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PREDICTORS OF BINGE EATING:  
PERFECTIONISM, DISTRESS TOLERANCE AND EATING SELF-EFFICACY

by

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## Abstract

Researchers have found that binge eating predicts obesity (Picot & Lilienfeld, 2003; Rand, Macgregor & Stunkard, 1997). Although binge eating is understood to be a major health risk, its predictors remain elusive. This study explored relationships between perfectionism, self-efficacy, and distress tolerance and binge eating, and the degree to which these three variables predict binge eating.

A cross-sectional correlation design was employed in this study. Participants recruited were female adult binge eaters, 18 years and older, who responded to the online survey. Participants who screened positive for binge eating responded to a series of surveys: the Eating Disorder Examination Questionnaire (EDE-Q 6.0; Fairburn & Beglin, 2008), to measure binge eating; the self-oriented (SOP) and socially-prescribed perfectionism (SPP) subscales of the Multidimensional Perfectionism Scale (MPS; Hewitt et al., 1991; Hewitt & Flett, 1991); the Distress Tolerance Scale (DTS; Simons & Gaher, 2005); and the Weight Efficacy Lifestyle Questionnaire (WEL; Clark, et al, 1991), to measure eating self-efficacy.

Four relationships were examined in this study: Hypothesis 1) Perfectionism is directly related to binge eating in women who binge eat, was supported in this study. [Perfectionism, as self-oriented perfectionism (SOP;  $r = .16, p = .04$ ), and socially prescribed perfectionism (SPP;  $r = .25, p < .01$ )]; Hypothesis 2) Distress Tolerance is inversely related to binge eating in women who binge eat, was supported in this study (DTS;  $r = -.20, p < .01$ ); Hypothesis 3) Eating self efficacy is inversely related to binge eating in women who binge eat, was supported in the study (WEL Tot;  $r = -.52, p < .00$ ); Hypothesis 4) Perfectionism, DT and ESE will predict binge eating in women who binge

eat, was only partially supported with ESE as the only predictor in the regression model ( $B = -.01, \beta = -.48, t = -5.93, Adjusted R^2 = .26, p < .000$ ).

Eating self-efficacy is evidently a robust predictor of binge eating. Further research examining the relationship of perfectionism, eating self-efficacy and binge eating with overconcern about weight is recommended.

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## CHAPTER I.

### The Problem

Overweight and obesity are major health concerns today. Obesity is associated with diabetes, hypertension, cardiovascular disease, stroke, gout, gallbladder disease, cancer, and early death (National Institute of Health and National Heart, Lung and Blood Institute, 1998). Sixty-six percent of all adults over 20 years of age were reported to be overweight by the National Health and Nutrition Examination Survey (NHANES) conducted during 2003 to 2004; among those classified as overweight, 32.2% were obese (Center for Disease Control; CDC, 2008). A body mass index (BMI) of greater than or equal to 25 is considered overweight, while a BMI of greater than or equal to 30.0 is considered obese (CDC, 2008).

Overweight and obesity occur when the amount of calories consumed exceeds the number of calories used by the body (NIH/NHLBI, 1998). There are complex factors leading up to the over-consumption of calories, not all of which are understood. Fairburn, Cooper and Shafran (2003) have found that the two major eating disorders contributing to calorie consumption, bulimia nervosa and binge eating share the same core psychopathology (an over-evaluation of weight, shape and eating, and dietary restraint, which includes an all or none approach to overeating) that interacts with other factors to help perpetuate the eating disorder (Fairburn, et al., 2003). Binge eaters do not practice the compensatory acts used by those with bulimia nervosa, and so will become overweight or obese if the bingeing continues. Although binge eating is understood to be a major health risk, its predictors remain elusive.

### *Binge Eating*

Binge eating is defined as "...eating in a discrete period of time (e.g., within any 2-hour period), an amount of food that is definitely larger than most people would eat in a similar period of time under similar circumstances" (APA, 1994, p. 731). Binge eating is also associated with a feeling of loss of control during the eating episode, as well as an abnormally rapid eating speed, and consumption of large amounts of food in the absence of hunger to an uncomfortable level of fullness which typically leaves the person feeling disgusted or depressed and guilty about the binge. Binge eating usually takes place in isolation.

Distress is a trigger of binge eating (Heatherton & Baumeister, 1991; Polivy & Herman, 1993; Corstorphine, Mountford, Tomlinson, Waller & Meyer, 2007; Wisner & Telch, 1999); if an individual has higher distress tolerance, then no impact should result from the distress; if low distress tolerance then binge eating may occur. Binge eating may be used to evade self-awareness (Wisner and Telch, 1999; Heatherton & Baumeister, 1991) to escape from the distress caused by self-appraisal (Heatherton & Baumeister, 1991) or dichotomous thinking (Orleans & Barnett, 1984; Lingswiler, Crowther, Stephens, 1989; Fairburn, et al., 2003) which occurs in perfectionism.

#### *Theoretical Framework: Relapse Prevention Model*

The Relapse Prevention Model (RPM) is a cognitive behavioral self-management program for overcoming addiction (Marlatt, 1979; 1985). Binge eating is conceptualized as an addictive behavior in the Relapse Prevention Model (RPM; Marlatt & Gordon, 1985). The model describes a continuum of high risk situations, coping, self-efficacy and the abstinence violation effect toward the prevention of binge eating. Perfectionism,

distress tolerance, and eating self-efficacy replace high risk situations, coping and self-efficacy, respectively, in the RPM in the current study, and are associated with binge eating (Lingswiler, et al., 1989; Pratt, Telch, Labouvie, Wilson & Agras, 2001).

#### *Perfectionism and Binge Eating*

Perfectionism has been related to binge eating in that individuals who binge eat usually hold unrealistic standards for themselves, and feel unsuccessful at dieting, and in other aspects of life as well (Fairburn, 1995; Stice, 2002).

#### *Distress Tolerance and Binge Eating*

Binge eating has occurred in response to emotional and stressful triggers (Polivy & Herman, 1993; Corstorphine, et al., 2007; Wiser & Telch, 1999; Heatherton & Baumeister, 1991). Corstorphine and colleagues (2007) have found that low levels of DT can lead to binge eating, which leads to overweight and obesity (Wiser & Telch, 1999; Picot & Lilienfeld, 2003).

#### *Eating Self-Efficacy and Binge Eating*

Eating self-efficacy, an individual's belief in his or her ability to engage in healthy eating behaviors, is inversely related to binge eating (National Institute of Health and National Heart Lung and Blood Institute, 1998); and has predicted changes in binge eating (Gormally et al.; 1982; Miller, Watkins, Sargent & Rickert, 1999; Cargill, Clark, Pera, Niaura, & Abrams, 1999; Heatherton & Baumeister, 1991; Wiser & Telch, 1999). Strategies that improve a person's eating self-efficacy will be useful to curtail binge eating (Clark, et al, 1991; Bandura, 1977; 1986; 1997).

### *Summary of the Three Independent Variables*

Amounts of eating self-efficacy (Clark, et al., 1991), distress tolerance (Corstorphine, et al., 2007) and perfectionism (Fairburn, et al., 2003) individuals possess influence the ability to avoid binge eating.

### *Statement of the Problem*

What are the relationships among perfectionism, DT, eating self-efficacy (ESE), and binge eating in women who binge eat?

### *Sub-problems*

1. What is the relationship between perfectionism and binge eating in women who binge eat?
2. What is the relationship between distress tolerance and binge eating in women who binge eat?
3. What is the relationship between eating self-efficacy and binge eating in women who binge eat?
4. To what extent do distress tolerance, eating self-efficacy, and perfectionism predict binge eating in women who binge eat?

### *Definition of Terms*

Binge eating has been theoretically defined as the type of recurrent episodic eating that occurs at least once a week for a period of three months or more, associated with a loss of control (Wilfley, Bishop, Wilson & Agras, 2007), and involving consumption of a much larger amount of food than most people would eat in the same time period without any of the compensatory behaviors associated with bulimia nervosa (American Psychiatric Association, 1994; 2000; Stunkard & Allison, 2003). Binge eating



was operationally defined as frequency scores for questions 14 (for binge eating events) and 15 (for binge eating days) of the Eating Disorder Questionnaire (EDE-Q 6.0; See Appendix C; Fairburn & Beglin, 2008). The EDE-Q is a self-report questionnaire that takes place over the last 28 days; this is done to ensure accuracy, as it is believed that the participant's recollection of events would not be as accurate beyond a month (Fairburn, Cooper & O'Connor, 2008). The authors of the EDEQ-16.0 further recommend that if this questionnaire is to be used for diagnosis purposes, then questions over 2 and 3 months ago may be added (Fairburn, Cooper & O'Connor, 2008). Perfectionism is theoretically defined as an individual holding and pursuing excessively high and unrealistic standards, focusing on and overemphasizing one's own failures, evaluating oneself in a very self-critical way, and possessing an all or none dichotomous thinking pattern in which total success or total failure are comprehended as the only possible choices (Hewitt, Flett, Turnbull-Donovan & Mikail, 1991). Perfectionism was operationally defined as the participant's score on two subscales of the Multidimensional Perfectionism Scale (MPS; See Appendix D; Hewitt, et al., 1991) which measure self-oriented perfectionism (SOP) and socially prescribed perfectionism (SPP; Hewitt, et al., 1991). SOP is theoretically defined as unrealistically high standards that an individual holds and directs toward oneself. SPP represents unrealistically high standards held and directed by significant others toward an individual (Hewitt, et al., 1991). These dimensions of perfectionism were operationalized by their respective MPS subscale scores.

Distress tolerance (DT) is theoretically defined as an individual's ability to tolerate negative emotional states (Linehan, 1993). DT is operationally defined as the

participant's total score on the Distress Tolerance Scale (DTS; See Appendix E; Simons & Gaher, 2005). Four first order factors of distress tolerance, tolerance, absorption, appraisal and regulation, represent the four dimensions of distress tolerance. Tolerance is theoretically defined as the individual's perception of ability to tolerate stress. Absorption is theoretically defined as the degree to which an individual is consumed by negative emotions. Appraisal is theoretically defined as the individual's assessment of the tolerability of the distress. Regulation is theoretically defined as the individual's feeling of urgency to do something to alleviate the negative emotion (Simons & Gaher, 2005). These components of DT are operationally defined by the total score of the DTS (Simons & Gaher, 2005).

Self-efficacy is the individual's belief in his or her ability to perform the necessary behavior in order to achieve a desired outcome (Bandura, 1977, 1986). Eating Self-efficacy is theoretically defined as an individual's belief in his or her ability to engage in healthy eating behaviors that result in or maintain a healthy weight (Glynn & Ruderman, 1986; Clark, et al., 1991). Eating self-efficacy is operationally defined as the total score on the Weight Efficacy Lifestyle Questionnaire (WEL; See Appendix F; Clark, et al, 1991). Dimensions of eating self-efficacy, negative emotions, availability, social pressure, physical discomfort, and positive activities were operationalized by their respective subscale scores.

### *Delimitations*

The sample studied was a convenience sample of self-identified adult binge eaters, ages 18 and over, whom screened positive for binge eating by answering yes to the screening question.

### *Significance of Binge Eating*

Researchers have found that binge eating predicts obesity (Gormally, et al., 1982; Loro & Orleans, 1981; Marcus, et al., 1985; Picot & Lilenfeld, 2003; Rand, Macgregor & Stunkard, 1997). The purpose of this study was to explore relationships between perfectionism, self-efficacy, and distress tolerance and binge eating, and the degree to which these three variables predict binge eating.

## CHAPTER II.

### Review of the Literature

#### *Dependent Variable*

##### *Binge Eating: Theoretical Support*

As early as the mid 20<sup>th</sup> century, binge eating was said to be prevalent among obese people (Stunkard, 1959). Kaplan and Kaplan (1957) theorized that emotions induced overeating in individuals who were obese, and that such overeating served to reduce anxiety. Stunkard observed that binge eating was associated with self-condemnation about the binge, (1959; Stunkard, 2003). Approximately two decades later, Marcus and colleagues reported that 50% of individuals who sought treatment for obesity had severe binge eating problems (Marcus, et al., 1985). Binge eating can occur in all weight groups, but is more common in obese (Picot & Lilenfeld, 2003; Gormally, et al., 1982; Loro & Orleans, 1981; Marcus, et al., 1985). Binge eating occurs in 3% of the general adult U.S. population (WIN/NIDDK/NIH, 2008), and in about 25% of patients seeking obesity treatment (Pull, 2004). Binge Eating Disorder has no compensatory mechanisms, such as purging, excessive exercise use, laxative abuse or fasting, to extinguish the effects of the large amount of calories ingested when bingeing, and therefore is the major eating disorder most associated with obesity (Yanovski, 1993; APA, 1994; Devlin, Walsh, Spitzer, Hasin, 1992).

Binge eating occurs in response to emotional and stressful triggers (Polivy & Herman, 1993; Corstorphine, et al., 2007; Wiser & Telch, 1999; Heatherton & Baumeister, 1991; Ghiz & Chrisler, 1995) which drain the amount of distress tolerance (DT) that a person possesses. Binge eating has been theoretically related to higher self-

standards and with the multi-dimensional construct of perfectionism (Hewitt, et al., 1991). The amount of eating self-efficacy an individual possesses influences the ability to overcome binge eating (Clark, et al., 1991; Cargill, et al., 1999; Clark, et al., 2000; Bandura, 1997).

The amount of eating self-efficacy an individual possesses influences the ability to overcome binge eating (Clark, et al., 1991; Cargill, et al., 1999; Clark, et al., 2000; Bandura, 1997).

Marlatt and Gordon's Relapse Prevention Model (RPM; Marlatt, 1979; Marlatt, 1985) illustrates a mechanism in which high risk situations, coping resources, self-efficacy and the abstinence violation effect are related to the addictive behavior, binge eating.

#### *Binge Eating: Empirical Support*

Gormally and others (1982) investigated the association between eating self-efficacy and binge eating in two obesity treatment-seeking samples of overweight participants. Sample 1 was female and between the ages of 24 and 55 ( $n = 65$ ); 34.6% were considered overweight on the Metropolitan Life Insurance Company (1959) Tables. Sample 2 was male and female ( $n = 47$ ) between the ages of 24 and 67. Study participants responded to the BES (Gormally, et. al, 1982) and the Cognitive Factor Scale (CFS). The CFS which measures high standards for dieting and low eating self-efficacy was designed by Gormally and others (1982) to "examine whether cognitive phenomena were related to binge eating" (p. 48) which was then used to examine for correlation with the binge eating scale. The researchers found a statistically significant relationship between low

eating self-efficacy and binge eating (sample 1:  $r = .56$ ,  $p < .001$ ; sample 2:  $r = .53$ ,  $p < .001$ ).

Robertson and Palmer (1997) investigated the prevalence of binge eating, binge eating disorder, and the correlates of binge eating in a sample of 111 obese women between the ages of 18 and 49 in Britain. This sample consisted of obese participants from a previous study of women investigated for eating behaviors, attitudes and psychopathology. Participants responded to the Questionnaire of Eating and Weight Patterns-Revised (Spitzer, et al., 1993) and the Dutch Eating Behaviors Questionnaire (DEBQ; Van Strien, Frijters, Bergers & Defares, 1986), either by verbal interview or in writing by mail (Robertson and Palmer, 1997). Twenty-four percent of these obese women reported binge eating; 12% of the sample who reported binge eating also reported that they experienced a loss of control over eating during the binge. Robertson and Palmer's study supports binge eating as a predictor of obesity.

Cachelin, Striegel-Moore, Elder, Pike, Wilfley and Fairburn (1999) investigated the natural course of binge eating disorder at baseline, 3 months and 6 months in a sample of women who were recruited by telephone and screened positive for binge eating based on the DSM-IV criteria. This sample of 31 women were mostly overweight, or obese on average, BMI ( $M = 33.8$ ), for a duration in years of ( $M = 7.5$ ,  $SD = 5.83$ ). Eating disorders were measured by the Eating Disorder Examination, 12<sup>th</sup> edition (Fairburn & Cooper, 1993) and Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994). Eating disorder risk factors was measured by the Risk Factor Interview (Fairburn, Welch, Dull, Davies & O'Connor, 1997; Welch & Fairburn, 1994). Psychiatric symptomatology was measured by the Brief Symptom Inventory (BSI;

Derogatis, 1975). The Social Adjustment Scale-Self Report (SAS-SR; Weissman & Bothwell, 1976) measured satisfaction and function in work, social, family, economical and leisure aspects of life. The Health Care Utilization Questionnaire (HCUQ; Striegel-Moore, Pike & Wilfley, 1995) measured the type of health care services an individual uses, the type of medications and psychiatric services. The EDE and the EDE-Q were shown to correlate significantly (Black & Wilson, 1996; Fairburn & Beglin, 1994). At baseline, height and weight were measured, and body mass index (BMI) was later calculated (Cachelin, et al., 1999). Age was the only variable that predicted binge eating frequency in the study participants remaining at 3 months ( $N = 31$ ;  $F(1,10) = 9.0$ ,  $p < .006$ ), while no variables predicted binge eating in the study participants remaining in the study at 6 months ( $N = 21$ ). The 10 participants who left the study after 3 months (drop-outs) were compared to the 21 participants who completed the 6 month assessment (completers). A comparison of the two groups revealed that drop-outs more likely had a history of childhood sexual abuse.

Binge eating was found to be inversely related to concern over weight and shape, though binge eaters in partial remission remained overweight (Cachelin, et al., (1999).

Paradoxically overweight or obese binge eaters that need to consume less calories are predisposed to binge eat more due to this inverse relationship. Concern over weight and shape is a perfectionistic aspect of body image. Cachelin and colleagues' study (1999) supports the need to examine perfectionism in relation to binge eating, since the above referenced paradox is found to be related to aspects of perfectionism.

### *Summary of Binge Eating*

The literature on binge eating is fairly young; there is still much unknown. Theorists agree that binge eating is associated with perfectionism (Wiser & Telch, 1999; Fairburn, et al., 2003). Binge eating is also theorized to be a consequence of low distress tolerance (Corstorphine, et al., 2007; Heatherton & Baumeister, 1991; Gormally, et al., 1982) and is inversely associated with eating self-efficacy (Gormally, et al., 1982; Clark, et al., 1991; Glynn & Ruderman, 1986; Clark, et al., 2000).

### *Independent Variables*

#### *Perfectionism: Theoretical Support*

Perfectionism is a multidimensional construct of dichotomous perspective to view oneself as either perfect or failed. Hollander (1965) initially defined perfectionism as an individual requiring a higher level of performance quality from oneself than is both required of the situation and which exceeds the expectations of others for that individual. Burns (1980a) broadened the analysis of perfectionism to include a “network of cognitions” that were theorized to include one’s expectations of how things should be and one’s assessment of how things are for oneself or others. According to Burns, perfectionistic individuals were said to have very high standards for a specific task or goal for oneself or others, and in addition, were expected to rigidly adhere to these standards. Frost, Marten, Lahart and Rosenblatt (1990) defined perfectionism as “the setting of excessively high standards for performance... accompanied by overly critical self-evaluation” (Frost, Marten, Lahart & Rosenblate, 1990, p. 450) which were related to a fear of failure (Flett, et al., 1991; Flett, Blankstein, Hewitt, & Koledin, 1992;



Thompson, Davis & Davidson, 1998). Perfectionism was theorized to also be related to procrastination (Frost, et al., 1990) and other avoidance related behaviors.

Perfectionism has been linked positively to achievement and adjustment (Hamachek, 1978), and as a neurotic behavior that pervades the entire personality and aspects of self (Flett, Hewitt & Dyck, 1989; Pacht, 1984). Perfectionistic behavior has also been theoretically linked to negative outcomes such as guilt, procrastination, reduced self-efficacy, and feelings of failure (Hollander, 1965; Pacht, 1984; Hamachek, 1978; Solomon & Rothblum, 1984; Sorotzkin, 1985). These negative personality outcomes of perfectionistic behavior have been noted to lead to alcoholism, anorexia, depression and personality disorders (Pacht, 1984; Burns & Beck, 1978). Burns (1980 b) theorized that such negative outcomes in maladjustment resulted from the cognitive discrepancy between unrealistically high standards and the overly critical assessment of self in comparison to these standards; that a selective attention to one's failure seemed to pervade the self by means of an overgeneralization of the perceived failure to one's entire life; and conceptualized perfectionism as unidimensional and self-directed. Hewitt and others (1991) disagreed with prior one-dimensional theoretical views that limited perfectionism to self-directed cognitions and posited that perfectionism is also associated with interpersonal issues that occur due to difficulties in adjustment. Some have theorized that perfectionism has social as well as personal components and is not just limited to the private self (Cheek & Briggs, 1982; Fenigstein, Scheier, & Buss, 1975; Greenwald & Breckler, 1985; Schlenker, 1980), while others have theorized that personality components from both within the individual and between individuals have important ramifications in the development of psychiatric disorders (Kiesler, 1982; McLemore &

Benjamin, 1979; Millon, 1981). Three basic components of perfectionism have been presented by Hewitt and colleagues (1991): self-oriented perfectionism, other-oriented perfectionism and socially prescribed perfectionism.

*Self-oriented Perfectionism.*

Hewitt and colleagues (1991) reason that SOP involves motivation aimed at striving toward high standards and attempting to prevent failure, which can result in productivity. SOP has been found to be associated with self-blame (Hewitt, Mittelstaedt & Wollert, 1989), maladjustment outcomes (Flett, et. al, 1989), eating disorders (Cooper, Cooper, & Fairburn, 1985; Garner, Olmstead & Polivy, 1983), and emotional distress (Hewitt & Dyck, 1986; Hewitt & Flett, 1990; Pirot, 1986). Hewitt and Flett noted that the discrepancy between the self-appraised self and the self-imposed ideal was responsible for distress (Higgins, Bond, Klein, & Strauman, 1986; Strauman, 1989) and low self-esteem (Hoge, & McCarthy, 1983; Lazzari, Fioravanti, & Gough, 1978).

*Socially Prescribed Perfectionism.*

SPP involves the perception of an individual that friends, family members or significant others, hold unrealistically high standards to critically evaluate the individual (Hewitt & Flett, 1991). Common results of these excessive expectations are anger, anxiety, depression and other negative emotional states caused by a failure to please others (Hewitt & Flett, 1991). Hooley and Teasdale (1989) noted that the best predictor of relapse to depression was the patients' perception of their spouse's critical treatment. The unrealistically high standard held by significant others sets the person up for failure, since the nearly impossible goal cannot be reached, and dichotomous thinking leads the person to give up trying and binge instead.

*Dimensions of Perfectionism and Binge Eating: Empirical Support.*

Pratt and colleagues (2001) investigated the relationship between all three dimensions of perfectionism with binge eating and general psychopathology variables in a non-clinical sample of 219 women between the ages of 18 and 60 enrolled in a study about eating behaviors. Participants met criteria for the following groups: bulimia nervosa (BN;  $n = 32$ ), binge eating disorder (BED;  $n = 127$ ) and non-eating disordered (NED;  $n = 60$ ). The groups varied on weight range as follows: the BN group within a normal weight range (BMI = 20-25), while the body mass indexes for both the NED and BED groups (BMI > 30) indicated that they were obese. Participants responded to the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Cooper, 1993), the Questionnaire on Eating and Weight Patterns-Revised (QEWP-R; Spitzer, et al., 1992), which measures frequency and duration of binge eating behavior. They also completed the Beck Depression Inventory (BDI; Beck, Steer & Garbin, 1988), the Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965), the Symptom Checklist-90 (SCL-90; Derogatis, 1977) for general psychiatric symptoms and distress, the Multidimensional Perfectionism Scale (MPS; Hewitt, et al, 1991) and the Binge Eating Scale (BES; Gormally, et al, 1982). The researchers found a significant relationship between Socially Prescribed Perfectionism (SPP) and binge eating. Neither SOP nor OOP revealed a statistically significant correlation with binge eating nor with any of the eating pathology measures, however both SOP and SPP were significantly associated with depressive symptoms ( $r = .21$  and  $r = .36$ ,  $p < .05$ , respectively) and with general psychiatric symptoms ( $r = .28$  and  $r = .29$ ,  $p < .01$ , respectively). Structural Equation Modeling was used to examine current models of binge eating against maintenance of BED. Six models were tested, only

four contained perfectionism. Models were examined for best fit, and for the relationship of perfectionism to the other variables previously mentioned to the understanding of BED (Pratt, 2001). None of the initial models provided a suitable fit. Reformulated models were then tested requiring the pathway from restraint to binge eating to be omitted, and for negative affect to be added. Two good fitting models resulted: Model A and Model B. Model B involved socially prescribed perfectionism to self-esteem to weight and shape overconcern, and then diverging to binge eating or to restraint. Model A did not involve perfectionism, but involved self-esteem diverging to weight and shape overconcern, and then to binge eating, or to negative affect and then to restraint.

Sherry (2006) used a structural equation model to investigate the relationships between the dimensions of perfectionism and binge eating. Participants were 566 female college students, of diverse ethnic background, who were recruited from multiple sites in Canada and who responded to Internet-based structured diaries over 7 consecutive days. Data collection occurred in two phases: Phase 1 involved participants reporting to the university lab and completing demographic and personality questionnaires, and then phase 2 was performed as an Internet-based structured consecutive 7-day diary on a website designed for the study. The website had been pilot-tested by 20 students to ensure that it was easy to navigate. A total of 572 participants completed Phase 1; 566 were included in the final sample. Participants completed the following questionnaires: Hewitt and Flett's Multidimensional Perfectionism Scale (MPS-H; Hewitt, et al, 1991); Eating Disorder Inventory-Perfectionism subscale (EDI-P; Garner, et al., 1983); the Frost's Multidimensional Perfectionism Scale (FMPS; Frost, et al., 1990); Big Five Inventory Neuroticism Subscale (BFI-N; Benet-Martinez & John, 1998);

Multidimensional Discrepancy Inventory (MDI; Flett & Hewitt, 2006); Body-Image Ideals Questionnaire (BIQ; Cash & Szymanski, 1995); Almost Perfect Scale-Revised (APS-R; Slaney, et al., 2001); State Self-Esteem Scale (SSES; Heatherton & Polivy, 1991); Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965), Janis-Field Feelings of Inadequacy (JFFIS; Janis & Field, 1959), Profile of Mood States (POMS-D; McNair, et al., 1992); Depression Adjective Checklist: Form E (DACL-E) and Form G (DACL-G; Lubin, 1965); Dutch Restrained Eating Scale (DRES; van Strien, Frijters, Bergers, & Defares, 1986); Dietary Intent Scale (DIS; Stice, 1998); Three-Factor Eating Questionnaire (RFEQ-R; Stunkard & Messick, 1985); Bulimia Test-Revised (BULIT-R; Thelen, Farmer, Wonderlich, & Smith, 1991). Eating Disorder Inventory Bulimia subscale (EDI-B; Garner, et al., 1983); and Eating Disorder Diagnostic Scale (EDDS; Stice, Telch & Rizvi, 2000); As predicted, SOP and SPP influenced binge eating.

Correlation was high for the original and revised binge eating subscales for the EDDS ( $r = .64, p < .001$ ). This relationship was mediated through the following binge eating triggers: perceived discrepancies, low self-esteem, depressive affect and dietary restraint. Support for the Perfectionism Model of Binge Eating (PMOBE) was demonstrated through acceptable fit. This study revealed that SPP has a strong influence in the occurrence of binge eating through these triggers but that SOP has a strong influence in the occurrence of binge eating through all studied triggers except dietary restraint (Sherry, 2006).

According to Sherry (2006), the study of perfectionism in eating disorders has primarily been in anorexia and bulimia nervosa, and little work has been done examining the relationship between perfectionism and binge eating. Sherry (2006) omitted Other

Oriented Perfectionism from his study of perfectionism and binge eating. Pratt and colleagues (2001) found significant relationships between SOP and SPP with binge eating, but no such relationship was found between OOP and binge eating. The current study therefore did not examine the relationship between OOP and binge eating.

#### *Distress Tolerance: Theoretical Support*

DT is defined as an individual's ability to undergo and endure distress (Linehan, 1993). Distress, which may be the consequence of both physical and cognitive processes, is often characterized by behaviors that strive toward alleviating the distress. Simons and Gaher (2005) classify DT as a meta-emotion construct. According to Jäger and Bartsch (2006) a meta-emotion is an emotion that one has about one's own emotions. DT consists of an individual's evaluation and expectations about experiencing distress as: tolerance, absorption, appraisal and regulation (Simons & Gaher, 2005).

Individuals with low DT would primarily be expected to describe distress as unbearable, describe feeling very upset or distressed, be unwilling to accept the distress, be ashamed of the distress, believe that their coping resources are inferior to those of most others, need to work very hard to avoid feeling distressed, and if unable to reduce the perceived distress then would report feeling overwhelmed by the experience which would result in significant compromise in functionality (Simons & Gaher, 2005).

Linehan (1993) noted that low DT occurs as a consequence of feedback between an individual's biological/behavioral system and interaction with interpersonal relationships. An individual who suffers from low DT would be inclined to use strategies that immediately help with the feeling of distress, such as binge eating, and that manifest

in attention selection or deployment (Gross, 1998; Linehan, 1993; Corstorphine, et al., 2007; Simons & Gaher, 2005).

Low DT causes an individual to feel that something must be done urgently to alleviate the emotion-laden feelings associated with the distress. Such urgent need to immediately resolve distress predisposes such individuals to eating disorders (Baumeister, Heatherton & Tice, 1994; Corstorphine, et al., 2007).

*Dimensions of Distress Tolerance: Theoretical Support.*

The dimension of tolerance represents the degree to which an individual perceives an ability to tolerate distress (Simons & Gaher, 2005). Absorption represents an individual feeling consumed by negative emotions. Appraisal is the dimension that represents an individual's assessment of distress tolerance. The dimension of regulation represents the urgency that an individual feels compelled to do something to alleviate the negative emotion (Simons & Gaher, 2005).

*Distress Tolerance and Binge Eating: Empirical Support*

Stein and colleagues (2007) investigated the relationship between emotional distress/negative mood and binge eating in a sample of overweight women having body mass indexes (BMI) between 27- 48 ( $M = 37.3$ ,  $SD = 5.5$ ) and between the ages of 28 and 63 ( $M = 45.2$ ,  $SD = 9.3$ ) who met the DSM-IV criteria for BED (APA, 1994; 2000; Stein, et al., 2007). Assessment was performed using the Eating Disorder Examination, 12<sup>th</sup> edition (EDE 12.OD; Fairburn & Cooper, 1993). Binge eating was significantly related to location ( $X^2(7) = 62.20$ , and to person present  $X^2(5) = 38.87$ ,  $p < .05$ ). Binge eating was more likely to occur when in the kitchen ( $z = 5.7$ ) and in the living room ( $z = 2.1$ ,  $p < .05$ ). Binge eating was also found to be more likely to occur when the person was

alone ( $z = 5.2$ ), and less likely when with a friend ( $z = -2.4$ ) or with a coworker ( $z = -4.0$ ,  $p < .05$ ). Frequency of binge eating was found to be related to time of day ( $X^2(2) = 21.91$ ,  $p < 0.001$ ). Binges were found to more likely occur at night between the hours of 6:00 p.m. to 1:00 a.m. ( $n = 119$ , 45.1%,  $z = 4.6$ ) compared with binges in the morning (5:00 a.m. to 11:59 a.m.;  $n = 78$ , 29.5%) and with the afternoon between 12:00 noon and 5:59 p.m. ( $n = 67$ , 25.4%,  $p < .05$ ). Binge eaters identified the size of the binge as large, unusually large or small. Unusually large was defined as eating three times as much as the average person would eat, large would be eating more than the average person would eat, and small would be eating less than the average person would eat. Unusually large amounts of food ingested was related to higher levels of distress. Binge eaters with low distress tolerance responded to emotional distress and negative moods by binge eating. Negative mood was found to be higher before a binge, than a non-binge time (negative mood at non-binge time  $M = 0.37$ ,  $SD = 0.21$ ; negative mood right before a binge  $M = 0.61$ ,  $SD = 0.52$ ; negative mood as consequence to a binge  $M = 0.91$ ,  $SD = 0.51$ ,  $F = 17.17$ ,  $p < 0.001$ ).

#### *Distress Tolerance and Eating Disorders: Empirical Support*

Anestis, Selby, Fink and Joiner (2007) investigated the relationship between DT and EDI-Bulimia in a sample of undergraduate students ( $N = 200$ ) aged between 16 and 25 ( $M = 18.32$ ,  $SD = 1.09$ ). Participants responded to the DTS (Simons & Gaher, 2005) to measure DT, and the Eating Disorder Inventory (EDI; Garner, et al., 1983) to measure bulimia (binge eating and subsequent purging associated with bulimia nervosa). Simon and Gaher's Distress Tolerance Scale (2005) is a 15-item questionnaire that focuses on the "...degree to which individuals experience negative emotions as intolerable..." (p.



720). A 7-point likert scale is used, 1 = strongly agree that psychological distress is intolerable, and 7 = strongly disagree. Cronbach's alpha for Simon and Gaher's DTS was .91 in this study (Anestis, et al., 2007). As predicted, DT significantly predicted bulimic symptoms ( $sr = -0.13$ ,  $t = -2.56$ ,  $p < .01$ ). DT therefore predicted binge eating, which is a component of bulimia nervosa. Other variables were introduced in the study to ascertain if distress tolerance was a robust predictor when other variables were controlled for. Other variables measured were Impulsive Behavior Scale (IPBS), Eating Disorder-Perfectionism (EDI-P), EDI-Body Dissatisfaction, EDI-Interoceptive Awareness, and EDI-Drive for Thinness. Individuals with low distress tolerance had a higher score on the EDI-bulimia scale since they would turn to bulimia or binge eating. Anestis and researchers also examined distress tolerance for mediated pathway between study variables. "The test was significant ( $z = 2.00$ ,  $p < .04$ ), suggesting that DT scores mediated the relationship between Anxiety Sensitivity Index scores and EDI-Bulimia scores" (2007, p. 723). The variable, anxiety sensitivity index and distress tolerance seem closely related: this mediational relationship is not relevant to the current study, however the significant prediction of bulimic symptoms that include binge eating by distress tolerance ( $sr = -0.134$ ,  $t = -.2558$ ,  $p < .01$ ), does empirically support the relationship between distress tolerance and binge eating.

Studies by Mountford, Corstorphine, Tomlinson and Waller (2007) and Corstorphine and colleagues (2007) used another scale that measures distress tolerance, named identically to Simons and Gaher's scale (2005) that used subscale scores to measure distress tolerance. Mountford and colleagues (2007) investigated the differences in DT between female eating disordered clinic patients ( $n = 73$ ,  $M$  (age) = 28.5,  $SD =$

7.80) and non-eating disordered women ( $n = 62$ ) recruited from a British University. Participants responded to a self-report questionnaire which included questions about their height and weight, yielding a BMI for the eating disordered participants ( $M = 22.7$ ,  $SD = 8.68$ ) and an average BMI for the control group ( $M = 23.0$ ,  $SD = 4.81$ ), the DTS (Corstorphine, et al., 2007) to measure distress tolerance, and the Eating Disorders Inventory (EDI; Garner, et al., 1983) to measure eating pathology. The DTS (Corstorphine, et al., 2007) measured distress tolerance on three subscales, anticipate and distract, avoidance of affect and accepting and managing emotion. The non-eating disordered group scored higher than the eating disordered group on anticipate and distract ( $M = 2.90$ ,  $SD = 0.683$ ;  $M = 2.73$ ,  $SD = 0.744$ ,  $t = 1.36$ ,  $p = 0.175$ ), though not statistically significant, and accept and manage ( $M = 2.89$ ,  $SD = 0.610$ ;  $M = 2.64$ ,  $SD = 0.664$ ,  $t = 2.25$ ,  $p < 0.026$ ), but lower on the avoidance dimension ( $M = 2.17$ ,  $SD = 0.499$ ;  $M = 2.81$ ,  $SD = 0.775$ ,  $t = 5.68$ ,  $p < 0.001$ ), respectively (Corstorphine, et al., 2007; Mountford, Corstorphine, Tomlinson & Waller, 2007). Higher scores on anticipate and distract and accept and manage subscales are indicative of higher levels of distress tolerance, while lower levels of avoidance subscale support higher distress tolerance since avoiding affect indicates less tolerance to distress. According to this study, lower levels of accept and manage and higher levels of avoidance are predictive of eating disorders.

#### *Summary of Distress Tolerance*

DT is an important construct in studying binge eating (Wiser & Telch, 1999; Corstorphine et al., 2007; Heatherton & Baumeister, 1991). While there is theoretical

support linking DT with binge eating (Wiser & Telch, 1999; Corstorphine, et al., 2007; Mountford, et al., 2007; Heatherton & Baumeister, 1991), empirical support is limited.

### *Eating Self Efficacy: Theoretical Support*

Eating self-efficacy (ESE) was first conceptualized by Glynn and Ruderman (1986) based on Bandura's theory of self-efficacy (1977; 1986) and research in phobia (Bandura, 1977), and addictive disorders (Condiotte and Lichtenstein, 1981). Self-efficacy related to eating was found to be one of several factors important when addressing binge eating (Clark, et al., 1991; Bandura, 1977; 1986). The construct of self-efficacy involves an individual's confidence in his or her ability to achieve a behavior or curtail a pathological behavior necessary for achievement of a desired outcome. Eating self-efficacy (Clark, et al., 1991) is an individual's appraisal about his or her ability to maintain healthy eating behaviors, and therefore minimize or abstain from binge eating. Early studies found that the amount of perceived control over food consumption and weight management that a person had would be directly associated with weight loss (Green, 1978; Hartigan, Baker-Strauch, & Morris, 1982; Stuart & Guire, 1977). Binge eating is a consummatory behavior that involves food rather than noxious substances (Wilson, 1991; Marlatt & Gordon, 1985; Sternberg, 1985; Gormally, et al., 1982). It has been theorized in the Relapse Prevention Model that eating self-efficacy is inversely related to binge eating (Marlatt & Gordon, 1985). The dimensions of ESE include Negative emotions, Availability, Social Pressure, Physical Discomfort and Positive Activities (Clark, et al., 1991).

*Negative Emotions: Theoretical Support.*

Negative emotions is the dimension of eating self-efficacy that relates to the temptation to eat in circumstances when an individual is nervous, depressed, angry, or feeling like a failure (Clark, et al., 1991). Negative emotions are a known common trigger to binge eating (Lingswiler, et al., 1989; Gormally, et al., 1982).

*Availability: Theoretical Support.*

Availability is the dimension of eating self-efficacy that relates to temptation to binge when the opportunity is there such as on the weekend, at a party, when either high-calorie or a wide variety of foods are available (Clark, et al., 1991).

*Social Pressure: Theoretical Support.*

Social Pressure is the dimension of eating self-efficacy that relates to temptation to binge when others are urging you to indulge. In such situations, an individual may feel obliged to eat the forbidden, or plentiful, fattening foods, or may feel guilty about refusing multiple helpings at dinner (Clark, et al., 1991).

*Physical Discomfort: Theoretical Support.*

Physical Discomfort is the dimension of eating self-efficacy that relates to temptation to eat when not feeling well, perhaps feeling weak or in pain (Clark, et al., 1991). Individuals may have difficulty resisting binge eating when they feel physically uncomfortable (Clark, et al., 1991).

*Positive Activities: Theoretical Support.*

Positive Activities is the dimension of eating self-efficacy that relates to temptation to indulge in binge eating when having fun, watching television, reading, before going to bed, or just generally happy (Clark, et al., 1991).

*Eating Self Efficacy and Binge Eating: Empirical Support.*

Gormally and colleagues (1982) investigated the relationship between eating self-efficacy and binge eating in two samples of overweight participants that sought treatment for obesity. Participants responded to the BES (Gormally, et. al, 1982) and the Cognitive Factor Scale, the latter of which measures high standards for dieting and low eating self-efficacy, and served as a tool to examine for a correlation between binge eating severity and cognitive phenomena for the development and validation of the BES. This study and both of these instruments are described in greater detail earlier in this chapter. The researchers found a statistically significant relationship between low eating self-efficacy and binge eating (sample 1:  $r = .56, p < .001$ ; sample 2:  $r = .53, p < .001$ ).

Miller, Watkins, Sargent & Rickert, (1999) investigated the differences in eating self-efficacy and binge eating among binge eaters, borderline binge eaters, and non-binge eaters who were either overweight or obese. Participants were self-referred as they were those who signed up to join a weight management program during a six-month period. All participants were administered the Weight Efficacy Lifestyle Questionnaire (Clark, et al., 1991), the Binge Eating Scale (Gormally, et al., 1982) and the diagnostic questions for BED in the DSM-IV (APA, 1994). Utilizing a Kruskal-Wallis Rank-Order Analysis of Variance among 79 male and female participants who were assigned to one of three groups based on their categorization of Binge Eating Disorder according to the DSM-IV diagnostic questions (APA, 1994), researchers found the following mean differences in ESE by total score WEL in these groups: BED ( $H = 93.8$ ), Borderline BED ( $H = 114.21$ ), and non-BED ( $H = 124.72, p < 0.0004$ ); by negative emotions BED ( $H = 12.60$ ), Borderline BED ( $H = 19.21$ ), and non-BED ( $H = 22.02, p < 0.0004$ ); by social pressure

BED ( $H=20.87$ ), Borderline BED ( $H=23.07$ ), and non-BED ( $H=26.48, p < 0.0342$ ); by physical discomfort BED ( $H=19.13$ ), Borderline BED ( $H=25.14$ ), and non-BED ( $H=27.20, p < 0.0002$ ). Post hoc-comparisons revealed significant differences between the non-BED and BED groups on negative emotions, physical discomfort, positive activities and social pressure ( $p < 0.03$ ); between the BED and borderline groups on negative emotions, physical discomfort and positive activities ( $p < 0.01$ ). Under post-hoc comparisons, the only statistically significant difference among groups on the WEL total score was between the non-BED and the BED groups ( $p < 0.0001$ ). Although significant differences were noted among all groups on the binge eating scale, the Borderline BED and BED groups did score significantly higher than the non-BED group. The findings indicate lower eating self-efficacy among binge eaters and borderline binge eaters than non-binge eaters (Miller, et al., 1999). In addition, the two binge eating groups also displayed lower confidence in being able to control eating when emotionally or physically distressed (Miller, et al., 1999).

Wolff and Clark (2001) investigated the effectiveness of cognitive-behavioral therapy (CBT) on eating self efficacy and binge eating. Participants responded to the Questionnaire of Eating and Weight Patterns-Revised (QEWP-R; Spitzer, Yanovski, et al., 1993) to measure binge eating frequency and the WEL (Clark, et al., 1991) to measure eating self-efficacy. The frequency of binge eating was reduced from a mean of 5 binges per week at baseline ( $n = 20$ ), down to a mean of one binge per week ( $n = 12$ ). There was no significant difference between those who withdrew ( $n = 8$ ), and those who completed the study ( $n = 12$ ). Researchers also found a statistically significant improvement in eating self-efficacy as measured by a total WEL score ( $t(11) = -6.56, p <$

.000), but not in binge eating differences. Wolf and Clark did report a clinical “...significance in reduction in the frequency of their binge episodes,” to one binge per week which is below the diagnostic criteria for binge eating disorder of at least two days per week (Wolff & Clark, 2001, p. 102). The reduction of binge eating from pre-test to post-test was also accompanied by an increase in eating self-efficacy by total score WEL from pretest ( $M = 72.4, SD = 26.3$ ) to posttest ( $M = 118.3, SD = 27.2; p = .001$ ). The improvement in dimensions of eating self-efficacy from pretest to posttest was also found for the subscales of the WEL: negative emotions pretest ( $M = 12.2, SD = 6.4$ ) to posttest ( $M = 19.8, SD = 7.1, p = .002$ ); availability pretest ( $M = 11.1, SD = 5.2$ ) to posttest ( $M = 20.0, SD = 7.7, p = .001$ ); social pressure pretest ( $M = 16.7, SD = 6.4$ ) to posttest ( $M = 25.6, SD = 5.4, p = .000$ ); physical discomfort pretest ( $M = 16.6, SD = 6.3$ ) to posttest ( $M = 25.4, SD = 6.4, p = .000$ ); and positive activities pretest ( $M = 15.5, SD = 5.8$ ) to posttest ( $M = 27.4, SD = 5.2, p = .000$ ). This intervention study supports the relationship between eating self-efficacy and binge eating, as the improvement in binge eating coincided with an increase in eating self-efficacy total score, as well as with the subscales. The above study (Wolff and Clark, 2001) focused on binge eating as a behavior separate from binge eating disorder as diagnosed by the DSM-IV criteria (APA, 1994; 2000). Wolff and Clark (2001) explored the possibility of a borderline binge eater that does not necessarily satisfy all four criteria of the DSM-IV, and sought to compare differences in eating self-efficacy using the WEL to compare these different categories of binge eating. The current study examined binge eating as a behavior, rather than being focused on the DSM-IV criteria for binge eating as a disorder, thus seeking to capture a wider range of individuals that demonstrate the behavior of binge eating.

Clark, Forsyth, and King (2000) investigated the differences in eating self-efficacy between two samples of obese females that were grouped according to whether or not they screened positive for binge eating disorder. Participants for their study were recruited as consecutive female subscribers to a weight management clinic over a one year period. The two groups, a binge eating group ( $n = 43$ ) and a non binge-eating group ( $n = 43$ ) were matched on age, gender and body mass index (BMI). Participants responded to self-report questionnaires, including the WEL (Clark, et al., 1991) to measure Eating Self Efficacy and the Questionnaire on Eating and Weight Patterns Revised (QEWP-R; Yanovski, 1993) to measure binge eating. As predicted, binge eaters had lower eating self-efficacy than non-binge eaters did on the total WEL score, ( $M = 92.94$ ,  $SD = 34.88$  vs.  $M = 70$ ,  $SD = 36.74$ ,  $t(84) = 2.86$ ,  $p < .005$ ). Binge eaters had lower ESE on the following dimensions of ESE: negative emotions  $t(84) = 3.31$ ,  $p < .001$ ; availability  $t(84) = 1.58$ ,  $p = \text{n.s.}$ ; social pressure  $t(84) = 1.40$ ,  $p = \text{n.s.}$ ; physical discomfort  $t(84) = 2.52$ ,  $p < .01$ ; and positive activities  $t(84) = 2.86$ ,  $p < .01$ . Social pressure and availability were not statistically different between the two groups. Clark, Forsyth and King (2000) support the relationship between eating self-efficacy (on three of the dimensions of the WEL) and binge eating disorder. The current study extended their work by testing the relationships between all dimensions of the WEL measure of eating self-efficacy with the behavior of binge eating.

Cargill, and researchers (1999) investigated differences of eating self-efficacy in binge eaters and non-binge eaters in a sample of 159 consecutive enrollees in a weight management clinic program. Participants were overweight by at least 20% according to the Metropolitan Life height-weight chart (Metropolitan Life Insurance Company, 1959).



Sixty-five percent were females, with a mean age of 45 (no S.D. was provided).

Participants that screened positive for binge eating did not differ significantly on weight from those from the non-binge eater group (binge eater group,  $M = 250.9$  pounds,  $SD = 65.7$ ; non-binge,  $M = 239.2$  pounds,  $S = 54.6$ ,  $p = 0.77$ ). Participants responded to the WEL (Clark, et al., 1991) to measure eating self-efficacy which is described in detail in chapter 3. A licensed clinical psychologist or social worker conducted a structured clinical interview to diagnose binge eating disorder according to the DSM-IV criteria. A 39-item version of the Eating Disorders Examination Questionnaire (EDE-Q; Fairburn, & Beglin, 1994), contained in the Eating Habits Questionnaire (EHQ; Wilson, Nonas, & Rosenblum, 1993) was used to measure body image (Cargill, et al., 1999).

The Beck Depression Inventory (Beck, Ward, Mendelson, Mock & Erbaugh, 1961), a 21-item self-report instrument was used to measure depressive symptoms. This interventional study involved a reduced calorie diet, a weekly exercise regime, and a group behavioral therapy treatment all under the medical supervision of a physician.

Binge eaters reported lower levels of eating self-efficacy than non-binge eaters ( $M = 97.1$ ,  $SD = 37.9$  vs.  $M = 116.1$ ,  $SD = 35.1$ ,  $p < 0.05$ ). Increased depression was related to binge eating ( $t(152) = 2.27$ ,  $p < 0.05$ ); lower eating self-efficacy was related to binge eating ( $t(152) = 2.41$ ,  $p < .05$ ); loss of control was related to binge eating ( $t(148) = 4.02$ ,  $p < 0.001$ ); increased negative body image was directly related to binge eating ( $t(148) = 3.88$ ,  $p < .001$ ); activity interference was related to binge eating ( $t(149) = 2.12$ ,  $p < .05$ ); dissatisfaction and obese self image were both related to binge eating ( $t(154) = 3.86$ ,  $t(145) = 2.85$ ,  $p < 0.01$ , respectively). “Perceptions of negative body image [was] also related to binge eating when depression was a covariate ( $F(1, 144) = 2.17$ ,  $p < 0.05$ )”

(Cargill, et al., 1999, p. 383). Stepwise multiple regression equations were used to test which factors were most related to depression; negative body image and obese self-image were most significantly related to depression. Eating self efficacy was found to be negatively correlated with depression as well as with negative body image ( $r = -0.37$ ;  $r = -0.33$ ,  $p < 0.01$ , respectively), but not correlated with obese body image dissatisfaction or with the figure rating test. A figure rating test is a component from the comprehensive Eating Habits Questionnaire that is made up of 9 male and female schematic figures varying in size from very thin to extremely overweight (Stunkard, Sorensen, Schulsinger, 1983; Cargill, et al., 1999). Cargill and colleagues' study (1999) supports a relationship between eating self-efficacy and binge eating.

Goodrick and others (1999) examined the relationships between eating self-efficacy, self-esteem, social support, energy expenditure and binge eating severity in a sample of overweight females between the ages of 25 to 50 who screened positive for binge eating (a score of 20 or more on the BES). Participants were grouped into 3 groups: dieting treatment, non-dieting treatment and wait-list control. The two groups were given different approaches to manipulate potential underlying antecedents to binge eating; both the dieting and the non-dieting group were given the same home-based walking regime. The dieting group was told to reduce their daily intake of fat to under 40 grams per day, but not to focus on calories; the dieters followed the LEARN program for Weight Control (Brownell, 1989). The non-dieting group intervention was based on the philosophy that dieting and exercise failure may lead to dysfunctional cognitions and binge eating (Foreyt & Goodrick, 1991; Goodrick & Foreyt, 1991) and were therefore taught about the “psychotherapeutic phase covering the psychology of being an obese female in a culture

which values thinness, and addressing self-esteem and body issues before attempting to modify eating and exercise” (Goodrick, et al., 1999, p. 296-7). The non-dieting group was also taught about other psychological awareness and strategies aimed at boosting self-concept and self-esteem while also attempting to break free of cycles that revert to binge eating. Participants responded to the BES (Gormally, et al., 1982) to measure binge eating, the Tennessee Self-Concept Scale (TSCS; Fitts, 1965) to measure self-esteem, the Dieter’s Inventory of Eating Temptations DIET (Schlundt & Zimering, 1988) to measure eating self-efficacy, and a questionnaire that has successively measured social support in maintenance of cardiovascular lifestyle (O’Reilly & Thomas, 1989). Participants were randomly assigned to one of three groups: the dietary treatment group ( $n = 79$ ), non-dietary treatment group (NDT;  $n = 78$ ), and the wait-list control group, which were not included in the analysis since they didn’t complete the program (Goodrick, et al., 1999). Only completers ( $N = 125$ ), the former two groups, were included in the statistical analysis. The exact numbers of completers in each group was not provided by Goodrick and colleagues. ESE was measured at baseline, 6 months, and 18 months. Changes in binge eating were found to be negatively associated with eating self-efficacy and with self-esteem at the six month point ( $r = -.497$  and  $-.439$ ,  $p < .001$ , respectively; and with eating self-efficacy, self-esteem and social support at 18 months ( $r = -.571$ ,  $-.550$  and  $-.291$ ,  $p < .001$ ). Social support was not significantly related to changes in binge eating at the 6-month interval (Goodrick, et al., 1991).

Researchers found eating self-efficacy to be inversely related to higher binge eating frequency (Gormally, et al., 1982); lower levels of eating self-efficacy to be more prevalent in binge eaters and borderline binge eaters, than in non-binge eaters (Miller, et

al., 1999); and improved eating self-efficacy by cognitive behavioral therapy predicted reduced binge eating frequency (Wolf & Clark, 2001). Researchers found reduced eating self-efficacy in binge eaters (Cargill, et al., 1999; Clark, Forsyth & King, 2000) especially on the dimensions of negative emotions, physical discomfort and positive activities (Clark, Forsythe, & King, 2000). The WEL (Clark, et al., 1991), a well-validated instrument, used to measure eating self-efficacy associated with abstaining from binge eating. The current study used all five subscales of the WEL, as well as the total scale to measure eating self-efficacy.

*Theoretical Rationale: The Relapse Prevention Model*

The Relapse Prevention Model (RPM) is a cognitive behavioral model to address addictive behaviors (Brownell, Marlatt, Lichtenstein & Wilson, 1986; Marlatt & Gordon, 1985), based on social cognitive psychology (Larimer, Palmer & Marlatt, 1999). The RPM is useful for any behavior that represents an over-learned pattern of use, which is how addiction is described in this model. Different processes may be responsible for causing and maintaining the addictive behavior (Wilson, 1993a; Brownell, et al., 1986).

The RPM includes high risk situations, coping response, self-efficacy, and the abstinence violation effect (AVE; Larimer, et al., 1999; Marlatt, 1985; see Figure 2/Appendix B). Factors leading up to a lapse, relapse, or binge involve conceptual and cognitive processes. Strategies to avoid relapse involve cognitive and behavioral processes (Larimer, et al., 1999; Marlatt, 1985). A central focus of the RPM is a taxonomy of factors that can lead to relapse. Individuals must re-learn cognitive and behavioral strategies to prevent relapse, and thereby bolster both their coping resources (distress tolerance), and their self-efficacy to avoid a binge. There are two categories of

triggers to high risk situations: immediate determinants and covert antecedents (Larimer, et al., 1999). Immediate determinants could be unexpected food triggers unanticipated by the individual, perhaps imposed as a food gift by someone else, such as a box of candy. Larimer and colleagues (1999) explained that therapists using the RPM would also assist the client to examine his or her emotions attached to certain situations, and to be on the lookout for potential triggers or high risk situations, analyze responses to such triggers, and finally to devise strategies to address the vulnerabilities in the individual's cognitive-behavioral response systems.

Once behavior change has begun, and some success at self-control is appreciated by the individual, there should be a boost in self-efficacy (Larimer, et al., 1999).

High-risk situations can be triggered by personal negative emotional states, interpersonal conflict, social pressure and positive emotional states. Social pressure can be either direct and overt, or non-verbal and covert in nature, and can usually expose the binge eater socially to the addictive substance, in this case hard to resist highly palatable or taboo foods (i.e.: food that the binge eating individual feels should not be ingested, food that is high-calorie, high-fat, trigger foods, foods that are in addition to what she should eat as a part of a sensible eating plan). Positive emotional states involve celebrations, cues from a crave-stimulating advertisement, and non-specific cravings that seem to arise un-stimulated.

### *Coping*

Coping is a key part of the RPM (Larimer, et al., 1999; Marlatt, 1985). Although the trigger may seem to be the cause, as it is the temptation and antecedent, the individual's coping response is the actual gatekeeper that determines whether or not the

high-risk situation will lead to a binge. Cognitive Behavioral Treatment aimed at identifying negative coping responses and replacing them with positive forms of coping would be part of relapse prevention training (Marlatt, 1985; Larimer, et al., 1986; Wilson & Fairburn, 1993).

#### *Outcome Expectancies*

Outcome expectancies are the part of the model that allows for an individual to fantasize about the pleasure of partaking in the addictive behavior (Marlatt, 1985). The instant gratification of the splurge, the focus on the elation associated with first planning the binge (known as outcome expectancies), and then of the actual binge (Marlatt, 1985) will allow for a reduction of distress.

#### *Abstinence Violation Effect*

The abstinence violation effect (Marlatt, 1985) begins with the first lapse or initial violation of the abstinence goal of no binge eating, no high-fat, no high calorie food, no eating between meals, nor eating excessive of a dietary plan. The movement from a lapse to a relapse does not necessarily occur, however it is highly likely that total relapse will follow a lapse (Larimer, et al., 1986; Marlatt, 1985).

AVE influences whether or not the lapse will turn to relapse. If a person feels like a failure from the lapse, then eating self-efficacy will be reduced, and relapse will probably occur (Larimer, et al., 1999; Marlatt, 1985). Contrarily, if the individual believes that the lapse was caused by a specific trigger or high-risk situation, then it may be possible for the individual to focus efforts on bolstering strength to improve strategies to target that particular high-risk situation (Larimer, et al., 1999; Marlatt, 1985).

### *Covert Antecedents of High-Risk Situations*

According to Marlatt (1985) covert antecedents serve to set the individual up in such a way as to place the individual in a high-risk situation. Covert antecedents may also involve convincing an individual not to be motivated to avoid binge eating. Examples of covert antecedents are one's overall stress level, cognitive antecedents, rationalization, denial and urges and craving (Larimer, et al., 1999).

### *Perfectionism, Distress Tolerance and Eating Self-Efficacy in the Relapse Prevention Model*

The RPM (Marlatt, 1979; Marlatt & Gordon, 1980; Marlatt, 1985) conceptualizes high risk situations as a trigger in relapse into addictive behaviors, including binge eating. Perfectionism was substituted for high-risk situations and cognitions in the RPM in this study. Perfectionistic cognitions leave a discrepancy between the ideal standard, and the individual's self-assessment which could lead to negative emotions and distress which could then predispose a person to binge eat. According to Marlatt (1985) a person must utilize coping resources to help tolerate distress so that it will not cause a lapse in control over binge eating. The construct, DT (Linehan, 1993) was used in place of coping resources in the RPM for this study.

Low Distress Tolerance would cause a distressed individual to try to regulate the emotion. Eating self-efficacy is an important component of the RPM since it influences a person's ability to resist binge eating (Gormally, et al., 1982; Marlatt, 1985).

According to Lingswiler and others, binge eaters, who often have dichotomous cognitions, will either be dieting or bingeing, and when bingeing will often indulge in foods that are considered decadent and fattening, called "negative foods" (1989). This

indulgence turned binge will temporarily reduce the emotional distress, but will bring new emotional distress from the guilt of the slip, as the abstinence violation effect (Marlatt, 1979; Marlatt, 1985) in their RPM.

*Perfectionism and Binge Eating in the Relapse Prevention Model*

Perfectionism involves dichotomous thinking and exceptionally high standards; comparing self-appraisal against ideal standards causes distress (Gormally, et al., 1982; Wisner & Telch, 1991; Pratt, et al., 2001; Hewitt & Flett, 1991). Perfectionism is involved in the RPM in two definite aspects; dichotomous cognitions involved in the abstinence violation effect (Marlatt, 1985; Stein, et al., 2007) and as the high risk situation variable in the RPM in the current study, as a trigger to relapse (Marlatt, 1985). The AVE involves the binge eater's tendency to feel as if he or she has completely failed, as though having totally yielded to uncontrolled binge eating, even if only having the lapse of eating a morsel of indulgence, or something that was not on a predetermined dietary plan. The second aspect of the RPM that involves perfectionism is proposed by this research study as the High Risk Situation variable in the RPM. Marlatt's RPM has high risk situations as a trigger to relapse (Marlatt, 1985). Marlatt's concept of high-risk situation is typically any situation that can trigger difficulty in adhering to abstinence from relapse into binge eating behavior. However, in this research study, perfectionism is superimposed on the model as the high risk situation which can upset all the systems that keep an individual from binge eating. How perfectionistic a person is may influence the person's ability to prevent relapse.



### *Distress Tolerance and Binge Eating in the Relapse Prevention Model*

DT involves an individual's ability to cope with emotional distress that can be from various sources and triggers (Simon & Gaher, 2005; Corstorphine, et al., 2007). Coping (distress tolerance in the current study) is a major factor in the RPM (Larimer, et al., 1999; Marlatt, 1985). The individual's coping response is one gatekeeper that determines whether or not the high-risk situation will do damage. This is another point in the model where individuals can be taught better strategies to help them cope in high-risk situations or high-risk cognitions (Marlatt, 1985).

### *Eating Self-Efficacy and Binge Eating in the Relapse Prevention Model*

Marlatt (1985) included Bandura's construct of self-efficacy (1977) in the model, as it is important to avoid temptation of the binge eating behavior. The model also involves the abstinence violation effect, which describes the mechanism of what occurs when an individual begins to slip (Marlatt, 1985). Marlatt posits that binge eating is an overlearned pattern of eating behavior, which is how Marlatt refers to addictive behavior (1985).

### *Hypotheses*

This study tested the following hypotheses that were derived from the above theoretical propositions (See Figure 1/Appendix A):

1. Perfectionism is directly related to binge eating in women who binge eat.
2. Distress Tolerance is inversely related to binge eating in women who binge eat.
3. Eating self efficacy is inversely related to binge eating in women who binge eat.

4. Perfectionism, distress tolerance DT and eating self-efficacy predicts binge eating in women who binge eat.

*Summary*

Attributes and correlates of binge eating were discussed. Theoretical and empirical support was presented for the theoretical relationships for each of the independent variables of perfectionism, DT and eating self-efficacy with binge eating. Finally, Marlatt's RPM (1985) was used to explain these relationships.

## CHAPTER III.

### Methods

A cross-sectional correlation design was employed in this study.

#### *Description of Research Setting*

Participants recruited were female adult binge eaters, 18 years of age and older, who responded to the online survey. The participants were expected to reside somewhere in the United States since the distribution of the magazine that published the recruitment letter was nationwide, however the nature of recruitment left the exact residence of participants to be unknown.

#### *Sample*

The sample was a convenience sample of participants who met the following inclusion criteria: (1) females age 18 or older and (2) able to read and write English. Participants were excluded from the study if they (1) did not have access to a computer or (2) screened out for binge eating. Those that met inclusion criteria (N=126) were all those females, 18 years and older, who identified themselves as binge eaters through the online surveys. A total of 820 individuals responded to the web site. A remaining sum of 433 individuals completed the survey session. One person answered “no” to the informed consent indicating that they either did not read or understand the consent. The number of participants who screened positive for binge eating was initially 139, while those who screened out numbered 293. The working sample eventually was further reduced by 13 (N = 126) for a final sample of 126 women who binge eat (see Chapter IV).

The sample was limited to females only since perfectionistic thinking about one’s shape is something that is a common issue with females (beginning with adolescence),

but not with males (Wadden & Stunkard, 1985). Eating disorders have historically been known to afflict primarily women (Stunkard & Allison, 2003). Researchers have studied binge eating (Marcus, et al., 1985; Koo-Loeb, Costello, Light & Girdler, 2000; & Richman, et al., 2001), binge eating and obesity (Robertson & Palmer, 1997; Freitas, Lopes, Appolinario, Coutinho, 2006; Marcus, et al., 1988; Safer, et al., 2002), binge eating and overweight (Cachelin, et al., 1999; Goodrick, et al., 1999) perfectionism and binge eating (Bardone-Cone, et al., 2006; Pratt, et al., 2001), distress tolerance with binge eating (Corstorphine, et al., 2007; Mountford, et al., 2007) and eating self-efficacy and binge eating (Dutton, et al., 2004; Clark, et al., 2000) in samples of female participants. The sample was not intentionally limited to nurses, however because of the method of recruitment the sample was primarily nurses. There was not a significant difference between both groups on the occupation of nursing as 91.3% ( $n = 115$ ) of binge eating women were nurses, and 88.4% ( $n = 259$ ) of non-binge eating women were nurses.

The statistical description of the sample of women who screened positive for binge eating ( $N = 126$ ) as well as of the respondents who screened out as non-binge eaters ( $N = 293$ ) is presented in Table 1.

The respondents who did not screen positive for binge eating differed significantly on work status ( $\chi^2 = 7.5, p < .05$ ) and income ( $\chi^2 = 15.6, p < .05$ ). In the binge eating group, 6.4% ( $n = 8$ ) were retired as compared with 11.6% ( $n = 34$ ) in the non-binge eating group. The binge eating group had 19.8% ( $n = 25$ ) part-time, and 73.8% ( $n = 93$ ) full-time workers as compared to the non-binge eating group 28.3% ( $n = 83$ ) part-time and 60.1% ( $n = 176$ ) full-time. Binge eating women were more likely to work full-time (73.8%,  $n = 93$ ) than non-binge eating women (60.1%,  $n = 176$ ). Non-binge

Table 1

*Comparison of Binge Eating (BE) Women and Non-Binge Eating (NBE) Women*

Variable	BE Women		NBE Women		
<i>Statistic</i>	<i>M(SD)</i>	Range	<i>M(SD)</i>	Range	<i>t</i>
Age	50.3 (9.5)	23-70	51.1(11.5)	21-77	.68
BMI	31.4 (6.87)	16.9-49.9	26.6 (6.4)	15.8-57.9	-6.8*
< 18.5	17.2 (.52)	16.9-17.8	17.6 (1.2)	15.8-18.4	
18.5 - 24.9	22.5 (1.6)	19.2-24.9	22.0 (1.7)	18.5-26.6	
25.0 - 29.9	27.6 (1.4)	25.2-29.9	27.1(1.5)	25-29.8	
>30.0	36.4 (4.6)	30- 49.9	35.7 (5.9)	30-57.9	
<i>Statistic</i>	%	<i>n</i>	%	<i>n</i>	$\chi^2$
Race					3.8
Black/non-Hisp.	2.4%	3	4%	11	
White/non-Hisp.	95.2%	120	91.1%	267	
Hispanic	1.6%	2	2.1%	6	
Other	1.0%	1	3.1%	9	
Education					4.6
High School	0%	0	0.3%	1	
Some College	6.4%	8	9.9%	29	
Completed Coll.	48.4%	61	53.2%	156	
Some Grad School	11.9%	15	7.5%	22	
Completed Grad	33.3%	41	29.0%	85	

Table 1

*Continued*

Variable	BE Women		Non-BE Women		
<i>Statistic</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	$\chi^2$
Work Status					7.5*
Retired	6.4%	8	11.6%	34	
Work part-time	19.8%	25	28.3%	83	
Work full-time	73.8%	93	60.1%	176	
Income Category					15.6*
\$100,000 or >	35.7%	45	33.8%	99	
\$ 50k - \$99,999	54.8%	69	49.5%	145	
\$ 30k - \$49,999	9.5%	12	10.6%	31	
\$ 20k - \$29,999	0%	0	2.7%	8	
\$ 19,999 or less	0%	0	3.4%	10	
Occupation					.8
Nurses	91.3%	115	88.4%	259	
Live with					2.9
Live alone	23.8%	30	16.7%	49	
Live with others	76.2%	96	83.3%	244	

\*  $p < .000$

eating women were more likely to work part-time (28.3%,  $n = 83$ ) than binge eating women (19.8%,  $n = 25$ ). The non-binge eating group was twice as likely to be retired (11.6%,  $n = 34$ ) than the binge eating group (6.4%,  $n = 8$ ). Binge eating women were more likely to be overweight or obese (BMI >25; 81.0%) than non-binge eating women (45.2%) in the current study. The two groups varied significantly on BMI ( $t = -6.8$ ,  $p < .05$ ). A variable named BMI was computed in SPSS from the formula BMI equals weight in pounds divided by height in inches squared multiplied by 703 (CDC, 2009). Almost twelve percent (11.9%) of the binge eating women vomited at least once, and 4.8% vomited ten times or more in the last 28 days, as a means of controlling their weight or shape; 12.7% of the binge eating sample used laxatives at least once, and 4.0% used laxatives ten times or more during the last 28 days to control their weight or shape. Almost one third of the binge eating women (31.0%;  $n = 39$ ) exercised excessively at least once, and 8.7% exercised excessively ten times or more in the last 28 days to control their weight or shape.

#### Power Analysis

A medium effect size was expected based on Pratt and colleagues' study (2001) for socially prescribed perfectionism ( $r = 0.37$ ,  $p < .0001$ ). Goodrick and colleagues (1999) found a large effect size between eating self-efficacy and binge eating ( $r = -.497$ ,  $p < .001$ ). Telch, Agras and Linehan (2000) found a large effect size for eating self-efficacy and binge eating ( $F = 39.0$ ,  $p < .000$ ). The more conservative effect size was used in order to ensure adequate power to detect study effects that exist. According to Cohen (1992), in a multiple regression correlation analysis with criterion alpha set at .05, having 3 predictors and assuming a medium effect size, 76 participants would be sufficient in

order to reach desired power of .80.

### *Instruments*

#### *Eating Disorder Examination-Questionnaire 6.0*

The EDE-Q 6.0 (Fairburn & Beglin, 2008) is a self-report version of the EDE (Fairburn & Cooper, 1993); the latter is a semi-structured interview which has been revised several times since its initial development (1987) and is standardized based on normative data from both clinical and community samples (Fairburn & Cooper, 1993). The EDE-Q correlated well with the EDE and both measure eating disorder pathology over the past 28 days across four dimensions: restraint, eating concern, shape concern and weight concern. Key behavioral features are also available as individual items which are answered as frequencies, and as number of episodes or days, depending on the question. Question 14 measures binge eating in events, while question 15 measures binge eating days, as individual frequency scores. Subscale scores reflect severity of eating disorder pathology and are answered on a 7-point Likert scale, ranging from 0 to 6. Subscale scores are calculated by summing ratings for each item in the subscale, dividing by the number of subscale items answered, resulting in subscale scores calculated as means. This provides an efficient way of addressing missing data for items not answered. Subscale scores are added together and then divided by the number of subscales used to give a total score (Fairburn & Beglin, 2008).

The EDE was developed by Cooper and Fairburn (1987) to separately measure cognitive and behavioral aspects of eating disorders for research. The EDE was revised 16 times and further developed into a self-report questionnaire, the EDE-Q, which has become the gold standard of self-report measures (Striegel-Moore, Perrin, DeBar,



Wilson, Rosselli, & Kraemer, in press). The EDE-Q serves as a good measurement of binge eating (Reas, Grilo and Masheb, 2006; Wilson, 1993b), and measures the psychopathology of the eating disorders by using “implicit unarticulated rules” which are culpable fundamentals of the eating disordered individual’s perceptions and cognitions that lead to or impact eating disordered patterns of behavior, also measured by the EDE-Q (Cooper & Fairburn, 1987, p. 3). The most recently revised measure of the EDE-Q is the 6.0 (Fairburn & Beglin, 2008). Reliabilities for the EDE-Q were .90 for global score, .70 to .85 for restraint, .73 to .81 for eating concern, .73 to .93 for shape concern, .72 to .89 for weight concern (Peterson, et al., 2007; Luce & Crowther, 1999). Reas, et al., (2006) found that the EDE-Q had good test-retest reliabilities with correlations ranging from .66 to .77. Luce and Crowther (1999) examined the reliability of the individual items measuring key behavioral features and found them all to be statistically significant: binge eating, self-induced vomiting, laxative misuse, and diuretic misuse (Phi = .62, .66, .70, .57;  $p < .001$ , respectively). Test-retest reliability scores were statistically significant for the behavioral features binge eating, self-induced vomiting, laxative misuse, and diuretic misuse ( $r = .68, .92, .65$  and  $.54, p < .001$ , respectively; Luce & Crowther, 1999). Researchers have posited that providing an informative definition about binge eating to participants could enhance the reliability of the EDE-Q scores (Passi, Bryson & Lock, 2003; Carter, Aime & Mills, 2001). The Cronbach’s alpha obtained for the current study was .84 for the global EDEQ, .79 for restraint, .80 for eating concern, .83 for shape concern, and .70 for weight concern.

### *Multidimensional Perfectionism Scale*

Perfectionism was measured by the Multidimensional Perfectionism Scale (MPS; Hewitt, et al., 1991; Hewitt & Flett, 1991), a 45-item instrument that measures three dimensions of perfectionism: self-oriented (SOP), other-oriented (OOP) and socially-prescribed perfectionism (SPP). Each of the three subscales consists of 15 items. Participants respond to these items using a 1-7 Likert scale; selection of 1 signifies strong agreement and selection of 7, strong disagreement. A Principal Components factor analysis done on the clinical sample's responses resulted in three factors being supported: Self-Oriented Perfectionism, Socially-Prescribed Perfectionism, and Other-Oriented Perfectionism (Hewitt & Flett, 1991). Concurrent validity was established by using normative data from clinical samples and community samples in Study 1 (Hewitt, et al., 1991) for certain groups. Several samples comprised study 1, including 387 adult clinical patients (a subsample of 49 psychiatric outpatients was further examined), 399 chronic pain outpatients, and 199 adults from a large urban community. A second study showed that there was no response bias, and that the questions were at a 6-7<sup>th</sup> grade reading level (Hewitt et al., 1991).

Convergent validity was established by correlations with dimensions of the Frost Multidimensional Perfectionism Scale (FMPS; Frost, et al., 1990) in a study by Chang, Ivezaj, Downey, Kashima and Morady (2008). SOP correlated significantly with dimensions of FMPS, concern over mistakes (FMPS-CM) personal standards (FMPS-PS), parental expectations (FMPS-PE), parental criticism (FMPS-PC), doubts about actions (FMPS-DA), and organization (FMPS-O) with correlations ranging from .20 to .66 ( $p < .01$ ). SPP correlated significantly with all dimensions of FMPS, except for

FMPS-O, ranging from  $r = .30$  to  $.55$  ( $p < .001$ ). OOP correlated significantly with three of the 6 dimensions of the FMPS, with correlations ranging from  $r = .24$  to  $.62$  ( $p < .001$ ). SOP, OOP, and SPP also correlated with the perfectionism dimension of the Eating Disorder Inventory (EDI; Garner, et al, 1983) with a range of  $.37$ , to  $.66$  ( $p < .001$ ).

Reliability was established in community samples with Cronbach's alphas of  $.79$  to  $.90$ , for SOP,  $.73$  to  $.89$  for OOP and  $.83$  to  $.91$  for SPP (Chang, et al., 2008; Hewitt & Flett, 1991; Saboonchi & Lundh, 2003; Sherry, Hewitt, Flett & Harvey, 2003); and in clinical samples of psychiatric patients with alphas of  $.75$  to  $.94$  for SOP,  $.65$  to  $.77$  for OOP, and  $.78$  to  $.81$  for SPP (Hewitt & Flett, 1991; Sherry, et al., 2003; Hewitt, et al., 1991). The Cronbach's alpha obtained for the current study was  $.92$  for SOP and  $.87$  for SPP.

#### *Distress Tolerance Scale*

Distress tolerance (DT) involves an individual's ability to tolerate negative emotional states (Linehan, 1993) and is represented by a total score on the Distress Tolerance Scale (DTS; See Appendix E; Simons & Gaher, 2005). Four first order factors of distress tolerance, (tolerance, absorption, appraisal and regulation) are measured by their respective subscale scores. The four subscales include tolerance (the individual's perceived ability to tolerate distress), absorption (the degree to which an individual is consumed by negative emotions), appraisal (the individual's subjective assessment of the distress as tolerable or intolerable), and regulation (the degree of urgency an individual feels to do something to alleviate the negative emotion; Simons & Gaher, 2005).

Simons and Gaher's Distress tolerance Scale (2005) was developed in a sample of 642 college students between the ages of 18 and 26 (70% were female) from two state

universities recruited in class by announcements. The four dimensions emerged based on Simons and Gaher's concept analysis of distress tolerance; sixteen items were derived from a theoretical review of the literature. A 5-point Likert scale was used to rate the items: strongly agree (5), mildly disagree (4), agree and disagree equally (3), mildly agree (2), and strongly disagree (1). Simons and Gaher (2005) used reliable and valid measurements of related constructs to establish concurrent and discriminant validity with the initial set of items. The scales used for comparison were the General Temperament Survey (Clark & Watson, 1990;  $\alpha = .84$ ), Affect Lability Scale (Harvey, Greenberg & Serper, 1989;  $\alpha = .95$ ), Negative Mood Regulation Questionnaire (Catanzaro & Mearns, 1990:  $\alpha = .67$  in men, and  $\alpha = .78$  in women), Mood Acceptance and Typicality (Mayer & Stevens, 1994;  $\alpha s \geq .75$ ), Alcohol and Marijuana Use Motives (Cooper, 1994; Simons, Correia, Carey & Borsari, 1998;  $\alpha s = .89-.92$  for marijuana, and  $\alpha = .88-.90$  for alcohol) as well as a 7-point scale created to rate lifetime use and frequency of marijuana and alcohol (ranging from 0= never used in my life to 6= used more than 300 days).

Participants responded to surveys anonymously. Fourteen of the sixteen original items loaded strongly on one factor resulting in a 14-item single factor solution. The DTS correlated in the expected direction with all scales compared: inversely associated with affective distress and dysregulation lability ( $r = -.59; -.51$ ) and positively correlated with positive affectivity, mood regulation expectancies, mood acceptance and mood typicality ( $r = .26, .54, .47, .17, p < .05$ ). Distress tolerance was also found to be inversely associated with alcohol and marijuana coping motives ( $r = -.23, -.20$ , respectively) of those who reported having used the substance once or more in their lifetime. Once concurrent and criterion validity were established in Study 1, a confirmatory factor analysis was

conducted in a second study. Study 2 was comprised of 823 students recruited (by email, fliers and announcements) from one state university. This sample was predominately women (67%) and ranged in age from 18 to 26. The 14 item single factor solution from Study 1 was used to measure distress tolerance, and examined for correlations with measures for negative emotions using the General Temperament Survey (T1  $r = -.59$ ,  $p < .0001$ ), the Rutgers' Alcohol Problem Index, and alcohol use (T1  $r = -.23$ ; T2  $r = -.17$ ;  $p < .0001$ ) in the past 6 months all measured at baseline, time 1, and 6 months later at time 2. There was no statistical difference from time 1 to time 2 for negative emotions or for the other measures. Correlations among the RAPI at time 1 and time 2 indicated strong test retest reliability ( $\alpha = .85$ ). Simons & Gaher (2005) reported reliability coefficient ( $\alpha = .95$ ) from previous research, and temporal stability over a month period ( $r = .83$ ). A confirmatory factor analysis on the 14-item DTS was conducted using baseline status (time 1) with a second sample of data using LISREL 8.54 (Joreskog & Sorbom, 2001) which failed to reveal the single-factor solution as the best fit ( $X^2(90, N = 397) = 505.34$ ,  $p < .001$ ; NNFI = .91; CFI = .92; RMSEA = 0.11; SRMR = 0.073). Instead a multifactor model resulted with the re-introduction of previously deleted item number 15. The 4-factor hypothesized model based on the theoretical analysis of the construct of distress tolerance provided a better fit ( $X^2(87, N = 420) = 328.18$ ,  $p < .001$ ; NNFI = .96; CFI = .96; RMSEA = 0.080; SRMR = 0.059, ( $\Delta X^2(3, N = 420) = 235.03$ ,  $p < .001$ ). The single factor solution from the initial sample was found to be confirmed, in the second sample, as a hierarchical solution with first order factors of Tolerance, Appraisal, Absorption, and Regulation under the single higher order factor of distress tolerance. Both studies showed that “men reported higher degrees of distress tolerance than women” (Simons &

Gaher, 2005, p. 97). The higher order factor of distress tolerance is a mean of all four subscales. Item 6 is scored in reverse. The Cronbach's alpha obtained for the current study was .93 for the higher order distress tolerance scale. Reliabilities for the subscales of the DTS were as follows: .81 for tolerance, .85 for absorption, .81 for appraisal, and .80 for regulation.

#### *Weight Efficacy Lifestyle Questionnaire*

Eating self-efficacy (ESE) was measured by the Weight Efficacy Lifestyle Questionnaire (WEL; Clark, et al, 1991), a 20-item scale with five subscales: negative emotions, availability, social pressure, physical discomfort, and positive activities. Developers used clinical experience with obesity to adapt the WEL from the Smoking Confidence Questionnaire (SCQ; Condiotte & Lichtenstein, 1981), which measured self-efficacy in resisting the addictive behavior of smoking. They tested the adapted scale on a clinical sample of overweight and obese individuals in two separate studies, (total  $N = 382$ ; Clark, et al., 1991).

The 40-item 5-factor scale WEL was administered to an initial sample of 162 obese persons (Sample 1) enrolled in a 14-session weight management program at work. Sample 1 was 91% female with a mean age of 42 and were "an average percentage overweight of 30.8%" ( $SD = 22.4$ ). A Principal Components factor analysis (PCA) performed on the initial 40-item WEL yielded a five-factor solution. A Varimax orthogonal rotation revealed the 20-item, five-factor solution with four items per factor (Clark, et al., 1991). Then, Sample 2, a clinical sample, comprised of 220 overweight adults enrolled in a weight management program that was 73% female with a mean age of 42 (no  $SD$  given) and a "average percentage overweight" of 83.9% ( $SD 39.5$ ) was

used for cross-validation and reliability (1991). Confirmatory Factor Analysis (CFA) was performed using structural equation modeling and confirmed that the 5-factor, 20-item solution was the best fit for the model. Factor loadings ranged from .62 to .92 for all twenty items in the solution. All paths from ESE to each of the five factors were congruent, ranging from .78 to .88 except for negative emotions, which was .64 (Clark, et al., 1991).

External validity of the WEL was supported in a third sample, Treatment Sample 1, a clinical sample of 38 obese diabetic adults (independent from Samples 1 and 2) enrolled in a 19-week behavioral program which involved cognitive behavioral training and education about healthy eating and exercise and included relapse prevention training. Treatment Sample 1 was 58% female with a mean age of 55.4 (no *SD* was provided by authors). Participants were overweight by 32.7% (*SD* = 10.9) at pretreatment and reduced to 29.4% “average percentage overweight” (*SD* = 10.7) at posttreatment. A significant improvement on the WEL total score was noted at posttreatment ( $p < 0.05$ ; Clark, et al., 1991). Participants showed significant improvement from pretest to posttest at the end of the 19-week program on WEL total score, negative emotions, and positive activities ( $t(37) = 2.49; 2.29; 3.22, p < .05$ , respectively).

Convergent validity was established by concurrently administering the Eating Self Efficacy Scale (ESES; Glynn & Ruderman, 1986) and the WEL to a sample of obese adults (66% female) enrolled in a twenty-six week behavioral therapy weight management program (Clark, et al., 1991). The two scales were significantly negatively correlated (since the scales are scored oppositely) from pretest to post-test on the WEL-

total score ( $r = -.67$  and  $-.55, p < .01$ ), comparing the WEL subscale of negative emotion with ESES subscale of Negative Affect ( $r = -.80$  and  $-.50, p < .05$ ) and comparing the WEL subscale of availability with the ESES subscale of Socially Acceptable ( $r = -.75$ , and  $-.51, p < .05$ ), respectively. Construct validity of the scale was supported by findings on pre-treatment and post-treatment WEL scores, which showed significant improvements on negative emotions, availability, social pressure, and total WEL score ( $t(20) = 2.30; 3.29; 3.43; 2.86, p < .05$ ), respectively.

Reliability was established in these three studies of clinical samples with Cronbach's alphas of .70 to .90 for total WEL score, .84 to .88 for negative emotions, .76 to .83 for availability, .79 to .90 for social pressure, .75 to .84 for physical discomfort, and .69 to .79 for positive activities (Clark, et al., 1991; Clark, Cargill, Medeiros, & Pera, 1996; Dutton, et al., 2004). The Cronbach's alpha obtained for the WEL total scale in the current study was .85. Reliabilities for the subscales of the WEL were as follows: .83 for negative emotion, .77 for availability, .79 for social pressure, .70 for physical discomfort, and .76 for positive activities.

#### *Procedure for Data Collection*

All study instruments were included in a study survey posted on a customized website designed by *FA Business Solutions, LLC*. A study comparing paper and online survey results showed no significant difference between the two methods of data collection (Truell, Bartlett, & Alexander, 2002). Response completeness and response speed were greater ( $t(157) = -5.14$  and  $4.21$ , respectively,  $p < .001$ ) for the Internet based survey group as compared with the paper mail-based group (Truell, et al., 2002).



The Internet contributes to a higher external reliability, generalizability, and methodological rigor, while retaining subject anonymity (Ahern, 2005). Binge eating is a sensitive topic (Wilson, 1993) and Ahern reports that many studies have found online surveys also provide "...increased access for sensitive issues, cultural groups and hidden populations" (p. 56). This web-based manner of data collection provided anonymity for participants; enlisting the services of an information specialist helped incorporate elements of rigor and security into the website design.

Participants who chose to participate in the study and access the survey website first indicated if they 1) were female; 2) were at least 18 years old, and 3) have electronically demonstrated to have both read the informed consent and agreed to participate. Next, potential participants were screened by being given the following explanation and screening question: "This study is about binge eating. Binge eating has two parts: 1) eating an unusually large amount of food and 2) experiencing a sense of loss of control. Did you binge eat, on average, once a week in the last month?" (see Appendix N). The study software was configured such that a positive response on the screening question was required in order to advance to the next question. If participants answered negatively to the screening question, they were advanced to the final screen, thanking them for their participation (see Appendix K). Those who screened positively for binge eating were prompted to continue with the survey. The software prevented advancement to subsequent questions before completing all previous questions (for all questions except most of the biographical questionnaire) to minimize missing data. The age, gender, height, weight and informed consent agreement were also mandatory for advancement through the study, which served to ensure that only females over the age of 18 who have

indicated that they have read and understood the informed consent and agreed to participate in the study would proceed to the screening questions. Participants were instructed in the consent document that they "...may choose not to answer any questions with which you are not comfortable...", although for some questions, this would mean that this would require the participant to leave the study, the questions that were anticipated to be most sensitive were in the biographic questionnaire, such as financial group, and race or ethnicity and these were not required to be answered in order to proceed to the next question. At the completion of all required questions (or if screened out due to age, sex or non-binge eater), participants got a thank you message (see Appendix K). Completion of questionnaires were estimated to take between 10 to 30 minutes, however the software did not track actual time participants took to complete them.

#### *Recruitment*

Participants were recruited in multiple ways to ensure an adequate sample size of binge eaters. A letter for publication (see Appendix H) was sent to the editor of *Nursing Spectrum*, and was published in all ten of their regional print magazines which have a circulation of 750,000 readers nationwide; it was also published in the digital edition of the magazine which is viewed electronically by 320,000 readers. The letter contained the study survey link and invited readers to participate in this study. There was no charge for publication of the letter.

#### *Human Subjects Protection*

Approval from the Institutional Review Board of Rutgers, The State University of New Jersey was obtained prior to data collection. An informed consent document (see

Appendix L) was uploaded to the study website, <https://www.fabshosting.com/eatingstudy>; participants were only able to proceed to the study survey if they indicated having read the document and consented to participate in the research study. Researchers have shown that web-based consent is not substantially different than paper-based consent (Varnhagen, et al., 2005). Logging was turned off by *FA Business Solutions, LLC*. so that neither the participant's email address nor the IP address were captured. The anonymity that existed in this mode of data collection also protected the integrity of the data by decreasing participants' inhibitions to answer accurately, honestly, and without reservation. Wilson (1993b) identifies the sensitive nature of binge eating which often occurs in secrecy.

#### Summary

This section described the research setting, sample, instruments, data collection, and human subjects protection for this study of binge eating on binge eating women.

## CHAPTER IV

### Analysis of the data

The purpose of this study was to examine the relationships among 1) perfectionism and binge eating, 2) distress tolerance and binge eating, 3) eating self-efficacy and binge eating, and to investigate if 4) perfectionism, distress tolerance and eating self-efficacy would predict binge eating in women who binge eat. The study was conducted with a convenience sample of 126 women, 18 years or older, who answered yes to screening criteria about binge eating on the study website. The following instruments were used: 1) Biographic Questionnaire to assess demographic data such as age, gender, race, educational level, work status, occupation, living arrangements, height, weight, and annual income; 2) the Eating Disorder Examination Questionnaire (Fairburn & Beglin, 2008); 3) the Multidimensional Perfectionism Scale (Hewitt, et al., 1991); 4) the Distress Tolerance Scale (Simons & Gaher, 2005); and 5) the Weight Efficacy Lifestyle Questionnaire (Clark, et al., 1991). The two indicators of binge eating (items 14 and 15 from the EDE-Q), number of binge eating *events* in the last 28 days, and number of binge eating *days* in the last 28 days, were strongly correlated ( $r = .90, p < .000$ ), therefore only item 15, number of binge eating *days* in the last 28 days was used. Analyses of these data are presented further in this chapter.

#### *Data Management*

A total of 820 individuals responded to the web site. A total of 433 respondents had agreed to consents, indicated they were female and completed their survey sessions. Those female respondents who answered “yes” to the screening question for binge eating totaled 140, while those answering “no” to the screening question numbered 293. The

number of people who initially screened in was reduced to 139, since one person didn't answer any questions after she answered yes to the screening question. The working sample eventually was further reduced by 13 ( $N = 126$ ) for contradiction of the screening question. In order to be admitted into the website, respondents had to answer "yes" to the screening question, "Did you binge eat on average, once a week in the last month?" However, 13 respondents selected zero for the number of days that they engaged in binge eating in the last 28 days. These cases were deleted from analyses. The total number that was analyzed for comparative purposes was 419 comprised of 293 non-binge eating women, and 126 women who binge eat. One of the non-binge eating women entered an erroneous value for weight, and so was excluded from the analysis on BMI, reducing the analysis on BMI to 292 non-binge eating women compared with 126 binge eating women to an overall total number compared of 418. The website was used for data collection for approximately 3 months, from September 2 through December 13, 2009.

#### *Statistical Description of the Variables*

Prior to analysis, SOP, SPP, DT, and ESE were examined for missing values, outliers, and assumptions of multivariate analyses. Assumptions were met, therefore analyses were conducted without transformations of the independent variables. The dependent variable, binge eating days, was substantially positively skewed (1.54) therefore a log transformation was performed to result in a much lower degree of skewness (0.18) and approximate a normal distribution.

Sixty-five and one tenths percent (65.1%) of the sample reported binge eating between 1 to 7 days ( $n = 82$ ); 27.8% ( $n = 35$ ) reported binge eating for 8 to 20 days; and 7.1% ( $n = 12$ ) reported binge eating for greater than 20 days.

A statistical description of the independent variables is presented in Table 2. Pearson's product-moment correlations were used to examine the relationships between the dependent variable and the independent variables of perfectionism, distress tolerance and eating self-efficacy (see Table 3). Spearman's Rho correlations were used to examine the relationships between the dependent variable and the categorical demographic variables (see Table 4). One-tailed correlation analyses were used for all variables based on hypothesized directional relationships with a significance level of .05. All analyses were performed using PASW (formerly, SPSS; 2009).

#### *Psychometric Properties of Instruments used in the Study*

Reliability coefficients were calculated for each of the instruments used in this study. Cronbach's alpha for SOP was .92, SPP was .87, DTS overall scale was .93, WEL total scale was .85. Reliability coefficients .70 and greater are considered acceptable for instruments used in the Social Sciences (Cohen, et al., 2003).

#### *Results of Hypothesis Testing*

Hypothesis one stated: Perfectionism is directly related to binge eating in women who binge eat. A Pearson product-moment correlation coefficient was obtained by testing the hypothesized relationship between perfectionism and binge eating. Statistically significant positive relationships were observed, which supported, as theorized, that high self-oriented perfectionism (SOP;  $r = .16, p < .04$ ), and socially prescribed perfectionism (SPP;  $r = .25, p < .01$ ) are directly related to binge eating in women who binge eat. Therefore, hypothesis one was supported.

Table 2  
*Statistical Description of Variables*

Variable	Mean	SD	Range
SOP	71.27	18.05	25-94
SPP	57.58	16.64	25-94
DTS overall	3.32	.89	1.29-5
DTS tolerance	3.22	1.07	1-5
DTS absorption	3.28	1.10	1-5
DTS appraisal	3.42	.93	1-5
DTS regulation	3.35	.99	1-5
WEL Total	82.28	33.45	7-169
WEL negative emotions	12.16	8.55	0-36
WEL availability	12.42	7.67	0-33
WEL social pressure	18.37	8.92	1-36
WEL physical discomfort	20.14	8.30	0-36
WEL positive activities	19.19	9.07	0-36

Hypothesis two stated: Distress Tolerance is inversely related to binge eating in women who binge eat. A Pearson product-moment correlation coefficient was obtained by testing the hypothesized relationship between distress tolerance and binge eating. Statistically significant negative relationships were observed, which supported, as theorized, that distress tolerance is inversely related to the number of binge eating days (DTS;  $r = -.20, p < .05$ ). Therefore, hypothesis two was supported.

Hypothesis three stated: Eating self-efficacy is inversely related to binge eating in women who binge eat. A Pearson product-moment correlation coefficient was obtained by testing the hypothesized relationship between eating self-efficacy and binge eating. Statistically significant negative relationships were observed, which supported, as theorized, that eating self-efficacy (WEL Tot;  $r = -.52, p < .000$ ) would be inversely related to binge eating in women who binge eat. Therefore, hypothesis three was supported.

Hypothesis four stated: Perfectionism, distress tolerance and eating self-efficacy predicts binge eating in women who binge eat. Since all three independent variables were each significantly correlated with binge eating, all three were included in the regression analysis. A multiple regression analysis was used to assess the degree to which perfectionism (SOP and SPP), distress tolerance (DTS) and eating self-efficacy (WEL) predicted binge eating (Log BE, the transformed DV). Only ESE emerged as a predictor in the regression model (Adjusted  $R^2 = .26, B = -0.05, \beta = -.48, t = -5.93, p < .000$ ; see Table 5).

#### *Additional Findings*

Secondary analyses were performed investigating the correlations between the



subscales of the DTS and the subscales of the WEL with binge eating days. All of the subscales of the WEL were inversely correlated with binge eating days (negative emotion  $r = -.43$ , availability  $r = -.40$ , social pressure  $r = -.37$ , physical discomfort  $r = -.41$ , and positive activities  $r = -.43$ ,  $p < .000$ ). Three of the four subscales of distress tolerance were significantly inversely correlated with binge eating days (absorption  $r = -.18$ , appraisal  $r = -.20$ , and regulation  $r = -.20$ ,  $p < .05$ ). Tolerance was the only subscale of distress tolerance that was not significantly correlated with binge eating days ( $r = -.12$ ,  $p = .09$ ). Table 6 presents the data from this analysis.

Another multiple regression analysis was performed investigating the subscales of the distress tolerance scale (DTS absorption, DTS appraisal, and DTS regulation), and the subscales of the weight efficacy lifestyle questionnaire, (WEL negative emotions, WEL availability, WEL social pressure, WEL physical discomfort, and WEL positive activities) in addition to the SOP and SPP subscales of MPS. The model showed that 24% of the variance in binge eating was explained by the eating self-efficacy subscales of negative emotions and positive activities. The tolerance subscale of the DTS was excluded from the regression analysis since it was not significantly correlated with binge eating. The data from this multiple regression analysis of the subscales are presented in Table 7.

Table 3  
*Correlation Matrix of the Dependent Variable with the Independent Variables*

	Log BE	SOP	SPP	DTS	WEL Tot
Log BE		.16*	.25**	-.20**	-.52***
SOP			.63***	-.32***	-.22**
SPP				-.41***	-.27**
DTS					.22**
WEL Tot					

\*  $p$  value < .05

\*\*  $p$  value < .01

\*\*\*  $p$  value < .000

*Note.*

SOP = self-oriented perfectionism

SPP = socially prescribed perfectionism

DT = distress tolerance (Overall DTS score)

WEL Tot = eating self-efficacy (WEL Total score)

Table 4.

*Correlation Matrix of the dependent variable and the demographic variables*

	Log BE	Race	Education	Work Stat	Live with	Income	Age
Log BE		.13	-.05	.13	-.08	-.01	-.08
Race			.10	.08	-.09	-.04	-.08
Education				.04	-.02	.19*	.11
Work Stat					-.15	.22*	-.15
Live with						.03	-.21*
Income							.06

\* *p value* < .05

Table 5

*Summary of Simultaneous Multiple Regression Analysis for Variables  
Predicting Binge Eating*

Variable	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>
SOP	-.001	.002	-.034	-.342
SPP	.002	.002	.111	1.060
DT	-.024	.035	-.060	-.700
ESE	-.005	.001	-.480	-5.931*

\*  $p < .000$

*Note.*

SOP = self-oriented perfectionism

SPP = socially prescribed perfectionism

DT = distress tolerance (Overall DTS score)

ESE = eating self-efficacy (WEL-Total score)

Table 6

*Correlation of the BE Days with the Subscales of DTS and WEL*

<u>Variable</u>	Log BE	DTS Tol	DTS Absor	DTS Appr	DTS Reg	WEL NE	WEL Aval	WEL SP	WEL PD	WEL PA
Log BE		-.12	-.18*	-.20*	-.20*	-.43***	-.40***	-.37***	-.41***	-.43***
DTS Tol			.78***	.66***	.54***	.15*	.18*	.13	.13	.09
DTS Absor				.79***	.59***	.18*	.11	.12	.23	.07
DTS Appr					.64***	.14	.11	.14*	.25**	.14*
DTS Reg						.09	.16*	.17*	.28***	.17*
WEL NE							.50***	.44***	.58***	.40***
WEL Aval								.63***	.45***	.44***
WEL SP									.61***	.61***
WEL PD										.61***
WEL PA										

\* *p value* < .05

\*\* *p value* < .01

\*\*\* *p value* < .00

Table 7

*Summary of Simultaneous Multiple Regression Analysis for Subscale Variables Predicting Binge Eating*

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Variable	<i>B</i>	Standard Error	$\beta$	<i>t</i>
SPP	.003	.002	.123	1.106
SOP	-.001	.002	-.054	-.507
DTS Absorp	.003	.044	.009	.07
DTS Appr	-.028	.054	-.072	-.513
DTS Reg	-.015	.039	-.041	-.387
WEL NE	-.009	.004	-.208	-1.969*
WEL Avail	-.008	.005	-.166	-1.525
WEL SP	2.93E-5	.005	.001	.006
WEL PD	.000	.005	-.008	-.067
WEL PA	-.010	.004	-.240	-2.28*

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\*  $p < .05$

## CHAPTER V

### Discussion of the Findings

The purpose of this study was to examine the relationships between the dependent variable of binge eating in women who binge eat and each of the independent variables of (a) perfectionism, (b) distress tolerance, and (c) eating self-efficacy; as well as to examine the extent to which these variables predict binge eating in women who binge eat.

#### *Perfectionism and Binge Eating*

Hypothesis one stated that perfectionism is directly related to binge eating in women who binge eat. This hypothesis was derived from theory. Fairburn (1995) and Stice (2002) have posited that individuals who binge eat usually hold unrealistic standards for themselves, and feel unsuccessful at dieting. Hypothesis one was also supported by empirical evidence (Pratt, et al., 2001; Sherry, 2006). Hypothesis one, the positive relationship between self-oriented perfectionism (SOP;  $r = .16, p < .04$ ), and socially prescribed perfectionism (SPP;  $r = .25, p < .01$ ) and binge eating in women who binge eat, was supported in this study. This finding indicates that individuals who have high levels of self-oriented perfectionism will have higher levels of binge eating. Pratt and others (2001) found no relationship between SOP and binge eating, however they did find a significant relationship between SPP and binge eating using the binge eating scale (BES: Gormally, et al., 1982;  $r = .37, p < .0001$ ). These findings from Pratt and others (2001) differ from the current study in that both SPP and SOP were significantly correlated to binge eating in the current study. Perhaps using a different measurement to measure binge eating was responsible for the relationship between SOP and binge eating not having been supported in the study conducted by Pratt and others (2001). Perhaps the

sample in Pratt et al.'s study was different enough to account for the difference in findings. The sample in Pratt et al.'s study (2001) differed from the sample in the current study in that in their study, 78% were white, 79% attended college, 70% were employed, and BMI was over 30 in the binge eating group; while the current study was 95.2% white, 100% attended at least some college, 93.7% were employed, 91.3% were employed as nurses, and 54.8% had BMIs of 30 or over, 26.2% had BMIs in the overweight range (25 to 29.9), 17.5% had BMIs in the normal range (18.5 to 24.9), and 2% were underweight. While these samples were not extremely different, the samples did vary considerably on BMI. Sherry (2006) found that both SOP and SPP were correlated with binge eating ( $r = .19$ ,  $r = .20$ , respectively,  $p < .001$ ). Sherry used binge eating subscales of the EDDS.

#### *Distress Tolerance and Binge Eating*

Hypothesis two stated that distress tolerance is inversely related to binge eating in women who binge eat. This hypothesis was derived from theory. Binge eating has been linked to emotional and stressful triggers (Polivy & Herman, 1993; Corstorphine, et al., 2007; Wiser & Telch, 1999; Heatherton & Baumeister, 1991). Hypothesis two was also supported by empirical evidence for the specific relationship between distress tolerance and binge eating (Stein, et al., 2007). Other empirical support comes from studies linking distress tolerance with the more generalized outcome of eating disorders (Anestis, et al., 2007; Mountford et al., 2007; Corstorphine, et al., 2007). Hypothesis two, the inverse relationship between overall distress tolerance and number of binge eating days (DTS;  $r = -.20$ ,  $p < .01$ ) in women who binge eat, was supported in this study. Anestis and colleagues (2007) using the DTS (Simons & Gaher, 2005), found distress tolerance to be related to binge eating behavior ( $sr = -.134$ ,  $t = -.2558$ ,  $p < .01$ ). Mountford and others and



Corstorphine and colleagues (2007) used a different DTS scale to measure distress tolerance developed by Corstorphine and others (2007) to compare non-eating disordered participants and eating disordered participants. The Corstorphine et al.'s DTS (2007) measured distress tolerance on three subscales, anticipate and distract, avoidance of affect and accepting and managing emotion. The non-eating disordered group scored higher than the eating disordered group on anticipate and distract ( $M = 2.90$ ,  $SD = 0.683$ ;  $M = 2.73$ ,  $SD = 0.744$ ,  $t = 1.36$ ,  $p = 0.175$ ), though not statistically significant, and accept and manage ( $M = 2.89$ ,  $SD = .610$ ;  $M = 2.64$ ,  $SD = .664$ ,  $t = 2.25$ ,  $p < 0.026$ ), but lower on the avoidance dimension ( $M = 2.17$ ,  $SD = 0.499$ ;  $M = 2.81$ ,  $SD = 0.775$ ,  $t = 5.68$ ,  $p < 0.001$ ), respectively (Corstorphine, et al., 2007; Mountford, Corstorphine, Tomlinson & Waller, 2007). Higher scores on anticipate and distract and accept and manage subscales are indicative of higher levels of distress tolerance, while lower levels of avoidance subscale support higher distress tolerance since avoiding affect indicates less tolerance to distress. According to this study, lower levels of accept and manage and higher levels of avoidance predicted eating disorders.

The current study is consistent with the findings of these studies (Anestis, et al., 2007; Corstorphine, et al., 2007; Mountford, et al., 2007).

#### *Eating Self-Efficacy and Binge Eating*

Hypothesis three stated that eating self-efficacy is inversely related to binge eating in women who binge eat. This hypothesis was derived from self-efficacy theory (Bandura, 1977). Based on this theory, strategies of cognitive behavioral training and relapse prevention training were posited as good strategies to address addiction in the Relapse Prevention Model (Marlatt & Gordon, 1985). Such treatments were employed in

the development of the WEL as the improvement of eating self-efficacy was measured. The hypothesis was also based on empirical findings. Eating self-efficacy is inversely related to binge eating (National Heart Lung and Blood Institute, 1998). Strategies that improve a person's eating self-efficacy were shown to curtail binge eating (Clark, et al., 1991; Bandura, 1977; 1986; 1997). Hypothesis three was also supported by empirical evidence (Gormally, et al., 1982; Miller, et al., 1999; Wolff & Clark, 2001; Clark, Forsyth & King, 2000; Cargill, et al., 1999; Goodrick, et al., 1999). Hypothesis three, the inverse relationship between eating self-efficacy and number of binge eating days (WEL Tot;  $r = -.52, p < .000$ ) was supported in this study. Gormally and others (1982) found a significant relationship between low eating self-efficacy and binge eating (sample 1:  $r = .56, p < .001$ ; sample 2:  $r = .53, p < .001$ ). Miller and colleagues (1999) found lower eating self-efficacy among binge eaters and borderline binge eaters than non-binge eaters ( $p < 0.0004$ ; Miller, et al., 1999). Wolff and Clark (2001) found a reduction in binge eating from pre-test to post-test accompanied by an increase in ESE by total score WEL from pretest ( $M = 72.4, SD = 26.3$ ) to posttest ( $M = 118.3, SD = 27.2, p < .001$ ) in an interventional study. Clark, Forsyth and King (2000) found binge eaters had lower eating self-efficacy than non-binge eaters did on the total WEL score, ( $M = 92.94, SD = 34.88$  vs.  $M = 70, SD = 36.74, t(84) = 2.86, p < .005$ ) in a convenience sample of enrollees of a hospital-based weight management program. In a study by Cargill and colleagues (1999), binge eaters reported lower levels of eating self-efficacy than non-binge eaters ( $M = 97.1, SD = 37.9$  vs.  $M = 116.1, SD = 35.1, t(152) = 2.41, p < .05$ ). Goodrick and others (1991) found that changes in binge eating were negatively associated with eating self-efficacy at 6 months ( $r = -.497, p < .001$ ) and at 18 months  $r = -.571, p < .001$ ) during a weight

management intervention. The current study is consistent with the findings of these studies.

### *Regression Model*

Hypothesis 4 stated that perfectionism, distress tolerance DT and eating self-efficacy would predict binge eating in women who binge eat. This hypothesis was built on three theoretical relationships that were supported by empirical evidence (Pratt, et al., 2001; Sherry, 2006; Anestis, et al., 2007; Mountford et al., 2007; Corstorphine, et al., 2007; Gormally, et al., 1982; Miller, et al., 1999; Wolff & Clark, 2001; Clark, Forsyth & King, 2000; Cargill, et al., 1999; Goodrick, et al., 1999) and were supported in the current study. Hypothesis 4 was only partially supported with ESE as the only predictor in the regression model (Adjusted  $R^2 = .26$ ,  $B = -.01$ ,  $B = -.48$ ,  $t = -5.9$ ,  $p < .000$ ; see Table 5) in this study.

Binge eating has been conceptualized as an addictive behavior in the Relapse Prevention Model (RPM; Marlatt & Gordon, 1985). Different processes may be responsible for causing and maintaining the addictive behavior (Wilson, 1993a; Brownell, et al., 1986). The RPM describes a continuum of high-risk situations, coping, self-efficacy and the abstinence violation effect toward the prevention of binge eating. Perfectionism, distress tolerance, and eating self-efficacy were indicators of high-risk situations, coping and self-efficacy, respectively, in the RPM in the current study, and were significantly associated with binge eating (SOP  $r = .16$ ; SPP  $r = .25$ ; DTS  $r = -.20$ ; WEL Tot  $r = -.52$ ,  $p < .05$ ); these relationships were as anticipated from the literature (Lingswiler, et al., 1989; Pratt, et al., 2001). Although all three of the independent variables had statistically significant relationships with binge eating, only eating self-

efficacy resulted as a significant predictor in the regression model. The relapse prevention model will be used to help understand why hypothesis four was only partially supported, with eating self-efficacy emerging as the only predictor in the regression model.

The RPM involves high-risk situations, coping response, and self-efficacy (Larimer, et al., 1999; Marlatt, 1985; see Figure 2/Appendix B). Factors leading up to a lapse, relapse, or binge involve conceptual and cognitive processes. Strategies to avoid relapse involve cognitive and behavioral processes (Larimer, et al., 1999; Marlatt, 1985) and such strategies must be re-learned to prevent relapse, to strengthen both coping resources (distress tolerance), and eating self-efficacy to avoid a binge. Larimer and colleagues (1999) explained that therapists using the RPM would also assist the client to examine her emotions attached to certain situations, and to become cognizant of potential triggers or high risk situations, to analyze responses to such triggers, and finally to devise strategies to address the vulnerabilities in the individual's cognitive-behavioral response systems. Once behavior change has begun, and some success at self-control is appreciated by the individual, there should be an increase in self-efficacy (Larimer, et al., 1999). This relationship between eating self-efficacy was supported in this study. High-risk situations are also said to be triggered by personal negative emotional states (negative emotions is a subscale of the WEL), interpersonal conflict, social pressure and positive emotional states (positive activities is a subscale in the WEL). Social pressure (a subscale of the WEL) can usually expose the binge eater socially to the addictive substance, in this case hard to resist highly palatable foods. Positive emotional states (positive activities is a subscale of the WEL) involve celebrations, cues from a crave-

stimulating advertisement, and non-specific cravings that seem to arise un-stimulated. Eating self-efficacy and its dimensions are woven into the conceptual framework of RPM; a very clear theoretical understanding for eating self-efficacy in relation to binge eating and other addictive behaviors is evident.

Coping is a key part of the Relapse Prevention Model (Larimer, et al., 1999; Marlatt, 1985) such that the individual's coping response is the actual gatekeeper that determines whether or not the high-risk situation will lead to a binge. Although an inverse correlation between binge eating and distress tolerance was supported in the current study, it was a weak one and distress tolerance did not emerge as a predictor in the regression model. Distress tolerance as a construct may not adequately represent coping as an antecedent to binge eating in the RPM.

In this study, distress tolerance was more strongly correlated with eating self-efficacy than with the criterion variable, binge eating. Similarly, self-oriented perfectionism and socially prescribed perfectionism were more strongly correlated with self-efficacy than with binge eating. This may explain why SOP, SPP and DTS did not uniquely contribute to the observed variance in BE.

The fact that only eating self-efficacy emerged as a predictor in the regression model, and only the negative emotions, and positive activities dimensions of eating self-efficacy were significant predictors in the secondary regression analysis, may indicate that distress tolerance does not adequately represent coping in the relapse prevention model, given that eating self-efficacy, and coping are described in the RPM, and negative emotions and positive emotions, and therefore activities are described as possible triggers

of high risk situations in the RPM (Marlatt & Gordon, 1985). Another explanation is that perfectionism related to binge eating is not adequately measured by SOP and SPP.

### Summary

The RPM (Marlatt, 1979; Marlatt & Gordon, 1980; Marlatt, 1985) conceptualizes high-risk situations as a trigger in relapse into addictive behaviors, including binge eating. Perfectionism was substituted for high-risk situations and cognitions in the RPM in this study. Perfectionistic cognitions leave a discrepancy between the ideal standard, and the individual's self-assessment, which could lead to negative emotions and distress, which could then predispose a person to binge eat. Low Distress Tolerance would cause a distressed individual to try to regulate the emotion. Eating self-efficacy is an important component of the RPM since it influences a person's ability to resist binge eating (Gormally, et al., 1982; Marlatt, 1985).

Distress tolerance involves an individual's ability to cope with emotional distress that can be from various sources and triggers (Simon & Gaher, 2005; Corstorphine, et al., 2007). Coping (distress tolerance in the current study) is a major factor in the RPM (Larimer, et al., 1999; Marlatt, 1985). The individual's coping response is one gatekeeper that determines whether or not the high-risk situation will do damage. This is another point in the model where individuals can be taught better strategies to help them cope in high-risk situations or high-risk cognitions (Marlatt, 1985). Coping is involved in both deterring binge eating, and in whether or not the abstinence violation effect will occur. In the RPM, binge eating can occur as a result of a lapse to a relapse, or by an immediate relapse. The abstinence violation effect can be a source of further distress, and decreased eating self-efficacy, as a further complication. Strategies that would improve coping,

thereby increasing eating self-efficacy would reduce binge eating. This was supported in the simple bivariate correlation in hypothesis two. The regression model revealed only eating self-efficacy as a significant predictor of binge eating. Based on the findings of this study, distress tolerance may not adequately conceptualize the quality and quantity of coping resources described in the relapse prevention model. Another possibility is that the instrument used to measure distress tolerance was not a valid measurement for the targeted construct in a population of women who binge eat. The scale used to measure perfectionism may not be a valid measure for the more clinical type of perfectionism related to a binge eater's obsession with rules related to eating, and over concern with weight, shape and eating. Based on the current study and the literature (Shafran, Cooper, Fairburn, 2003), the dichotomous cognitions related to binge eating in the relapse prevention model would be more aptly measured with a more focused unidimensional construct of perfectionism, such as clinical perfectionism (Shafran, Cooper, Fairburn, 2003).

#### *Discussion of Additional Findings*

The secondary analysis performed on the correlations between the subscales of the DTS and the subscales of the WEL with binge eating days revealed all significant relationships with the exception of the tolerance subscale of the DTS ( $r = -.12, p = .09$ ). All of the subscales of the WEL were inversely correlated with binge eating days (negative emotion  $r = -.43$ , availability  $r = -.40$ , social pressure  $r = -.37$ , physical discomfort  $r = -.41$ , and positive activities  $r = -.43, p < .000$ ) indicating that the higher level of eating self-efficacy a person has across each of the 5 dimensions of eating self efficacy, the lower the binge eating. High self-efficacy across the five dimensions can be

described as a person feeling confident to eat healthy and be able to avoid binge eating during negative emotions when feeling anxious, depressed, angry or when experiencing failure; when high calorie foods are readily available, on the weekends, or when at a party; experiencing social pressure, from others who are encouraging her to eat, ( she might feel that it is either impolite or that she would be hurting someone's feelings), when she is not feeling well, has a headache, or is generally uncomfortable or in pain, or even during positive activities such as watching television, reading, feeling happy or just before going to bed. The fact that all of the subscales of eating self-efficacy were significantly inversely correlated with binge eating indicates that if a person is able to have strong eating self-efficacy even during periods of temptation, then she might refrain from binge eating. Three of the four subscales of distress tolerance were significantly inversely correlated with binge eating days (absorption  $r = -.18$ , appraisal  $r = -.20$ , and regulation  $r = -.20$ ,  $p < .05$ ). A relationship between tolerance and binge eating was not supported in the current study indicating that a person's inability to accept distress as a part of life may not be important as an antecedent to binge eating. However the dimensions of appraisal, regulation and absorption were significant in their inverse relationship with binge eating for example: how typical an individual feels in relation to others and distress (appraisal), and how inclined she is to regulate the distress through binge eating (regulation), or feeling consumed by negative emotions (absorption) such that she might respond by using food to numb the distress. Since two of the three subscales of the multidimensional perfectionism scale were already in the main analyses as measurements of perfectionism, they were not mentioned here; however they were included in the secondary regression analysis. The results of the secondary regression



analysis showed only WEL negative emotions and positive activities subscales as significant predictors in the regression model (WEL NE:  $B = -.01$ ,  $\beta = -.21$ ,  $t = -1.97$ ,  $p < .05$ ; PA:  $B = -.01$ ,  $t = -2.28$ ,  $\beta = -.24$ ,  $t = -2.28$ ,  $p < .05$ ; Adj  $R^2 = .24$ ,  $p < .000$ ), revealing that negative emotions and positive activities together account for 24% of the variance in binge eating. Eating self-efficacy associated with positive activities was a significant predictor in the secondary regression model indicating that lower levels of self-efficacy associated with positive activities such as watching television, reading, being happy, and the time just before going to bed would predict higher levels of binge eating. Researchers have found reduced eating self-efficacy in binge eaters on the dimension of positive activities, negative emotions, and physical discomfort (Clark, Forsyth & King, 2000). The current study is consistent with Clark, Forsyth and King (2000) on negative emotions and positive activities, but contrary to that study, this study did not support physical discomfort as a predictor of binge eating.

## CHAPTER VI

### Summary, Conclusions, Implications, Recommendations

#### *Summary*

This study was designed to better understand the relationships between perfectionism, distress tolerance, eating self-efficacy and binge eating. The study empirically tested the theoretical relationships between the dependent variable of binge eating, and each of the three independent variables of (a) perfectionism, (b) distress tolerance, and (c) eating self-efficacy.

Based on review of the theoretical and empirical literature, the following hypotheses were derived: a direct relationship between perfectionism and binge eating; an inverse relationship between distress tolerance and binge eating; and an inverse relationship between eating self-efficacy and binge eating; and the proposed multiple regression model in which perfectionism, distress tolerance and eating self-efficacy will predict binge eating in women who binge eat.

An additional multiple regression analysis was conducted to assess the degree to which the subscales of the independent variables: perfectionism (SOP, SPP), distress tolerance (DTS Tolerance, DTS absorption, DTS appraisal, DTS regulation), and eating self-efficacy (WEL negative emotion, WEL affect, WEL availability, WEL social pressure, WEL physical discomfort, and WEL positive activities) predicted binge eating

#### *Outcome Variable: Binge Eating*

Binge eating was defined as the type of recurrent episodic eating that occurs at least once a week for a period of three months or more, associated with a loss of control (Wilfley, Bishop, Wilson & Agras, 2007), and involving consumption of a much larger

amount of food than most people would eat in the same time period without any of the compensatory behaviors associated with bulimia nervosa (American Psychiatric Association, 1994; 200; Stunkard & Allison, 2003). This study measured binge eating during the past 28 days to provide for higher accuracy in subjective recollection of binge eating related events and behaviors.

### *Perfectionism and Binge Eating*

Theory posits a direct relationship between perfectionism and binge eating (Fairburn, 1995; Stice, 2002). The relationship between self-oriented perfectionism and binge eating is supported by empirical literature (Pratt, et al., 2001; Sherry, 2006). The relationship between socially prescribed perfectionism and binge eating is also supported by empirical literature (Pratt, et al., 2001; Sherry, 2006). Sherry (2006) found significant correlations between SOP and binge eating, and between SPP and binge eating, as the current study did for self-oriented perfectionism and socially prescribed perfectionism ( $r = .16$ ,  $r = .25$  respectively,  $p < .05$ ). Sherry (2006) found that both SOP and SPP were correlated with binge eating ( $r = .19$ ,  $r = .20$ , respectively,  $p < .001$ ). The strength of the correlations were not that different, however SPP was stronger in the current study ( $r = .25$ ) compared with Sherry's study ( $r = .20$ ), while Sherry's study showed a stronger correlation than the current study did for the relationship of SOP ( $r = .19 > r = .16$ ). These relationships in both Sherry's study, and the current study were fairly weak, though statistically significant. In Pratt et al.'s study (2001) only one relationship was supported SPP and binge eating ( $r = .37$ ,  $p < .0001$ ), but the relationship was considerably stronger than the same relationship in the current study ( $r = .25$ ,  $p < .01$ ). The entirely obese sample in Pratt's study may account for some of the difference in

results.

This study adds support to the relationship between higher levels of self-oriented perfectionism, and socially prescribed perfectionism with binge eating. For the relationship of self-oriented perfectionism, this suggests that individuals who demand extraordinary levels of success and hold themselves to unusually high standards would be more inclined to binge eat. For the relationship of socially prescribed perfectionism, this study suggests that individuals who have internalized the messages of authoritative figures and society that they need to strive toward abnormally high levels of achievement or feel they have failed, will also be more inclined to binge eat.

#### *Distress Tolerance and Binge Eating*

Theory posits an inverse relationship between distress tolerance and binge eating (Polivy & Herman, 1003; Corstorphine, et al., 2007; Wisner & Telch, 1999; Heatherton & Baumeister, 1991). The relationship between distress tolerance and binge eating is also supported by empirical literature (Stein, et al., 2007). Stein and others (2007) found that overweight women who binge eat would have a higher level of binge eating in response to emotional distress and negative moods. Negative mood was found to be higher before a binge than a non-binge time (negative mood at non-binge time  $M = .37$ ,  $SD = .21$ ; negative mood before a binge  $M = .61$ ,  $SD = .52$ ). Although Stein and others did not use the distress tolerance scale, their findings do support a relationship between distress level and binge eating. In the current study the relationship between distress tolerance and binge eating was significantly inverse (DTS;  $r = -.20$ ,  $p < .05$ ). Other researchers supported the relationship between distress tolerance and eating disorders (Anestis, et al., 2007; Mountford, Corstorphine, Tomlinson & Waller, 2007). Anestis and others (2007)

investigated the relationship of distress tolerance and binge eating in a sample of undergraduate students between the ages of 16 and 25. A significant relationship was found between distress tolerance and binge eating ( $sr = -.134, t = -2.558, p < .01$ ). This compares to the findings in the current study (DTS;  $r = -.20, p < .05$ ). Both studies (Anestis, et al., 2007) and the current study used Simons and Gaher's DTS to measure distress tolerance. The current study showed a stronger correlation, though still weak, between distress tolerance and binge eating. The samples in both studies were all women, however the women in Anestis, et al.'s study was considerably younger (16-25) than the current study (18-65). Studies by Mountford, Corstorphine, Tomlinson and Waller (2007) and Corstorphine and colleagues (2007) used Corstorphine, et al.'s DTS to measure distress tolerance in female eating disordered clinical patients as compared with non-eating disordered women. Though it was a different instrument used, significant relationships were attributed to the subscale measures. Eating disordered women scored higher on the avoidance dimension of distress tolerance than non-eating disordered women ( $M = 2.81, SD = .78; M = 2.17, SD = .50; t = 5.68, p < .001$ ) and lower on anticipate and distract than the non-eating disordered women, though not significant, ( $M = 2.73, SD = .74; M = 2.90, SD = .68; t = 1.36, p = .18$ ). According to Mountford, et al. (2007), lower levels of accepting and managing distress, and higher levels of avoidance of distress, are predictive of eating disorders. The current study found an inverse relationship between distress tolerance and binge eating. Low levels of distress tolerance would cause an individual to avoid the distress and turn to strategies to immediately numb the distress, such as addictive behaviors, such as binge eating. Though the research on the relationship between distress tolerance and binge eating is limited, findings in

these afore mentioned studies were consistent with the findings in the current study.

The statistically significant relationship in the current study indicates that individuals who are more able to tolerate distress would be less inclined to binge eat. Though the relationship is weak, it was however statistically significant.

### *Eating Self-Efficacy*

Theory posits an inverse relationship between eating self-efficacy and binge eating (National Institute of Health and National Heart Lung and Blood Institute, 1998; Gormally, et al., 1982; Miller, Watkins, Sargent & Rickert, 1999; Cargill, Clark, Pera, Niaura, & Abrams, 1999; Heatherton & Baumeister, 1991; Wiser & Telch, 1999).

The relationship between eating self-efficacy and binge eating is also supported by empirical literature (Gormally, et al., 1982; Miller, et al., 1999; Wolf & Clark, 2001; Clark, Forsythe & King, 2000; Cargill, et al., 1999; Goodrick, et al., 1999). All three of these studies were interventional studies of weight management programs that measured the correlation of eating self-efficacy with binge eating which were significant. This study was a cross-section analysis of a convenience sample of women who binge eat. Gormally and others found a significant relationship between low eating self-efficacy and binge eating in sample 1 ( $r = .56, p < .001$ ) and in sample 2 ( $r = .53, p < .001$ ). The current study found a significant inverse relationship between eating self-efficacy and binge eating ( $r = -.52, p < .000$ ) which is approximately equivalent to the relationship found by Gormally, et al. (1982). Cargill and others (1999) found lower levels of eating self-efficacy in the binge eating group than the non-binge eating group ( $t(152) = 2.41, p < .05$ ). Goodrick and colleagues (1999) found statistically significant correlations in this relationship as well ( $r = -.571, p < .001$ ), which is just slightly greater than the strength of

the correlation found for the relationship between eating self-efficacy and binge eating in the current study ( $r = -.52, p < .000$ ). None of the studies examined eating self-efficacy as a predictor of binge eating. This study adds support to observations that the more confidence a person feels in her ability to abstain from binge eating, and to adhere to healthy eating behaviors, the less she will be inclined to binge eat. The regression analysis revealed that eating self-efficacy predicts binge eating (Adjusted  $R^2 = .26, p < .000$ ) indicating that eating self-efficacy explains 26 % of the variance in binge eating. Eating self-efficacy emerged as the only predictor in the model. A second analysis of all the subscales regressed on binge eating revealed two dimensions of eating self-efficacy that predict binge eating: negative emotions and positive activities ( $B = -.01, \beta = -.21, t = -1.97$ ;  $B = -.01, \beta = -.24, t = -2.28, p < .05$ ; Adjusted  $R^2 = .24, p < .000$ ).

### *Hypotheses*

Participants were recruited in multiple ways and were those females 18 years of older who responded to the study website, indicated having read and agreed to the informed consent, answered yes to the screening question for binge eating, and completed the online survey questions. The final convenience sample consisted of 126 female participants aged 23 to 70 years ( $M = 50.33, SD = 9.5$ ).

Data were collected using the following instruments: (1) Biographic Questionnaire; the Eating Disorder Examination Questionnaire 6.0 (EDE-Q; Fairburn & Beglin, 2008); Multidimensional Perfectionism Scale (MPS; Hewitt, et al., 1991); Distress Tolerance Scale (DTS; Simons & Gaher, 2005); and the Weight Efficacy Lifestyle Questionnaire (WEL; Clark, et al., 1991). Participants also responded to a screening question for binge eating which was accompanied by explanation text included

for the purposes of increasing the reliability and validity of the responses to the screening question, as the literature supports (Passi, Bryson & Lock, 2003; Carter, Aime & Mills, 2001).

Data were analyzed using the Predictive Analysis Software (PASW) Statistics 18 (formerly SPSS; 2009). Cronbach's alpha coefficients were calculated for each scale used: SOP was .92, SPP was .87, DTS overall scale was .93, and WEL total scale was .85. Cronbach's alpha coefficients were also calculated for each subscale used: WEL negative emotion was .83, WEL availability was .77, WEL social pressure was .79, WEL physical discomfort was .70 and WEL positive activities was .76. Reliability coefficients .70 and greater are considered adequate for instruments used in the social sciences (Cohen, et al., 2003). Descriptive analyses and bivariate correlation analyses were conducted on the data. Hypothesis testing included the use of Pearson's product-moment correlations and a one-tailed test of significance with a significance criterion of .05. The fourth hypothesis was tested using multiple regression analysis with all three independent variables. Additional analyses were done with binge eating and all subscales of the independent variables.

Hypothesis one, two and three were tested using Pearson's product-moment correlation and were supported. In hypothesis four, predictors significantly related to binge eating were tested using multiple regression. Eating self-efficacy predicted 26% of the variance in binge eating. In additional analyses, negative emotions ( $B = -.01, \beta = -.21, t = -1.97, p < .05$ ) and positive activities ( $B = -.01, \beta = -.24, t = -2.28, p < .05$ ) dimensions of eating self-efficacy predicted 24% of the variance in binge eating indicating that the amount of self-efficacy that a person possesses related to healthful



eating behaviors and to avoiding binge eating during periods of negative emotions whether from stress, anxiety, overall distress, guilt, or concern, and during periods of positive activities such as watching television, going to the movies, reading a book, when feeling happy, or just before going to bed will be very important to whether or not a person will binge eat.

### *Conclusions*

The findings of this study support the theoretical relationships between binge eating and the independent variables as follows: direct relationship between perfectionism and binge eating, and inverse relationships between distress tolerance and binge eating, and between eating self-efficacy and binge eating. Hypotheses 1, 2 and 3 were simple correlations and were all statistically significant. Hypothesis 4 involved the multiple regression analysis model of binge eating with all three independent variable and resulted in only one predictor being supported in the model: eating self-efficacy.

Eating Self-Efficacy is evidently a very strong predictor in binge eating, and was the only independent variable that emerged as a predictor in the model. Eating self-efficacy (Clark, et al., 1991) is an individual's appraisal about his or her ability to maintain healthy eating behaviors, and minimize or abstain from binge eating. Theory posits an inverse relationship between eating self-efficacy and binge eating (Clark, et al., 1991; Cargill, et al., 1999; Clark, et al., 2000; Bandura, 1997). The amount of eating self-efficacy an individual possesses influences the ability to overcome binge eating (Clark, et al., 1991; Cargill, et al., 1999; Clark, et al., 2000; Bandura, 1997). While eating self-efficacy was strongly correlated inversely with binge eating, perfectionism and distress tolerance were weakly correlated (distress tolerance, inversely, and perfectionism,

directly) with binge eating; furthermore, distress tolerance as measured by Simons' and Gaher's (2005) DTS, and perfectionism, as measured by the self oriented perfectionism and socially prescribed perfectionism from the MPS (Hewitt, et al., 1991), may not have adequately captured the targeted constructs that effect binge eating. Since the Distress Tolerance Scale that was created by Corstorphine and others (2007), was developed in a sample of eating disordered individuals it may be a more valid measurement for distress tolerance in this sample of binge eating women. Another consideration is that the Clinical Perfectionism Scale (Fairburn, et al., 2003), which measures a more specific and clinical type of perfectionism and one that is thought to be more valid for the weight and shape dichotomous cognitions associated with binge eating and other eating disorders (Shafran, Cooper, & Fairburn, 2003), might also have been a better measurement of perfectionism in this current study, as well.

This study adds to the extant body of knowledge on binge eating. Further theory testing will further expand the knowledge about binge eating. There are no published peer reviewed studies that address eating self-efficacy prediction of binge eating. One dissertation was located that supported this relationship (Yenason, 2001). Yenason's study examined self-efficacy as a predictor of binge eating in bulimia nervosa, while the current study looked simply at binge eating. Yenason (2001) found that eating self-efficacy related to avoiding binge eating was a predictor of binge eating in women with bulimia nervosa and explained 20% of the variance in binge eating events, while the current study found eating self-efficacy explained 26 % of the variance in binge eating (Adjusted  $R^2 = .26$ ,  $p < .000$ ). Yenason recruited 42 female participants with bulimia nervosa by contacting eating disorder therapists. Forty-one of the 42 participants were

enrolled in treatment for bulimia nervosa at the time of recruitment. Participants with bulimia responded to questionnaires by mail: Bulimia Test-Revised (BULIT\_R; Thelen, Farmer, Wonderlich & Smith, 1991), The Eating and Eating without purging subscales of The Eating to Manage Negative Affect subscale (EEI1) of The Eating Expectancy Inventory (EEI; Hohlstein, Smith & Atlas, 1988), The Thinness and Restricting Expectancy Inventory (TREI; Atlas, Smith & Hohlstein, 1988) and a bulimic symptom checklist that reported on frequency of binge eating, purging, excessive exercising, laxative misuse, and medications taken to compensate for eating. While the Bulimia Test-Revised (BULIT-R; Thelen, et al., 1991) is an established reliable and valid screening tool for bulimia nervosa (Peterson & Mitchell, 2008), the other scales used in Yenason's study are not widely known or used. The age of the sample in Yenason's study ranged from 18 to 49 years of age ( $M = 26.9$ ,  $SD = 6.37$ ) as compared with the age in the current study which ranged from 23 to 70 ( $M = 50.3$ ,  $SD = 9.5$ ). Both samples were predominately white, 90.5% in Yenason's study, and 95.2% in the current study. All participants in the current study completed at least some college, and the mean years of education in Yenason's study was 14.95 years, an average of 2 years of college education. In the current study 90.1% of participants were of annual family incomes of \$50,000 or more, while only 66.7% of the participants in Yenason's study earned that amount. Yenason's sample was very small, and she did not report having conducted a power analysis. Tabachnick (1989) recommends 40 times as many participants as independent variables in a stepwise regression analysis, therefore in the case of 4 independent variables and one dependent variable, 160 participants would be the minimum rule of thumb. Yenason's study described a study having 4 independent

variables and 2 dependent variables. Forty-two participants for a stepwise regression analysis measuring four independent variables and two dependent variables is inadequate.

Future studies are needed. The vast majority of sample in the current study were nurses. Although between group differences of work among binge eating and non-binge eating women were significant in the current study, the sample, comprised of mostly nurses, is therefore relating caregiver type of work to binge eating. Other studies need to be done with a more diverse sample regarding other types of work. Individuals who work in caregiver professions may be more vulnerable to binge eating versus non-binge eating. It is unclear whether this is influenced by gender, since this sample was all female. Women may be affected more by the caregiver role. Since the women in the binge eating group were those who were more likely to work full-time than the non-binge eating women, and since both groups were mostly nurses, then the amount of hours working in caregiver occupations may be directly related to binge eating. The respondents who did not screen positive for binge eating differed significantly on work status ( $\chi^2 = 7.5, p < .05$ ) and income ( $\chi^2 = 15.6, p < .05$ ). In the binge eating group, 6.4% ( $n = 8$ ) were retired as compared with 11.6% ( $n = 34$ ) in the non-binge eating group. The binge eating group had 19.8% ( $n = 25$ ) part-time, and 73.8% ( $n = 93$ ) full-time workers as compared to the non-binge eating group 28.3% ( $n = 83$ ) part-time and 60.1% ( $n = 176$ ) full-time. Binge eating women were more likely to work full-time (73.8%,  $n = 93$ ) than non-binge eating women (60.1%,  $n = 176$ ). Non-binge eating women were more likely to work part-time (28.3%,  $n = 83$ ) than binge eating women (19.8%,  $n = 25$ ). The non-binge eating group was twice as likely to be retired (11.6%,  $n = 34$ ) than the binge eating group (6.4%,  $n = 8$ ). In the binge eating group, 90.1% earned \$50,000 or more, as compared with 83.3%

earning as much in the non-binge eating group. The difference in work status and income adds to the knowledge of binge eating. Though income was a significant difference in the two groups, it was likely a proxy for full-time work.

### *Relapse Prevention Model*

Marlatt and Gordon's Relapse Prevention Model (Marlatt, 1979; Marlatt, 1985) describes a mechanism in which high risk situations, coping resources, self-efficacy and the abstinence violation effect are related to the addictive behavior, binge eating. Abstinence violation effect (AVE) influences whether or not a lapse toward binge eating would result in a relapse into binge eating, and is associated with certain triggers (Larimer, et al., 1999; Marlatt, 1985) such as high-risk situations (represented by perfectionism in this study), coping resources (represented by distress tolerance), and eating self-efficacy.

Based on the findings from this study, distress tolerance, as a representation of coping resources in the model of RPM might not adequately describe coping in terms of its prediction of binge eating. Coping responses in the Relapse prevention model represents the gatekeeper that determines whether or not a high-risk situation such as perfectionism or over-evaluation of weight, shape and eating, or dietary restraint would actually lead to binge eating. Higher levels of eating self-efficacy have been described in the model as predicting reduced levels of binge eating.

Perfectionism related to body image along with eating self-efficacy might result in more significant results in the prediction of binge eating. Since perfectionism was only weakly correlated with binge eating in this study (SOP:  $r = .16$ ; SPP:  $r = .25$ ,  $p < .05$ ) and not found to be a predictor of binge eating, it must follow that either perfectionism is not

a good indication of high risk situations in the relapse prevention model or that the scales used to measure perfectionism, the self-oriented perfectionism and socially prescribed perfectionism subscales of the Multidimensional Perfectionism Scale (Hewitt & Flett, 1991) do not adequately measure the weight and shape overconcern aspects of the dichotomous perfectionistic cognitions this study intended to circumscribe, and measure. If the SOP and SPP subscales of the MPS were of inadequate validity to measure the specific construct of perfectionism that represents high-risk situations in the RPM, then this study may not have adequately investigated this elusive construct.

The abstinence violation effect (AVE) is described as influencing whether or not a lapse or a relapse into full-blown binge eating behavior will occur (Larimer, et al, 1986; Marlatt, 1985). According to the RPM, if a person feels like a failure from a lapse, then eating self-efficacy will be reduced, and relapse will probably occur (Larimer, et al., 1999; Marlatt, 1985). Further exploration could also involve further examination of the abstinence violation effect and its relationship with eating self-efficacy.

The relapse prevention model describes a continuum in understanding the framework of addictive behavior. Self-efficacy is both an independent variable, as well as something that effects every step along the way in the continuum. Both self-efficacy and coping effect whether a lapse occurs, whether a lapse becomes a relapse, whether or not binge eating will occur, and how detrimentally the abstinence violation effect will impact the individual who is trying to refrain from binge eating activity, should she have a lapse toward binge eating. A person with higher levels of eating self-efficacy that feels empowered to exercise behaviors that avoid binge eating, will be less inclined to binge eat. Strategies that improve eating self-efficacy may also help individuals to binge eat

less, and to find better methods of coping.

### *Limitations*

The data collection was limited to self-report online questionnaires. If individuals had difficulty with the use of the computer, they might quit using the website, therefore those who completed surveys would be those who were more adept at computer skills, and more patient with technology. In order to assure confidentiality and anonymity, no logging information was stored, and individuals were not able to log in and save their progress to return at a later time. Individuals who had difficulty navigating the website closed their browser and re-started from the beginning. Though highly unlikely, the data collection method for this study did not protect against people doing multiple submissions. Individuals had to complete their participation in this study in one session; if participants were short on time, they might have been compelled to end the session before completion then return and start over. Five phone calls were received from participants who were having difficulty, and started over. Only complete submissions were included in data analysis.

Individuals who elect to take part in a study are a special group of people, and are not totally representative of the entire population of female women who binge eat, since the sample was skewed in that the participants were predominantly white (95.2%,  $SD = .22$ ) and predominantly nurses (91.3%,  $SD = .26$ ). Findings of this study are not generalizable to the entire female adult population that binge eat. A more diverse sample of women would have been preferable.

### *Recommendations for Future Research*

Distress tolerance was only weakly correlated with binge eating (for DTS  $r = -.20$ ,

$p < .05$ ), and therefore may have been compensated for by a higher level of eating self-efficacy in the regression model. Self-oriented perfectionism and socially prescribed perfectionism, though significant, were also weakly correlated with binge eating. Socially prescribed perfectionism was more strongly correlated with binge eating, than self-oriented perfectionism ( $r = .25$ ;  $r = .16$ ,  $p < .05$ , respectively). Perhaps the high risk situations in the RPM relate to perfectionism that is specific to weight and shape concerns, and not the less specific nature of the multidimensional construct of perfectionism measured by the MPS (Hewitt, et al., 1991). This study did not aim to measure weight and shape concerns, which is a more specific extension of the principles of perfectionism. Although weight and shape concern is not a component of the multidimensional construct of perfectionism, it is, however, a component of clinical perfectionism, a more focused clinical construct that is unidimensional (Shafran, Cooper & Fairburn, 2003; Shafran, Lee & Fairburn, 2004). Pratt and others (2001) recommended further research on the roles of SOP, SPP in binge eating with weight and shape over concern.

High levels of perfectionism and low levels of eating self-efficacy appear to be important predictors of binge eating when associated with body dissatisfaction, common in Western cultures (Bardone-Cone, et al., 2008). Simons' & Gaher's distress tolerance scale (DTS; Simons & Gaher, 2005) chosen to measure distress tolerance for this study was the one with the higher reliability coefficients as compared with the other DTS, named identically (Corstorphine, et al., 2007), that had marginal reliability coefficients. Although Corstorphine, et al.'s measure seemed of desirable validity, a decision was made to choose Simon's and Gaher's DTS (2005) associated with higher reliability



coefficients. However, perhaps the distress tolerance scale (Corstorphine, et al., 2007), which was developed in a sample of individuals with eating disorders, might have been a more valid measurement of binge eating in this study, because of its relevance to eating disorder pathology.

Researchers have found that the two major eating disorders contributing to calorie consumption, bulimia nervosa and binge eating share the same core psychopathology (an over-evaluation of weight, shape and eating, and dietary restraint, which include an all-or-none approach to overeating) that interacts with other factors to help perpetuate the eating disorder (Fairburn, Cooper and Shafran 2003; Fairburn, et al., 2003). A study examining the relationship between perfectionism, eating self-efficacy, and weight and shape concerns or body dissatisfaction, with binge eating, is recommended in women who binge eat. This over-evaluation of weight, shape and eating is dichotomous involving an all or none approach to overeating which interacts with other factors to help perpetuate the disorder (Fairburn, et al., 2003). Shafran, Cooper and Fairburn (2003) have described clinical perfectionism as a circumscribed construct of perfectionism which they believe may be better suited than the SOP and SPP subscales of the Multidimensional Perfectionism Scale (Hewitt et al., 1991) to assess and measure the nuances of perfectionism at the crux of the eating disorder pathology, and aim to target treatment directly on this clinical perfectionism that they believe to be at the core of the psychopathology of all eating disorders. Thus, the Clinical Perfectionism Scale (Fairburn, et al., 2003) might be a better measure of the specific perfectionism related to binge eating.

### *Nursing Implications*

Obesity is a major health risk associated with diabetes, hypertension, cardiovascular disease, stroke, gout, gallbladder disease, cancer and early death (National Institute of Health and National Heart, Lung and Blood Institute, 1998). The two eating disorders that contribute to calorie consumption are binge eating disorder and bulimia nervosa, however binge eating does not have any of the compensatory mechanisms such as purging, laxative abuse, and excessive exercising, therefore binge eating is the eating disorder most related to overweight and obesity. In the current study, 81% of the sample of women who binge eat ( $n = 102$ ) was either overweight or obese, as compared with 45.2% of non-binge eating women ( $n = 150$ ). Binge eaters were significantly more obese than non-binge eaters ( $t = -6.8, p < .000$ ).

Prevalence statistics for women in the United States are 35.5% for obesity (BMI 30 or higher), and 64.1% for overweight and obesity (BMI 25 or higher; Flegal, Carroll, Ogden, & Curtin, 2010). The general US population of women are more likely to be overweight or obese (64.1%) than non-binge eating women (45.2%) found in this sample, while binge eating women (81%) were more likely to be overweight or obese than the general US population of women who are overweight or obese.

In the study reported here, both the binge eaters (91.3%) and the non-binge eaters (88.4%) were predominately nurses. Among nurses, prevalence of overweight and obesity was found to be 54.2% with the mean BMI being 27.2 (Miller, Alpert & Cross, 2008) indicating that prevalence of overweight and obesity is approximately 9% higher among all nurses in the United States than the non-binge eaters in the current study. The general population of women would be 9.9% more likely to be either overweight or obese

than the population of nurses. The current study is predominately nurses, however since the prevalence of overweight and obesity among nurses (54.2%) was found to be considerably lower than the sample of binge eating women in this study (81%) but only 9% higher than the non-binge eating group, a strong case for the association of binge eating and overweight and obesity is made. The difference between BMI of the non-binge eating and the binge eating group of women in the current study was found to be significant ( $t = .68, p < .000$ ). Although one does not have to binge eat to become overweight or obese, binge eating is the one eating disorder that can contribute to obesity since there is an increase in calorie ingestion in the absence of any compensatory behaviors. Wilson, Wilfley, Agras and Bryson (2010) found that individuals who had stopped binge eating had higher levels of weight loss than those who were unable to stop binge eating. These researchers also found remission from binge eating to be associated with a higher number of clients losing 5% or more of their body weight by the 2-year follow up visit (Wilson, et al., 2010) which represents a dual benefit of weight not being gained back after two years, as well as a maintained weight loss for two years.

By testing theory, this study contributes to the knowledge of predictors of binge eating. This study adds to the extant body of knowledge on binge eating. Further theory testing will further expand the knowledge about binge eating. There was limited prior evidence of eating self-efficacy as a predictor of binge eating. Future studies are needed. The vast majority of this sample was nurses. Although the relationship of work to binge eating was significant in the current study, the sample being comprised of mostly nurses, is therefore relating caregiver type of work to binge eating. Other studies need to be done with a more diverse sample regarding other types of work. Individuals who work in

caregiver professions may be more vulnerable to binge eating versus non-binge eating. It is unclear whether this is influenced by gender, since this study was female only. The respondents who did not screen positive for binge eating differed significantly on work status ( $\chi^2 = 7.5, p < .05$ ) and income ( $\chi^2 = 15.6, p < .05$ ). In the binge eating group, 6.4% ( $n = 8$ ) were retired as compared with 11.6% ( $n = 34$ ) in the non-binge eating group. The binge eating group had 19.8% ( $n = 25$ ) part-time, and 73.8% ( $n = 93$ ) full-time workers as compared to the non-binge eating group 28.3% ( $n = 83$ ) part-time and 60.1% ( $n = 176$ ) full-time. Binge eating women were more likely to work full-time (73.8%,  $n = 93$ ) than non-binge eating women (60.1%,  $n = 176$ ). Non-binge eating women were more likely to work part-time (28.3%,  $n = 83$ ) than binge eating women (19.8%,  $n = 25$ ). The non-binge eating group was twice as likely to be retired (11.6%,  $n = 34$ ) than the binge eating group (6.4%,  $n = 8$ ). In the binge eating group, 90.1% earned \$50,000 or more, as compared with 83.3% earning as much in the non-binge eating group. The difference in work status and income adds to the knowledge of binge eating. Though income was a significant difference in the two groups, it was likely a proxy for full-time work.

Since binge eating is the major eating disorder most associated with obesity (Yanovski, 1993; APA, 1994; Devlin, Walsh, Spitzer, Hasin, 1992), enhancing what is known about what predicts binge eating will inform weight management interventions. Recognizing that clients who binge eat will have the most successful results with a higher level of eating self-efficacy, strategies aimed at empowering clients with cognitive behavior therapy, and healthy strategies that will help them gain more confidence in their ability to assume healthy eating behaviors and abstain from binge eating behaviors will be most successful. Wilson and others have found cognitive behavior therapy (CBT) and

interpersonal psychotherapy (IPT) specially developed for binge eating to be significantly more successful than behavioral weight loss treatment (BWL) in the treatment of binge eating disorder in obese patients (2010).

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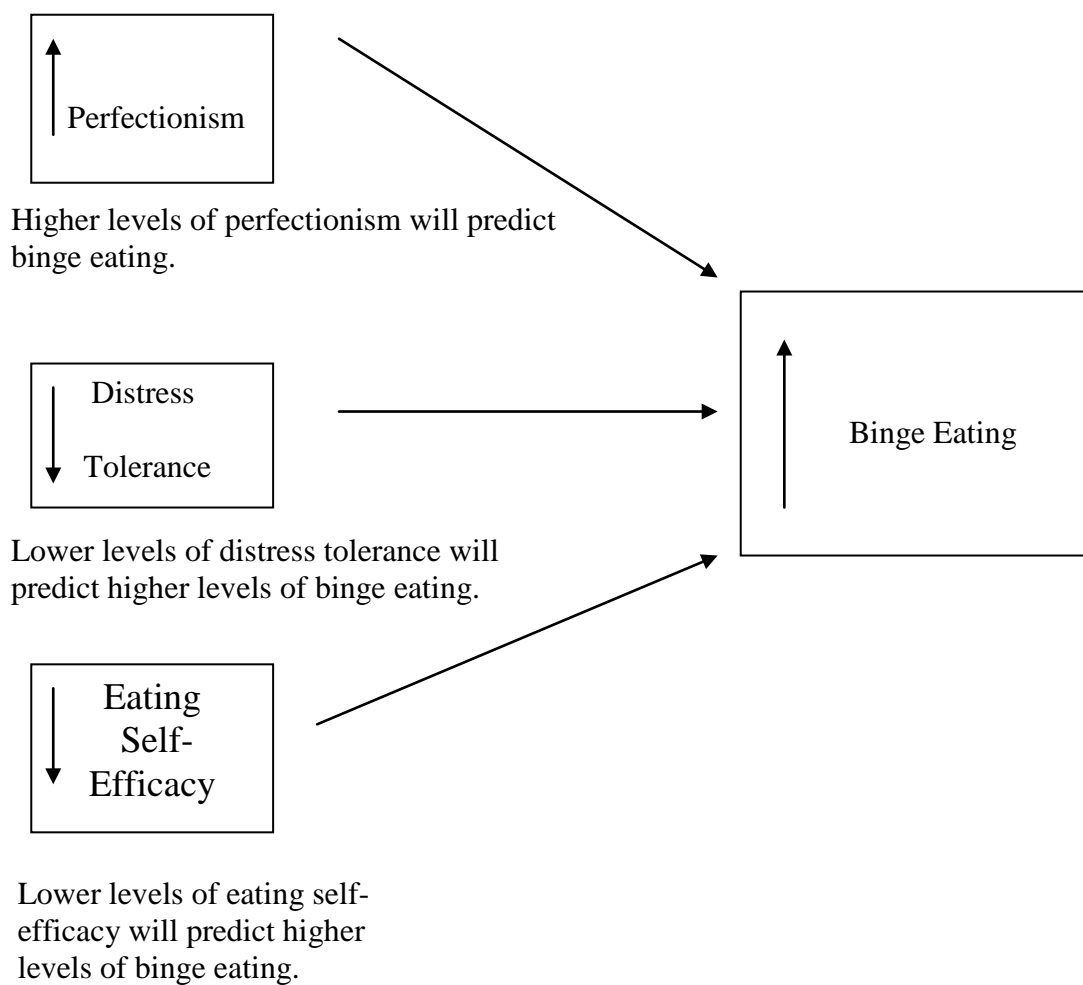
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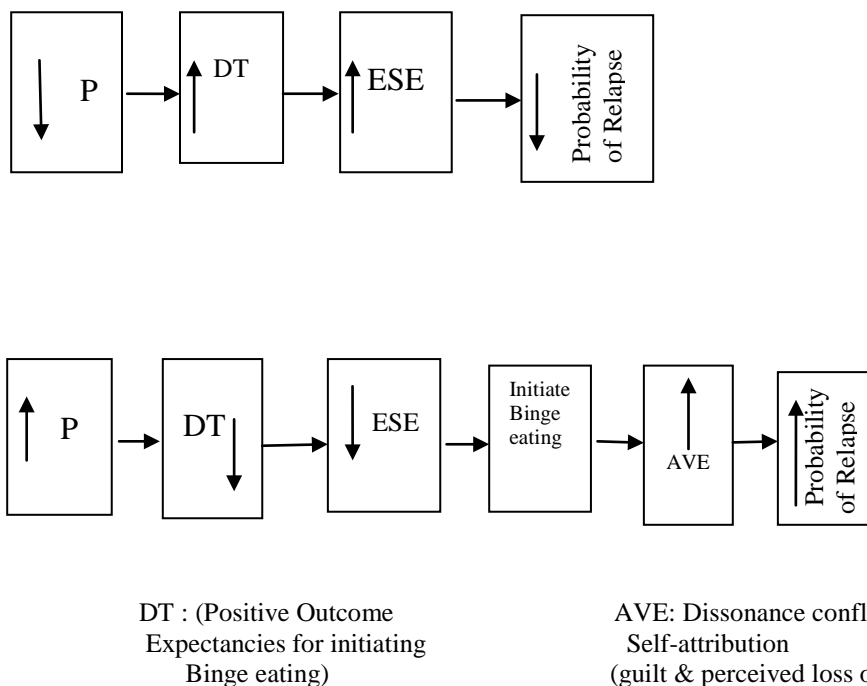
## APPENDIX A

Figure 1

**PERFECTIONISM, DISTRESS TOLERANCE,**  
**EATING SELF-EFFICACY AND**  
**BINGE EATING**



## APPENDIX B

FIGURE 2Perfectionism, Eating Self-Efficacy, Distress Tolerance and Binge Eating  
A Relapse Prevention Model**Legend**

**DT**= Distress Tolerance   **ESE**= Eating Self-Efficacy  
**AVE**=Abstinence Violation Effect   **P**= Perfectionism   **BE**= Binge Eating

Based on Cognitive Behavior Model of Relapse Prevention (Marlatt, 1985, Relapse Prevention: Theoretical Rationale and Overview of the Model, In, Marlatt & Gordon, Relapse Prevention, Guilford Press, NY.) and (Simons, Gaher, 2005; Bardone,-Cone, 2006).

## APPENDIX C

## Eating Disorder Examination Questionnaire (EDE-Q)

**Instructions:** The following questions are concerned with the past four weeks (28 days) only. Please read each question carefully. Please answer all the questions.

**Questions 1 to 12:** Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days only).

	On how many of the past 28 days...	No Days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every-day
1	Have you been deliberately <u>trying</u> to limit the amount of food you eat to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
2	Have you gone for long periods of time (8 waking hours or more) without eating anything at all in order to influence your shape or weight?	0	1	2	3	4	5	6
3	Have you <u>tried</u> to exclude from your diet any foods that you like in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
4	Have you <u>tried</u> to follow definite rules regarding your eating (for example, a calorie limit) in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
5	Have you had a definite desire to have an <u>empty</u> stomach with the aim of influencing your shape or weight?	0	1	2	3	4	5	6
6	Have you had a definite desire to have a <u>totally flat</u> stomach?	0	1	2	3	4	5	6

## APPENDIX C (Continued)

## Eating Disorder Examination Questionnaire (EDE-Q)

	On how many of the past 28 days...	No Days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
7	Has thinking about <u>food, eating or calories</u> made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	0	1	2	3	4	5	6
8	Has thinking about <u>shape or weight</u> made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	0	1	2	3	4	5	6
9	Have you had a definite fear of losing control over eating?	0	1	2	3	4	5	6
10	Have you had a definite fear that you might gain weight?	0	1	2	3	4	5	6
11	Have you felt fat?	0	1	2	3	4	5	6
12	Have you had a strong desire to lose weight?	0	1	2	3	4	5	6

## APPENDIX C (Continued)

## Eating Disorder Examination Questionnaire (EDE-Q)

**Questions 13-18: Please fill in the appropriate number in the boxes on the right.**

**Remember that the questions only refer to the past four weeks (28 days).**

**Over the past four weeks (28 days) .....**

13	Over the past 28 days, how many <u>times</u> have you eaten what other people would regard as an <u>unusually large amount of food</u> (given the circumstances)? .....
14	On how many of these times did you have a sense of having lost control over your eating (at the time that you were eating)? .....
15	Over the past 28 days, on how many <b>DAYS</b> have such episodes of overeating occurred (i.e., you have eaten an unusually large amount of food <u>and</u> have had a sense of loss of control at the time)? .....
16	Over the past 28 days, how many <u>times</u> have you made yourself sick (vomit) as a means of controlling your shape or weight? .....
17	Over the past 28 days, how many <u>times</u> have you taken laxatives as a means of controlling your shape or weight? .....
18	Over the past 28 days, how many <u>times</u> have you exercised in a “driven” or “compulsive” way as a means of controlling your weight, shape or amount of fat, or to burn off calories? .....



## APPENDIX C (Continued)

## Eating Disorder Examination Questionnaire (EDE-Q)

**Questions 19 to 21: Please circle the appropriate number. Please note that for these questions the term “binge eating” means eating what others would regard as an unusually large amount of food for the circumstances, accompanied by a sense of having lost control over eating.**

		No Days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
19	Over the past 28 days, on how many days have you eaten in secret (i.e., furtively)? ...Do not count episodes of binge eating	0	1	2	3	4	5	6
20	On what proportion of the times that you have eaten have you felt guilty (felt that you've done wrong) because of its effect on your shape or weight? ...Do not count episodes of binge eating	0	1	2	3	4	5	6
21	Over the past 28 days, how concerned have you been about other people seeing you eat? ....Do not count episodes of binge eating	0	1	2	3	4	5	6

## APPENDIX C (Continued)

## Eating Disorder Examination Questionnaire (EDE-Q)

**Questions 22 to 28: Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days).**

	Over the past 28 days...	Not at all	Slightly	Moderately	Markedly			
22	Has your <u>weight</u> influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
23	Has your <u>shape</u> influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
24	How much would it have upset you if you had been asked to weigh yourself once a week (no more, or less, often) for the next four weeks?	0	1	2	3	4	5	6
25	How dissatisfied have you been with your <u>weight</u> ?	0	1	2	3	4	5	6
26	How dissatisfied have you been with your <u>shape</u> ?	0	1	2	3	4	5	6
27	How uncomfortable have you felt seeing your body (for example, seeing your shape in the mirror, in a shop window reflection, while undressing or taking a bath or shower)?	0	1	2	3	4	5	6
28	How uncomfortable have you felt about <u>others</u> seeing your shape or figure (for example, in communal changing rooms, when swimming, or wearing tight clothes)?	0	1	2	3	4	5	6

If female: Over the past three-to-four months have you missed any menstrual periods?

If so, how many?"

Have you been taking the "pill"?

## APPENDIX D

## Multidimensional Perfectionism Scale

## MPS

Paul L. Hewitt, Ph.D. and Gordon L. Flett, Ph.D.

Client ID

Age

Gender      Male              Female

Date              \_\_\_\_/\_\_\_\_/\_\_\_\_

Listed below are a number of statements concerning personal characteristics and traits. Read each item and decide whether you agree or disagree and to what extent. If you strongly agree, circle 7. If you strongly disagree, circle 1. If you feel somewhere in between, circle one of the numbers between 1 and 7. If you feel neutral or undecided, the midpoint is 4.

	Disagree					Agree
15. It is very important that I am perfect in everything I attempt.	1	2	3	4	5	6 7
40. I set very high standards for myself.	1	2	3	4	5	6 7
20. I demand nothing less than perfection of myself.	1	2	3	4	5	6 7

	Disagree					Agree
33. Although they may not show it, other people get very upset with me when I slip up.	1	2	3	4	5	6 7
41. People expect more from me than I am capable of giving.	1	2	3	4	5	6 7
18. The people around me expect me to succeed at everything I do.	1	2	3	4	5	6 7

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*Note: This is a limited sample of the MPS, including three questions from each subscale used in this study, as allowed by copyright.*

## APPENDIX E

## Distress Tolerance Scale

Directions: Think of times that you feel distressed or upset. Select the item from the menu that best describes your beliefs about feeling distressed or upset.

1. Strongly agree
2. Mildly agree
3. Agree and disagree equally
4. Mildly disagree
5. Strongly disagree

## Scale

1. Feeling distressed or upset is unbearable to me. (Tolerance)
2. When I feel distressed or upset, all I can think about is how bad I feel. (Absorption)
3. I can't handle feeling distressed or upset. (Tolerance)
4. My feelings of distress are so intense that they completely take over. (Absorption)
5. There's nothing worse than feeling distressed or upset. (Tolerance)
6. I can tolerate being distressed or upset as well as most people. (Appraisal)
7. My feelings of distress or being upset are not acceptable. (Appraisal)
8. I'll do anything to avoid feeling distressed or upset. (Regulation)
9. Other people seem to be able to tolerate feeling distressed or upset better than I can. (Appraisal)
10. Being distressed or upset is always a major ordeal for me. (Appraisal)
11. I am ashamed of myself when I feel distressed or upset. (Appraisal)
12. My feelings of distress or being upset scare me. (Appraisal)
13. I'll do anything to stop feeling distressed or upset. (Regulation)
14. When I feel distressed or upset, I must do something about it immediately. (Regulation)
15. When I feel distressed or upset, I cannot help but concentrate on how bad the distress actually feels. (Absorption)

Scoring: Item 6 is reverse scored. Subscale scores are the mean of the items. The higher-order DTS is formed from the mean of the four subscales.



## APPENDIX F (Continued)

## Weight Efficacy Lifestyle Questionnaire (Continued)

Not confident at all that  
I can resist the desire  
to eat.



0 1 2 3 4 5 6 7 8 9

Very confident that I  
can resist the desire  
to eat.



I AM CONFIDENT THAT:

CONFIDENCE  
NUMBER

- |                                                                                   |       |
|-----------------------------------------------------------------------------------|-------|
| 5. I can resist eating when I am watching TV.                                     | _____ |
| 6. I can resist eating when I am depressed (or down).                             | _____ |
| 7. I can resist eating when there are many different kinds of food available.     | _____ |
| 8. I can resist eating even when I feel it's impolite to refuse a second helping. | _____ |
| 9. I can resist eating even when I have a headache.                               | _____ |
| 10. I can resist eating when I am reading.                                        | _____ |
| 11. I can resist eating when I am angry (or irritable).                           | _____ |
| 12. I can resist eating even when I am at a party.                                | _____ |
| 13. I can resist eating even when others are pressuring me to eat.                | _____ |
| 14. I can resist eating when I am in pain.                                        | _____ |
| 15. I can resist eating just before going to bed.                                 | _____ |
| 16. I can resist eating when I have experienced failure.                          | _____ |
| 17. I can resist eating even when high calorie foods are available.               | _____ |
| 18. I can resist eating even when I think others will be upset if I don't eat.    | _____ |
| 19. I can resist eating when I feel uncomfortable.                                | _____ |
| 20. I can resist eating when I am happy.                                          | _____ |

## APPENDIX G

## Biographic Questionnaire

1. What is your age? AGE\_\_\_\_\_

2. What is your gender?

Male \_\_\_\_\_

Female\_\_\_\_\_

3. What is your main racial or ethnic group?

BLACK (not Hispanic)	_____	01
WHITE (not Hispanic)	_____	02
HISPANIC	_____	03
ASIAN or PACIFIC ISLANDER	_____	04
AMERICAN INDIAN or ALASKAN NATIVE	_____	05
Other (What?)	_____	06

4. What is the highest level of school you completed?

NO FORMAL SCHOOL	_____	01	SOME COLLEGE	_____	05
GRAMMAR SCHOOL	_____	02	COMPLETED COLLEGE	_____	06
SOME HIGH SCHOOL	_____	03	SOME GRAD SCHOOL	_____	07
HIGH SCHOOL	_____	04	COMPLETED GRADSCHOOL	_____	08

5. What is your work status (outside the home)

RETIRED/NOT WORKING	_____	01
WORKING PART-TIME	_____	02
WORKING FULL TIME	_____	03

6. What is your occupation?

---

## APPENDIX G (Continued)

## Biographic Questionnaire

7. Right now, which of the following are living together with you? (Check all that apply.)

Husband	_____	01
LONG-TERM PARTNER	_____	02
ROOMMATE	_____	03
PARENT/S	_____	04
CHILD/CHILDREN	_____	05
GRANDCHILD/GRANDCHILDREN	_____	06
OTHER FAMILY MEMBERS	_____	07
LIVE ALONE	_____	08

8. What is your height? \_\_\_\_\_ feet \_\_\_\_\_ inches

9. What is your weight in pounds? \_\_\_\_\_

10. What was your income from all sources before taxes last year?

\$4,999 or less	_____	01	\$40,000-\$49,999	_____	06
\$5,000-\$9,999	_____	02	\$50,000-\$59,999	_____	07
\$10,000-\$19,999	_____	03	\$60,000-\$74,999	_____	08
\$20,000-\$29,999	_____	04	\$75,000-\$99,999	_____	09
\$30,000-\$39,999	_____	05	\$100,000 or more	_____	10



## APPENDIX H

## Letter to the Editor

Dear Editor,

I am a Registered Nurse, an employee at Stamford Hospital in Stamford, Connecticut, and a doctoral candidate at Rutgers University College of Nursing.

For my dissertation, I am conducting an anonymous web-based survey that will increase nurses' understanding of eating behaviors and attitudes in women.

I invite female Nursing Spectrum readers who are over the age of 18 to participate in this 15-minute survey. Readers may also invite other females over the age of 18 to participate in the survey. Please visit my website for study participation at <https://www.fabshosting.com/eatingstudy>.

Participants will not be asked their names and will remain anonymous. The website is secure and email addresses and IP addresses of participants will not be captured.

I will share the results of this survey with readers when the research is complete.

Thank you for your support of nursing research!

Debbie Migliore, M.S., R.N.

Any questions, please call 203-276-5551.

## APPENDIX I

## Newline Blurb

My name is Debra Migliore and I am the IRB Coordinator here at Stamford Hospital. I am also a student in the PhD degree program in Nursing Research at Rutgers University. For my dissertation, I am conducting a research study in which I will be collecting data through Internet-based surveys. I would like to invite Stamford Hospital female employees over the age of 18 to participate in my online surveys about their eating behaviors and related attitudes. In order to ensure that I will have an adequate number of research participants, other females over the 18 years of age, who are not Stamford Hospital employees, will also be welcome. I will be happy to share the results with my fellow employees when the research is complete.

Thank you for your support toward nursing research!

Please visit my website for study participation at

<https://www.fabshosting.com/eatingstudy>

If you have any questions call Debbie at X-5551

## APPENDIX J

## Recruitment Flyer

Attention Women 18 years and older!

Do you sometimes feel that your eating is out of control?

You are invited to participate in my Online Research Study if you are:

- An Interested Female 18 years or older
- Have access to the Internet
- Know how to use a computer
- Can read and understand English

Visit my website to participate in my research study at:

<https://www.fabshosting.com/eatingstudy>

Participation is voluntary and involves answering

**anonymous** questions online. All data collected will be kept confidential.

*I need your help to help me understand how eating behaviors are related to other attitudes. I am also doing this as a research study toward my PhD in Nursing at Rutgers University. I am Debra Migliore, the principal investigator, and my advisor, Lucille Eller, is the co-investigator on this study. Questions? Call 203-276-5551*

## APPENDIX K

## Thank you/Exit Screens

Thank you for your participating in my research study!

Have a nice day.

Or for participants who don't qualify for the study by gender or age:

Thank you for visiting my study website.

This study involves females over the age of 18.

Thank you for participating in my research study.

Have a nice day!

## APPENDIX L

**Informed Consent Form**

## Eating Behaviors Study

**Purpose of the Study**

You are invited to participate in a research study that is being conducted by Debra A. Migliore, a PhD student in the nursing research program at Rutgers University, and an employee of Stamford Hospital. Lucille Eller, PhD, RN is my faculty advisor at Rutgers University and the Co-Investigator on this study. The purpose of this research is to determine if certain patterns of thought and behavior are linked to eating behaviors that can lead to weight gain or being overweight.

At least 76 women, age 18 or older, will participate in this study. Your participation will last between 10 to 30 minutes, depending on your speed. The study procedures include logging on to the study survey site and completing questionnaires designed to learn about your eating behaviors and other factors about your lifestyle that may help researchers better understand how to help people manage their weight.

**Description of the Research**

You will first be asked to complete a brief questionnaire about personal, but anonymous information, and an initial question about eating patterns. Some participants will have more questions to answer than others depending on their answers. When you are done with the study, a final screen will emerge telling you that the study is finished, and thanking you for participating.

**Potential Benefits**

You are not expected to benefit personally from this study unless reflecting about your behavior patterns related to eating and other lifestyle patterns is helpful to you. It is hoped that the information collected from this research study will lead to a better understanding about the factors related to eating behaviors.

**Alternatives to Participants**

You have the right to refuse to participate in this research study.

**Confidentiality**

If you agree to take part in the study, you will be assigned a random code number that will be used on each of your questionnaires. Your name will be unknown to the researcher. You will not be asked for your name, email address or any other identifying information. The code number will be assigned by the order that you access the Website. Your email will not be captured. There will be no way to link your responses back to you. Therefore, data collection is anonymous.

## APPENDIX L (Continued)

## Informed Consent (Continued)

**Potential Risks and Discomforts**

There is no foreseeable risk to confidentiality, since your information will be collected without your name, and the information that you share about yourself, will not be known about you. The questions asked will involve you thinking about how you typically think and behave related to eating and other parts of your life. There is a potential for minimal risk from participating in this study, if thinking about your life makes you upset. If you do find you are upset, call your physician, healthcare provider, and/or one of the contacts provided below for guidance on how to get attention for your distress:

National Eating Disorders Association  
1-800-931-2237  
Crisis Hotline: 1-800-273-TALK (8255)  
Web: [www.nationaleatingdisorders.org](http://www.nationaleatingdisorders.org)  
Email: [info@nationaleatingdisorders.org](mailto:info@nationaleatingdisorders.org)

National Institute of Mental Health  
1-866-615-NIMH (6464)  
1-866-415-8051 (TTY)  
Web: <http://www.nimh.nih.gov>  
Email: [nimhinfo@nih.gov](mailto:nimhinfo@nih.gov)

**Costs/Reimbursements**

You will not be reimbursed for time and expenses, though your participation in the online questionnaire is not expected to cause you any expense. The researcher will benefit by your participation in this research study, since this research study is being done as a degree requirement in the PhD nursing research program at Rutgers University. If you need professional or health care related to this survey, you will not be compensated by this study.

**Voluntary Participation**

Participation in this study is voluntary. You may choose not to participate, and you may withdraw at any time during the study procedures without any penalty to you. In addition, you may choose not to answer any questions with which you are not comfortable.

This research is anonymous. Anonymous means that no information will be recorded about you that could identify you. This means that I will not record your name, address, phone number, date of birth, etc.

## APPENDIX L (Continued)

## Informed Consent (Continued)

If you have any questions about the study procedures, you may contact Debra Migliore, R.N. at (203) 276-5551. If you have any questions about your rights as a research participant, you may contact the Sponsored Programs Administrator at Rutgers University and the Institutional Review Board of Stamford Hospital at:

Rutgers University Institutional Review Board for the Protection of Human Subjects  
Office of Research and Sponsored Programs  
3 Rutgers Plaza  
New Brunswick, NJ 08901-8559  
Tel: 732-932-0150 ext. 2104  
Email: [humansubjects@orsp.rutgers.edu](mailto:humansubjects@orsp.rutgers.edu)

Stamford Hospital Institutional Review Board  
30 Shelburne Road  
Stamford, CT, 06902  
Tel: 203-276-7487

An Institutional Review Board (IRB) is a committee of people organized to protect the rights and welfare of research participants.

- You may print a copy of this consent form for your records.

Since this research is conducted online, is anonymous and the only record linking you and your information would be your signature on a consent document, your signature will not be required. Instead, your participation in this study will demonstrate your agreement to participate in this study. Please select the appropriate response below:

I have read the above information and agree to participate in this study:

- Yes, I agree.
- No, I have not read the above information, or I do not agree to participate.

## APPENDIX M

## Legend of Abbreviations

AN	Anorexia nervosa
APA	American Psychiatric Association
APS-R	Almost Perfect Scale-Revised
ASI	Anxiety Sensitive Index
AVE	Abstinence Violation Effect
BDI	Beck Depression Inventory
BE	Binge eating
BED	Binge eating disorder
BES	Binge Eating Scale
BFI-N	Big Factor Inventory –Neuroticism Subscale
BIQ	Body-Image Ideals Questionnaire
BPD	Borderline personality disorder
BMI	Body Mass Index
BN	Bulimia nervosa
BULIT-R	Bulimia Test-Revised
CBT	Cognitive Behavioral Therapy
CDC	Center for Disease Control
CFA	Confirmatory Factor Analysis
CFS	Cognitive Factor Scale
DBT	Dialectical Behavioral Therapy
DEBQ	Dutch Eating Behaviors Questionnaire



## APPENDIX M (Continued)

## Legend of Abbreviations (Continued)

DIET	Dieter's Inventory of Eating Temptations
DIS	Dietary Intent Scale
DRES	Dutch Restrained Eating Scale
DSM-III	Diagnostic and Statistical Manual of Mental Disorders, 3 <sup>rd</sup> Edition
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders, 4 <sup>th</sup> Edition
DT	Distress tolerance
DTS	Distress Tolerance Scale
EDDS	Eating Disorder Diagnostic Scale
EDE	Eating Disorder Examination
EDE-Q	Eating Disorder Examination Questionnaire
EDI	Eating Disorder Inventory
EDI-B	Eating Disorder Inventory-Bulimia Subscale
EDI-P	Eating Disorder Inventory-Perfectionism Subscale
EDNOS	Eating Disorder Not Otherwise Specified
EHQ	Eating Habits Questionnaire
ESE	Eating self-efficacy
FMPS	Frost Multidimensional Perfectionism Scale
FMPS-CM	Concern over mistakes subscale or dimension of the Frost Multidimensional Perfectionism Scale

## APPENDIX M (Continued)

## Legend of Abbreviations (Continued)

FMPS-DA	Frost Multidimensional Perfectionism Scale- doubts about actions subscale
FMPS-PE	parental expectations subscale or dimension of the Frost Multidimensional Perfectionism Scale
FMPS-PS	Frost Multidimensional Perfectionism Scale- personal standards
ICES	Invalidating Childhood Environment Scale
IRB	Institutional Review Board
JFFIS	Janis-Field Feelings of Inadequacy Scale
MDI	Multidimensional Discrepancy Inventory
MMPI	Multidimensional Discrepancy Inventory
MPS	Multidimensional Perfectionism Scale
(MPS-H)	Multidimensional Perfectionism Scale-Hewitt (Same Test)
NDT	Non-dieting Treatment
NED	Night Eating Disorder
NHANES	National Health and Nutrition Examination Survey
NHLBI	National Heart Lung and Blood Institute
NIDDK	National Institute of Diabetes and Digestive and Kidney Diseases
NIH	National Institute of Health
OOP	other-oriented perfectionism
P	Perfectionism

## APPENDIX M (Continued)

## Legend of Abbreviations (Continued)

PCA	principal components factor analysis
PMOBE	Perfectionism Model of Binge Eating
POMS-D	Profile of Mood States-Depression Subscale
QEWPR	Questionnaire on Eating and Weight Patterns-Revised
RFEQR	Three-Factor Eating Questionnaire
RSE	Rosenberg Self-Esteem Scale
RPM	Relapse Prevention Model
SAS-SR	Social Adjustment Scale-Self Report
SCL-90	Symptom Checklist-90
SCQ	Smoking Confidence Questionnaire
SOP	self-oriented perfectionism
SPP	socially prescribed perfectionism
SSES	State Self-Esteem Scale
TSCS	Tennessee Self-Concept Scale
WEL	Weight Efficacy Lifestyle Questionnaire
WIN	Weight-control Information Network

## APPENDIX N

## Explanation about Binge Eating

This study is about binge eating. Binge eating has two parts:

- 1) eating an unusually large amount of food and
- 2) experiencing a sense of loss of control.

What is an "unusually large amount of food"? An unusually large amount of food is definitely more than most people would eat under similar circumstances. Some examples might be:

- 1) eating two full meals;
- 2) eating three main courses, or
- 3) eating an unusually large amount of one food or combination of foods.

What is a sense of loss of control?

A sense of having lost control while eating might be experienced by different people in different ways:

- 1) feeling driven or compelled to eat;
- 2) not being able to stop eating once you've started;
- 3) not being able to keep yourself from eating large amounts of certain kinds of food in the first place; or
- 4) giving up on even trying to control your eating because you know that no matter what, you're going to overeat.

Did you binge eat, on average, once a week in the last month?

**VITA**

Debra A. Migliore

- 1956 Born in Bronx, New York.
- 1973 Graduated from Spring Valley High School, Spring Valley, New York.
- 1977 A.A.S. Nursing, Misericordia College of Nursing, Bronx, New York.
- 2002 B.S. Nursing, Mercy College, Dobbs Ferry, New York.
- 2004 M.S. Nursing, Western Connecticut State University, Danbury, Connecticut.
- 2003-10 Attended Rutgers, The State University of New Jersey, College of Nursing, Newark, New Jersey.
- 2003 Teaching Assistantship, College of Nursing.
- 2004 Research Assistantship, New Jersey Collaborating Center for Nursing.
- 2005-present Employed by Stamford Hospital, Stamford, Connecticut, as Institutional Review Board Coordinator.
- 2010 Ph.D. in nursing research.