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Examining the Potential Interactions of Expectancies and Disordered Eating Behavior

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by

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ABSTRACT

Expectancy models (i.e., cognitions regarding perceived consequences of behavior) have been applied to eating behaviors to understand the development and maintenance of disordered eating. The two primary categories of expectancies, thinness/restriction expectancies (i.e., perceived rewards from being thin or restricting one's diet) and negative affect reduction expectancies (i.e., the belief that eating will reduce negative emotions) have largely been studied in isolation, despite evidence that individuals can endorse both sets of expectancies simultaneously. To address this, the current study proposed an interactive model of thinness/restriction and eating to manage negative affect expectancies and disordered eating behavior. Specifically, it was hypothesized that for individuals endorsing higher levels of one expectancy, greater endorsement of the second category of expectancies would be more strongly associated with more dietary restriction, binge eating, and compensatory behaviors than for individuals endorsing only one category of expectancies. A total of 406 university students (54.2% female; 68.8% non-Hispanic White; M_{BMI} = 25.05) completed measures of thinness/restriction expectancies, eating to manage negative affect, dietary restriction, and binge eating and compensatory behaviors. A linear regression (dietary restriction) and negative binomial regressions (binge eating, compensatory behaviors) revealed no statistically significant interactions of thinness/restriction and eating to manage negative affect expectancies. Main effects of expectancies on disordered eating were observed, and there was evidence to support

future tests of mediation. Findings support the inclusion of expectancies in indices of cognitive recovery from eating disorders and suggest that expectancies may hold value in prevention and intervention efforts.

CHAPTER ONE:

INTRODUCTION

Disordered eating is highly prevalent among young adults (Harrer et al., 2020), with an estimated 2-4% of young adults having eating disorders (Hudson et al., 2007). The college years are especially critical, as this transitional period is the peak onset for various behavioral and mental disorders (Auerbach et al., 2016). Disordered eating among college students manifests in a variety of maladaptive attitudes and behaviors, including dietary restraint (Schaumberg & Anderson, 2016), binge eating (Craven & Fekete, 2019), purging (Anderson et al., 2005), body dissatisfaction (Harrer et al., 2020), compulsive exercise (Dittmer et al., 2018), and preoccupation with weight and body shape (Harrer et al., 2020). Because disordered eating is such a prevalent and pervasive issue, it is crucial to identify specific risk factors and predictors of disordered eating, especially in samples of young adults, in order to develop effective preventive interventions.

Increasingly, models of addiction and alcohol are being applied to disordered eating behaviors. One risk factor that is well-established in the alcohol field, but is comparably understudied in the disordered eating literature, is expectancies (Goldman et al., 1999). Expectancies involve the perceived outcomes of behavior (Bolles, 1972), and they can be influenced by previous experiences, cultural norms, and observations of one's own and others' behavioral consequences (Miller et al., 1990). Despite evidence of associations between

expectancies and various manifestations of disordered eating, few models within the disordered eating literature include expectancies as a risk factor for, or predictor of, disordered eating behaviors. The purpose of this thesis is to investigate two categories of expectancies highlighted in the disordered eating literature (i.e., eating expectancies, thinness/restriction expectancies) and their associations with various behaviors along the spectrum of disordered eating.

Expectancy Research Overview

Expectancies are defined as the perceived outcomes or consequences of a specific behavior (Bolles, 1972) and can be used to assess risk for problematic behaviors. Within the field of psychology, expectancies were first described as learned relations between behaviors and their consequences (Tolman, 1932). Individuals develop expectancies through both observation and experimentation (Miller et al., 1990) by noticing consequences of others' actions, as well as their own. Because expectancies are developed from experience, they are also involved in and influence future decision-making (Bolles, 1972). Expecting a positive result from a behavior motivates individuals to perform that behavior, while negative expectations are likely to deter them from that particular behavior (Vroom, 1964). Expectancies and expectancy theory, which posits that people select certain behaviors due to their expected outcomes (Vroom, 1964), have been applied to numerous psychological domains, such as education (Green, 2002), workplace motivation (Vroom, 1964), and alcohol and substance use (Goldman et al., 1999). Less work, however, has explored the role of expectancies in disordered eating behaviors (Hohlstein et al., 1998).

Expectancies have been extensively researched within the alcohol use literature. The alcohol use literature generally specifies two types of expectancies: positive and negative (Jones & McMahon, 1996). Positive outcome expectancies involve the belief that positive events will

occur as a result of drinking (i.e., “Drinking makes the future seem brighter;” Brown et al., 1987). Typically, endorsing high positive outcome expectancies is predictive of various drinking behaviors, such as heavy drinking, alcohol-related problems, and frequency of drinking (Brown et al., 1980; Sher et al., 1996). Negative outcome expectancies involve the belief that consuming alcohol will modify social and emotional behavior in negative ways, such as loss of behavioral control (Adams & McNeil, 1991). As would be expected, negative outcome expectancies are related to less drinking and feelings of reservation towards drinking (Burke & Stephens, 1999). Negative outcome expectancies yield treatment implications, with treatment-seekers who have high negative outcome expectancies being less likely to drink (Jones & McMahon, 1996).

Historically, positive and negative alcohol expectancies had been considered antithetical (Adams & McNeil, 1991). However, evidence suggests that these varying expectancies are positively correlated (Goldman & Darkes, 2004), meaning individuals can endorse both positive and negative expectancies simultaneously. As a result, Goldman and Darkes (2004) proposed a conceptualization of alcohol expectancies that would allow for individuals to endorse multiple expectancies, contrasting the historical view. As opposed to only conceptualizing expectancy words as positive or negative, these words were also classified as being characteristic of arousal (e.g., funny) or sedation (e.g., sleepy; Goldman & Darkes, 2004). This cognitive model of expectancy expanded the notion that expectancies are simply positive or negative by adding the contextual element of arousal, and it provided a more dynamic and elaborative framework describing the cognitions that may influence drinking behavior (Goldman & Darkes, 2004). This broader framework may be applied to other areas of expectancy research, as expectancies that appear to be conflicting may be simultaneously endorsed and related to distinct behavioral patterns.

Expectancies and Disordered Eating Behaviors

While the alcohol expectancies literature distinguishes between positive and negative outcome expectancies, no such distinction exists within the eating expectancies literature. Rather, the disordered eating literature characterizes expectancies based on eating experiences and body image concerns (Hohlstein et al., 1998). Due to the research suggesting that individuals may endorse positive and negative expectancies simultaneously (Goldman & Darkes, 2004), it is crucial for other research areas to consider how relevant categories of expectancies may manifest together within individuals. Expectancies related to disordered eating are suggested to lead to a range of behaviors (e.g., binge eating, purging, restriction) that are not mutually exclusive (Tuschl, 1990; Linardon, 2018), therefore it is possible that individuals may endorse multiple types of eating or body image-related expectancies simultaneously. However, contrary to the alcohol expectancies literature, expectancies in the disordered eating field primarily have been studied in isolation. It is possible that interactions between different categories of expectancies influence the severity of disordered eating behavior, as well as the likelihood of different behavioral outcomes.

While the majority of the eating expectancies literature focuses on binge eating disorder and bulimia nervosa (Smith et al., 2020; Hayaki, 2009), there has been a recent emphasis on conceptualizing eating disorders dimensionally based on behaviors and behavioral severity (Forbush et al., 2018). Disordered eating behaviors encompass a range of behaviors, including dietary restriction, binge eating, purging, and various compensatory behaviors to counteract weight gain (e.g., fasting, use of laxatives/diuretics, vomiting, excessive exercise; Anderson & Bulik, 2004). Examining expectancies as predictors of various disordered eating behaviors as

opposed to specific diagnoses may yield promise for obtaining better treatment outcomes and developing more effective prevention programs.

One of the two main categories of expectancies within the eating disorder literature is eating expectancies (Hohlstein et al., 1998). Eating expectancies are perceived consequences or outcomes associated with eating. Eating expectancies encompass a wide range of beliefs associated with eating, such as the belief that eating will lead to a loss of control, eating will relieve negative emotions, and eating will relieve boredom (Hohlstein et al., 1998). The most commonly researched eating expectancy is the expectancy that eating will manage negative affect (Hohlstein et al., 1998). This expectancy is thought to arise and persist as a result of experiences in which a person eats in order to reduce negative emotions, as ingestion can illicit hedonic responses (Macht & Simons, 2011). The expectancy that eating will decrease negative emotion is negatively reinforced when the individual experiences a decrease in emotion after eating, thus the individual is more likely to expect that eating will make them feel better in the future. As a result, the person will be more likely to eat in order to manage their negative emotions (i.e., eating to feel better or eating to prevent negative emotions at a later time). The expectancy that eating manages negative affect is positively related to greater overall eating pathology (Hayaki & Free, 2016; Brosof et al., 2019), more binge eating (Smith et al., 2020), and greater bulimia nervosa symptomology (Hayaki, 2009). Also, the relationship between eating to manage negative affect and eating pathology is intensified as negative affect increases (Smith et al., 2020).

The second category of expectancies within the eating disorder literature is thinness/restriction expectancies. These expectancies are beliefs that being thin and restricting one's diet will result in more social acceptance, greater attractiveness, and overall improved

well-being (Hohlstein et al., 1998). Thinness/restriction expectancies are often perpetuated by the societal preoccupation with body weight and the belief that thinness is associated with greater beauty and attractiveness (Hesse-Biber, 2007). Individuals who endorse greater thinness/restriction expectancies believe that their lives would be improved if they limited their eating and became thinner. Thinness/restriction expectancies are largely thought to arise from social experiences emphasizing that greater social acceptance is gained when one restricts their diet and obtains a thin body shape (e.g., a positive interaction with a peer in which an individual is told they look skinny; Hohlstein et al., 1998). Because thinness/restriction expectancies are so closely linked with the belief that thinness results in greater social acceptance and well-being, it makes sense that people who have greater thinness expectancies are more likely to report restrained eating (Stojek & Fischer, 2013). Similar to eating to manage negative affect, thinness/restriction expectancies are related to more binge eating (Smith et al., 2007; Combs et al., 2011), greater bulimic symptomology (Hohlstein et al., 1998; Smith et al., 2007), and greater weight cycling among men and women (Olson et al., 2012). While most research regarding thinness/restriction expectancies has been conducted with samples of women, some research suggests that thinness/restriction expectancies are relevant for the prediction of disordered eating in boys and men as well (Olson et al., 2012). Lastly, decreasing thinness expectancies has been shown to also reduce eating disorder attitudes and body dissatisfaction (Annus et al., 2008), suggesting that explicitly addressing expectancies could aid eating disorder prevention efforts.

Though eating to manage negative affect and thinness/restriction expectancies demonstrate similar relationships with various disordered eating behaviors (i.e., more binge eating, more purging, greater overall symptomology), the existing literature does not adequately address the possibility of these expectancies existing simultaneously within a person. That

positive and negative alcohol expectancies can coexist (Davis et al., 2016) supports the importance of investigating whether eating and thinness/restriction expectancies also may occur simultaneously. To that end, the extent to which a given disordered eating behavior may be contingent on levels of both eating to manage negative affect and thinness/restriction expectancies has yet to be explored. Existing research supports the notion that these expectancies can independently predict various disordered eating behaviors (Combs et al., 2010; Pearson et al., 2010), but it is possible that endorsing varying levels of these expectancies simultaneously relates to different behavioral outcomes or the severity of these behaviors. Additionally, evidence that these conceptually opposing expectancies relate to similar behavioral outcomes (e.g., binge eating; Smith et al., 2020; Combs et al., 2011) provides further justification for the exploration of potential interaction effects, as the endorsement of both types of expectancies may increase the severity or frequency of a given disordered eating behavior. Exploring eating to manage negative affect and thinness/restriction expectancies simultaneously could provide novel insights into how these expectancies interact to predict symptoms across the range of disordered eating behaviors and potentially amplify eating disorder symptomology. If there is evidence of an interaction of eating and thinness/restriction expectancies, interventions for eating disorder prevention and treatment approaches could benefit from simultaneously addressing and attempting to reframe multiple expectancies that could be causing or maintaining individuals' disordered eating behaviors.

Models of Eating Behavior Incorporating Expectancies

Until recently, recovery from an eating disorder was defined by weight restoration (Morgan & Russell, 1975) and a lack of disordered eating behaviors (i.e., binge eating and compensatory behaviors; Bulik et al., 2000), overlooking any potential cognitive aspects of

recovery. Bardone-Cone and colleagues (2010) proposed a comprehensive definition of recovery from eating disorders that included physical, behavioral, and cognitive components. This comprehensive definition of recovery including cognitive recovery (i.e., reduced overvaluation of weight and shape) has been empirically supported in women and men (Bardone-Cone et al., 2019). Thinness/restriction expectancies were measured as part of the development of this comprehensive definition, with individuals who were fully recovered from eating disorders being indistinguishable from controls (Bardone-Cone et al., 2019). However, despite preliminary evidence that certain eating expectancies (i.e., eating to manage negative affect, eating leads to feeling out of control, eating is pleasurable and useful as a reward) may be indicators of cognitive recovery (Fitzsimmons-Craft et al., 2013), further research has yet to examine their role in recovery. Additionally, the extent to which endorsing multiple types of expectancies might influence the severity of one's eating pathology is unknown. Consistent with evidence suggesting that expectancies are involved in the cognitive component of recovery in alcohol-use disorders, early evidence yields support for their application to eating disorder recovery. Despite relevance to cognitive recovery, thinness/restriction and eating expectancies have not been well-integrated into existing models of disordered eating behavior.

While there is no explicit expectancy model of disordered eating, eating and thinness/restriction expectancies have been incorporated into some larger models of disordered eating behaviors. For example, Smith and colleagues (2018) incorporated eating to manage negative affect into a model of emotion regulation and binge eating. This model posits eating to manage negative affect as a mediator of the relationship between the interaction of emotion regulation difficulties and anticipatory reward, and binge eating. For individuals with greater anticipatory reward, greater emotion dysregulation is associated with higher eating to manage

negative affect, which is associated with more binge eating behavior. This model is important in that it depicts the role of eating to manage negative affect in the relationship between emotion dysregulation and binge eating, however, it is limited in that it only focuses on binge eating behavior as an outcome. Also, expectancies are not described as the primary predictor of disordered eating behavior within this model. Because of this, the model does not explicitly describe expectancies as a direct risk factor for the development of disordered eating.

Pearson and colleagues (2010) extended the acquired preparedness model of eating disorder risk, positing that negative urgency is associated with various expectancies that lead to binge eating and purging. Acquired preparedness models more generally describe how personality differences lead to differences in learning and experience (Pearson et al., 2010; Combs et al., 2010). This model suggests that the interactions between a person and their environment shape the expectancies, specifically those involving body image and thinness/restriction (Pearson et al., 2010; Combs et al., 2010). Combs and colleagues (2010) found that ineffectiveness (i.e., feelings of inadequacy, worthlessness) and thinness/restriction expectancies are associated with binge eating and purging behavior in young girls; Pearson and colleagues (2010) used the acquired preparedness framework to support thinness/restriction expectancies and eating to manage negative affect as independent predictors of binge eating in young boys. Additionally, Pearson and colleagues (2010) found that eating to manage negative affect, but not thinness/restriction expectancies, was associated with purging among young boys. Importantly, the extension of the acquired preparedness model by Pearson and colleagues (2010) is one of the few studies to incorporate both thinness/restriction expectancies and eating to manage negative affect. This model is limited in that it includes these expectancies as independent predictors and does not address any potential interaction effects. Further, Pearson

and colleagues' (2010) model describes how acquired expectancies can lead to later eating pathology, but it only focuses on binge eating and one specific compensatory behavior (i.e., purging) as outcomes. While this is an improvement related to other models that only include binge eating as an outcome, it is important to consider how these expectancies may relate to additional compensatory behaviors, such as compulsive exercise and the use of diet pills, laxatives, or diuretics (Anderson & Bulik, 2004).

The acquired preparedness model and the model proposed by Smith and colleagues (2018) are limited in that both posit only a subset of all possible disordered eating behaviors as outcomes, and they do not address potential interactions between expectancies. One model that begins to address these limitations is the goal conflict model of eating behavior (Stroebe et al., 2013). This model incorporates multiple eating-related "goals," which can be understood in the context of expectancies, and its conceptual framework allows for the investigation of how these expectancies may interact and relate to numerous manifestations of disordered eating.

The goal conflict model of eating behavior, first proposed by Stroebe and colleagues (2013), attempts to explain why many people failed to adhere to diets. This model suggests that the mismatch between two competing goals-wanting to enjoy food and following a diet-can result in breaking a diet (i.e., choosing to consuming high-calorie foods instead of lower-calorie options). As predictors of behavioral outcomes, the manner in which the goal conflict model describes "goals" is consistent with the notion of expectancies (i.e., cue-driven determinants of behavior). This suggests that the goal conflict framework can be applied to thinness/restriction expectancies, eating expectancies, and the broader spectrum of disordered eating.

Within the goal conflict model, cues that signal palatable food (e.g., sights, smells, and tastes associated with certain foods) are thought to motivate people to enjoy their food and make

food selections based on the tastiness and enjoyability of the food. In contrast, diet cues (i.e., sociocultural norms/ideals, social influence regarding thinness, and social desirability; Ohtomo, 2017) motivate people to go on diets and set dieting goals (Papies & Veling, 2013). According to the goal conflict model, food enjoyment goals are thought to lead to the behavioral outcome of unhealthy eating (i.e., diet violation), while weight control goals lead to healthy eating (Stroebe et al., 2013). Evidence suggests that pairing stop signals (i.e., cues and/or behaviors meant to decrease of a certain behavior through negative reinforcement; weight control goals) with sweet foods results in individuals selecting smaller portion sizes (i.e., healthy eating; van Koningsbruggen et al., 2014). Within this model, the conceptualization of dieting goals could be understood to reflect restricting behavior (i.e., restricting food intake; Stojek & Fischer, 2013). Weight control goals are believed to inhibit unhealthy eating, but if a person also wants to enjoy eating, they might be more at risk of violating their diet. The model posits conflict between the goals of food enjoyment and dieting results in people being more likely to break their diets, meaning that people fail diets (and therefore overeat) because they desire to enjoy their food and eating experience (Stroebe et al., 2013).

Stroebe and colleagues (2013) suggest it is the dilemma of self-control between the competing goals of food enjoyment and weight control that ultimately leads to diet failure. Because of this, the goal conflict model allows for the inclusion of multiple "goals," or expectancies, potentially interacting to predict behavior. Using the goal conflict model as a basis and incorporating aspects from Smith and colleagues' model (2018) and the acquired preparedness model (2010), the current study proposes a novel model of expectancies that includes both eating to manage negative affect and thinness/restriction expectancies as antecedents of a broad range of disordered eating behaviors.

Proposed Theoretical Model of Expectancies and Disordered Eating

Using the conceptual framework of the goal conflict model (Stroebe et al., 2013) in conjunction with Smith and colleagues' (2018) model and the acquired preparedness model (Combs et al., 2010), the current study proposes a theoretical model that accounts for both eating to manage negative affect and thinness/restriction expectancies as antecedents to various disordered eating behaviors (see Figure 1). Because the goal conflict model includes two distinct goals that lead to opposing behavioral outcomes (i.e., restricting or overeating), its underlying principles serve as rationale for the comparison between eating to manage negative affect and thinness/restriction expectancies. If a person eats to manage negative affect, then they may be in violation of any potential thinness/restriction expectancies. This could in turn intensify a person's pattern of maladaptive eating, as existing research suggests that individuals who engage in restricted eating are more likely to subsequently engage in binge eating (Polivy et al., 2020; Herman & Polivy, 1983).

The proposed model begins with previous experiences as risk factors for the development of eating to manage negative affect and thinness/restriction expectancies. The acquired preparedness model of bulimic symptom development (Combs et al., 2011) highlights the importance of a person's environment on later problematic eating, and also describes how previous experiences can reinforce expectancies related to body image and eating. These learned experiences vary and include societal messages regarding thin as the ideal body shape and instances in which an individual engaged in eating to avoid feeling sadness. Eating episodes that resulted in the removal of negative emotions negatively reinforce eating to manage negative affect (Hohlstein et al., 1998), while experiences related to thinness or dietary restriction can either positively reinforce (e.g., a friend telling a teenager that they look skinny after skipping

meals) or negatively reinforce (e.g., restricting one's diet to avoid feeling bad for eating previous meals) thinness/restriction expectancies (Combs et al., 2010).

In addition to these previous experiences, the proposed model includes emotion dysregulation accompanied by anticipatory reward as a predictor of eating to manage negative affect. The model proposed and supported by Smith and colleagues (2018) found that emotion dysregulation alone was not related to eating to manage negative affect, but individuals who reported difficulties with emotion regulation in addition to higher anticipatory reward (i.e., anticipating pleasure from a stimulus or event) reported greater eating to manage negative affect (Smith et al., 2018). This suggests that individuals with higher reward anticipation may be particularly likely to engage in eating to address emotion dysregulation.

Next, internalization of thinness as the ideal body shape is proposed as a predictor of thinness/restriction expectancies. The acquired preparedness model of bulimic symptom development posits that learned experiences from one's environment relate to later eating behaviors, and specifically, being exposed to certain societally perpetuated ideals regarding thinness can lead to greater thinness/restriction expectancies (Combs et al., 2010). In addition to the exposure to these ideals and messages, the extent to which an individual internalizes thinness as the beauty ideal can result in problematic eating behaviors, such as binge eating and dietary restriction (Stice & Desjardins, 2018). Because of this, individuals who internalize the thin body ideal are more likely to engage in maladaptive behaviors with the goal of becoming thin (Low et al., 2003).

The proposed model includes interactions between thinness/restriction expectancies and eating to manage negative affect predicting three forms of disordered eating behavior: dietary restriction, binge eating, and compensatory behaviors. The existing literature supports direct

effects of these two types of expectancies on these disordered eating behaviors (Stojek & Fischer, 2013; Smith et al., 2007; Brosof et al., 2019). The proposed model goes beyond main effects and posits potential interactions between the expectancies. In addition, the model also proposes associations between the disordered eating outcomes. Research suggests that binge eating may occur following a time period during which an individual restricts their diet (Polivy & Herman, 1985; Zunker et al., 2011), therefore a pathway from dietary restriction to binge eating was included in the model. Additionally, according to Fairburn and colleagues' (1986) cognitive behavioral model of bulimia nervosa, binge eating and purging can occur in a cyclical manner (Byrne & McLean, 2002). As such, the proposed model also included pathways between binge eating and compensatory behaviors to account for this potential cycle (Neumark-Sztainer et al., 2006).

In sum, the proposed model of expectancies and disordered eating posits that eating to manage negative affect and thinness/restriction expectancies will interact to predict various disordered eating behaviors. The proposed model specifically includes eating to manage negative affect as a moderator of the relationships between thinness/restriction expectancies and dietary restriction, and thinness/restriction expectancies and compensatory behaviors. The model also posits that eating to manage negative affect is related to compensatory behaviors (i.e., fasting after eating episodes, excessive exercise after eating) as a result of binge eating, while thinness/restriction expectancies are related to binge eating, as well as compensatory behaviors, as a function of dietary restriction. Research suggests that eating to manage negative affect is related to binge eating (Smith et al., 2020), and it is possible that individuals who eat to manage negative affect and endorse thinness/restriction expectancies are more likely to binge eat following a period of time during which they restrict their diet. Also, individuals who eat to

manage their negative affect and concurrently hold thinness/restriction expectancies may be more inclined to perform unhealthy behaviors to compensate for their eating behaviors (e.g., purging, compensatory exercise, laxative/diuretic use). The conflict that potentially arises from highly endorsing these expectancies simultaneously is suggested to amplify disordered eating behaviors.

Current Study

The current study proposed to test pieces of this hypothesized model of expectancies and disordered eating among college students, a high-risk group for disordered eating behaviors (Auerbach et al., 2016). This study specifically tested the interaction of eating to manage negative affect and thinness/restriction expectancies in relation to binge eating, dietary restriction, and compensatory behaviors. Based on previous research, it was hypothesized that stronger thinness/restriction expectancies would be related to greater dietary restriction (Stojek & Fischer, 2013), greater binge eating (Smith et al., 2007; Polivy et al., 2020), and more compensatory behaviors (Smith et al., 2007). Eating to manage negative affect was hypothesized to be related to greater binge eating (Hayaki & Free, 2016; Brosof et al., 2019) and compensatory behaviors (Smith et al., 2007; Pearson et al., 2010). In terms of the interaction between the two expectancies, it was hypothesized that individuals who reported high levels of both of categories of expectancies would report the highest dietary restriction (H1 in Figure 2), the most binge eating episodes (H2 in Figure 2), and the most compensatory behaviors (H3 in Figure 2).

Additionally, exploratory cross-sectional mediation models were tested to investigate the relationships between thinness/restriction expectancies, eating to manage negative affect, and compensatory behaviors through dietary restriction and/or binge eating. Recognizing the

limitations of cross-sectional mediation, these analyses were performed with the goal of testing for a signal that these pathways should be examined using longitudinal data in a future study.

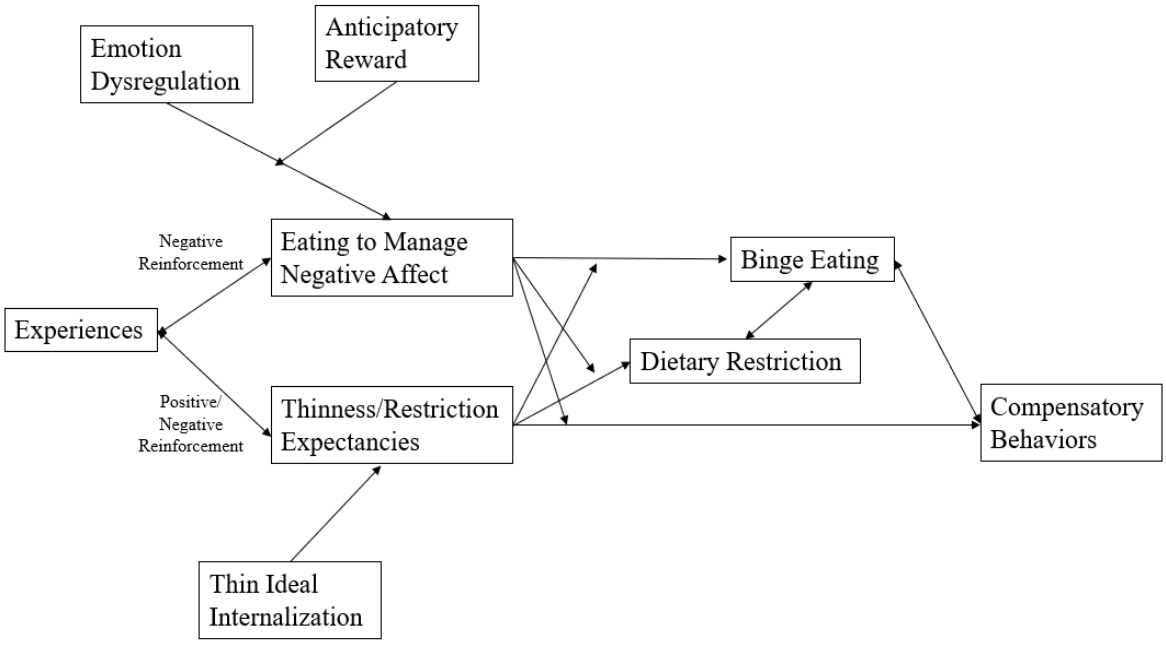

Figure 1: A proposed theoretical model of interactions between eating to manage negative affect and thinness/restriction expectancies predicting disordered eating.

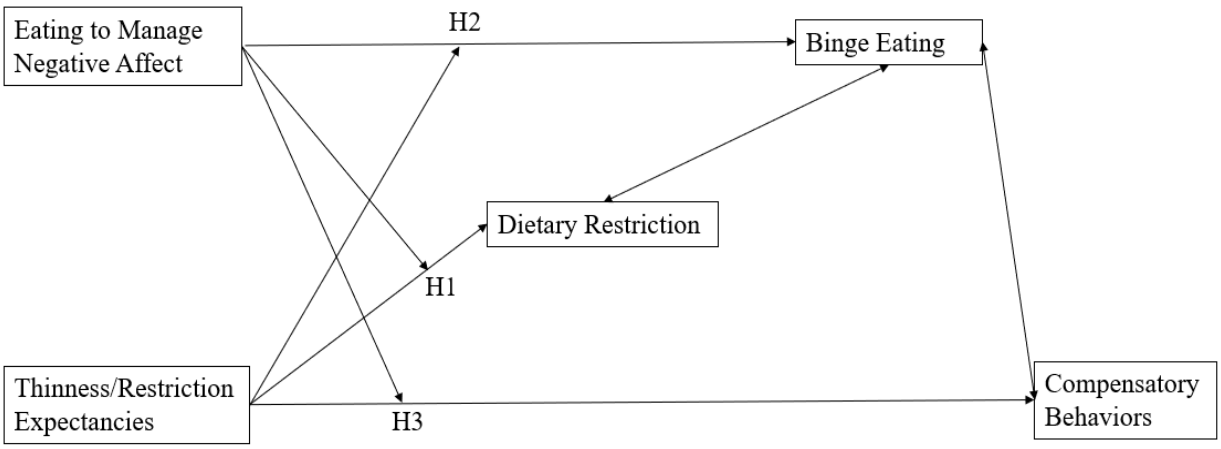

Figure 2: Portions of the proposed theoretical model tested in the current study.

CHAPTER TWO:

METHOD & PROCEDURE

Participants and Procedure

The current study was a secondary cross-sectional data analysis. Data were collected from 406 participants from a large Southeastern university via an online Qualtrics survey. Participants were recruited using convenience sampling from the university's research participant pool from the summer of 2019 to the spring of 2020. After providing informed consent, participants anonymously completed measures via an online survey and received partial course credit upon completion of the study. The study was deemed exempt by the University's Institutional Review Board.

Data cleaning procedures based on Meade and Craig's (2012) suggestions for identifying careless responders. A total of 513 responses were initially collected. Two participants did not consent to participate in the study and were removed before providing any data. Eleven participants were removed for their data being labeled as "incomplete" by Qualtrics (i.e., only answering the informed consent question, answering very few items overall). Two participants were removed for missing demographic data and/or having extremely partial data overall (i.e., missing > 50% data and demographic information). One participant entered duplicate data and their earliest data were retained. A total of 90 participants were removed for careless responding, including missing at least two attention checks (n=57), completing the questionnaire below the

5th percentile for time (*n*=22), or completing the questionnaire above the 98th percentile for time (*n*=11). Lastly, one participant was removed for implausible body mass index (BMI) data. This resulted in a final sample of 406 participants (54.2% female, M_{age}=20.99, *SD*=4.77).

The sample was primarily Non-Hispanic (74.1%; White: 68.8%; Asian: 15.9%; Black or African American: 14.3%; Other: 5.0%; Native Hawaiian/Pacific Islander: 1.3%; American Indian/Native Alaskan: .7%). Hispanic individuals primarily identified as White (79.0%; Other: 13.3%; Black or African American: 6.7%; Asian: 1.9%). It is important to note that 81 (20.0%) participants who were retained in the final sample completed the survey after March 13, 2020, which was the beginning of COVID-19-related quarantines/lockdowns and remote learning.

Measures

Data were collected as a part of a larger investigation of eating behaviors, food craving, and alcohol-use. The following measures are relevant to the current study.

Demographics

Demographics included sex, age, race, and ethnicity. BMI was calculated using self-reported height and weight (kg/m^2).

Eating to Manage Negative Affect

Eating to manage negative affect was assessed using the Eating Manages Negative Affect subscale of the Eating Expectancy Inventory (EEI; Hohlstein et al., 1998). This 18-item subscale measures the extent to which a person eats in order to alleviate negative emotions, such as sadness and inadequacy (e.g., “When I am feeling depressed or upset, eating can help me take my mind off my problems.”). Item responses range from 1 (*completely disagree*) to 7 (*completely agree*), with a greater mean score indicating a greater endorsement of the expectancy. The internal consistency was high in the current sample (α = .95).

Thinness/Restriction Expectancies

Thinness/restriction expectancies were assessed using the Thinness and Restricting Expectancy Inventory (TREI; Hohlstein et al., 1998). This 44-item scale measures the extent to which a person believes that their life would be improved if they were thin and restricted their food intake (e.g., "Restricting what I eat makes me feel good about myself."). Item responses range from 1 (*completely disagree*) to 7 (*completely agree*), with higher mean scores reflecting a greater endorsement of these expectancies. The internal consistency was high in the current sample (α = .99).

Dietary Restriction

Restrictive eating was assessed using the Cognitive Restraint subscale of the Eating Pathology Symptoms Inventory (EPSI; Forbush et al., 2013). This 3-item subscale measures the extent to which a person attempts to limit their diet and avoid certain foods (e.g., "I tried to exclude 'unhealthy' foods from my diet."). Item responses range from 0 (*never*) to 4 (*very often*), with higher mean scores reflecting more dietary restriction. The internal consistency was adequate in the current sample (α = .79).

Binge Eating

Binge eating was assessed using the Eating Disorder Diagnostic Scale for *DSM-5* (EDDS; Stice, n.d.). The EDDS is a self-report measure that assesses eating disorder symptoms and generates possible diagnoses. One component of the EDDS generates a score of objective binge eating episodes (i.e., eating an unusually large amount of food and experiencing a loss of control while eating). Each participant reported the number of binge eating episodes they experienced per month over the past three months. Responses ranged from 0 to 16+. This single item was used to reflect participants' binge eating behavior in the current study.

Compensatory Behaviors

Compensatory behaviors were assessed using the Eating Disorder Diagnostic Scale for *DSM-5* (EDDS; Stice, n.d.). Four items from the EDDS capture compensatory behaviors (e.g., vomiting, using laxatives, fasting, exercise to counteract overeating). Each of these items asks individuals to individual the average number of times per month each compensatory behavior was performed over the past three months. Responses ranged from 0 to 16+. These four items were summed, with a higher sum score indicating more frequent engagement in compensatory behaviors. Internal consistency is not an appropriate measure for compensatory behaviors in the current study because compensatory behaviors were assessed as a symptom count, with each specific behavior potentially being independent.

Data Analytic Strategy

Descriptive statistics, correlations, and multivariate and negative binomial regression analyses were performed in SPSS v26. Multivariate and negative binomial regression models were used to test hypotheses that eating to manage negative affect and thinness/restriction expectancies would have an interactive effect on dietary restriction, binge eating, and compensatory behaviors. Three total regression models (one per outcome) were calculated with age, BMI, and sex included as covariates. Sensitivity analyses included models with race and ethnicity as additional covariates and models excluding all covariates.

A linear regression with moderation was conducted to test the hypothesis that individuals who endorsed high levels of both thinness/restriction expectancies and eating to manage negative affect reported more dietary restriction using Model 1 in PROCESS v3.4 with 10,000 bootstrap samples (Hayes, 2017). Thinness/restriction expectancies was the independent variable and

eating to manage negative affect was specified as the moderator. Age, BMI, and sex were included as covariates.

Two negative binomial regressions were used to test the hypotheses that individuals who endorsed high levels of both thinness/restriction expectancies and eating to manage negative affect reported more binge eating and more compensatory behaviors. Negative binomial regressions were used to test these hypotheses because each of the outcome variables was operationalized as a count score (e.g., symptom count). Eating to manage negative affect and thinness/restriction expectancies were entered as the independent variables, with age, BMI, and sex included as covariates. In the first model, number of binge eating episodes was the outcome variable, while in the second model the sum score of compensatory behaviors was the outcome variable.

Exploratory mediation analyses were conducted using the Model Constraint command in Mplus v8 (Muthén & Muthén, 2017) to examine the association between thinness/restriction expectancies and compensatory behaviors through dietary restriction and binge eating, and the association between eating to manage negative affect and compensatory behaviors though binge eating. To conserve statistical power and because the results of the moderation analyses did not change when the covariates were removed from the linear and binomial regression models, no covariates were included in the exploratory mediation models.

CHAPTER THREE:

RESULTS

See Table 1 for descriptive statistics and correlations. Eating to manage negative affect and thinness/restriction expectancies were significantly and positively correlated. Also, as expected, each category of expectancies was significantly and positively correlated with dietary restriction, binge eating, and compensatory behaviors.

Moderation Analyses

Controlling for sex, BMI, and age, no statistically significant interaction of thinness/restriction expectancies and eating to manage negative affect was observed for dietary restriction ($p = .22$; see Table 2). A main effects model demonstrated a significant main effect of thinness/restriction expectancies, such that individuals with greater thinness/restriction expectancies endorsed greater dietary restriction ($b = .33$, $p < .01$; see Table 3). There was no main effect of eating to manage negative affect on dietary restriction ($p = .50$).

Controlling for sex, BMI, and age, no statistically significant interaction of eating to manage negative affect and thinness/restriction expectancies was observed for binge eating ($p = .55$; see Table 2). A main effects model demonstrated significant main effects of eating to manage negative affect ($b = .28$, $p < .01$) and thinness/restriction expectancies ($b = .24$, $p < .01$; see Table 3). Endorsing greater eating to manage negative affect was associated with approximately 1.33 times more binge eating episodes, while endorsing greater

thinness/restriction expectancies was associated with approximately 1.28 times more binge eating episodes.

Controlling for sex, BMI, and age, no statistically significant interaction of thinness/restriction expectancies and eating to manage negative affect was observed for compensatory behaviors ($p = .99$; see Table 2). A main effects model demonstrated a significant main effect of thinness/restriction expectancies ($b = .53$, $p < .01$; see Table 3). Endorsing greater thinness/restriction expectancies was associated with approximately 1.70 times more engagement in compensatory behaviors. There was no significant main effect of eating to manage negative affect on compensatory behaviors ($p = .97$).

Sensitivity Analyses

While not included as covariates in the original hypotheses, there is evidence that members of minority racial and ethnic groups also endorse expectancies related to eating and thinness (Atlas et al., 2002; Henrickson et al., 2010). Though little is known regarding racial and ethnic differences in expectancies, research suggests that African American women may endorse lower rates of thinness/eating expectancies and eating to manage negative affect than Caucasian women (Atlas et al., 2002). To examine potential impacts of race and ethnicity on the relationships between eating to manage negative affect, thinness/restriction expectancies, and disordered eating behavior on hypotheses, models were re-estimated including race and ethnicity as additional covariates. Moderation analyses including racial/ethnic categories of non-Hispanic White (reference group), non-Hispanic Black/African American, non-Hispanic Asian, Hispanic White, Hispanic Other, and non-Hispanic Other as covariates revealed no change in the current findings (see Tables 4 and 5). No racial/ethnic identity emerged as a significant predictor of dietary restriction, binge eating, or compensatory behaviors.

Hypotheses also were re-tested using unadjusted models (i.e., including no covariates). Removing all covariates from these models yielded no change in the current findings (see Tables 6 and 7). Because the results remained consistent when all covariates were removed, as well as to conserve statistical power, the exploratory mediation models were tested without covariates.

Exploratory Mediation Analyses

Due to none of the previously mentioned moderation analyses being statistically significant, mediation models, as opposed to moderated mediation models were tested.

Thinness/Restriction Expectancies

Mediation analyses revealed a significant direct effect of thinness/restriction expectancies on compensatory behaviors (c' = .31, p < .01, see Figure 3). Additionally, there was a significant indirect effect of thinness/restriction expectancies on compensatory behaviors through dietary restriction. Greater thinness/restriction expectancies were associated with greater dietary restriction, which was associated with more compensatory behaviors (ab = .11, p < .01). There was also a significant indirect effect of thinness/restriction expectancies on compensatory behaviors through binge eating. Greater thinness/restriction expectancies were associated with more binge eating, which was associated with more compensatory behaviors (ab = .02, p = .02). There was no significant serial indirect effect of thinness/restriction expectancies on compensatory behaviors through both dietary restriction and binge eating (p = .94), and dietary restriction was not associated with binge eating (p = .94). The total effect of this model was significant (c = .31, p < .01).

Eating to Manage Negative Affect

Mediation analyses revealed a significant direct effect of eating to manage negative affect on compensatory behaviors (c' = .12, p = .05, see Figure 4). Additionally, there was a significant

indirect effect of eating to manage negative affect on compensatory behaviors through binge eating. Greater eating to manage negative affect was associated with more binge eating, which was associated with more compensatory behaviors ($ab = .04$, $p < .01$). The total effect of this model was also significant ($c = .16$, $p < .01$).

Table 1: Descriptive statistics and correlations for all study variables (N = 406).

Variable	Age	BMI	EEI-NA	TREI	Dietary Restriction	Binge Eating	Comp. Behaviors	Sex
Age	--							
BMI	.24**	--						
EEI-NA	-.13**	.14**	--					
TREI	.06	.39**	.43**	--				
Dietary Restriction	.10	.23**	.18**	.49**	--			
Binge Eating	-.04	.24**	.45**	.42**	.22**	--		
Compensatory Behaviors	.02	.15**	.25**	.47**	.43**	.37**	--	
Sex	.01	-.02	-.16**	-.15**	-.06	-.08	-.09	--
Sample Mean	20.99	25.05	2.79	3.42	2.51	2.23	4.50	45.8%
Sample SD	4.77	5.87	1.33	1.63	1.08	3.22	7.06	-
Sample Reliability	-	-	.95	.99	.79	-	-	-

Note: **$p < .01$. BMI = Body Mass Index. EEI-NA = Eating Expectancy Inventory Negative Affect subscale. TREI = Thinness and Restricting Expectancy Inventory. Sex: Female = 0, Male =1 (45.8% Male).

Table 2: Thinness/restriction expectancies and eating to manage negative affect interacting to predict dietary restriction, binge eating, and compensatory behaviors.

Variable	*B*	*95% CI*	*SE*	*p*	*Exp(B)*
Dietary Restriction					
Intercept	1.36	[.62, 2.10]	.38	<.01	
Sex (0=female)	.004	[-.19, .19]	.10	.97	
Body Mass Index	.004	[-.01, .02]	.01	.64	
Age	.01	[-.01, .03]	.01	.21	
TREI	.25	[.12, .39]	.07	<.01	
EEI-NA	-.13	[-.32, .05]	.09	.17	
TREI X EEI-NA	.03	[-.02, .07]	.02	.22	
Binge Eating					
Intercept	-1.25	[-2.30, -.23]	.66	.06	.29
Sex (0=female)	.06	[-.20, .31]	.14	.68	1.06
Body Mass Index	.02	[-.01, .04]	.01	.12	1.02
Age	-.02	[-.05, .01]	.01	.06	.98
TREI	.30	[.10, .49]	.11	.01	1.35
EEI-NA	.36	[.09, .63]	.16	.02	1.43
EEI-NA X TREI	-.02	[-.08, .04]	.03	.55	.98
Compensatory Behaviors					
Intercept	-.50	[-1.53, .52]	.75	.51	.61
Sex (0=female)	.14	[-.10, .38]	.17	.40	1.16
Body Mass Index	-.01	[-.03, .01]	.01	.40	.99
Age	.004	[-.02, .03]	.02	.81	1.00
TREI	.53	[.35, .71]	.11	<.01	1.70
EEI-NA	-.004	[-.26, .26]	.19	.98	1.00

Table 2 (Continued)

Variable	*B*	*95% CI*	*SE*	*p*	*Exp(B)*
TREI X EEI-NA	.000	[-.05, .06]	.03	.99	1.00

Note: TREI = Thinness and Restricting Expectancy Inventory. EEI-NA = Eating Expectancy Inventory Negative Affect Subscale.

Table 3: Main effects of thinness/restriction expectancies and eating to manage negative affect on dietary restriction, binge eating, and compensatory behaviors.

Variable	*B*	*95% CI*	*SE*	*p*	*Exp(B)*
Dietary Restriction					
Intercept	1.06	[.50, 1.62]	.29	<.01	
Sex (0=female)	.02	[-.17, .20]	.10	.83	
Body Mass Index	.01	[-.01, .02]	.01	.55	
Age	.01	[-.01, .03]	.01	.21	
TREI	.33	[.26, .39]	.03	<.01	
EEI-NA	-.03	[-.11, .05]	.04	.50	
Binge Eating					
Intercept	-1.03	[-1.79, -.29]	.41	.01	.36
Sex (0=female)	.07	[-.19, .32]	.14	.63	1.07
Body Mass Index	.02	[-.01, .04]	.01	.13	1.02
Age	-.02	[-.05, .01]	.01	.06	.98
TREI	.24	[.15, .34]	.05	<.01	1.28
EEI-NA	.28	[.18, .39]	.05	<.01	1.33
Compensatory Behaviors					
Intercept	-.50	[-1.29, .27]	.55	.36	.61
Sex (0=female)	.14	[-.09, .38]	.17	.40	1.16
Body Mass Index	-.01	[-.03, .01]	.01	.39	.99
Age	.004	[-.02, .03]	.02	.81	1.00
TREI	.53	[.44, .62]	.07	<.01	1.70
EEI-NA	-.003	[-.10, .09]	.06	.97	1.00

Note: TREI = Thinness and Restricting Expectancy Inventory. EEI-NA = Eating Expectancy Inventory Negative Affect Subscale.

Table 4: Thinness/restriction expectancies and eating to manage negative affect interacting to predict dietary restriction, binge eating, and compensatory behaviors, accounting for race and ethnicity (reference group = Non-Hispanic White).

Variable	*B*	*95% CI*	*SE*	*p*	*Exp(B)*
Dietary Restriction					
Intercept	1.31	[.55, 2.06]	.38	<.01	
Sex (0=female)	.01	[-.18, .20]	.10	.95	
Body Mass Index	.01	[-.01, .03]	.01	.39	
Age	.01	[-.01, .03]	.01	.23	
Hispanic White	.04	[-.21, .28]	.12	.78	
Hispanic Other	-.05	[-.47, .37]	.21	.80	
Non-Hispanic Asian	.16	[-.17, .49]	.17	.35	
Non-Hispanic Black	-.20	[-.54, .14]	.17	.25	
Non-Hispanic Other	.06	[-.29, .41]	.18	.72	
TREI	.24	[.11, .38]	.07	<.01	
EEI-NA	-.14	[-.32, .05]	.10	.16	
TREI X EEI-NA	.03	[-.02, .07]	.02	.21	
Binge Eating					
Intercept	-1.17	[-2.82, .47]	.91	.20	.31
Sex (0=female)	.06	[-.20, .32]	.14	.66	1.06
Body Mass Index	.02	[-.01, .04]	.01	.14	1.02
Age	-.02	[-.01, .01]	.01	.07	.98
Hispanic White	-.16	[-.50, .18]	.20	.45	.86
Hispanic Other	.16	[-.43, .75]	.29	.57	1.18
Non-Hispanic Asian	-.07	[-.51, .36]	.20	.72	.93
Non-Hispanic Black	-.09	[-.55, .36]	.26	.73	.91
Non-Hispanic Other	-.08	[-.57, .40]	.26	.77	.93

Table 4 (Continued)

Variable	*B*	*95% CI*	*SE*	*p*	*Exp(B)*
TREI	.31	[.12, .52]	.11	.01	1.37
EEI-NA	.38	[.11, .66]	.16	.02	1.46
EEI-NA X TREI	-.02	[-.08, .04]	.03	.46	.98
Compensatory Behaviors					
Intercept	-.84	[-2.46, .77]	1.06	.43	.43
Sex (0=female)	.13	[-.11, .37]	.17	.44	1.14
Body Mass Index	-.004	[-.03, .02]	.01	.78	1.00
Age	.002	[-.02, .03]	.02	.87	1.00
Hispanic White	-.28	[-.60, .02]	.24	.23	.75
Hispanic Other	.28	[-.27, .80]	.36	.43	1.33
Non-Hispanic Asian	-.09	[-.50, .30]	.23	.69	.91
Non-Hispanic Black	.26	[-.20, .70]	.26	.32	1.29
Non-Hispanic Other	-.03	[-.48, .40]	.38	.94	.97
TREI	.54	[.36, .72]	.11	<.01	1.71
EEI-NA	.003	[-.26, .26]	.18	.99	1.00
TREI X EEI-NA	-.002	[-.06, .05]	.03	.95	1.00

Note: TREI = Thinness and Restricting Expectancy Inventory. EEI-NA = Eating Expectancy Inventory Negative Affect Subscale.

Table 5: Main effects of thinness/restriction expectancies and eating to manage negative affect on dietary restriction, binge eating, and compensatory behaviors, accounting for race and ethnicity (reference group = Non-Hispanic White).

Variable	*B*	*95% CI*	*SE*	*p*	*Exp(B)*
Dietary Restriction					
Intercept	.99	[.41, 1.57]	.30	<.01	
Sex (0=female)	.02	[-.17, .21]	.10	.81	
Body Mass Index	.01	[-.01, .03]	.01	.33	
Age	.01	[-.01, .03]	.01	.23	
Hispanic White	.04	[-.20, .29]	.13	.74	
Hispanic Other	-.08	[-.50, .34]	.21	.70	
Non-Hispanic Asian	.14	[-.19, .47]	.17	.40	
Non-Hispanic Black	-.20	[-.53, .14]	.17	.26	
Non-Hispanic Other	.06	[-.29, .41]	.18	.75	
TREI	.32	[.25, .39]	.04	<.01	
EEI-NA	-.03	[-.11, .05]	.04	.50	
Binge Eating					
Intercept	-.84	[-2.24, .56]	.75	.26	.43
Sex (0=female)	.08	[-.18, .33]	.14	.59	1.08
Body Mass Index	.02	[-.01, .04]	.01	.15	1.02
Age	-.02	[-.05, .01]	.01	.07	.98
Hispanic White	-.15	[-.49, .19]	.20	.47	.86
Hispanic Other	.13	[-.46, .70]	.30	.66	1.14
Non-Hispanic Asian	-.09	[-.53, .34]	.20	.65	.92
Non-Hispanic Black	-.10	[-.56, .35]	.26	.71	.91
Non-Hispanic Other	-.08	[-.57, .40]	.26	.76	.92
TREI	.25	[.15, .35]	.05	<.01	1.28

Table 5 (Continued)

Variable	*B*	*95% CI*	*SE*	*p*	*Exp(B)*
EEI-NA	.28	[.18, .39]	.06	<.01	1.33
Compensatory Behaviors					
Intercept	-.81	[-2.21, .58]	.92	.38	.44
Sex (0=female)	.13	[-.11, .37]	.17	.43	1.14
Body Mass Index	-.004	[-.03, .02]	.01	.78	1.00
Age	.002	[-.02, .03]	.02	.88	1.00
Hispanic White	-.28	[-.60, .02]	.24	.24	.75
Hispanic Other	.28	[-.27, .79]	.35	.43	1.32
Non-Hispanic Asian	-.09	[-.50, .30]	.24	.69	.91
Non-Hispanic Black	.26	[-.20, .70]	.26	.33	1.29
Non-Hispanic Other	-.03	[-.48, .40]	.38	.94	.97
TREI	.53	[.44, .63]	.06	<.01	1.70
EEI-NA	-.001	[-.10, .09]	.06	.92	.99

Note: TREI = Thinness and Restricting Expectancy Inventory. EEI-NA = Eating Expectancy Inventory Negative Affect Subscale.

Table 6: Thinness/restriction expectancies and eating to manage negative affect interacting to predict dietary restriction, binge eating, and compensatory behaviors, unadjusted models.

Variable	*B*	*95% CI*	*SE*	*p*	*Exp(B)*
Dietary Restriction					
Intercept	1.74	[1.26, 2.22]	.25	<.01	
TREI	.26	[.13, .39]	.07	<.01	
EEI-NA	-.15	[-.33, .03]	.09	.11	
TREI X EEI-NA	.03	[-.01, .07]	.02	.18	
Binge Eating					
Intercept	-1.37	[-2.14, -.61]	.52	<.01	.25
TREI	.31	[.12, .50]	.11	<.01	1.37
EEI-NA	.37	[.11, .64]	.16	.02	1.45
EEI-NA X TREI	-.02	[-.07, .04]	.03	.58	.98
Compensatory Behaviors					
Intercept	-.65	[-1.34, .05]	.52	.21	.52
TREI	.53	[.36, .71]	.11	<.01	1.71
EEI-NA	.03	[-.23, .28]	.18	.88	1.03
TREI X EEI-NA	-.01	[-.06, .05]	.03	.86	.99

Note: TREI = Thinness and Restricting Expectancy Inventory. EEI-NA = Eating Expectancy Inventory Negative Affect Subscale.

Table 7: Main effects of thinness/restriction expectancies and eating to manage negative affect on dietary restriction, binge eating, and compensatory behaviors, unadjusted models.

Variable	*B*	*95% CI*	*SE*	*p*	*Exp(B)*
Dietary Restriction					
Intercept	1.46	[1.22, 1.70]	.12	<.01	
TREI	.34	[.28, .40]	.03	<.01	
EEI-NA	-.04	[-.11, .04]	.04	.34	
Binge Eating					
Intercept	-1.17	[-1.53, -.81]	.23	<.01	.31
TREI	.26	[.18, .35]	.05	<.01	1.30
EEI-NA	.30	[.20, .40]	.05	<.01	1.35
Compensatory Behaviors					
Intercept	-.58	[-.91, -.26]	.26	.03	.56
TREI	.52	[.43, .60]	.06	<.01	1.68
EEI-NA	.000	[-.10, .10]	.06	1.00	1.00

Note: TREI = Thinness and Restricting Expectancy Inventory. EEI-NA = Eating Expectancy Inventory Negative Affect Subscale.

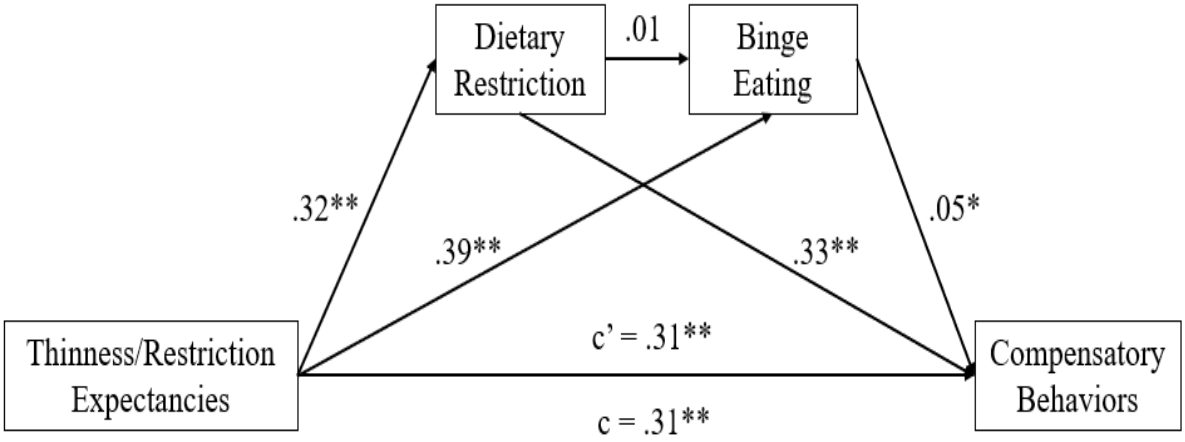

Figure 3: Mediation model of the association between thinness/restriction expectancies and compensatory behaviors through dietary restriction and binge eating.

Note: $^{**}p < .01$, $^{*}p < .05$.

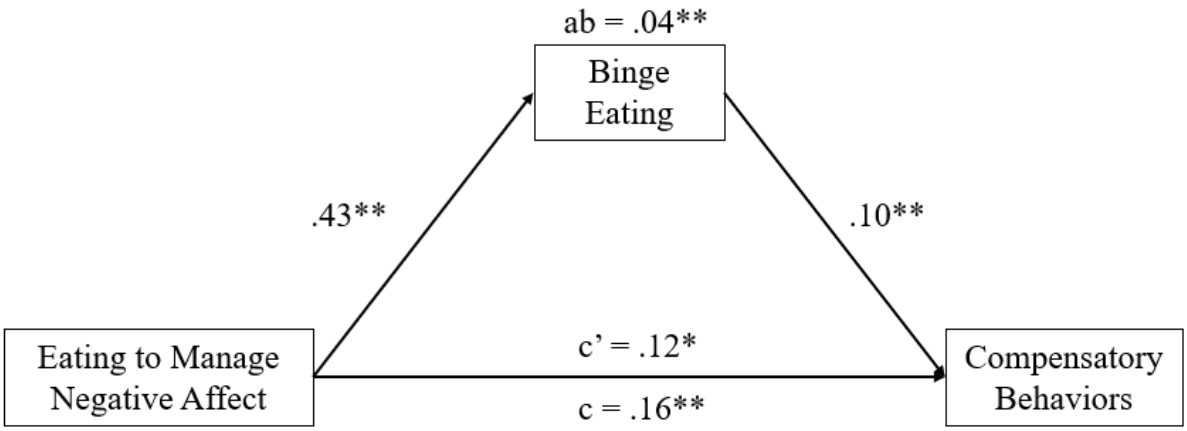

Figure 4: Mediation model of the association between eating to manage negative affect and compensatory behaviors through binge eating.

Note: **$p < .01$, *$p = .05$.

CHAPTER FOUR:

DISCUSSION

The results of the current study do not suggest a multiplicative, or interactive, model of expectancies; however, they support previous work demonstrating that different categories of expectancies are independently related to the full spectrum of disordered behaviors. Further, exploratory cross-sectional mediation models provided evidence for future longitudinal studies investigating the temporal sequence of expectancies and disordered eating behavior. The current study highlights the importance of assessing cognitive processes to better understand risk for disordered eating, as well as how cognitive processes might predict various disordered eating behaviors.

Interaction Effects

Contrary to hypotheses and inconsistent with the goal conflict framework (Stroebe et al., 2013), no significant interaction of thinness/restriction expectancies and eating to manage negative affect was observed for dietary restriction, binge eating, or compensatory behaviors. As no previous study has investigated potential interactions between these expectancies, current results suggest that an interactive model may not be appropriate and that these expectancies should be considered as independent predictors. This is consistent with previous literature investigating these expectances individually (Pearson et al., 2010). The lack of interactions between the categories of expectancies suggests that the relationships between expectancies and

eating behaviors do not depend on other categories expectancies, however eating to manage negative affect and thinness/restriction expectancies are each independently associated with binge eating frequency.

It is possible that variables unaccounted for in the current study, such as body dissatisfaction (Brosof et al., 2019), self-efficacy (Linardon, 2018), or emotion regulation (Smith et al., 2018), could have attenuated potential interactive relationships between expectancies and disordered eating behaviors. It may be that individuals with a certain level of body dissatisfaction are more prone to experience competition between expectancies, whereas others do not experience this potential tension. For example, body dissatisfaction and thinness/restriction expectancies have been shown to interact and influence the development of eating disorders, with greater thinness/restriction expectancies and body dissatisfaction amplifying the relationship between overeating and onset of bulimia nervosa (Stice & Desjardins, 2018). Perfectionism and negative urgency are related to eating disorder maintenance (Culbert et al., 2015), and they have been hypothesized as components of cognitive eating disorder recovery (Bardone-Cone et al., 2019). It is possible that additional cognitive and personality factors could account for some of the variance in the relationships between expectancies and disordered eating. Additionally, general negative affect could influence the relationships between expectancies, as increased negative affect and greater endorsement of eating expectancies interact to predict subsequent binge eating (Smith et al., 2018; Smith et al., 2020). If a person generally eats to avoid negative affect, but does not endorse negative affect in the moment, they may be less susceptible to the negative outcomes associated with this expectancy. Future research should assess body dissatisfaction and other relevant constructs (e.g., self-criticism, perfectionism,

negative urgency) as potential moderators of the associations between expectancies and a range of disordered eating behaviors.

Consistent with sociocultural theories of eating disorders (Striegel-Moore & Bulik, 2007), it is possible that the context or situation in which an expectancy is endorsed could influence susceptibility to disordered eating. For example, endorsement of thinness and eating expectancies might be heightened in certain situations (e.g., with peers, after viewing an add highlighting the thin ideal; Fister & Smith, 2004). While individuals may endorse multiple types of expectancies, it is possible that the levels at which the expectancies are salient fluctuate. This situational sensitivity may better reflect the relationship between expectancies as they independently relate to disordered eating, as opposed to the previously hypothesized interaction effects. Future studies should examine the extent to which expectancies are state (i.e., fluid) or trait (i.e., concrete) characteristics to determine if risk of engaging in disordered eating behavior varies depending on context.

While no significant interaction effects were observed, main effects generally supported findings from the existing literature. The current study found that greater eating to manage negative affect was related to binge eating episodes, but not dietary restriction or compensatory behaviors. These findings support the existing literature and expectancy theory applications to eating disorders by replicating the effects of eating to manage negative affect on binge eating (Smith et al., 2020). However, the finding that eating to manage negative affect was unrelated to compensatory behaviors conflicts with the acquired preparedness model of bulimic symptom development, which suggest associations between eating to manage negative affect and purging behavior (Pearson et al., 2010; Combs et al., 2010). The current study used a sum score of compensatory behaviors that reflected engagement in a potential range of compensatory

behaviors (e.g., compulsive exercise, laxative and diuretic use, vomiting) and it is possible that eating to manage negative affect may be specifically related to purging behavior. Nonetheless, the proposed model only included a direct effect of eating to manage negative affect on binge eating, which was supported in the current study.

Thinness/restriction expectancies were significantly and positively related to all three behavioral outcomes, supporting evidence that suggests these expectancies are related to restriction (Stojek & Fischer, 2013) and binge eating (Combs et al., 2011). Pearson and colleagues (2010) found that thinness/restriction expectancies led to binge eating but not purging in young boys, but the current study suggests that these expectancies are related to compensatory behaviors in male and female young adults. It is possible that compensatory behaviors in males manifest more broadly than only purging behavior (e.g., compensatory exercise, steroid use), as disordered eating presentations in males often include pathological exercise behaviors (Lavender et al., 2017). Additionally, these findings expand the literature base by suggesting thinness/restriction expectancies relate to a broader range of compensatory behaviors.

Results are somewhat consistent with the proposed theoretical model, as it included direct effect pathways from thinness/restriction expectancies to dietary restriction and compensatory behaviors. The model did not originally include a main effect pathway from thinness/restriction expectancies to binge eating, given evidence that self-imposed dieting can result in subsequent binge eating (Polivy, 1996). However, the main effect of thinness/restriction expectancies and binge eating is supported by the acquired preparedness model (Combs et al., 2010), as failure to receive the perceived rewards of thinness/restriction expectancies may result in binge eating (Smith et al., 2007). Compared to eating to manage negative affect, it appears that

thinness/restriction expectancies may be more strongly related to a broader range of disordered eating behaviors.

Cross-Sectional Mediation

The cross-sectional mediation analyses of the current study were explorational. Consistent with the existing literature, results suggested that greater thinness/restriction expectancies were associated with greater dietary restriction, which was then associated with more compensatory behaviors (Buchholz & Crowther, 2014). Additionally, greater thinness/restriction expectancies were associated with more binge eating, which was then associated with more compensatory behaviors (Byrne & McLean, 2002). These results support the acquired preparedness model of bulimic symptom development by suggesting that these expectancies are related to binge eating, which then leads to purging (Pearson et al., 2010; Combs et al., 2010). Findings also expand on this model, as binge eating was related to a variety of compensatory behaviors, not simply purging behavior. Additionally, these results suggest that dietary restriction could also be involved in the relationship between thinness/restriction expectancies and compensatory behaviors (Buchholz & Crowther, 2014), but longitudinal studies are needed to test this relationship. Future studies should examine if utilizing two independent mediation models, with dietary restriction and binge eating specified as parallel mediators, best describes the relationship between thinness/restriction expectancies and compensatory behaviors.

Contrary to previous research based on the restraint model of binge eating (Polivy & Herman, 1985), dietary restriction and binge eating were unrelated in the cross-sectional mediation model involving thinness/restriction expectancies. One possible explanation for this finding is measurement bias. Dietary restriction was measured using items from a severity index, while binge eating was measured via the episodic symptom count of a diagnostic tool. Dietary

restriction is predictive of both behavioral and cognitive components of binge eating (Linardon, 2018), and it is possible that restriction and binge eating *frequency* are not as strongly related as restriction and binge eating *severity*. Most studies examining binge eating placing greater emphasis on the frequency of binge eating episodes (Brownley et al., 2007), therefore the relationship between dietary restriction and binge eating severity is less clear. Another potential explanation is that dietary restriction could be more closely related to subjective binge eating episodes. Kerzhnerman & Lowe (2002) found that dieting was related to subjective but not objective binge eating frequency. The current measure of binge eating frequency may have attenuated the association between restriction and binge eating, and future research should investigate whether measures of severity generate the same pattern of findings.

Another possibility is that not all restrictive behaviors are strongly related to binge eating (Elran-Barak et al., 2015). It is possible that the subtype of restrictive behaviors captured in the study (e.g., avoiding high calorie and "unhealthy" foods, counting calories) does not relate to binge eating as strongly as others. Consistent with findings from the current study, dietary and cognitive restraint were not associated with binge eating or overeating among individuals with binge eating disorder (Masheb & Grilo, 2000). Additionally, Spoor and colleagues (2006) found that dietary restraint did not longitudinally predict binge eating. It is possible that restriction interacts with other factors, such as self-efficacy (Linardon, 2018), to predict binge eating.

Due to the inconsistencies regarding the association between dietary restriction and binge eating, specifically those related to measurement (i.e., subjective versus objective binge eating, binge frequency versus severity, behavioral versus cognitive restraint; Kerzhnerman & Lowe, 2002; Masheb & Grilo, 2000), it is important to reassess these relationships capturing a greater diversity of restrictive behaviors and conceptualization of binge eating. Future studies should

utilize a continuous measure of binge eating severity, or a measure that adequately captures the cognitive components of binge eating (e.g., Binge Eating Scale, Gormally et al., 1982; Eating Pathology Symptoms Inventory-Binge Eating subscale; Forbush et al., 2013), to reexamine the pattern of associations observed in the current study. Replication efforts could provide clarifying information regarding the relationship between restriction and binge eating in the context of expectancies.

The results of the second cross-sectional mediation model suggested that greater eating to manage negative affect was related to more binge eating, which was then related to more compensatory behaviors. This finding supports acquired preparedness models that suggest eating expectancies can relate to purging behavior via binge eating (Pearson et al., 2010; Combs et al., 2010), as well as the broader literature that supports the occurrence of compensatory behaviors after binge eating episodes (Byrne & McLean, 2002). The temporal sequence of this relationship is likely cyclical (Byrne & McLean, 2002); therefore, it is important to investigate this research longitudinally.

Implications

The current study examined how eating and thinness/restriction expectancies were related to disordered eating behaviors among male and female college students. While most research regarding expectancies and eating disorders is conducted using female samples, the current study included almost 50% male participants and thus may be more generalizable to the population of individuals experiencing disordered eating. Additionally, the current study included a wide range of eating behaviors because it is possible that the eating patterns of individuals who endorse different types of expectancies differ. Because of the supported relationships between multiple categories of expectancies and maladaptive behaviors, cognitive interventions may be able to

decrease the frequency or severity of individuals with eating disorders by targeting individuals' expectancies related to thinness and eating behavior.

The current study's findings support the inclusion of expectancies, as well as highlight how thinness/restriction expectancies may be important to cognitive recovery models of eating disorders (Bardone-Cone et al., 2019). Regarding intervention, cognitive-behavioral therapy (CBT) is one of the primary and most effective treatment methods for eating disorders (Atwood & Friedman, 2020). Though CBT for eating disorders does not explicitly address expectancies, weight and shape concerns, which are the primary cognitive constructs of interest within eating disorder research (Gowers & Shore, 2001), are influenced by previous experiences and can be related to expectancies (Fairburn et al., 2003). By relating expectancies to disordered eating behavior, the current study supported the limited research suggesting that expectancies may be significantly associated with a range of maladaptive eating behaviors. Identifying and reframing maladaptive or distorted expectancies as a part of CBT could improve treatment outcomes, especially among adults who endorse high levels of thinness/restriction expectancies.

Additionally, reframing expectancies could be a focal point of preventative interventions for individuals at higher risk of experiencing disordered eating. The Expectancy Challenge Alcohol Literacy Curriculum (Fried & Dunn, 2012) suggests that a single group session that involves challenging alcohol expectancies can decrease drinking, and this phenomenon could potentially translate to eating behavior. Programs developed to challenge these expectancies could be adapted from The Body Project modules that include resisting the thin ideal and challenging fat talk (Stice & Presnell, 2007). Additionally, creating informational modules that associate non-thin body sizes with positive outcomes, such as employment success and social capital, could serve to challenge thinness/restriction expectancies (Annus et al., 2008).

Lastly, as disordered eating continues to become more prevalent among men (Strother et al., 2012), it is important to understand how risk factors for disordered eating, such as expectancies, function within males. Little is known about the impacts of expectancies on disordered eating in men, as the majority of studies involving expectancies and disordered eating have used exclusively female samples. Interestingly, there was no main effect of sex on any of the outcome variables of the current study, suggesting that men may endorse certain expectancies and eating behaviors at similar rates as women. This supports existing preliminary data that suggest thinness/restriction expectancies may be predictive of disordered eating behaviors in males (Olsen et al., 2012), however further research regarding the various categories of expectancies is needed to support this claim.

Design Considerations and Limitations

This study had a number of strengths, including a relatively sex-balanced sample (54.2% female) and the measurement of a wider range of disordered eating behaviors compared to previous studies. Additionally, the current study is one of few to examine the relationships between expectancies and eating behavior in a sample of young adults, as many of the models of eating behavior that include expectancies were developed using adolescent samples (Combs et al., 2011; Pearson et al., 2010). Nonetheless, findings should be considered in light of design considerations and limitations. Though endorsement of the expectancy that eating leads to feeling out of control is associated with greater eating pathology (Brosof et al., 2019), the existing research regarding this expectancy was too limited to justify its inclusion in the proposed model. Brosof and colleagues (2019) found that the expectancy that eating leads to feeling out of control was related to various disordered eating behaviors (i.e., binge eating, purging, and restraint), and Fitzsimmons-Craft and colleagues (2013) found that lower

endorsement of this expectancy was related to eating disorder recovery, but these are the only two major findings related to this expectancy. In addition, when utilizing the framework of the goal conflict model (Stroebe et al., 2013), eating to manage negative affect and thinness/restriction expectancies appear to be more conceptually in conflict, as eating to manage negative affect directly violates thinness/restriction expectancies. The expectancies of eating to manage negative affect and eating leads to feeling out of control do not appear to conflict with one another, but the specific relationship between these expectancies is relatively unknown. Also, individuals who expect that eating will lead to feeling out of control may be more likely to restrict their diet and follow the behavioral patterns of individuals who endorse thinness/restriction expectancies. Future studies should investigate the expectancy that eating leads to feeling out of control in relation to other expectancies and disordered eating behaviors.

Because this study involved secondary data analysis, there are important limitations to consider. First, the current study was only able to test certain portions of the proposed model of expectancies and disordered eating. The existing data did not include information regarding previous experiences, emotion regulation, or internalization of bodily ideals, therefore, only the associations between expectancies and disordered eating outcomes were examined. Also, because the data are cross-sectional, the conclusions drawn from the current study are limited. Results from the cross-sectional mediation models should be interpreted with extreme caution, as the data were not able to test for temporal sequencing of the constructs of interest. Disabato (2016), however, argues that theoretical contributions can arise out of cross-sectional mediation, as this analysis can serve as justification for examining relationships longitudinally in the future. Indeed, current findings suggest the utility of examining the relationship between thinness/restriction expectancies and compensatory behaviors and whether this association is

mediated by both restriction and binge eating, as well as whether the relationship between eating to manage negative affect and compensatory behaviors occurs via binge eating. Longitudinal studies will be able to determine the temporal sequencing of these expectancies and behaviors, as well as the reliability of the indirect effects presented in the current study.

Additionally, because the current study utilized secondary data, it is important to consider the varying structure of the outcome variables. The outcome variables included in this study were from different inventories and diagnostic tools, and therefore may have varying levels of clinical utility. The binge eating and compensatory behaviors scores were derived from a self-report tool intended to generate a preliminary eating disorder diagnosis, while the dietary restriction score was calculated from a severity inventory. The single item used to measure binge eating frequency omits subjective binge eating episodes, as well as fails to capture the severity of each episode. However, due to the novelty of testing potential interactions between expectancies, it was determined that the frequency of binge eating episodes was essential to measure, and that perceived binge eating episodes and binge eating severity must be assessed in future studies.

Another limitation is that twenty percent of individuals in the current sample reported data after the outbreak of COVID-19 and subsequent shift to remote learning. It is possible that the situation regarding COVID-19 influenced the responses of participants. Future studies should calculate base rates of disordered eating behaviors and various risk factors during the COVID-19 pandemic and lockdowns to understand how the situation impacted eating behavior. It is possible that the endorsement eating expectancies was elevated as a result of social distancing, quarantining, and increased stress and anxiety experienced during the pandemic (Husky et al., 2020). Sensitivity analyses excluding participants who completed the study after the outbreak of COVID-19 were conducted, and these analyses yielded a consistent pattern of findings to that of

the complete sample. However, age emerged as a significant predictor of binge eating (b = -.03, p = .03) when excluding these individuals. Research comparing the behavioral responses of varying age cohorts to the COVID-19 outbreak should be conducted.

Because the study was conducted within a sample of university students, it is possible that findings may not generalize to the broader population. Young adults are an at-risk group for the development of disordered eating (Harrer et al., 2020), so it is possible that the endorsed levels of expectancies in the current study are higher than that of the general population. Extensive work has been conducted analyzing the role of eating and thinness/restriction expectancies in adolescents (Combs et al., 2010; Combs et al., 2011; Smith et al., 2007), but there is little research regarding expectancies of middle-aged and older adults. Future research should investigate how expectancies may change over time beyond young adulthood, as these changes may impact individuals' physical and mental health throughout the lifespan.

A final limitation is that only one category of eating expectancies, eating to manage negative affect, was included in the current study. There is limited evidence suggesting that two other eating expectancies -- eating leads to feeling out of control and eating to alleviate boredom -- are related to eating pathology broadly (Brosof et al., 2019). Though eating to manage negative affect is the most strongly supported risk factor for disordered eating regarding eating expectancies, future studies should examine how other categories related to thinness/restriction expectancies and various disordered eating behaviors.

Future Directions

One methodology that could assess the temporal sequencing of expectancies and various maladaptive eating behaviors is ecological momentary assessment (EMA). An EMA study focusing on how expectancies relate to behaviors could better suggest how expectancies lead to

behaviors and vice versa, depending on the outcome of the behavior. By collecting data over multiple time points, an EMA study would also be able to depict the nature of the relationships between maladaptive behaviors (e.g., the binge-purge cycle; Pearson et al., 2015). Schaefer and colleagues (2021) recently found that reductions in negative affect following an episode of binge eating predicted greater eating expectancies the next day, highlighting how these expectancies are reinforced. Longitudinal data must be collected in order to draw strong conclusions regarding the sequencing of various types of expectancies and behaviors, and future EMA studies would be able to provide sufficient data for such conclusions.

Within the field of eating disorders, research on expectancies has exclusively relied upon explicit measures (i.e., using questionnaires to directly ask participants what they believe will happen). However, alcohol use research has suggested that expectancies can be measured both explicitly and implicitly (Goldman et al., 2006). The P300 amplitude of an event-related potential (ERP) was found to be related to endorsement of positive/arousal expectancies (Fishman et al., 2008), suggesting that there is a preconscious component of alcohol expectancies. Implicit measures, such as those implicated in (ERP) studies, could be used to determine if thinness/restriction and eating expectancies exist in the form of a preconscious network. ERP studies could provide clinical utility by serving as indicators of functional processes (Polich, 1998), and they could provide additional insight regarding individuals who are consciously unaware that their levels of expectancies are influencing their maladaptive eating patterns. If evidence of a preconscious component of eating and thinness/restriction expectancies emerges, then it is possible that priming individuals with information challenging their expectancies could decrease disordered eating behavior, consistent with findings from the alcohol use literature (Carter et al., 1998). These studies could be significant indicators of change

within clinical intervention efforts as well. Additionally, future studies should examine how mismatches between implicit and explicit measures of expectancies relate to maladaptive eating behaviors.

Lastly, future studies should continue to broaden the expectancy literature by including measures that capture expectancies related to muscularity-oriented disordered eating. While the measures of expectancies in the current study have previously been used in samples of males (Pearson et al., 2010), they were developed in samples of women (Hohlstein et al., 1998) at a time before which muscularity-oriented disordered eating was commonly studied. Because of this, expectancies involving aspects of disordered eating prominent in males (e.g., steroid use, eating to gain weight/muscle mass, compensatory exercise; Nagata et al., 2019) are largely omitted in current examinations of expectancies. While compensatory exercise is associated with thinness/restriction expectancies in females (Davis et al., 2016), men's exercise behaviors related to expectancies are relatively unknown. Future research should strive to update and develop expectancy measures that can effectively men's cognitions surrounding maladaptive eating and exercise behaviors.

Conclusion

While the hypotheses of the current study were not supported, the results from the current study can help propel the eating expectancy literature. Different categories of expectancies were shown to predict various eating behaviors, and these expectancies should be examined in relation to additional understudied components of disordered eating (e.g., muscularity-oriented behaviors, maladaptive exercise). Thinness/restriction expectancies specifically were associated with behaviors across the eating disorder spectrum, and it is possible that the explicit measures used to capture an individual's level of expectancy could be adapted and expanded in future

studies to incorporate expectancies regarding exercise behavior and muscularity. The current study supports the examination of cognitive processes, specifically expectancies, to be included in the study of disordered eating. How an individual perceives the consequences or rewards of eating impacts whether they will experience disordered eating, and understanding these processes is crucial to the prevention and treatment of eating disorders.

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