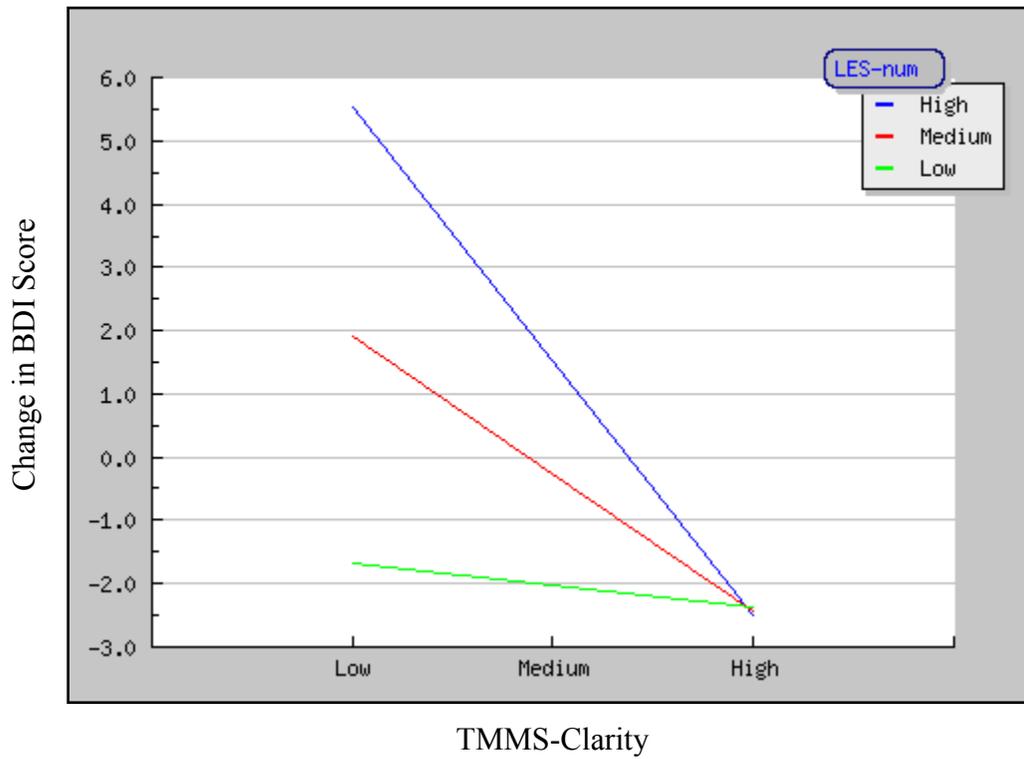


Figure 2. Hypothesis #5d (Analysis 1). Interaction Between Time 1 Emotion Awareness (TMMS-clarity) and Dysfunctional Appearance Beliefs (BAAS) Predicts Time 2 Depression (BDI-II)

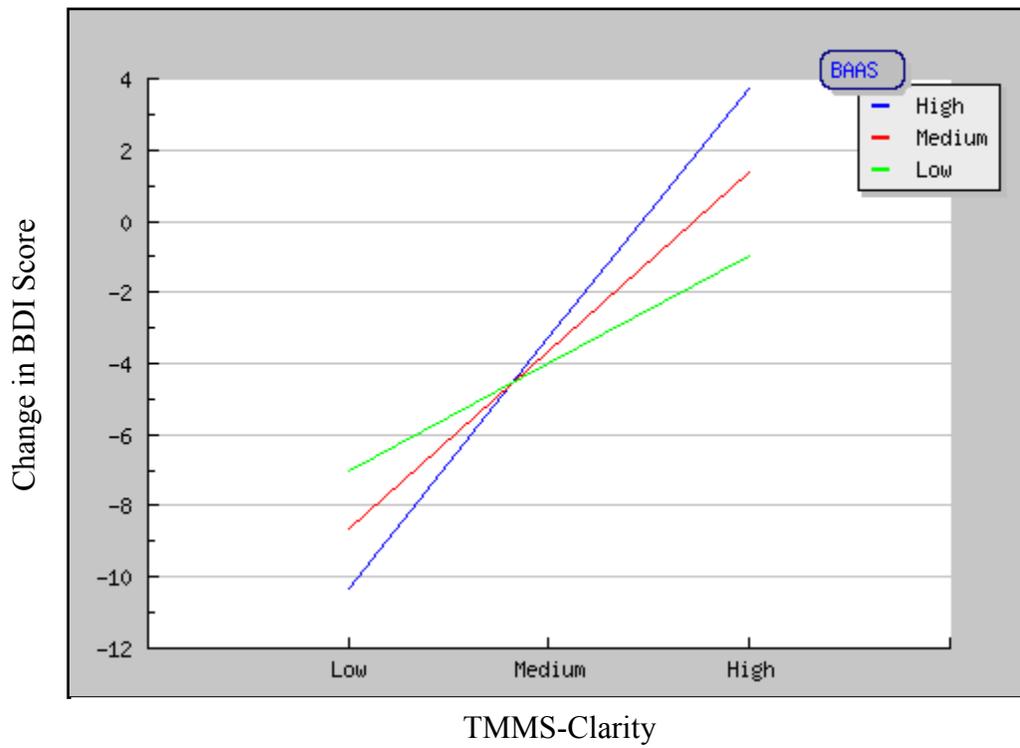


Table 18. Hypothesis #5d. Summary of Hierarchical Regression Analysis Testing the Interaction Between Time 1 Emotion Awareness, Dysfunctional Appearance Beliefs, and Subjective Negative Impact Associated with Life Events Reported Between Time 1 and Time 2 Predicting to Time 2 Depression (BDI-II), Controlling for Number of Life Events

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	<i>R</i> <sup>2</sup>	$\Delta R^2$	$\Delta F$
Step 1				.50	.50	18.81***
Time 1 BDI-II	.30	.09	.32**			
Time 1 BAI	.10	.07	.11			
Time 1 PSS	.27	.10	.24**			
Time 1 EAT-26	.01	.06	.01			
LES_num	.21	.06	.22**			
Ethnicity						
White vs. African American	-.54	1.35	-.03			
White vs. Asian American	.90	1.73	.03			
White vs. Hispanic American/Other	-.66	1.71	-.02			
Step 2				.54	.04	4.14**
Time 1 BDI-II	.31	.09	.33**			
Time 1 BAI	.10	.07	.11			
Time 1 PSS	.25	.10	.23**			
Time 1 EAT-26	-.01	.06	-.01			
LES_num	-.16	.133	-.17			
Ethnicity						
White vs. African American	-1.23	1.33	-.06			
White vs. Asian American	-.01	1.76	.00			
White vs. Hispanic American/Other	-1.05	1.67	-.04			
Time 1 BAAS	-.01	.04	-.02			
Time 1 TMMS_C	1.42	.88	.11			
LES_sub	.13	.04	.45**			

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , BAI = Beck Anxiety Inventory; BAAS = Belief About Appearance Scale; BDI-II = Beck Depression Inventory; EAT-26 = Eating Attitudes Test, 26-item; LES\_num = Number of Life Events; LES\_sub = Subjective Negative Impact of Life Events; PSS = Perceived Stress Scale; TMMS\_C = Trait Meta-Mood Scale, Clarity subscale score

Table 18. (continued)

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	$R^2$	$\Delta R^2$	$\Delta F$
Step 3				.59	.05	6.02**
Time 1 BDI-II	.39	.09	.41***			
Time 1 BAI	.07	.07	.08			
Time 1 PSS	.18	.09	.16			
Time 1 EAT-26	-.04	.06	-.04			
LES_num	-.16	.13	-.17			
Ethnicity						
White vs. African American	-2.10	1.30	-.10			
White vs. Asian American	-.37	1.68	-.01			
White vs. Hispanic American/Other	-.52	1.59	-.02			
Time 1 BAAS	-.60	.17	-1.09***			
Time 1 TMMS_C	-.22	1.78	-.02			
LES_sub	.35	.11	1.22**			
Time 1 BAAS X Time 1 TMMS_C	.18	.04	1.01***			
Time 1 BAAS X LES_sub	.00	.00	.01			
Time 1 TMMS_C X LES_sub	-.07	.03	-.77*			
Step 4				.59	.00	.01
Time 1 BDI-II	.39	.09	.41***			
Time 1 BAI	.07	.07	.08			
Time 1 PSS	.18	.09	.16			
Time 1 EAT	-.04	.06	-.04			
LES_num	-.16	.13	-.17			
Ethnicity						
White vs. African American	-2.11	1.31	-.10			
White vs. Asian American	-.40	1.72	-.01			
White vs. Hispanic American/Other	-.52	1.60	-.02			
Time 1 BAAS	-.57	.34	-1.04			
Time 1 TMMS_C	-.04	2.74	.00			
LES_sub	.36	.17	1.26*			
Time 1 BAAS X Time 1 TMMS_C	.17	.10	.97			
Time 1 BAAS X LES_sub	.00	.01	-.06			
Time 1 TMMS_C X LES_sub	-.07	.05	-.81			
Time 1 BAAS X Time 1 TMMS_C X LES_sub	.00	.00	.07			

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , BAI = Beck Anxiety Inventory; BAAS = Belief About Appearance Scale; BDI-II = Beck Depression Inventory; EAT = Eating Attitudes Test, 26-item version; LES\_num = Number of Life Events; LES\_sub = Subjective Negative Impact of Life Events; PSS = Perceived Stress Scale; TMMS\_C = Trait Meta-Mood Scale, Clarity subscale score

each of the four steps showed that the significant model associated with step 3 predicted the most amount of variance in Time 2 BDI-II. In other words, based on the predictors in this analysis, the significant model that best predicted Time 2 BDI-II included Time 1 EAT-26, Time 1 BDI-II, Time 1 BAI, Time 1 PSS, LES-num, ethnicity, TMMS-clarity, BAAS, LES-sub, and all two-way interactions between TMMS-clarity, BAAS, LES-sub. Within this model, there were main effects for Time 1 BDI-II, BAAS, and LES-sub and there were two-way interactions for TMMS-clarity X LES-sub (Figure 3) and BAAS X TMMS-clarity (Figure 4). Time 1 BDI-II was positively correlated with Time 2 BDI-II. The direction of main effects for BAAS and LES-sub will not be reported here because these should not be interpreted in light of the evidence of their roles in two-way interactions. TMMS-clarity interacted with LES-sub such that low clarity and elevated subjective negative impact associated with life events prospectively predicted higher levels of depression. Additionally, TMMS-clarity interacted with BAAS such that high clarity and high BAAS predicted higher levels of depression.

*Anxiety (BAI) as dependent variable.* Two hierarchical regression analyses were run to test the interaction between Time 1 TMMS-clarity and BAAS, and LES-num and LES-sub. In the first analysis, LES-num was used as a predictor and in the second analysis, LES-sub was used as a predictor.

The first analysis (see Table 19) revealed that Time 1 TMMS-clarity did not interact with BAAS and LES-num to predict Time 2 BAI, after controlling for ethnicity, Time 1 depression (BDI-II), Time 1 BAI, disordered eating, and perceived stress (PSS), as well as all main effects and two-way interactions between TMMS-clarity, BAAS, and LES-num. A review of the models from each of the four steps showed that the significant model associated with step 3 predicted the most amount of variance in Time 2 BAI. In other words, based on the predictors in this analysis,

Figure 3. Hypothesis #5d (Analysis 2). Interaction Between Time 1 Emotion Awareness (TMMS-clarity) and Subjective Negative Impact Associated with Life Events (LES-sub) Predicts Time 2 Depression (BDI-II)

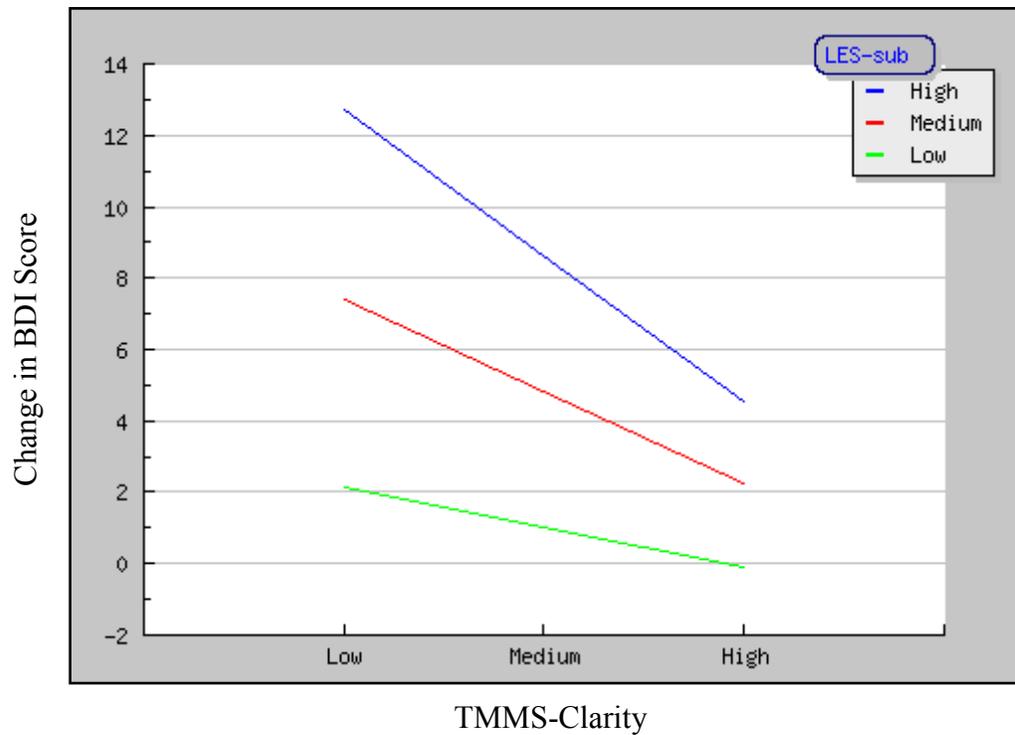


Figure 4. Hypothesis #5d (Analysis 2). Interaction Between Time 1 Emotion Awareness (TMMS-clarity) and Dysfunctional Appearance Beliefs (BAAS) Predicts Time 2 Depression (BDI-II)

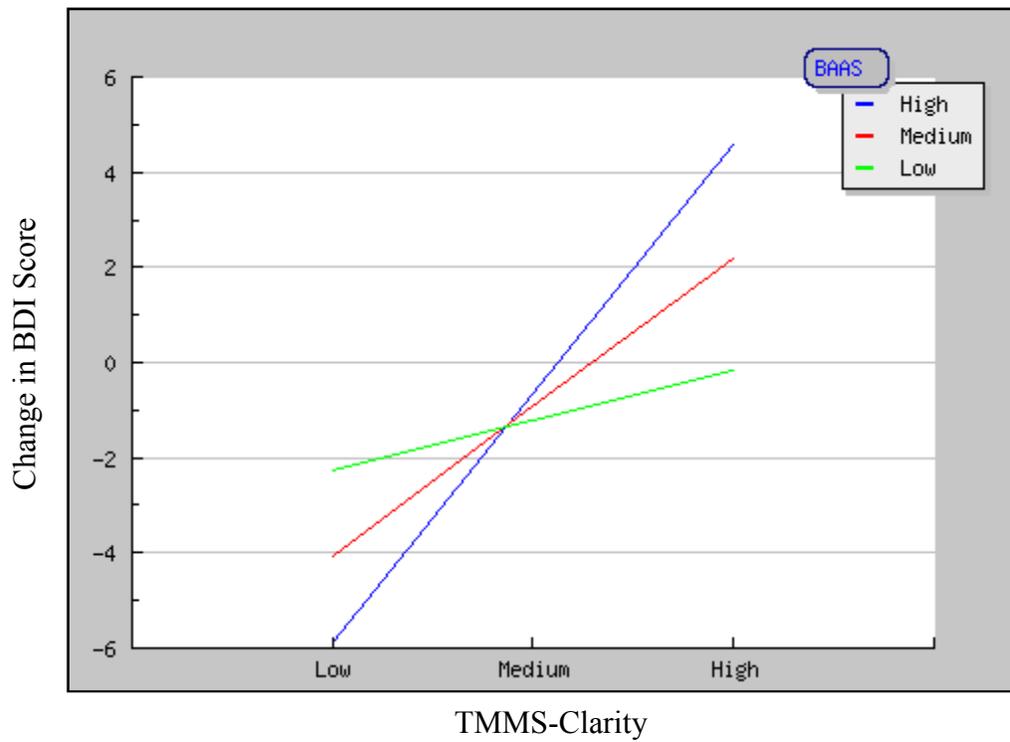


Table 19. Hypothesis #5d. Summary of Hierarchical Regression Analysis Testing the Interaction Between Time 1 Emotions Awareness, Dysfunctional Appearance Beliefs, and Number of Life Events Reported Between Time 1 and Time 2 Predicting to Time 2 Anxiety (BAI)

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	<i>R</i> <sup>2</sup>	$\Delta R^2$	$\Delta F$
Step 1				.46	.46	18.28***
Time 1 BDI-II	-.03	.11	-.02			
Time 1 BAI	.61	.09	.54***			
Time 1 PSS	.13	.12	.10			
Time 1 EAT-26	.01	.07	.01			
Ethnicity						
White vs. African American	-5.89	1.70	-.23**			
White vs. Asian American	-2.58	2.16	-.08			
White vs. Hispanic American/Other	-5.44	2.16	-.16*			
Step 2				.48	.02	1.89
Time 1 BDI-II	.00	.12	.00			
Time 1 BAI	.60	.09	.53***			
Time 1 PSS	.14	.12	.10			
Time 1 EAT-26	.03	.08	.03			
Ethnicity						
White vs. African American	-6.06	1.71	-.23**			
White vs. Asian American	-1.43	2.23	-.04			
White vs. Hispanic American/Other	-5.19	2.15	-.15*			
Time 1 BAAS	-.06	.05	-.08			
Time 1 TMMS_C	.95	1.14	.06			
LES_num	.13	.07	.11			
Step 3				.51	.03	2.80*
Time 1 BDI-II	.09	.12	.08			
Time 1 BAI	.58	.09	.52***			
Time 1 PSS	.06	.12	.04			
Time 1 EAT-26	.01	.08	.01			
Ethnicity						
White vs. African American	-6.38	1.74	-.25***			
White vs. Asian American	-1.83	2.21	-.05			
White vs. Hispanic American/Other	-4.91	2.12	-.14*			
Time 1 BAAS	-.47	.23	-.70*			
Time 1 TMMS_C	-1.47	2.95	-.10			
LES_num	.51	.47	.44			
Time 1 BAAS X Time 1 TMMS_C	.15	.06	.71**			
Time 1 BAAS X LES_num	.00	.01	-.15			
Time 1 TMMS_C X LES_num	-.09	.12	-.28			

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , BAI = Beck Anxiety Inventory; BAAS = Belief About Appearance Scale; BDI-II = Beck Depression Inventory; EAT-26 = Eating Attitudes Test, 26-item version; LES\_num = Number of Life Events Reported Between Time 1 and Time 2; PSS = Perceived Stress Scale; TMMS\_C = Trait Meta-Mood Scale, Clarity subscale score

Table 19. (continued)

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	$R^2$	$\Delta R^2$	$\Delta F$
Step 4				.52	.01	1.82
Time 1 BDI-II	.10	.12	.09			
Time 1 BAI	.59	.09	.52***			
Time 1 PSS	.04	.12	.03			
Time 1 EAT	.02	.08	.02			
Ethnicity						
White vs. African American	-6.54	1.74	-.25***			
White vs. Asian American	-2.18	2.22	-.06			
White vs. Hispanic American/Other	-5.23	2.12	-.15*			
Time 1 BAAS	.18	.50	.19			
Time 1 TMMS_C	2.81	4.32	.18			
LES_num	1.23	.71	1.07			
Time 1 BAAS X Time 1 TMMS_C	-.03	.14	-.12			
Time 1 BAAS X LES_num	-.03	.02	-1.37			
Time 1 TMMS_C X LES_num	-.30	.19	-.93			
Time 1 BAAS X Time 1 TMMS_C X LES_num	.01	.01	1.10			

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , BAI = Beck Anxiety Inventory; BAAS = Belief About Appearance Scale; BDI-II = Beck Depression Inventory; EAT = Eating Attitudes Test, 26-item version; LES\_num = Number of Life Events Reported Between Time 1 and Time 2; PSS = Perceived Stress Scale; TMMS\_C = Trait Meta-Mood Scale, Clarity subscale score

the significant model that best predicted Time 2 BAI included Time 1 EAT-26, Time 1 BDI-II, Time 1 BAI, Time 1 PSS, ethnicity, TMMS-clarity, BAAS, LES-num, and all two-way interactions between TMMS-clarity, BAAS, LES-num. Within this model, there were main effects for Time 1 BAI, ethnicity, and BAAS, and there was a two-way interaction for BAAS X TMMS-clarity (Figure 5). Time 1 BAI was positively correlated with Time 2 BAI. Additionally, White participants had higher anxiety levels than African American and Hispanic American/Other participants<sup>6</sup>. The main effect for BAAS will not be discussed here in light of its two-way interaction with TMMS-clarity. TMMS-clarity interacted with BAAS such that high clarity and high BAAS interacted to predict higher levels of anxiety.

The second analysis (see Table 20) revealed that Time 1 TMMS-clarity did not interact with BAAS and LES-sub to predict Time 2 BAI, after controlling for ethnicity, Time 1 depression (BDI-II), BAI, disordered eating, perceived stress (PSS), and the number of life events reported to have occurred during the prospective period (LES-num), as well as all main effects and two-way interactions between TMMS-clarity, BAAS, and LES-sub. A review of the models from each of the four steps showed that the significant model associated with step 3 predicted the most amount of variance in Time 2 BAI. In other words, based on the predictors in this analysis, the significant model that best predicted Time 2 BAI included Time 1 EAT-26, Time 1 BDI-II, Time 1 BAI, Time 1 PSS, LES-num, ethnicity, TMMS-clarity, BAAS, and LES-sub, and all two-way interactions between TMMS-clarity, BAAS, LES-sub. Within this model, there were main effects for Time 1 BAI, LES-num, ethnicity, and LES-sub and there were two-way interactions for TMMS-clarity X BAAS (Figure 6) and BAAS X LES-sub (Figure 7). Time

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<sup>6</sup> Strong conclusions should not be drawn regarding the comparison between White participants and Hispanic/Other participants given the heterogeneous nature of the Hispanic/Other group. See “Demographic Information” section under “Measures” for more information.

Figure 5. Hypothesis #5d (Analysis 1). Interaction Between Time 1 Emotion Awareness (TMMS-Clarity) and Dysfunctional Appearance Beliefs (BAAS) Predicts Time 2 Anxiety (BAI)

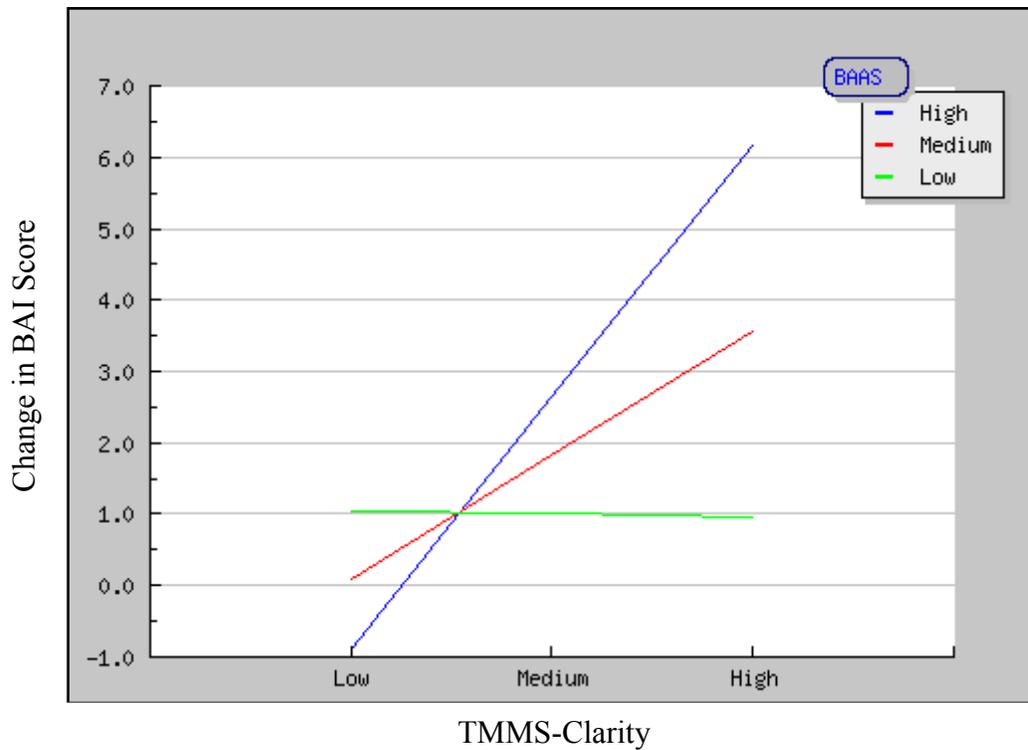


Table 20. Hypothesis #5d. Summary of Hierarchical Regression Analysis Testing the Interaction Between Time 1 Emotion Awareness, Dysfunctional Appearance Beliefs, and Subjective Negative Impact Associated with Life Events Reported Between Time 1 and Time 2 Predicting to Time 2 Anxiety(BAI), Controlling for Number of Life Events

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	<i>R</i> <sup>2</sup>	$\Delta R^2$	$\Delta F$
Step 1				.47	.47	16.67***
Time 1 BDI-II	-.06	.11	-.05			
Time 1 BAI	.61	.09	.54***			
Time 1 PSS	.12	.12	.09			
Time 1 EAT-26	.00	.07	.00			
LES_num	.14	.07	.12			
Ethnicity						
White vs. African American	-5.76	1.69	-.22**			
White vs. Asian American	-1.97	2.17	-.06			
White vs. Hispanic American/Other	-5.20	2.15	-.15*			
Step 2				.53	.06	5.88**
Time 1 BDI-II	-.07	.12	-.06			
Time 1 BAI	.59	.09	.52***			
Time 1 PSS	.08	.12	.06			
Time 1 EAT-26	.00	.07	.00			
LES_num	-.45	.16	-.39**			
Ethnicity						
White vs. African American	-6.58	1.64	-.25***			
White vs. Asian American	-2.93	2.17	-.09			
White vs. Hispanic American/Other	-5.86	2.06	-.17**			
Time 1 BAAS	-.06	.05	-.09			
Time 1 TMMS_C	.75	1.09	.05			
LES_sub	.20	.05	.59***			

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , BAI = Beck Anxiety Inventory; BAAS = Belief About Appearance Scale; BDI-II= Beck Depression Inventory; EAT-26 = Eating Attitudes Test, 26-item; LES\_num = Number of Life Events; LES\_sub = Subjective Negative Impact of Life Events; PSS = Perceived Stress Scale; TMMS\_C = Trait Meta-Mood Scale, Clarity subscale score

Table 20. (continued)

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	$R^2$	$\Delta R^2$	$\Delta F$
Step 3				.58	.05	5.43**
Time 1 BDI-II	.02	.11	.02			
Time 1 BAI	.58	.09	.52***			
Time 1 PSS	-.04	.12	-.03			
Time 1 EAT-26	-.02	.07	-.02			
LES_num	-.57	.16	-.49**			
Ethnicity						
White vs. African American	-6.43	1.61	-.25***			
White vs. Asian American	-2.87	2.09	-.08			
White vs. Hispanic American/Other	-5.71	1.98	-.17**			
Time 1 BAAS	-.35	.21	-.52			
Time 1 TMMS_C	-2.37	2.21	-.16			
LES_sub	.38	.14	1.09**			
Time 1 BAAS X Time 1 TMMS_C	.14	.05	.65*			
Time 1 BAAS X LES_sub	-.00	.00	-.42*			
Time 1 TMMS_C X LES_sub	-.02	.03	-.16			
Step 4				.59	.01	3.33
Time 1 BDI-II	.04	.11	.04			
Time 1 BAI	.59	.09	.53***			
Time 1 PSS	-.06	.12	-.04			
Time 1 EAT	-.03	.07	-.02			
LES_num	-.54	.16	-.46**			
Ethnicity						
White vs. African American	-6.65	1.60	-.23***			
White vs. Asian American	-3.57	2.11	-.10			
White vs. Hispanic American/Other	-5.83	1.96	-.17**			
Time 1 BAAS	.31	.41	.46			
Time 1 TMMS_C	2.26	3.36	.15			
LES_sub	.66	.21	1.92**			
Time 1 BAAS X Time 1 TMMS_C	-.05	.12	-.24			
Time 1 BAAS X LES_sub	-.01	.01	-1.96*			
Time 1 TMMS_C X LES_sub	-.10	.06	-.98			
Time 1 BAAS X Time 1 TMMS_C X LES_sub	.00	.00	1.40			

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , BAI = Beck Anxiety Inventory; BAAS = Belief About Appearance Scale; BDI-II = Beck Depression Inventory; EAT-26 = Eating Attitudes Test, 26-item version; LES\_num = Number of Life Events; LES\_sub = Subjective Negative Impact of Life Events; PSS = Perceived Stress Scale; TMMS\_C = Trait Meta-Mood Scale, Clarity subscale score

Figure 6. Hypothesis #5d (Analysis 2). Interaction Between Time 1 Emotion Awareness (TMMS-clarity) and Dysfunctional Appearance Beliefs (BAAS) Predicts Time 2 Anxiety (BAI)

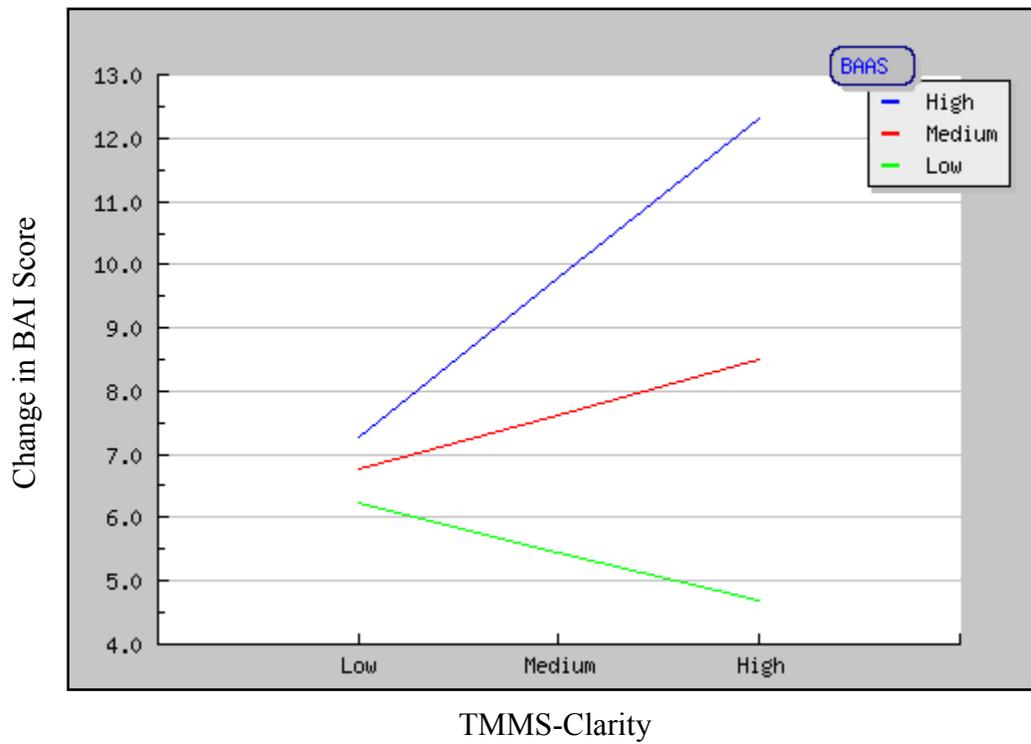
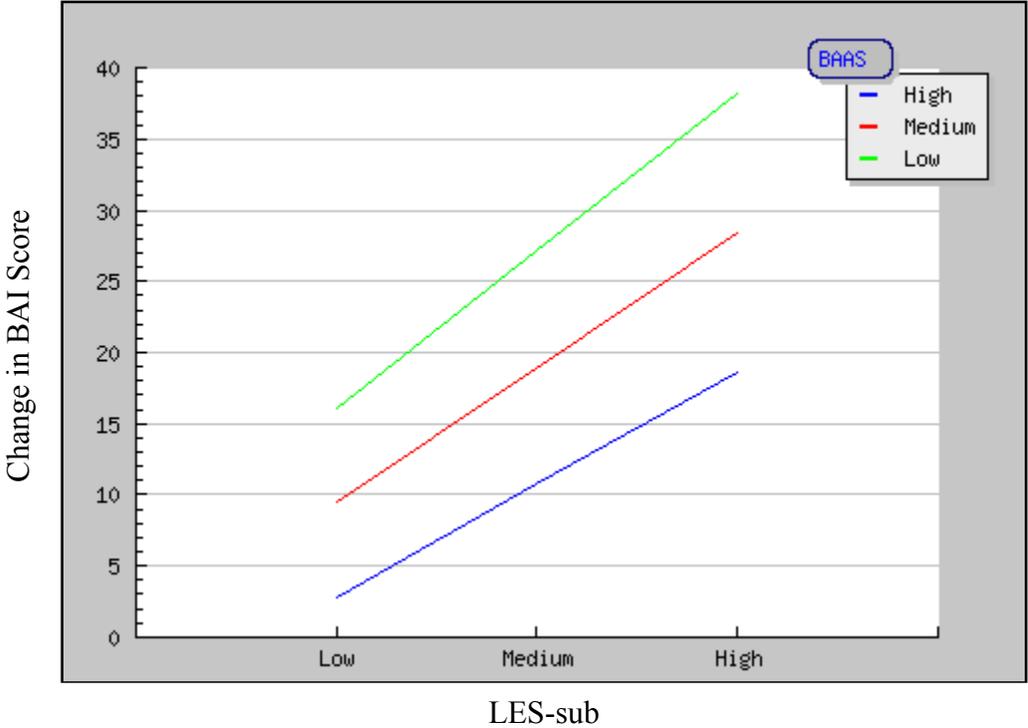


Figure 7. Hypothesis #5d (Analysis 2). Interaction Between Dysfunctional Appearance Beliefs (BAAS) and Subjective Negative Impact Associated with Life Events (LES-sub) Predicts Time 2 Anxiety (BAI)



1 BAI was positively correlated with Time 2 BAI, White participants had higher anxiety levels than African American and Hispanic American/Other participants<sup>7</sup>, and LES-num was negatively correlated with anxiety. The main effect for LES-sub will not be discussed here because of its interaction with BAAS. BAAS interacted with clarity such that high BAAS and high clarity predicted higher levels of anxiety. Additionally, BAAS interacted with LES-sub such that high LES-sub and low BAAS predicted higher levels of anxiety.

*Hypothesis #6: The relation between emotion awareness and disordered eating would be mediated by one's ability to repair/manage her mood, both concurrently and over time.*

Baron and Kenny's (1986) four step test of mediation was used to assess whether one's ability to manage mood, measured by the repair subscale from the TMMS (TMMS-repair), mediated the relation between emotion awareness and disordered eating. Step 1 revealed that Time 1 TMMS-clarity and Time 1 EAT-26 were negatively correlated,  $r = -.19, p < .01$ . Step 2 revealed that Time 1 TMMS-clarity and Time 1 TMMS-repair were positively correlated,  $r = .44, p < .01$ . Step 3 revealed that when Time 1 TMMS-clarity and TMMS-repair were entered in a single step regression analysis, the overall model was significant, but neither TMMS-clarity nor TMMS-repair individually predicted Time 1 EAT-26 (see Table 21). Because it is necessary for the proposed mediator (TMMS-repair) to significantly relate to the criterion (EAT-26) while the other predictor (TMMS-clarity) is controlled, step 4 was not conducted. In other words, the necessary requirements for mediation were not met; TMMS-repair did not mediate the relation between TMMS-clarity and EAT-26. Similarly, at Time 2, the requirements for mediation were not met as TMMS-repair did not relate to Time 2 EAT-26 scores,  $r = -.13, p = .10$ . In sum,

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<sup>7</sup> Strong conclusions should not be drawn regarding the comparison between White participants and Hispanic/Other participants given the heterogeneous nature of the Hispanic/Other group. See "Demographic Information" section under "Measures" for more information.

TMMS-repair did not mediate the relation between TMMS-clarity and EAT-26 at either Time 1 or Time 2.

Table 21. Hypothesis #6. Regression Analysis Testing the Ability of Time 1 Emotion Awareness and Mood Repair to Predict Time 1 Disordered Eating (EAT-26)

Step and predictor variable	<i>B</i>	<i>SEB</i>	$\beta$	<i>R</i> <sup>2</sup>	$\Delta R^2$	$\Delta F$
Step 1				.05	.05	4.45*
TMMS_C	-2.05	1.18	-.14			
TMMS_R	-1.43	1.01	-.11			

\**p* < .05, \*\**p* < .01, \*\*\**p* < .001, TMMS\_C = Trait Meta-Mood Scale, Clarity subscale score; TMMS\_R = Trait Meta-Mood Scale, Mood Repair subscale score

## CHAPTER 4

### DISCUSSION

Emotions provide us with invaluable information about how to respond in specific situations. They assist us in decision making skills, prepare us for quick motor actions, and assist us in social relationships by allowing us to understand others and scripting social situations (Gross, 1998; Mayer, Salovey, & Caruso, 2004). As such, it is unsurprising that numerous researchers have found links between the ability to recognize, label, or differentiate one's emotions and/or one's ability to describe her/his emotions to others (emotion awareness) and psychological health.

Over 40 years ago, researchers began to theorize about the importance of emotion awareness in disordered eating. Since that time, extensive empirical evidence to support the relation between poor emotion awareness and disordered eating from research using both clinical and sub-clinical samples has emerged. Much of this past research, however, has been riddled with methodological limitations that leave one questioning how relevant the role of emotion awareness in disordered eating actually is. The present study attempted to answer this question by addressing some of the limitations inherent in past research as well as examining whether emotion awareness interacted with other known risk factors to predict disordered eating. Whereas the results of this study supported some of the main hypotheses, other findings suggest that emotion awareness is not specific to disordered eating, but rather is relevant to psychological distress more generally. This section will briefly summarize the study's results, while highlighting and discussing some of the more interesting findings. Additionally, it will review the strengths and limitations of the study as well as provide suggestions for future research.

### *Summary of Hypotheses and Results*

This study's most basic hypothesis, that emotion awareness would be stable over time, was supported. Even after taking into account the influence of depression and anxiety, emotion awareness was relatively stable over a 3-month prospective period. This finding lends support to the theory that emotion awareness is a stable, trait-like construct (Parker & Taylor, 1997), and is consistent with the results from several longitudinal studies that also have supported its stability over time (Martinez-Sanchez, Ato-Garcia, Adam, Medina, & España, 1998; Mikolajczak & Luminet, 2006; Pinard, Negrete, Annable, & Audet, 1996; Saarijärvi, Salminen, & Toikka, 2001; Salminen, Saarijärvi, Aäirelä, & Tamminen, 1994).

Less straight-forward were the results from analyses testing the central hypothesis of this study, that emotion awareness would relate to disordered eating concurrently and over time. Emotion awareness, as measured by the Trait Meta-Mood Clarity Subscale, was related to disordered eating cross-sectionally, however, it was not related to disordered eating prospectively nor was it related to disordered eating once the effects of depression and anxiety were controlled. Furthermore, emotion awareness, as measured by the Levels of Emotional Awareness Scale, a more behaviorally based measure, was not related to disordered eating concurrently or prospectively. These results were consistent with some of those found in previous studies and inconsistent with others.

The cross-sectional relation found between self-reported emotion awareness and disordered eating was consistent with results from several previous research studies (e.g., De Berardis et al., 2007; Gilboa-Schechtman, Avnon, Zubery, & Jeczmiem, 2006; Kessler, Schwarze, Filipic, Traue, & Wietersheim, 2006; Markey & Vander Wal, 2007; Sim & Zeman, 2004; Sim & Zeman, 2006). However, the finding that the relation between emotion awareness

and disordered eating completely disappeared after controlling for depression and anxiety was consistent with the results of some past research studies (Gilboa-Schechtman et al., 2006), but not with others (De Berardis et al., 2007; Jimerson et al., 1994; Markey & Vander Wal, 2007; Montebanocci et al., 2006; Sim & Zeman, 2006; Zonneville-Bender et al., 2004a). Interestingly, this study's finding, that the relation between emotion awareness and disordered eating disappeared when depression was controlled, contradicted the result found by De Berardis et al. (2007) who used a very similar undergraduate sample. Different measures might account for this contradiction as De Berardis et al. (2007) used the Toronto Alexithymia Scale, although this is unlikely given the strong correlation between the TAS and TMMS clarity subscale previously reported (e.g.,  $r = .76$ ; Lumley, Gustavson, Partridge, & Labouvie-Vief, 2005).

Comparing the prospective results from this study to those from past research proves more difficult. Other than a handful of pre/post intervention studies, no other study has examined the prospective relation between emotion awareness and disordered eating. In studies that have examined changes in emotion awareness as a result of treatment, researchers found more time intensive interventions (e.g., inpatient and day hospitalization programs) led to decreases in disordered eating and improved emotion awareness, as assessed by the Toronto Alexithymia Scale (Becker-Stoll, & Gerlinghoff, 2004; de Groot et al., 1995; Sexton et al., 1998; Subic-Wrana, Bruder, Thomas, Lane, & Köhle, 2005), but not as assessed by the Levels of Emotional Awareness Scale (Subic-Wrana et al., 2005). However, in the studies above that examined the impact of depression and anxiety on changes in emotion awareness, researchers found that, after controlling for changes in depression (Sexton et al., 1998) and anxiety and general distress (Subic-Wrana et al., 2005), pre/post changes in emotion awareness were no longer significant. In studies that examined less intensive forms of treatment (e.g., outpatient group therapy,

medication treatment), two found decreases in disordered eating over time, but not improved emotion awareness (Iancu et al., 2006; Shiina et al., 2005), whereas one found baseline emotion awareness predicted treatment outcome 3 years later independent of the effects of depression (Speranza et al., 2007). Additionally, in a study examining the effect of weekly dissonance-based intervention groups in a non-clinical undergraduate sample, Mitchell et al. (2007) found the treatment led to both decreases in disordered eating and improved emotion awareness. Thus, this study's finding that emotion awareness did not relate prospectively to disordered eating was consistent with the results of two of the four longitudinal studies examining the impact of less intensive forms of treatment on emotion awareness as well as the findings from studies examining more intensive treatments indicating that the relation between changes in emotion awareness and disordered eating disappeared after controlling for depression and anxiety.

Comparing the finding that emotion awareness, as measured by the Levels of Emotional Awareness Scale, was not related to disordered eating to results from other studies is also somewhat difficult because only two studies have used this measure to study disordered eating. In one study, researchers found individuals with eating disorders had *higher* (i.e. better emotion awareness) levels of emotion awareness relative to individuals with other psychiatric disorders, such as anxiety disorders and somatic disorders (Subic-Wrana et al., 2005), but they did not include a control group. Additionally, they found no pre/post intervention changes on the LEAS in the eating disorder group. In the other study, researchers found individuals with eating disorders had lower LEAS scores relative to normal control individuals (Bydlowski et al., 2005) and that their LEAS scores were not correlated with depression or anxiety. Thus, the results of this study were consistent with those finding no pre/post intervention changes in the LEAS, but they were inconsistent with those from a study that compared individuals with eating disorders to

normal control individuals. Given that Bydlowski et al. (2005) used a clinical sample that was younger in age (eating disorder group age:  $M = 16.9$ ; normal control group age:  $M = 19.3$ ), it is possible that the results of this study differed in part because of sample differences.

The next hypothesis was exploratory and concerned the specificity of emotion awareness to disordered eating; specifically, this study hypothesized that emotion awareness would have a more specific relationship (i.e. larger correlation) with disordered eating than with depression and anxiety. The results did not support this hypothesis. In fact, this study found evidence for the opposite effect- emotion awareness had significantly larger relationships with depression and anxiety than with disordered eating. Past studies have reported correlations between emotion awareness and disordered eating (e.g.,  $r$ s ranging from absolute value of 0.17 to 0.46; Laquatra & Clopton, 1994; Quinton & Wagner, 2005; De Berardis et al., 2007; Kiyotaki & Yokoyama, 2006; Gilboa-Schechtman et al., 2006; Sim & Zeman, 2005), emotion awareness and depression (e.g.,  $r$ s ranging from absolute value of 0.20 to 0.56; Espina Eizaguirre et al., 2004; Hintikka, Honkalampi, Lehtonen, Viinamaki, 2001; Extremera & Fernandez-Berrocal, 2006; Saarijarvi, Salminen, & Toikka, 2001; Salovey, Stroud, Woolery, & Epel, 2002), and emotion awareness and anxiety (e.g.,  $r$ s ranging from absolute value of 0.28 to 0.49; Espina Eizaguirre et al., 2004; Extremera & Fernandez-Berrocal, 2006; Marchesi, Brusamonti, Maggini, 2000; Salovey, Stroud, Woolery, & Epel, 2002), but none of these studies have statistically compared the differences between these correlations within the same sample. Thus, this result cannot be directly compared easily to results from past studies.

In addition to examining the specificity of emotion awareness to disordered eating versus depression and anxiety, this study also tested the hypothesis that emotion awareness would uniquely relate to disordered eating after taking into account emotional avoidance and fear of

emotions. The results did not support this hypothesis; emotion awareness was not related to disordered eating concurrently or prospectively once the effects of emotional avoidance and fear of emotions were controlled. Because individuals may confound their clarity of emotion with their tendency to experience or avoid emotions, taking emotional avoidance and fear of emotions into account is vital to understanding emotional dysfunction in disordered eating. Although some researchers have found support for the role of reluctance to express emotions in disordered eating (Quinton & Wagner, 2005; Sim & Zeman, 2004), no one to date has examined the roles of emotional avoidance and fear of emotions. Thus, these results cannot be compared to results from other studies. An important follow-up to this finding involved examining whether emotional avoidance and fear of emotions related to disordered eating, independent of emotion awareness. Similar to the results with emotion awareness as a predictor, after controlling for depression and anxiety, emotional avoidance and fear of emotions were not related to disordered eating either.

Another hypothesis tested was whether life events or stress and dysfunctional appearance beliefs, two empirically supported risk factors for disordered eating, would moderate the relation between emotion awareness and disordered eating, both concurrently and over time. Specifically, this study hypothesized that when a girl is under high stress, her psychological resources are tested, and the need to engage in emotion regulation is heightened. If her ability to engage in emotion regulation is limited due to poor emotion awareness, and she holds dysfunctional appearance beliefs, she will be more likely to misattribute negative affect to appearance (versus the actual stressor), and thus engage in disordered eating. The results did not support two-way or three-way moderation effects. At both Time 1 and Time 2, and prospectively, life events and stress, and dysfunctional appearance beliefs did not interact with emotion awareness to predict

disordered eating, after controlling for depression and anxiety. Although several studies have found support for the individual relations between disordered eating and emotion awareness, stress, and dysfunctional appearance beliefs, this is the first study to test moderators of the relation between emotion awareness and disordered eating. Thus, this finding cannot be compared to results from other studies. In addition to testing whether life events and stress and dysfunctional appearance beliefs moderated the relation between emotion awareness and disordered eating, this study examined whether these predictors interacted with emotion awareness to predict depression and anxiety, with the intention of comparing the effects to those predicting disordered eating. Contrary to the results using disordered eating as a criterion variable, there were some main effects and two-way interactions found in these analyses. This set of findings highlights the lack of specificity found in this study for the relation between emotion awareness and disordered eating and is consistent with the relations found in past research between emotion awareness and stress and coping (e.g., Gohm, Corser, & Dalsky, 2005; Salovey et al., 2002; Slaski & Cartwright, 2003), and between dysfunctional attitudes and negative affect (Alloy et al., 2000; Alloy et al., 1999).

The last hypothesis tested in this study was that the ability to repair one's mood, as measured by the TMMS repair subscale, would mediate the relation between emotion awareness and disordered eating. The results did not support a mediation model. At Time 1, TMMS repair was negatively correlated with disordered eating, but it was not correlated with disordered eating at Time 2. Additionally, at Time 1, when emotion awareness was controlled, mood repair was no longer significantly related to disordered eating. The finding at Time 1 was consistent with previous research. For example, Gilboa-Schechtman et al. (2006) found mood repair negatively correlated with disordered eating. They did not test mood repair as a mediator of emotion

awareness, but they did find that after controlling for depression and anxiety, the relation between mood repair and disordered eating disappeared.

### Key Findings

The most notable finding in this study involved the lack of specificity of emotion awareness to disordered eating versus depression and anxiety. Emotion awareness had significantly larger correlations with depression and anxiety than it did with disordered eating; emotion awareness predicted depression and anxiety prospectively, but it did not predict disordered eating over time; and when depression and anxiety were statistically controlled, the cross-sectional relations between emotion awareness and disordered eating completely disappeared. Furthermore, emotion awareness interacted with life events/stress and dysfunctional appearance beliefs, two empirically supported risk factors for disordered eating, to predict depression and anxiety, but not disordered eating. Taken together, these findings suggest that emotion awareness does *not* have a unique relation to disordered eating.

Consistent with these findings, Gilboa-Schechtman et al. (2006) argued that eating disorders are a subtype of emotional disorders; thus, emotional deficits experienced by individuals with eating disorders are not specific to eating pathology, but rather to the underlying symptoms of depression and anxiety that they experience. Supporting their “distress-mediation hypothesis”, in one study, they found evidence that depression and anxiety fully mediated group differences in emotion awareness between those with eating disorders and normal control individuals. Given the meditational evidence from Gilboa-Schechtman et al.’s (2006) research and the lack of specificity found for the relation of emotion awareness to disordered eating in the current study, this investigation included some unplanned mediation analyses. The results of these tests did indeed suggest that depression and anxiety fully mediated the relation between

emotion awareness and disordered eating (see Appendix A), lending support to the distress-mediation hypothesis of Gilboa-Schechtman et al. (2006). This finding could have important clinical implications. For instance, it may suggest that emotional deficits associated with disordered eating, such as poor emotion awareness, are related to depression and anxiety and not necessarily to eating pathology. In this case, treatment targeting the underlying depression and anxiety may improve emotional deficits and potential impairment related to these deficits, or alternatively, specifically targeting emotional deficits, like poor emotion awareness, may prevent or alleviate symptoms of depression and anxiety.

Another interesting finding concerning the specificity of emotion awareness to disordered eating came from tests examining the associations between emotional avoidance and fear of emotions and disordered eating. Similar to the results from tests controlling depression and anxiety, the relation between emotion awareness and disordered eating disappeared when emotional avoidance and fear of emotions were controlled. This finding, along with the evidence for depression and anxiety serving as mediators of the relation between emotion awareness and disordered eating, highlights the importance of better clarifying the nature of emotional dysfunction involved in disordered eating. In line with these findings, it appears that emotional distress and emotional avoidance and fear of emotions play more central roles in disordered eating than does emotion awareness.

Although not a central component of this study, the interactions found predicting depression and anxiety were noteworthy. Specifically, low emotional clarity interacted with high subjective and objective stress to predict depression prospectively, high emotional clarity interacted with high dysfunctional appearance beliefs to predict depression and anxiety prospectively, and high subjective stress interacted with low dysfunctional appearance beliefs to

predict anxiety prospectively. The finding that low emotional clarity interacted with high stress to predict depression is consistent with past research that has found higher emotional clarity to be associated with more adaptive stress responses (Salovey et al., 1995; Salovey et al., 2002). This finding is also consistent with theories that emphasize the importance of emotions for providing vital information for responding and coping well with specific situations (Gross, 1998; Mayer, Salovey, & Caruso, 2004). The finding that *high* clarity interacted with high dysfunctional appearance beliefs to predict depression and anxiety was initially surprising because high clarity is usually associated with greater health and well-being. With further review, however, this finding is not completely unforeseen and actually suggests the importance of simultaneously examining the roles of both cognitive and emotional processes in depression and anxiety. Research has firmly established the role of dysfunctional attitudes in negative affect (e.g., Alloy et al., 2000; Alloy et al., 1999). It may be that having high emotion awareness leads one to be particularly aware of negative affect related to the activation of dysfunctional beliefs, and thus, more likely to report and/or ruminate over these experiences. A more thorough test of this hypothesis would therefore include an analysis of how individuals cope with dysfunctional attitudes. For instance, if one has high emotion awareness and high dysfunctional attitudes, but has good coping skills, s/he may not be at greater risk for experiencing negative affect when compared to someone with low dysfunctional attitudes or poor coping abilities. The last finding, that high subjective stress and *low* dysfunctional appearance beliefs predicted higher anxiety, is somewhat perplexing. As previously mentioned, typically, dysfunctional attitudes relate to greater negative affect, not less. Additionally, the zero order correlation between dysfunctional appearance beliefs and anxiety was positive in nature. Therefore, because an explanation for this finding is not readily apparent, replication of this effect in other samples is warranted before the

finding is afforded significant consideration.

In addition to the key findings concerning the interactions predicting depression and anxiety and the specificity of emotion awareness to disordered eating, the lack of correlations between the LEAS measure and disordered eating, depression, and anxiety was also notable. The LEAS Total score, in fact, did not correlate with any measures in the entire study. The scoring procedure was straightforward and inter-rater reliability was quite high for this measure, making it unlikely that this occurred due to scoring errors. Because the LEAS measure was the only non self-report measure in this study, its failure to predict anything raised the question of whether self-report measures of emotion awareness used in disordered eating research are actually leading to spurious correlations and/or whether the LEAS is an invalid measure.

A review of studies that have examined emotion awareness in disordered eating using non self-report data suggests it is unlikely that self-report measures of emotion awareness are producing spurious results. The vast majority of studies examining the role of emotion awareness in disordered eating have relied heavily on self-report measures, but there have been a few studies that have found that individuals with eating disorders have lower emotion awareness than normal control individuals on non self-report measures. Specifically, Jimerson et al. (1994) found that individuals with eating disorders had lower levels of emotion awareness relative to normal controls on the Beth Israel Questionnaire (BIQ), an interview based measure of alexithymia; Sim and Zeman (2004) found that, relative to normal control individuals, adolescents with bulimia took longer to label emotions associated with self-generated negative situations and used less specific emotional terms to describe their feelings on the Access the Emotions Interview (AEI); and Bydlowski et al. (2005) found that individuals with eating disorders had lower emotion awareness relative to normal controls on the LEAS.

There is, however, evidence to suggest that the LEAS may have poor validity or unique predictive validity. For example, in a large sample of young adults, Lumley et al. (2005) found that several different forms of emotion awareness measures (e.g., behaviorally based, self-report, interview-based) correlated with one another in the predicted manner, but none correlated with the LEAS, and several other studies have found the LEAS to have no or very low correlations with self-report emotion awareness measures (Lane, Sechrest, & Riedel, 1998; Lundh et al., 2002; Subic-Wrana et al., 2002; Suslow et al., 2000). Furthermore, other researchers have found that the LEAS generated inconsistent results within similar samples. For instance, using the LEAS, Levine, Marziali, and Hood (1997) found individuals with borderline personality disorder to have lower emotional awareness relative to normal control individuals, whereas Wagner (1996) did not. Similarly, Bydlowski et al. (2005) found individuals with eating disorders to have lower levels of emotion awareness relative to normal controls, whereas the current study did not find a link between emotion awareness, as measured by the LEAS, and disordered eating. Based on this information, one could easily draw the conclusion that the LEAS has questionable validity; however, there are studies in which the LEAS has demonstrated an ability to predict phenomena, such as the participants' ability to identify emotions and brain activation in response to emotional stimuli (Lane et al., 1995, 1996, 1998; Suslow, Junghanns, Donges, & Arolt, 2001). Some researchers (e.g., Lumley et al., 2005) consequently have argued that the LEAS may have some unique predictive validity that is different from emotion awareness.

Another interesting finding in this study involved the low correlation between disordered eating and mood repair at Time 1 and the lack of a correlation between disordered eating and mood repair at Time 2. A large body of research supports the relationship between coping skills and disordered eating (Bloks et al., 2001; Christiano, & Mizes, 1997; Janzen et al., 1992; Nagata

et al., 2000; Neckowitz & Morrison, 1991; Soukop et al., 1990; Troop et al., 1998; Troop et al., 1994; Yager et al., 1995) and research has demonstrated a relation between the TMMS mood repair subscale and disordered eating, as measured by the EAT-26 (e.g.,  $r = -.46$ ; Gilboa-Schechtman et al., 2006) as well as TMMS mood repair and general psychological functioning (e.g., Salovey et al., 2002). Thus, this finding was unexpected. It is not entirely clear why mood repair did not play a bigger role in this study. It may be that the TMMS mood repair subscale predicts general distress better than disordered eating. Indeed, it predicted depression and anxiety cross-sectionally at Time 1 and Time 2 as well as prospectively with relatively large effects. However, the lack of a consistent correlation between mood repair and disordered eating also may have resulted from the TMMS mood repair subscale's ability to fully capture mood repair skills. Using a more thorough coping measure may have better illuminated one's ability to improve her mood and could have possibly contributed to a better test of mediation as well.

### *Strengths and Limitations*

The most notable strength of this study was its design. It was the first non-intervention based investigation to examine the relationship between emotion awareness and disordered eating over time. Examining this association prospectively provided the ability to test whether emotion awareness actually led to disordered eating, or conversely, whether it was simply a correlate of disordered eating. A second notable strength was its examination of the specificity of emotion awareness to disordered eating versus emotion distress (depression and anxiety) and emotional avoidance and fear of emotions. Although some past studies have examined the relationship between emotion awareness and disordered eating after controlling for depression and anxiety, none has tested differences in correlation sizes between emotion awareness and disordered eating and depression and anxiety, none has tested the relationship between emotion

awareness and disordered eating after controlling for emotional avoidance and fear of emotions, and none has tested all of these predictors prospectively.

Another strength of this study was the ethnic diversity and size of the sample as well as the range of eating pathology represented. There is evidence that disordered eating varies in different ethnic groups (e.g., Wildes et al., 2001) and both severe and milder forms of disordered eating are associated with psychological distress and medical problems. Thus, examining predictors of disordered eating in a large, ethnically diverse sample using a dimensional conceptualization of eating pathology may have allowed an enhanced ability to detect true relationships between variables that may generalize to the wider population.

A final strength of this study was its examination of a mediator and moderators of the association between emotion awareness and disordered eating. To date, over 35 studies have examined the relationship between emotion awareness and disordered eating. Within these studies, only Gilboa-Schechtman et al. (2006) examined mediators (depression and anxiety) of the relationship between emotion awareness and disordered eating and no one has examined moderators of this relationship. By examining mediators and moderators of this association, this study allowed for a more precise understanding of how emotion awareness related to disordered eating. Obtaining a more thorough understanding of this relationship provides vital information for future research as well as potential intervention designs.

Despite these strengths, this study also had limitations. The most notable limitation was its reliance on self-report measures. Although this study included the LEAS, a more behaviorally based measure of emotion awareness, all of the other measures were self-report in nature, with the participants being the sole informants of their experiences. Self-report measures rely on participants' perceptions of themselves. As they are not as objective as behavioral and interview

based measures, participants may over or underestimate phenomena due to errors in perception. With respect to the emotional experiences examined in this study (e.g., emotion awareness, emotional avoidance, fear of emotions, depression, anxiety), it could be argued that using self-report measures was the best method to tap into participants' subjective experiences. However, it was possible that participants' perceptions of their emotional experiences, including their abilities, mood states, and avoidance tendencies, differed from how they actually presented or what they actually did. For instance, a participant may have endorsed poor emotion awareness, but may have been quite clear about her emotions relative to others. Thus, assessing emotional processes through multiple methods, such as interviews, diary reviews, behavioral tasks, etc., may have provided clearer, less error prone, data. With respect to measuring disordered eating, some researchers (e.g., Rosen, Compas, & Tacy, 1993) have argued that self-report questionnaires of eating disorder symptoms are limited in their ability to differentiate between eating attitudes and behaviors that are normative for a weight conscious culture and the more extreme attitudes and behaviors associated with eating disorders. However, in contrast to this contention, researchers (e.g., Fairburn & Beglin, 1994) have found similar results for disordered eating when comparing self-report measures and interview based measures of eating pathology, and still, others (e.g., Keel, Crow, Davis, & Mitchell, 2002) have argued that participants may actually be more open and honest on self-report measures of disordered eating because of the anonymity associated with this type of measure. Thus, given the shame and lack of disclosure often associated with disordered eating (e.g., Swan & Andrews, 2003), along with evidence for the validity of self-report measures of disordered eating, this study's use of the EAT-26 was likely not a significant weakness. Nonetheless, it is still possible that assessing disordered eating through multiple methods may have improved the ability of this study to fully and clearly

capture the construct of disordered eating.

Other limitations of this study related to the sample and the length of the prospective period. Although the sample was ethnically diverse, it was composed solely of undergraduate females. Thus, the results of this study may not generalize to the overall population. Additionally, this study's prospective design improved upon past research, but the length of the prospective period was relatively short. It may be that the relationship between emotion awareness and disordered eating would be better captured by examining these constructs over a longer prospective period and through multiple time points.

### *Clinical Implications*

The findings from this study have some important clinical implications. In particular, they emphasize the importance of the association between depression and anxiety and disordered eating. Depression and anxiety related to disordered eating both concurrently and prospectively and they fully mediated the association between emotion awareness and disordered eating. Several etiological models have emphasized the importance of the role of negative affect in disordered eating. For instance, the transdiagnostic cognitive-behavioral model of anorexia and bulimia (Fairburn et al., 2003) suggests that difficulty tolerating negative mood states leads to disordered eating behaviors; the affect regulation model of bulimia (Deaver et al., 2003) suggests individuals engage in bingeing behaviors to control negative affect; the anxiety reduction model of bulimia (Rosen & Leitenberg, 1982) suggests individuals purge in order to escape anxiety; and the interpersonal model of bulimia (Fairburn, 1997) suggests that individuals engage in binge eating to cope with negative affect arising from interpersonal conflict. Further, treatments based on these models have demonstrated efficacy in reducing symptoms of disordered eating (e.g., Fairburn & Wilson, 2002; Garner et al., 1993; Wilson, 1999). None of these models,

however, specifically addresses the role of emotion awareness. It may be that improving emotion awareness could lead to reductions in depression and anxiety, and subsequently, reductions in disordered eating. Consistent with this, treatments for disordered eating that have applied dialectical behavior therapy skills training, which include improving emotion awareness, have been shown to effectively reduce distress and disordered eating (Chen, Matthews, Allen, Kuo, & Linehan, 2008; Palmer et al., 2003). Thus, this study suggests that interventions for disordered eating may benefit from including skills aimed at improving emotion awareness. Such skills may alleviate negative affect, possibly leading to a reduction of disordered eating behaviors.

The results of this study also have implications for the treatment of depression and anxiety, separate from disordered eating. In particular, they suggest that treatments that target emotion awareness without also addressing possible dysfunctional appearance beliefs may be counter-productive. For example, such treatments could lead one to become more aware of negative emotions arising from dysfunctional appearance beliefs, and, without the use of approaches to modify such dysfunctional beliefs, these negative emotions could increase or perpetuate depression and anxiety. It is also notable that dysfunctional appearance beliefs played a role in depression and anxiety, independent of disordered eating. This finding contrasts with Beck's cognitive content-specificity hypothesis (Beck, 1967, 1987), which suggests that dysfunctional appearance beliefs would likely be unique to disordered eating and, in turn, emphasizes the importance of assessing a range of dysfunctional beliefs when treating depression and anxiety. Additionally, the results of this study emphasize the potential importance of emotion awareness as a moderator of the relation between stress and depression. Treatments that help improve one's emotion awareness may lead to resilience in the face of high stress. Although determining the precise mechanism for this would require further research.

### *Conclusion and Future Research Directions*

The results of this study suggest that emotion awareness does not play a significant role in disordered eating. Specifically, it did not relate to disordered eating prospectively, it did not relate to disordered eating once the effects of depression, anxiety, and emotion avoidance and fear of emotions were taken into account, it did not interact with other known risk factors for disordered eating, and its cross-sectional correlations with disordered eating were fully mediated by depression and anxiety.

The results of this study were consistent with some of those from past research and inconsistent with others. To replicate these findings and reconcile differences from past research, as well as extend the research, future research should use more advanced and thorough designs. At this point in time, another cross-sectional study, solely using self-report measures of emotion awareness, would likely not add to this research area. Instead, this study suggests that researchers examining this topic use multiple methods of assessment, such as self-report, daily diary recordings, interviews, behavioral measures, and input from informants, examine these constructs over time, and examine other emotional processes (e.g., depression, anxiety, emotional avoidance, fear of emotions, ambivalence about expressing emotions, etc.) in addition to emotion awareness. Additionally, this study suggests that researchers conducting intervention studies assess emotion awareness and other emotional processes regularly (i.e., not just pre/post intervention) and in relation to specific intervention methods to further explore the clinical implications or lack thereof improving emotion awareness.

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## APPENDIX A

### UNPLANNED MEDIATION ANALYSES

#### *Does Emotional Distress Mediate the Relation between Emotion Awareness and Disordered Eating?*

Given the relationships between emotion awareness and depression and emotion awareness and anxiety, this study tested whether depression and anxiety actually mediate the association between emotion awareness and disordered eating. Using Baron and Kenny's (1986) four step test of mediation, I ran two analyses, one assessing the potential mediating role of depression, and the other testing the potential mediating role of anxiety.

#### *Does Depression Mediate the Relation Between Emotion Awareness and Disordered Eating?*

Step 1 revealed that Time 1 TMMS-clarity and Time 1 EAT-26 are negatively correlated,  $r = -.19, p < .05$ . Step 2 revealed that Time 1 TMMS-clarity and Time 1 BDI-II are negatively correlated,  $r = -.51, p < .001$ . Step 3 revealed that when Time 1 TMMS-clarity and BDI-II are entered in a single step regression analysis, the overall model is significant and the only significant predictor is BDI-II,  $\beta = -.24, t(184) = 2.87, p < .01$ . Finally, Step 4 revealed that when Time 1 BDI-II is controlled by entering it first in hierarchical regression analysis, Time 1 TMMS-clarity no longer related to Time 1 EAT-26; however, Time 1 BDI-II did,  $\beta = -.24, t(184) = 2.87, p < .01$  and the overall model was significant,  $R^2 = .08, F(1, 184) = 7.67, p < .01$ . As Time 1 TMMS-clarity no longer related to Time 1 EAT-26 when Time 1 BDI-II scores are controlled, there is evidence that depression fully mediates the relationship between emotion awareness and disordered eating.

#### *Does Anxiety Mediate the Relation Between Emotion Awareness and Disordered Eating?*

Step 1 revealed that Time 1 TMMS-clarity and Time 1 EAT-26 are negatively

correlated,  $r = -.19, p < .05$ . Step 2 revealed that Time 1 TMMS-clarity and Time 1 BAI are negatively correlated,  $r = -.40, p < .001$ . Step 3 revealed that when Time 1 TMMS-clarity and BAI are entered in a single step regression analysis, the overall model is significant and the only significant predictor is BAI,  $\beta = .28, t(184) = 3.73, p < .001$ . Finally, Step 4 revealed that when Time 1 BAI is controlled by entering it first in hierarchical regression analysis, Time 1 TMMS-clarity no longer relates to Time 1 EAT-26, however Time 1 BAI does,  $\beta = .28, t(184) = 3.73, p < .001$  and the overall model is significant,  $R^2 = .10, F(1, 184) = 10.61, p < .001$ . As Time 1 TMMS-clarity no longer relates to Time 1 EAT-26 when Time 1 BAI scores are controlled, there is evidence that anxiety fully mediates the relation between emotion awareness and disordered eating.