

PSYCHOLOGICAL VARIABLES IMPACTING WEIGHT GAIN RAPIDITY  
IN ADOLESCENTS HOSPITALIZED WITH  
EATING DISORDERS

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*For St. Dymphna*

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EATING DISORDERS

by

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The University of Texas Southwestern Medical Center at Dallas, 2008

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Eating disorders are associated with a variety of pervasive consequences and often necessitate immediate treatment that focuses on medical and psychological improvement. With the high cost of hospitalization, treatment facilities are experiencing increased pressure to quickly and effectively treat these disorders, though past studies have concluded that the psychological symptoms associated with eating disorders are slow to resolve. While there are multiple



studies on outcome in eating disorder patients, very few studies have evaluated psychological variables as predictors of weight gain rapidity and duration of hospitalization among hospitalized adolescents. The aims of the present study were to identify what psychological variables at admission predicted rapidity of weight gain and duration of hospitalization and to evaluate what psychological variables improved during acute treatment. The sample consisted of 38 patients who were hospitalized for an eating disorder and were found to be below 93 percent of their healthy weight range. Upon admission, patients completed self-report measures assessing the following psychological variables: self-esteem, self-efficacy, perfectionism, readiness to change, emotion regulation, and cognitive distortions. Patients completed these measures again when reaching 85 percent of their ideal body weight ( $n = 29$ ), if applicable, and once more upon discharge ( $n = 33$ ). This prospective investigation revealed that self-efficacy, emotion regulation, and self-esteem at admission predicted time to reach 85 percent ideal body weight. Readiness to change at admission and, self-esteem at trend level, were predictive of duration of hospitalization. Several aspects of psychological functioning were found to significantly improve over the course of treatment, with readiness to change increasing and both perfectionism and cognitive distortions decreasing. Despite significant improvement in these psychological variables and in weight gain, no relationship was found between these changes. These results suggest that certain psychological factors can be utilized to predict weight gain

rapidity and duration of hospitalization for treatment of eating disorders.

Additionally, there is significant improvement in both weight restoration and psychological functioning over the course of acute treatment. This information has important implications in identifying psychological severity of eating disorder, potential weight gain prognosis in treatment and determining specific treatment goals.

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## LIST OF ABBREVIATIONS

AN: Anorexia Nervosa

ANSOCQ: Anorexia Nervosa Stages of Change Questionnaire

BMI: Body Mass Index

BN: Bulimia Nervosa

CAPS: Child Adolescent Perfectionism Scale

DERS: Difficulties in Emotion Regulation Scale

GSES: Generalized Self-Efficacy Scale

IBW: Ideal Body Weight

MAC-R: Mizes Anorectic Cognition Questionnaire-Revised

RSES: Rosenberg Self-Esteem Scale

# **CHAPTER ONE**

## **INTRODUCTION**

### **Statement of the Problem**

Anorexia Nervosa (AN) has been found to have the highest mortality rate among all psychiatric disorders, is associated with increased risk of suicide (2005) and contributes to pervasive psychological, social and medical consequences. Compensatory behaviors, such as laxative use, restricting or vomiting, to control weight have been found in over one-half of teenage girls and almost one-third of teenage boys (Neumark-Sztainer, 2005), while an overwhelming 81% of 10 year olds acknowledged that they are afraid of becoming fat (McNutt et al., 1997). Females aged 15-19 years have the highest incident rates of AN, constituting approximately 40 percent of all identified cases, though there has also been a rise in incidence among females aged 10-14 years since the 1950s (Hoek & van Hoeken, 2003).

Increases in prevalence of this disorder and the high cost of hospitalization have lead to increased pressure to identify and understand prognostic indicators. Though predictive variables have been identified in multiple studies, results are inconsistent. A review of the literature reveals that body weight, amenorrhea, family dysfunction, psychiatric comorbidity, psychological and social functioning, and number of hospitalizations are predictive of outcome (Tozzi,

Sullivan, Fear, McKenzie, & Bulik, 2003). Additionally, T. van der Ham and colleagues (1998) found that long duration of illness, low self-esteem and maturity fears were also predictive of poor outcome. Furthermore, they noted that psychological characteristics, excluding duration of illness, were more predictive of prognosis than population characteristics or behavior variables. In contrast, another study found no association between duration of illness, lower body weight, or prior treatment failure, but did find that compulsive drive to exercise, family dysfunction, and preexisting social difficulties were significant predictors of chronic course illness (Strober, Freeman, & Morrell, 1997). Pike (1998) concluded that many of these studies are inconclusive in identifying predictive variables because they have varying methodologies and criteria, lack detailed analyses, or fail to evaluate how factors independently contribute to the disorder.

A disorder of secrecy and shame, individuals often resist care as recovery may mean letting go of the very function the eating disorder serves: preventing maturity, seeking attention from others, maintaining a sense of control or security, or providing identity (Pike, 1998; Slade, 1982). Due to the serious consequences of this disorder, intervention is vital in improving both medical and psychological outcomes. However, it is estimated that only one third of individuals with AN receive treatment and that most people with severe eating disorders do not receive adequate care (Hoek & van Hoeken, 2003).

Even with sufficient treatment, research has shown that recovery may take approximately 5 years and relapse rates following treatment are 30% (Strober et al., 1997). Multiple definitions of treatment response, remission, recovery and relapse have led also to a wide array of results documented within the literature. Despite inconsistencies in criteria for recovery, studies consistently indicate that weight improvement occurs significantly faster than psychological improvement (Fennig, Fennig, & Roe, 2002). Psychological symptoms such as cognitive distortions continue to plague patients months after ideal body weight has been achieved and appear particularly resistant to change.

Evaluating weight as a separate predictor variable has important implications within the adolescent eating disorder population. Lock and Litt (2003) found that weight gain response, specifically in meeting 85 percent of ideal body weight, during initial hospitalization had important implications in predicting outcome and recovery. Lay and colleagues (2002) evaluated the weight patterns of 40 female adolescent anorectic patients that had been readmitted for inpatient hospitalization. From the patients' weight curves it was found that short duration of ideal weight during inpatient hospitalization predicted shorter time to readmission. Additionally, individuals with faster rapidity of weight gain during inpatient treatment had faster decreases in weight after discharge. Lay remarks that additional research of weight gain characteristics in inpatient treatment may provide valuable information for weight maintenance and

treatment planning. While there are multiple studies on outcome of psychological variables in eating disorder patients, few studies have evaluated the impact of psychological variables on rapidity of weight gain among adolescents hospitalized in an inpatient psychiatry unit. In addition, determining what psychological variables change and how they impact weight gain during the course of hospitalization could be helpful in assessing the prognosis at a much earlier time in treatment, informing treatment programs of specific needs, and preventing relapse.



## CHAPTER TWO

### REVIEW OF THE LITERATURE

#### Significance and Background

##### *Diagnosing Anorexia Nervosa*

To obtain a diagnosis of anorexia nervosa, the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV), (Association, 1994) specifies that an individual must meet the following four criteria: 1) body weight below 85% of expected weight, 2) intense fear of becoming fat or gaining weight, 3) disturbed perception of one's body weight or shape, or denial of the severity of one's low body weight, and 4) absence of at least three consecutive menstrual cycles. The presentation is specified and coded as either "restricting type" or "binge-eating/purging type"

Though the diagnostic criteria for this disorder appears straightforward, children and adolescents may present differently than adults. Instead of losing weight, children and adolescents may fail to meet expected weight gains based on their height and development. Additionally, young females that are premenarchal or experience irregular menses may not meet the standard criterion of amenorrhea. Additionally, Golden and colleagues (2003) note that adolescents may lack the ability to sufficiently verbalize their emotions and cognitions regarding their disorder. When coupled with the often present characteristic of

denial, the anorectic adolescent may initially seem ambiguous about weight, fat, or body perception, thus creating uncertainty regarding the psychological criterion needed for a diagnosis of AN. Fisher and colleagues (1995) recommend that when determining healthy weight range, consideration should be taken for the individual's history of height and weight, age norms, anticipated growth, sex, height, and sexual maturity rating. Due to the unique presentation of eating disordered adolescents, a diagnosis of Eating Disorder Not Otherwise Specified (ED NOS) is sometimes given as a primary diagnosis (Robin, Gilroy, & Dennis, 1998).

### ***Prevalence and Incidence***

AN and Bulimia Nervosa (BN) have also been described as “disorders of adolescence” (Lewinsohn, Striegel-Moore, & Seeley, 2000). Anorexia has been found to have a younger age of onset with the highest incidence rates between the ages of 10 to 19 years (Turnbull, Ward, Treasure, & Jick, 1996). As previously mentioned, there has been a rise in incidence for females between the ages of 10-14 since the 1950's (Hoek & van Hoeken, 2003). With a prevalence rate of 0.48, AN is the third most common chronic condition among adolescent girls, following obesity and asthma (Lucas, Beard, O'Fallon, & Kurland, 1991). In addition, adolescent females with eating disorders far exceed adolescent eating disordered males with a lifetime prevalence rate of 23 per 1,000 compared to the

male prevalence rate of 1.4 per 1,000 (Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993).

### ***Etiology and Risk Factors***

There are a variety of different models and theories which attempt to explain the complex etiology of AN. Theories have contributed the cause to a wide variety of factors including psychological, familial, sociocultural, and biological, though much of the literature posits an interaction between many of these factors. With the spread of Western culture and ideals, researchers are observing increased numbers of eating disorders within other nations (Iancu, Spivak, Ratzoni, & Apter, 1994). Dubbed a “culture-transition syndrome,” it is believed that societies undergoing rapid transition present a challenge to previously held beliefs, values, perceptions, and culture, resulting in disordered eating (Haudek, Rorty, & Henker, 1999). The media’s portrayal of the “normal” and acceptable body image reflects society’s obsession with the idealization of thinness and is commonly implicated in the cause of eating disorders.

Accordingly, the media’s thin ideal image appears to be solidified by peer influence, attitude, and behaviors on what is acceptable and what are acceptable practices for acquiring such physique (Polivy & Herman, 2002).

Blank and Latzer’s (2004) Boundary Control Model suggests that the etiology of AN is determined by “four bio-psychosocial agents:” self, parents,

school, and society. This model suggests that the individual's basic needs are met by one of these four agents, thus providing a sense of accomplishment, control, and emotional fulfillment. When these needs are not met, one begins to derive value from body shape and weight, as emphasized by society, and the individual begins to engage in a power struggle with food to establish a sense of control. The anorectic individual believes that by strictly controlling eating behaviors they will obtain the ideal body, thus reinforcing their sense of self-worth.

With advances in science and technology, researchers are exploring biological and genetic causes for eating disorders, though results are currently inconclusive. Genetic factors may influence the development of eating disorders (Schmidt, 2003), as high heritability coefficients have been identified (Polivy & Herman, 2002). Research has shown that there is an increased risk of developing an eating disorder if another family member also has an eating disorder, though it is currently unclear whether this relationship is associated with environmental or genetic influences (Polivy & Herman, 2002). Minuchin and colleagues (1978) found dysfunctional qualities within eating disordered families such as enmeshment, intrusiveness, and hostility between family members. Within the family unit, quality of parental bond, parenting style, and degree of maternal warmth attachment have also been implicated in the etiology of eating disturbances (Haudek et al., 1999). Though these characteristics may be apparent

at the time of the study, it is still difficult to discriminate if these factors preceded the eating disorder or are a manifestation of other variables.

Due to the increased prevalence of this life threatening disorder in adolescents, identifying risk factors in eating disorders has become an important part of education and prevention. Risk factors for AN have included low self-esteem, perfectionism (Fairburn, Cooper, Doll, & Welch, 1999), neuroticism (Bulik et al., 2006), increased concern about shape and weight, negative self-evaluation, sexual abuse, and eating difficulties in early childhood (Jacobi, Hayward, de Zwaan, Kraemer, & Agras, 2004). Additionally, cigarette smoking, appearance concerns, and alcohol use were found to be risk factors for disordered eating (Croll, Neumark-Sztainer, Story, & Ireland, 2002). Personality characteristics implicated as risks for developing eating disordered behavior have included perfectionism, obsessiveness, low novelty seeking, anxiety, harm avoidance, compulsiveness and diminished self-directedness (Group, 2001; Klump et al., 2000). Despite the growing literature on risk factors of eating disorders, researchers continue to note that it is difficult to discriminate between risk factors and early symptoms of the disorder (Bulik, Reba, Siega-Riz, & Reichborn-Kjennerud, 2005).

### *Transdiagnostic Theory of Eating Disorders*

As previously noted, researchers have developed multiple models in attempts to identify the etiology, development, and maintaining mechanisms that underlie eating disorders. Fairburn et al. (Fairburn, 1997; Fairburn, Cooper, & Cooper, 1986; Fairburn, Cooper, & Shafran, 2003) proposes a transdiagnostic theory for the maintenance of bulimia nervosa, stating that an eating disorder is developed and maintained by an individual's dysfunctional system of self worth (Appendix E, Figure 1). This system disregards other domains of life such as interpersonal abilities, social relationships, school success or career realms, and is instead based upon self-evaluation of one's shape, weight, eating habits and dietary control. Instead, an over-emphasis on eating, shape and weight lead to weight controlling behaviors such as dietary restriction, binge eating and purging (Fairburn et al., 2003). These behaviors feed back into the individual's critical self-perception and create a vicious cycle between eating disordered self-perception and eating disordered behavior.

Fairburn and colleagues (2003) conclude that AN and BN have the same core psychopathology, though these two disorders manifest differently with regards to eating and weight management techniques. Fairburn et al. note that,

In summary, anorexia nervosa, bulimia nervosa and the atypical eating disorders share the same distinctive psychopathology, and patients move between these diagnostic states over time. These two characteristics,

together with the clinical observation that shared clinical features tend to be maintained by similar psychopathological processes, suggest that common mechanisms are involved in the persistence of bulimia nervosa, anorexia nervosa and the atypical eating disorders (Fairburn et al., 2003).

This theory has provided the basis for a treatment manual proposed by Fairburn, which has been used in over 20 studies (Fairburn et al., 2003). Though these studies support the dynamics and efficacy of this treatment model, the authors state that additional research is needed to continue evaluating the core psychopathology involved in the disorder. As a result, Fairburn, Cooper and Shafran (2003) extended upon the original transdiagnostic theory to include the addition of four maintaining processes to aid in explaining the complexity of this disorder: clinical perfectionism, low core self-esteem, interpersonal difficulties and mood intolerance. According to this theory, core eating disorder mechanisms interact with one or more of these maintaining processes, and inhibit the individual from progressing in the recovery process (Fairburn et al., 2003). Elaboration and evidence regarding these maintaining psychological variables follow in a subsequent section.

Though the transdiagnostic model incorporates important psychological factors implicated in the development and maintenance of this disorder, additional variables should continue to be considered. Due to the multifaceted nature of this disorder, no model thus far has included all of the possible risk factors or

psychological mechanisms found within this disorder. In addition, researchers should continue to consider the multiple dimensions that interact within an adolescent's life to provide additional information about possible contributions to eating disorder pathology.

### **Psychological Characteristics**

***Mood intolerance and emotion regulation.*** Mood intolerance is defined as “an inability to cope appropriately with certain emotional states” (Fairburn et al., 2003). Research shows that intense mood states, particularly negative emotions, create emotional dissonance that eating disordered individuals have difficulty modulating. Many of these individuals do not possess the ability to accurately identify their emotions, and consequently, they are unable to use appropriate coping mechanisms to express their emotions. Instead, it appears that they use eating disorder behaviors such as dietary restriction, purging, or exercising to manage their negative mood states (Fairburn et al., 2003; Gilboa-Schechtman, Avnon, Zubery, & Jeczmiem, 2006).

Similar to the definition of mood intolerance, emotion regulation includes the ability to accurately identify, understand, accept and modulate emotions and to respond to negative and positive emotions in socially appropriate ways (Gratz & Gunderson, 2006). Gratz and Roemer (2004) add that emotion regulation also includes two other elements that an individual must accomplish to control



emotions and adapt in positive ways. They conclude that even while experiencing negative emotions, an individual must control impulsive behaviors to attain a desired goal and that one must use emotion regulation strategies in appropriate and flexible ways so that emotions are modulated and individual goals are achieved. In eating disordered individuals, particular emphasis would be placed on the ability to tolerate negative emotions without initiating or influencing eating disordered cognitions or behaviors.

Sim and Zeman (2006) studied 234 early adolescent females to investigate whether difficulties in emotion regulation could discriminate between body dissatisfaction and disordered eating. The authors found that poor emotional awareness served as a predictor of disordered eating, noting that girls who have high levels of body dissatisfaction and difficulty with emotion identification may be at an increased risk for developing an eating disorder. Though previous studies have investigated the role of emotion regulation in eating disorders, there is presently no research evaluating the role of this concept on weight gain rapidity in adolescents with anorexia nervosa.

*Perfectionism.* Multiple studies have evaluated different conceptualizations of perfectionism including multidimensional, unidimensional, maladaptative, neurotic, self-oriented, other-oriented, socially prescribed, and self-presentational. Franco-Paredes and colleagues (2005) posit that a multidimensional approach to studying the role of perfectionism in eating

disorders provides a better understanding of how behavior is influenced in interpersonal or intrapersonal ways. This perspective serves to include the negative schemas of the individual and understand how they affect and are changed by social interaction.

Clinical perfectionism, as defined by Fairburn et al (2003), is “the over-evaluation of, the striving for, and achievement of, personally demanding standards, despite adverse consequences.” Research proposes that the combination of perfectionistic standards and intense emphasis on eating, shape and weight result in eating disordered behaviors and cognitions. The individual begins to fear negative evaluation from others and responds by becoming overly self-critical of their own behaviors, performance and ability to achieve personal goals. As a means to alleviate this negative self-appraisal, they diligently strive towards achieving idealistic standards and goals. A maladaptive cycle ensues between negative self-evaluation and perfectionism, thus increasing eating disorder behaviors (Fairburn et al., 2003). This becomes especially problematic when patients continue to strive for perfection and are unable modify their behavior or self-evaluations, thus resulting in negative consequences to their health, relationships, and psychological welfare.

In a meta-analytic review, Stice (2002) notes that studies have found that perfectionism causes an increase in eating pathology in both adolescents (Killen et al., 1996; Killen, Taylor, Hayward, & Wilson, 1994; Leon, Fulkerson, Perry,

Keel, & Klump, 1999) and adults (Vohs, Bardone, Joiner, & Abramson, 1999; Vohs et al., 2001) and that individuals with eating disorders have higher levels of perfectionism when compared to control groups. Fairburn, Cooper and Shafran (2003) and Santonastosa (1999) have shown that perfectionism not only serves to increase eating disorder pathology, but also acts as a maintaining mechanism that inhibits the recovery process. Studies indicate that even after individuals with AN have regained a healthy bodyweight, perfectionistic traits have been found to continue (Srinivasagam, Kaye, Plotnicov, & Greeno, 1995; Sutandar-Pinnock, Woodside, Carter, Olmsted, & Kaplan, 2003). In fact, underweight anorectics and those within their healthy weight range have been found to report similar levels of perfectionism (Bastiani, Rao, Weltzin, & Kaye, 1995).

*Self-esteem.* The transdiagnostic theory of eating disorders clearly illustrates the impact of shape and weight concerns on self-esteem and dietary restraint (Fairburn et al., 2003). Geller and colleagues (2000) found that adolescents whose self worth was based on shape and weight had increased eating disorder symptoms and lower levels of global self-esteem. Given the impact of weight on self-evaluation, it is not surprising that anorexic individuals have been found to have lower levels of self-esteem and negative self-concept when compared to control groups (Cooper & Turner, 2000; Iniewicz, 2005). Despite treatment and time, former anorectics regarded as having poor outcome had

significantly lower levels of self-esteem and life satisfaction scores (Halvorsen & Heyerdahl, 2006).

Studies have also evaluated the role of self-esteem in predicting onset of disordered eating in adolescence and treatment completion. Latency age females with low-self esteem have been found to be eight times more likely to develop eating problems by mid-adolescence when compared to females with high self-esteem (Button, Sonuga-Barke, Davies, & Thompson, 1996). Halmi and colleagues (2005) examined the predictors of treatment acceptance and completion in a group of anorexic patients assigned to one of three treatment groups: cognitive behavioral therapy, fluoxetine, or a combination of both. After one year of treatment, results showed that high self-esteem was the only predictor of treatment completion.

*Self-efficacy.* Self-efficacy is defined as “belief in one’s capabilities to organize and execute the course of action required to manage prospective situations” (A. Bandura, 1995). Only recently has self-efficacy been distinguished and explored as a separate construct within the eating disorder population. In attempts to understand the mechanisms driving eating disorders, research has increased in the areas of self-esteem, self-efficacy and ineffectiveness. Though these might appear to be similar constructs and are all associated with eating pathology (Wagner, Halmi, & Maguire, 1987) researchers have differentiated and defined these as quite different psychological variables.

Bandura and Cervone (1986) assert that individuals with low self-efficacy have little confidence in their abilities and are particularly sensitive to the difference between their abilities and idealized standards, thus affecting the individual behaviorally and emotionally. In individuals with eating disorders, discrepancy between their capabilities and ideal self may perpetuate eating disordered behavior and feed into negative self-perception. Mizes and Christiano (1995) state that self-efficacy plays a significant role in the process of behavioral change, including the initiation, maintenance and alteration of behaviors. Considering this, it is not surprising that authors note the degree to which self-efficacy influences motivation to work towards specific goals during the recovery process (Pinto, Guarda, Heinberg, & DiClemente, 2006).

Studies evaluating self-efficacy within eating disordered populations typically consist of individuals with bulimia, obesity, or binge-eaters. Research evaluating this construct demonstrated that interactions between self-efficacy, perfectionism, and perceived weight were predictive of binge eating (Bardone-Cone, Abramson, Vohs, Heatherton, & Joiner, 2006), whereas increases in self-efficacy are associated with decreased symptoms of bulimia and improvement in binge eating (Goodrick et al., 1999; Schneider, O'Leary, & Agras, 1987). Additionally, recovery self-efficacy was associated with greater levels of eating disorder pathology (Pinto et al., 2006).

Pinto and colleagues (2008) evaluated recovery self-efficacy in a sample of underweight patients with eating disorders to determine how this construct might impact length of hospital stay and partial hospital weight gain rate. They discovered that higher scores at admission predicted shorter hospital duration and greater weight gain rates during partial hospitalization. However, the authors did not evaluate how this might impact inpatient weight gain rate, citing that the inpatient structure would decrease variability in weight gain rates.

***Motivation to Change.*** Given the egosyntonic nature of anorexia, individuals with this disorder are often resistant to treatment, ambivalent towards recovery, and have high rates of attrition and relapse (Serpell, Treasure, Teasdale, & Sullivan, 1999; K. Vitousek, Watson, & Wilson, 1998). Research has shown that both adult and adolescent anorexics consider issues pertaining to weight gain and appearance to be a priority within their eating disordered self-concept. As a result, eating disorder behaviors and symptoms become internalized and embraced, thus inhibiting motivation to change (Rieger & Touyz, 2006).

A large number of studies evaluate motivation to change using measures based on Prochaska and DiClemente's transtheoretical stages of change model (Prochaska & DiClemente, 1982; Prochaska, DiClemente, & Norcross, 1992), which delineates stages that an individual must progress through in order to change behavior. Levels of motivation and desire for change are determined by the individual's progression through the following stages: precontemplation,

contemplation, preparation, action, maintenance and termination. While motivational deficits are pervasive within this population, motivation may change depending on the degree to which anorexic symptoms are distressing for the person (Orimoto, Vitousek, & Wilson, 1992; Rieger & Touyz, 2006).

There are very few studies that have evaluated the willingness and motivation to change in eating disordered adolescents, though this literature has important implications for treatment and recovery prognosis. Ametller and colleagues (2005) evaluated 70 adolescents with anorexia to determine whether readiness to change impacted necessity for hospital admission. Using hospital admission as an outcome measure, researchers found that the number of patients admitted for inpatient hospitalization fell as they progressed through the stages of change. Additionally, increased readiness to change at the beginning of treatment has been found to predict the amount of weight gained during the first eight weeks of hospital admission (Rieger et al., 2000). While these studies appear to illustrate the positive effects of increased motivation levels on treatment recovery, additional research is needed to evaluate the process of change and if motivation changes other psychological variables.

***Cognitive Distortions.*** Dysfunctional cognitions and attitudes regarding weight, appearance, food and eating behavior appear to underlie, perpetuate and maintain the psychopathology of eating disorders and eating disordered behavior (Mizes & Christiano, 1995). Individuals with eating disorder symptoms use

simplistic internalized social representations, suggesting they view themselves and others in a rigid and inflexible manner that is resistant to change (Heesacker & Neimeyer, 1990). Vitousek and Hollon (1990) propose that eating disordered individuals have distorted schemata with regard to three areas: self-concept, meaning of weight on personal characteristics, and interaction between weight and critical self-perception. The authors propose that these individuals primarily evaluate themselves using inaccurate beliefs drawn from these schemas and that conclusions based on these negative cognitive representations enable and maintain eating disorder behavior.

Cognitive distortions and irrational beliefs regarding body image have been found to be a risk factor for adolescents. Dobmeyer and Stein (2003) evaluated 80 female undergraduates over a 4 year duration to assess whether drive for thinness, depressed mood, maladaptive cognition or ineffectiveness were related to severity of eating disorder symptoms. Maladaptive cognitions in this study specifically consisted of cognitions and beliefs concerning weight and eating issues. They found that initial increases in maladaptive cognitions and drive for thinness were correlated with more severe eating disorder symptoms 4 years later. In a group of anorectic adolescents, Castro and colleagues (2004) also found that abnormal eating attitudes, low rate of weight gain, and age upon admission were associated with rehospitalization.



A study by Steihaus (1985) evaluating 18 female adolescents who were hospitalized for anorexia, found that eating disordered beliefs, as measured by the EAT, significantly improved from time of admission to discharge. Additional studies also reveal improvement in abnormal eating attitudes over the course of inpatient treatment (Lowe, Davis, Annunziato, & Lucks, 2003). Presently, there are few studies that evaluate cognitive distortions, particularly with regard to how these distortions affect weight gain within an inpatient setting. Understanding how these cognitions affect weight gain and change over time could have a powerful impact on discerning treatment needs, weight restoration and maintenance, and psychological recovery.

### ***Psychiatric Comorbidity***

As stated previously, anorexia nervosa has the highest mortality rate of any psychiatry disorder (Garner & Garfinkel, 1997) with rates reported to be approximately 10% in anorectic individuals (Litt, 1995). Despite these disturbing statistics, research concerning in depth analysis of suicidal behaviors in the anorectic adolescent population is currently scarce (Manley & Leichner, 2003). In a national comorbidity survey replication, Hudson and colleagues (2007) found that 56.2% of anorectics and 94.5% with bulimia nervosa met criteria for at least one psychiatric disorder, with no one disorder showing higher comorbidity. The lifetime prevalence of MDD in AN patients has been estimated to be between

9.5% - 64.7%, an occurrence that is 4 times more likely to occur within this population. Additionally, high rates of substance abuse has been found within this population (Dansky, Brewerton, & Kilpatrick, 2000), an occurrence that is explained by some as a means of achieving the idealized thin physique (Measelle, Stice, & Hogansen, 2006).

### ***Medical Complications***

Serious medical complications are associated with anorexia nervosa and contribute to the high mortality rate of this disorder. Though resistance to change may initially inhibit individuals from seeking treatment, patients may be hospitalized due to potentially life threatening complications from such low body weight. Individuals with anorexia often present with cardiac complications, hypotension as a result of starvation and dehydration (McCallum et al., 2006), electrolyte abnormalities, osteopenia, hormonal changes that may impair development, long-term growth, and stature (McCallum et al., 2006), gastrointestinal complications (Nicholls & Stanhope, 2000), dental complications (Newton & Travess, 2000), and nutrition deficiencies (Katzman, 2005). Resolving these issues impact immediate and long-term health care, an important factor as little is known about the impact this disorder may have on long term health consequences.

## **Treatment Goals**

### ***Refeeding***

Because of the significant medical complications associated with low body weight, weight restoration is a primary goal in treatment of anorexia. However, weight must be gained in gradual increments to prevent further medical complications such as refeeding syndrome, a complication involving fluid and electrolyte shifts after acute nutritional support. Consequences of immediate weight gain in severely malnourished individuals include cardiac, hematological, and neurological complications that can lead to immune dysfunction, cardiac failure and death (Katzman, 2005). Research has shown that a gradual weight gain of .36 kg -.55 kg during the initial four days of treatment decreases chances for medical complications related to refeeding (Solanto, Jacobson, & Heller, 1994). To decrease medical risks and promote weight gain, continuous evaluation of increasing metabolic rates and caloric intake must be monitored throughout the weight restoration period (Marx & Herrin, 2005).

### ***Weight Restoration***

With increases in health care costs, hospitals are under increasing amounts of pressure to supply effective and efficient treatment, particularly with regard to weight restoration. Bremer and Herzog (1997) found that 75% of hospital treatment programs use ideal body weight as discharge criterion, with body

weight at discharge ranging from 85% to 100%. Additionally, Lock and Litt (2003) found that weight gain response, specifically in meeting 85% of ideal body weight, during initial hospitalization had important implications in predicting outcome and recovery. Though individuals may be medically stabilized after weight restoration, the psychological consequences of anorexia leave the individual vulnerable to relapse. Decreased duration of inpatient hospitalization and lower body weight upon discharge are associated with increased risks of rehospitalization (Wiseman, Sunday, Klapper, Harris, & Halmi, 2001). Additionally, low body weight upon admission and inadequate weight gain during initial hospitalization have also been associated with poor outcome (Pike, 1998; Zipfel et al., 2002). Unfortunately, weight loss after discharge is not an uncommon phenomenon, with rates of relapse approaching 30% in one study of anorectic adolescents (Strober et al., 1997). Eckert and colleagues (1995) note that after attaining ideal body weight, relapse is most common within the first year, with the greatest risk for relapse following discharge from the hospital (Strober et al., 1997).

### ***Rapidity of Weight Gain***

Despite the important implications weight may have upon outcome and recovery, there are currently few studies evaluating the course of weight gain during treatment (Vandereycken, 2003). The few studies within this area have evaluated the effects of psychiatric medication (Boachie, Goldfield, & Spettigue,

2003; Casper, Schlemmer, & Javaid, 1987; Corwin, Connelly, Paz, & Schwartz, 1995) and refeeding behavioral strategies (Touyz, Beumont, & Dunn, 1987; Vandereycken & Pieters, 1978) on weight gain rapidity in anorectic individuals. Rate of weight gain differences between types of anorexia, restricting versus purging, has also been examined with the finding that bulimic anorectics gain weight at a significantly faster rate compared to restricting anorectics during a 30 day inpatient hospital stay (Neuberger, Rao, Weltzin, & Greeno, 1995).

With regard to research evaluating rapidity of weight gain and positive outcome, existing research appears to be inconclusive. Willer and colleagues (2005) reviewed hospital charts to examine the differences in hospital treatment of AN from the 1970's to the 1990's. In the later cohort, they discovered that higher rates of weight gain were associated with increased rates of rehospitalization. However, after following 101 anorectic adolescents one year after discharge from treatment, Castro and colleagues (2004) found that slow rate of weight gain during initial treatment was predictive of later hospitalization. While these studies provide important information, they fail to evaluate how the psychological variables assessed in this study change with weight restoration.

Lock (1999) remarks that "further information is required regarding the emotional outcome of relatively rapid weight restoration." Fennig and colleagues (2002) posit that when physical recovery happens at a faster pace than psychological recovery in anorexia, an interim stage is created where individuals

are particularly vulnerable. While some researchers conclude that rapid weight restoration may have negative psychological effects on patients (Vandereycken, 2003) others posit that the individual's attitude toward treatment will determine whether rapidity of weight gain is a positive or poor outcome predictor (Castro et al., 2004). Given the contradictory results and paucity of research existing on the impact of psychological variables on rapidity of weight gain, additional research is imperative, particularly as hospital stays decrease in length and health care costs increase. This is particularly true with the adolescent population as they are in the fragile stage of developing psychological resources and learning to utilize their coping abilities.

### ***Recovery***

Though recovery is one of the most studied concepts within the eating disorder literature, there is currently no standardized way to define recovery. Studies evaluating recovery have used different criteria to determine outcome including percent body weight, body mass index, duration of weight maintenance psychological symptoms, reoccurrence of menses, or the combination of these factors. Steinhausen (2002) notes that weight recovery is used more often than psychological recovery when evaluating outcome.

Commonly used in studies of recovery, the Morgan Russell Criteria (1975) divides individuals into three outcome groups: good, intermediate and

poor. Good outcome is defined as weight within 85% of healthy weight range with reoccurrence of menses. Intermediate outcome is given when the individual does not have regular menses and weight cannot be maintained consistently at 85%, while poor outcome is rated when weight is below 85% with the absence of menses. Though this criterion has two main symptoms needed for a diagnosis of anorexia, it fails to include some of the psychological symptoms associated with the disorder and overlooks duration of weight maintenance. Strober and colleagues' (Strober et al., 1997) study evaluating recovery and relapse in adolescents divides recovery into two parts: partial or full. Partial recovery includes the "good" outcome of the Morgan Russell Criteria, but adds that a patient must maintain the criteria for at least 8 consecutive weeks, while full recovery includes the absence of psychological symptoms for at least 8 consecutive weeks.

Because recovery of anorexia nervosa is defined in various ways, studies on adolescent have varying results. In a review of literature, Pike (1998) states that the majority of studies report that 50 to 70% of individuals achieve intermediate outcome, while 15-25% are considered to have chronic problems. Couturier and Lock (2006) found that if recovery was defined by achieving 85% of body weight, then recovery would be 94%, whereas if recovery was defined by the combination of weight and EDE scores, then recovery rate would drop to 74%. They also state that increases in weight recovery occur before

psychological recovery and that psychological improvement may take an additional year.

Due to the entrenched psychological nature of this disorder, involving additional areas of functioning besides weight appears to more accurately assess the of the individual's recovery process. Eckert and colleagues (1995) suggest that relapse be defined criteria in various areas including one full year of weight maintenance without: weight loss below normal range, amenorrhea, body image distortions, and eating and weight control abnormalities. Though this criterion evaluates functioning in a variety of domains, researchers continue to note the multiple ways one could measure distortions and degree of eating abnormalities.

Current literature lacks sufficient information evaluating the psychological variables involved in rapidity of weight gain in anorectic adolescents in acute inpatient treatment. Presently, weight gain rates show contradictory findings with studies showing both rapid and slow weight gain leading to higher readmission rates. Multiple studies have implicated the role of perfectionism, self-efficacy, self-esteem, desire to change, emotion regulation and cognitive distortions in eating disorders, but additional research is needed to determine how these factors affect weight gain, and how they change over the course of treatment.



**CHAPTER THREE**  
**RATIONALE, AIMS, AND HYPOTHESES**

**Rationale and Aims**

The primary purpose of this study is to investigate the psychological variables involved in rapidity of weight gain. Identifying the impact of the patient's characteristics on weight gain and determining which of these variables change during hospitalization would be helpful in determining the patient's prognosis with regards to weight gain, evaluating psychological response to treatment, and informing treatment programs.

1. The first aim of this study is to determine whether certain patient characteristics obtained at admission can predict length of time for a patient to achieve a) 85% of their ideal body weight and b) length of stay through partial hospitalization.
2. The second aim will be to explore which psychological variables and behaviors related to eating disturbances change during the course of hospitalization.
3. The third aim is to determine the relationship between change in psychological variables and change in weight.

## Hypotheses

**Hypothesis One:** Patient's who have lower self-esteem, less self-efficacy, less readiness to change and more perfectionism, more difficulties with emotion regulation, and more cognitive distortions, as measured by the Rosenberg Self-Esteem Scale (RSES), General Self Efficacy Scale (GSES), and Anorexia Nervosa Stages of Change Questionnaire (ANSOCQ), Children and Adolescent Perfectionism Scale (CAPS), Difficulty in Emotion Regulation Scale (DERS), and Mizes Anorectic Cognitions-Revised (MAC-R), and will:

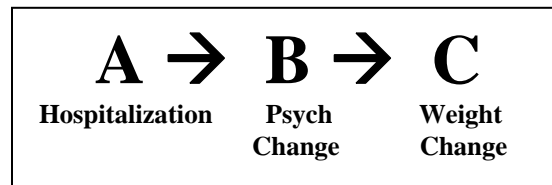
- a) take a longer time to achieve 85% of ideal body weight.
- b) have a longer overall hospital stay.

**Hypothesis Two:** Patients will show improvement in their self-esteem, self-efficacy, emotion regulation, perfectionism, cognitive distortions, and readiness to change, as measured by the RSES, GSES, DERS, CAPS, MAC-R, and ANSOCQ by time of discharge.

**Hypothesis Three:** Amount of weight gain will positively correlate with changes in self-esteem, self-efficacy, and readiness to change as measured by the RSES, GSES, and ANSOCQ, and negatively correlate with perfectionism, emotion regulation and cognitive distortions, as measured by the CAPS, DERS, and MAC-R.

Though this hypothesis evaluates the relationship between two outcome variables, it does not assess the process by which weight and psychological variables change. While evaluating the process of this change during the course of hospitalization is beyond the scope of this study, determining what facilitates change has important implications for treatment. Therefore, four models proposing the process of change are presented. Though all four models result in correlations between change in weight and psychological functioning, the processes by which this change occurs are quite different.

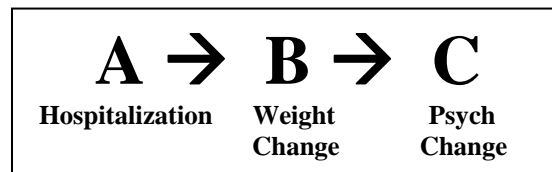
**Model 1:**



The first model assumes that hospitalization promotes psychological change, which then results in patient weight gain. Without the intervention of hospitalization, many individuals with eating disorders would likely continue to engage in eating disorder behaviors, such as food restriction, purging, or exercise even after hospital admission. However, psychological health begins to improve as the patient actively participates in therapeutic activities, gains insight into the mechanisms that drive the disorder, and utilizes cognitive strategies that challenge eating disorder thoughts and behaviors. This psychological change intrinsically

motivates the patient to change the eating disorder behaviors that prevented weight gain. As the patient begins to engage in “normalized” eating patterns, they then begin to gain weight.

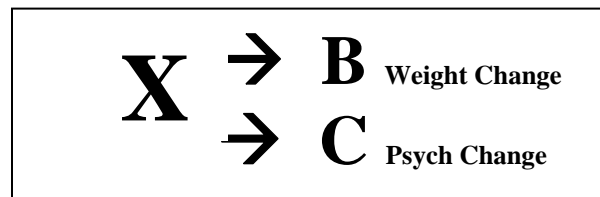
**Model 2:**



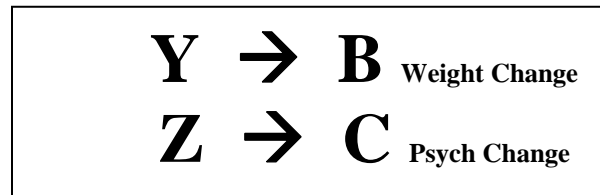
The second model posits that hospitalization causes weight gain, which then promotes psychological change. Since all subjects are required to engage in behavioral strategies that modify or prevent eating disordered behaviors, such as restricting, exercising, or purging, patients will consequently gain weight. Providing such structure at the beginning of treatment addresses and alters the behaviors of patients who have difficulty controlling their eating disorder behaviors. Staff can more easily support those that are visibly struggling with such limitations, whereas a patient’s engagement and investment in therapeutic activities may be more difficult to monitor. Given the ambivalence and resistance to treatment associated with this disorder, it is likely that patients will initially resist altering the thoughts and beliefs associating with their eating disorder. Instead, a patient’s psychological health will improve as they slowly accept and internalize the physical changes that result from weight gain. Also, severely underweight patients may be cognitively impaired as a result of their eating

disorder and may initially have difficulty engaging in therapeutic aspects of treatment. These patients are more likely to make behavioral changes that would lead to weight gain and then focus on psychological change as their cognitive functioning returns to baseline.

**Model 3:**



The third model suggests that weight gain and psychological change occur simultaneously, but are both dependent upon another variable. There are a multitude of causal variables that could influence the patient's outcome, ranging from an individual's personality to family functioning. It is assumed in this model that the severity of such a preexisting condition, whether psychopathology or family conflict, would impact the degree to which weight and psychological variables change over the course of treatment. However, change might also occur after the occurrence of a particular event, as in the previous two models, which began with hospitalization. As applied to this model, a single factor employed during hospitalization would foster concurrent improvement in psychological health and weight gain.

**Model 4:**

The fourth model proposes that change in psychological variables and in weight occur as a result of different causal factors. The behavioral techniques employed by the treatment program, such as restricting bathroom use after eating, restricting exercise, implementation of a specific meal plan, would prevent patients from engaging in behaviors that previously resulted in weight loss. Additionally, the therapeutic techniques and activities used within the treatment program would foster psychological change as patients learn to challenge and alter the thoughts and feelings associated with their eating disorder. Though different factors drive this change, psychological change and weight gain would occur simultaneously within treatment.

While these models are certainly not exhaustive, they may provide some guidance for researchers evaluating the process of change during acute treatment. It would be interesting to assess whether other factors that contribute to the etiology and maintenance of eating disorders also influence weight and psychological change. This would suggest that researchers evaluate additional variables that were not examined within the current study, such as family functioning, interpersonal relationships and personality characteristics. Given the

importance of these variables, this information might provide valuable insights into how these factors influence each other and change over the course of hospitalization.

## CHAPTER FOUR

### METHODOLOGY

#### *Participants*

Participants for this study were part of the University of Texas Southwestern Medical Center at Dallas' IRB approved study entitled "Psychological Variables Involved in the Rapidity of Weight Gain in Children and Adolescents with Eating Disorders." The proposed study consisted of 53 participants who are admitted to the inpatient or partial hospitalization program for treatment of Anorexia Nervosa, Bulimia Nervosa, or Eating Disorder Not Otherwise Specified at Children's Medical Center of Dallas and weighed less than 93 percent of their ideal body weight upon admission.

#### Inclusion Criteria

1. Participants must have been between the ages of 12 and 18 years of age at time of admission.
2. Participants must have been living with at least one parent or legal guardian who could provide consent.
3. Participants must have had good functional English and had one parent or guardian who also had adequate language skills because of the importance of obtaining informed consent and the absence of readily available translation.



4. Patients must have had a primary DSM-IV diagnosis of Anorexia Nervosa, Bulimia Nervosa, or Eating Disorder Not Otherwise Specified.
5. Patients must have weighed less than 93 percent of their ideal body weight at time of admission.

#### Exclusion Criteria

1. Patients who had a diagnosis of psychotic disorder or Conversion Disorder were excluded from this study.
2. Patients were excluded from the study if they had borderline intellectual functioning (IQ of below 80 based on report of primary caregiver, observations, or formal intellectual testing).

#### *Design and Procedure*

Patients were recruited from the Center for Pediatric Eating Disorder at Children's Medical Center following admission to the inpatient or partial hospitalization program for an eating disorder. Participants for this study were recruited from February 2007 until July 2008, with the expectation that at least 50 patients and their parents would consent to participate in the study. During the first 72 hours of admission, the treatment team informed potentially eligible patients about the research project to obtain permission for a researcher to discuss the study with them. If the family expressed a willingness to be further informed about the study, the treatment team provided the research coordinator with the

patient's name and she scheduled a time to inform the patient and parent/guardian about the study.

While obtaining consent, the purpose, procedures, possible risks and benefits, and alternatives to the study were explained and the research coordinator answered any questions. Participants were informed that they were allowed to withdraw from the study at any time. The participant and their guardian signed an informed consent form (Appendix A) as well as a HIPAA Authorization form (Appendix B). The original consents were maintained in the subjects' research binder at UT Southwestern, a signed copy was provided to the primary caregiver/guardian and a copy was placed in the medical chart. The following demographic variables were also obtained from the medical record: age, gender, date of birth, ethnicity, date of admission, height, weight and prior psychiatric hospital admissions.

Patients were then asked to complete the Rosenberg Self-Esteem Scale (RSES), the Difficulties in Emotion Regulation Scale (DERS), the Anorexia Nervosa Stages of Change Questionnaire (ANSOCQ), the Generalized Self-Efficacy Scale (GSES), and the Child and Adolescent Perfectionism Scale (CAPS) within 72 hours of admission to the unit. The Mizes Anorectic Questionnaire – Revised (MAC-R) was already given at time of admission and discharge as part of standard clinical care and was included as part of the patient's data in this study. Patients were asked to complete these self-report

questionnaires again when they reached 85 percent of their ideal body weight and at time of discharge. At time of discharge, the patient's weight was obtained from the patient's medical record. Subsequently, all data and identifying information was stored in a locked file within a locked room at the University of Texas Southwestern Medical Center, Psychology Division.

### *Setting*

Though the psychiatric unit at Children's Medical Center is a medical psychiatric unit treating a variety of psychiatric disorders, the Center for Pediatric Eating Disorders within this unit has specific protocols for eating disorder patients and their families. The program includes five levels of care in order to meet the medical and psychological needs of each patient: outpatient, intensive outpatient, day treatment, partial hospitalization, and inpatient hospitalization. For purposes of this study, only individuals admitted in the inpatient or partial hospitalization programs were included. The general goals of the eating disorder program include gradual weight restoration and monitoring, nutrition education, and addressing abnormal eating attitudes and behaviors.

The program is based on a point and level system where patients are given three individualized goals, one of which includes a personalized meal plan. Caloric needs and goals are set by the multidisciplinary treatment team and based on the patient's caloric intake prior to admission, weight goals, and medical

status. Caloric intake generally increases per day by 100-150 ckal increments and meal plans are modified depending on the patient's needs. Patients' daily caloric requirements are divided into "blocks" which include 3 meals and 3 snacks each day.

Patients are weighed on a daily basis each morning and are allowed to see their weight in kilograms. The dietician makes recommendations to the multidisciplinary team regarding each patient's "healthy weight range" taking into consideration their age, height, and highest weight attained during the duration of their eating disorder, with the lower end of the healthy weight range attaining 93 percent of their ideal body weight. While patients work towards meeting their healthy weight range, they are not given a numeric goal weight because of the potential problems associated with eating disordered patients fixation on numbers.

Patients engage in numerous therapeutic activities throughout the week including: eating disorders groups, values clarification group, recreational therapy, music therapy, pet therapy, art therapy, multi-family group, and teen group. Treatment teams, consisting of a dietician, psychiatry fellow, nurse, milieu therapist and patient are conducted two to three times each week to evaluate the patient's progress and negotiate specific aspects of treatment. Family participation is imperative in the patient's treatment and includes family therapy, meal education, nutrition education, parent support groups, multi-family groups, and participation in treatment team meetings. Patients also participate in

individual psychotherapy twice each week with a clinical psychology intern or post-doctoral fellow. Cognitive behavioral strategies are used in therapy to address eating disordered cognitive distortions, maladaptive behaviors, negative feelings, schemas, and automatic thoughts.

### **Psychological Measures**

#### ***The Anorexia Nervosa Stages of Change Questionnaire (ANSOCQ)***

The Anorexia Nervosa Stages of Change Questionnaire (ANSOCQ) (Rieger et al., 2000) is a 20 item self-report questionnaire that assesses readiness to recover from Anorexia Nervosa. The ANSOCQ is based on Prochaska and DiClemente's (1982) stages of change model which posits six stages through which an individual must advance in order to modify behaviors: precontemplation, contemplation, preparation, action, maintenance, and termination. Items include questions regarding weight, body shape, appearance, eating behaviors, emotions and relationships. Statements are grouped by topic and include five descriptions of increasing severity of eating disorder symptoms. Individuals are asked to choose one or more statements that they feel best describe them based on their current behaviors and attitude.

The ANSOCQ yields three subscales that identify an individual's level of readiness for changing eating disorder behaviors and cognitions. The weight gain subscale assesses the readiness to achieve a weight within their healthy weight

range. The eating, shape and weight concerns subscale yields readiness to alter one's perspective that one's happiness and success is dependent upon shape and weight. The ego alien aspects subscale indicates readiness to change interpersonal difficulties with others. Internal consistency for the ANSOCQ yielded a Cronbach alpha of .90 with a 1-week test-retest reliability of .89 (Rieger et al., 2000; Serrano, Castro, Ametller, Martinez, & Toro, 2004).

Given the recent development of this measure, the ANSOCQ has only recently been used in research studies, though results are promising. The ANSOCQ significantly correlates with measures of decisional balance and self-efficacy, indicating that decreases in concern for eating disordered behavior are associated with increased readiness to change (Rieger, Touyz, & Beumont, 2002). Additionally, significant correlations were identified between the ANSOCQ and ratings of treatment engagement (McConaughy, DiClemente, Prochaska, & Velicer, 1989). With regards to established measures of change and eating disorder pathology, the ANSOCQ significantly correlates with most subscales of the EDI-2 and with the University of Rhode Island Change Assessment Scale (URICA), a generic scale that assesses four stages of readiness to change: -.64 for the precontemplation scale, .66 for the contemplation scale, .72 for the action scale, and .34 for the maintenance scale.

In adolescent populations, the ANSOCQ has provided important information regarding outcome and predictive value. A study by Castro-Fornieles

(2007) evaluated predictors of weight maintenance in 49 anorectic adolescents in an inpatient eating disorder unit. High motivation to change, as measured by the ANSOCQ, at discharge and high body mass index at admission were predictive of weight maintenance. Higher readiness to change scores upon admission have also been found to have shorter hospital stays compared to those with lower readiness to change scores (McHugh, 2007).

For the present study, the wording of several questions was slightly changed due to the program's treatment philosophy and structure. These questions specifically asked that the subject's healthy weight be filled in and that the subject respond accordingly. While in inpatient and partial hospitalization treatment, patients at Children's Medical Center are typically not given a numeric value for their "healthy weight" because of existing tendencies to focus on weight and become fixated with numbers. In collaboration with the authors of this measure, this was replaced to say "healthy weight range" and subjects are asked to write in what weight they were thinking of when answering these questions.

### ***The Mizes Anorectic Cognition Questionnaire – Revised (MAC-R)***

The Mizes Anorectic Cognition Questionnaire – Revised (MAC-R) (Mizes et al., 2000) is a revised version of the Mizes Anorectic Cognition Questionnaire (Mizes & Klesges, 1989) and is a self-report questionnaire that assesses the dysfunctional cognitions related to AN and bulimia nervosa. The MAC-R

consists of 24 items and evaluates three specific dimensions of eating disorder cognitions: self-control as the basis of self-esteem (e.g., “I am proud of myself when I control my urge to eat”), rigid weight regulation and fear of weight gain (e.g., “When I eat desserts, I get fat. Therefore, I must never eat desserts so I won’t be fat”), and weight and eating behavior as the basis of approval from others (e.g., “No one likes fat people; therefore, I must remain thin to be liked by others”). Respondents report their answers using a 5 point response format (1 = *strongly disagree*, 2 = *moderately disagree*, 3 = *neither agree nor disagree*, 4 = *moderately agree*, and 5 = *strongly agree*) with higher scores indicating higher levels of distorted thinking.

Mizes and colleagues (2000) found the MAC-R to have high internal consistency, with Cronbach’s alpha of .90 for the total score, .85 for the approval subscale, .84 for the self-control subscale, and .82 for the rigid weight regulation subscale. It was found to significantly correlate with the Eating Disorder Inventory at  $r = .69$  and the Restraint Scale-Revised at  $r = .62$ . The MAC-R is written at a sixth grade level and is appropriate for individuals in middle school through adulthood (Mizes et al., 2000).

The MAC has been used to assess core beliefs and specific cognitions (Gongora, Derksen, & van Der Staak, 2004; Mizes et al., 2000), anorexic risk (Thomsen, McCoy, Gustafson, & Williams, 2002) and body image disturbances (Mizes, Heffner, Madison, & Varnado-Sullivan, 2004) in eating disordered



individuals. Additionally, it has been found to be reflective of change in cognitive distortions in individuals undergoing cognitive behavioral therapy (Mizes et al., 2000). The MAC-R has been primarily used in undergraduate populations, though the measure is cognitively appropriate for adolescents.

### ***The Child and Adolescent Perfectionism Scale (CAPS)***

The Child and Adolescent Perfectionism Scale (CAPS) is a 22 item self-report questionnaire that assesses multidimensional perfectionism in children and is based on the adult version called the Multidimensional Perfectionism Scale (Hewitt & Flett, 1991; Hewitt, Mittelstaedt, & Wollert, 1989). The CAPS scale evaluates two dimensions of perfectionism: self-oriented perfectionism (e.g. “I feel that I have to do my best all the time”) and socially-prescribed perfectionism (e.g. “There are people in my life who expect me to be perfect”). Respondents report their feelings regarding perfectionism using a 5 item response format of 1 = *false - not at all true of me*, 2 = *mostly false*, 3 = *neither true nor false*, 4 = *mostly true*, and 5 = *very true of me*. The CAPS has adequate internal consistency and a one week test-retest reliability of 0.74 (Flett et al, 1997). The alpha coefficient for the self-oriented subscale was 0.85 and the socially-prescribed perfectionism subscale was assessed at 0.86 (Hewitt et al., 2002). Additionally, significant correlations have been found between the Eating Disorder Inventory Perfectionism Subscale (EDI-2) (Garner, 1991), a measure commonly found in

eating disorder research (Castro-Fornieles, Gual et al., 2007) . The CAPS requires a third grade reading level (Castro et al., 2004).

Few studies have evaluated dimensions of perfectionism in the adolescent population, especially within the eating disordered population. The CAPS has been used in adolescent populations to study the interaction between perfectionism and constructs such as suicidal ideation and emotional distress (Boergers, Spirito, & Donaldson, 1998; Hewitt, Newton, Flett, & Callander, 1997). The Spanish version of the CAPS, which was found to have similar psychometric properties, evaluated perfectionism in a group of 71 adolescent anorectic patients and found that anorexic patients scored higher on self-oriented perfection when compared to a control group (Castro et al., 2004). Consistent with the previous study, self-oriented perfectionism was again found to be significantly higher in eating disorder patients when compared to a control group and to a group of psychiatric patients with anxiety, depression or adaptive disorders (Castro-Fornieles, Gual et al., 2007).

### ***The Difficulties in Emotion Regulation Scale (DERS)***

The Difficulties in Emotion Regulation Scale (DERS)(Gratz & Roemer, 2004) is a self-report questionnaire that assesses aspects of emotion dysregulation. The DERS consists of 33 items and respondents are asked to answer how often the items apply to them using a 5 point response format (1 = *almost never*, 2 =

*sometimes*, 3 = *about half the time*, 4 = *most of the time*, and 5 = *almost always*), with 5 indicating greater levels of emotional dysregulation. The DERS yields six subscales: (a) nonacceptance of emotional responses, (b) difficulties engaging in goal directed behavior, (c) impulse control difficulties, (d) lack of emotion awareness, (e) limited access to emotion regulation strategies and (f) lack of emotional clarity. The DERS has demonstrated high internal consistency, with Cronbach alpha at .93, good test-retest reliability and adequate construct and predictive validity (Gratz & Roemer, 2004). Additionally, the DERS has adequate convergent validity with established measures of emotional expressivity, emotional avoidance and emotion dysregulation (Gratz & Roemer, 2004). This questionnaire was written for individuals aged 18-60, though the author states that the measure is appropriate for adolescents.

The DERS has been used in studies to investigate emotion regulation as a risk factor associated with individuals that engage in self-injurious behaviors and were maltreated as children (Gratz & Chapman, 2007) and to evaluate the efficacy of an emotion regulation group for self-harmers in women with borderline personality disorder (Gratz & Gunderson, 2006). This measure has also been used to determine associations with chronic worry and generalized anxiety disorder (Salters-Pedneault, Roemer, Tull, Rucker, & Mennin, 2006). Though multiple studies have evaluated positive and negative affect, alexithymia, and emotional functioning in eating disorder populations (Gilboa-Schechtman et

al., 2006; Overton, Selway, Strongman, & Houston, 2005; Zonneville-Bender et al., 2004), the measures used in these studies fail to capture the specific domains of emotional expressivity offered by the DERS subscales. While the DERS has been used to evaluate emotional regulation within a sample of binge eaters (Whiteside et al., 2007), no studies to date have used this measure to evaluate underweight eating disorder patients. Such detailed understanding into what aspects of emotional functioning are dysfunctional within this population has important implications in conceptualizing the individual's difficulties and in treatment programming.

### ***Generalized Self-Efficacy Scale (GSES)***

The Generalized Self-Efficacy Scale (GSES) (Jerusalem & Schwarzer, 1992) is a self-report questionnaire that assesses an individual's general sense of self-efficacy, as well as predicting ability to cope efficiently with daily stressors and adjustment after stressful events. The GSES consists of 10 items (e.g., "I am confident that I could deal efficiently with unexpected events") and participants are asked to choose an answer using a 5 point response format (1 = *not at all true*, 2 = *barely true*, 3 = *moderately true*, 4 = *exactly true*). With its adaptation to multiple languages, the GSES has been used in multiple international research studies yielding internal consistencies from 0.75 to 0.90. Schwarzer and colleagues also found it to have good internal consistency, good test-retest

reliability and good construct validity (Schwarzer, Babler, Kwiatek, & Schroder, 1997). Schwarzer concluded that the scale has valid convergent and discriminant validity and that it correlates positively with self esteem and negatively with depression and physical symptoms. The GSES is intended for individuals ages 12 and older.

The GSES has been translated into 28 different languages and has been used internationally by researchers to assess general self-efficacy. Researchers evaluating the construct of this measure have found a unidimensional factor structure underlying items of the measure (Scherbaum, Cohen-Charash, & Kern, 2006; Scholz, Dona, Sud, & Schwarzer, 2002). As a measure of general self-efficacy, the GSES has been used in adolescent populations to evaluate risk of depressive symptoms (Wiesner, Bittner, & Silbereisen, 2000) interaction between parenting styles, self-efficacy, and emotional intelligence (Wang & He, 2002), test anxiety (Yue, 1996), and the impact of a girls' program. Self-efficacy has become an important construct in multiple areas of psychology for its role in the initiation and maintenance of health behaviors (Schwarzer, Fuchs, Conner, & Norman, 1996).

### ***The Rosenberg Self-Esteem Scale (RSES)***

The Rosenberg Self-Esteem Scale (RSES) (Rosenberg, 1965) is a 10 item self-report questionnaire that assesses global self-esteem. The RSES is a

unidimensional measure that is commonly used in treatment outcome studies. Individuals report their feelings of self-worth using a 4 item response format (*strongly agree, agree, disagree, or strongly disagree*) with higher scores indicating higher levels of self-esteem. Internal consistency for the RSES has been reported to range from .77 to .88 (Blascovich, Tomaka, Robinson, Shaver, & Wrightsman, 1991; Rosenberg, 1986) with a test-retest reliability ranging from .82 to .88. Originally developed as a scale for assessing self-esteem in adolescents, the RSES is appropriate for use in adolescent and adult populations (Blascovich et al., 1991; Bowling, 1991).

The RSES has been used with anorectic adolescents in inpatient settings and has identified decreased levels of self-esteem (Halvorsen & Heyerdahl, 2006) and changes in self-esteem in adolescents participating in a day treatment program (Kong, 2005). The RSES has been used internationally to evaluate the role of self-esteem in eating disorders and disturbed eating habits (Bas, Asci, Karabudak, & Kiziltan, 2004; Erol, Yazici, Erol, & Kaptanoglu, 2000; Vinales-Mas, Fernandez-Aranda, Jimenez-Murcia, Turon-Gil, & Vallejo-Ruiloba, 2001). In addition, the RSES has been found to significantly correlate with measures assessing dieting disorder psychopathology such as abnormal eating attitudes, body shape concern, desire for thinness, and the Ineffectiveness subscale of the EDI-2 (Griffiths et al., 1999).

## CHAPTER FIVE

### RESULTS

#### Characteristics of the Sample

##### *Descriptive Statistics*

All results that reached the significant level of  $p < .05$  as well as those reaching trend level,  $p < .10$  but  $> .05$ , are reported. Due to the limited number of males enrolled in this study ( $n = 4$ ), only females were used when conducting the statistical analyses. The means and standard deviations for all psychological measures given at admission and discharge are displayed in Appendix D, Tables 1-6. Mean admission scores of the CAPS, GSES, and RSES were compared by one sample t-tests to the mean scores of a non-clinical population, while the ANSOCQ was compared to another eating disorder sample (Tables 7-10). When comparing the ANSOCQ to another eating disorder sample (Rieger & Touyz, 2006), it was discovered that the current sample had higher scores on the Weight Gain subscale, though there were no significant differences found between other subscales or the total score. As seen in Appendix D, Table 8, the current sample scored significantly higher than the normative sample (Castro-Fornieles, Gual et al., 2007) on the Self-Oriented subscale of the CAPS and on the overall perfectionism score. With regards to the GSES, the current sample was compared to two different non-clinical sample populations. No significant differences were

found when the current sample was compared to a sample of German adolescents (Schwarzer, 2008). However, when compared to a group of non-clinical sample of female adolescents (Steese et al., 2006), the current sample had significantly higher self-efficacy scores (Table 9). Comparisons between groups on the RSES revealed that the current sample had significantly lower self-esteem than a non-clinical sample (Steese et al., 2006) of adolescent females (Table 10).

### ***Demographic Information***

A total of 53 patients who were admitted into the Children's Medical Center Psychiatric Inpatient unit and met criteria for the study were approached to participate in the study. Of these potential study participants, one patient declined the study, three participants stated that they did not understand the questions that made up the psychological measures, and two patients were found to be within their healthy weight range after being consented. Nine participants ended treatment precipitously; two of these nine were discharged to another treatment facility, while seven patients discontinued treatment against the advice of the treatment team. These nine participants and the five participants who continue to be in treatment were not included in the statistical analysis evaluating change from admit to discharge. Thus, 44 participants were included in hypothesis testing. This information is summarized in Appendix E, Figure 2 and details the number of participants used in each hypothesis.



A summary of demographic variables (age at admission, intake and discharge ideal body weight, and length of treatment) is provided in Appendix D, Table 11. Additionally, eating disorder diagnosis, comorbid diagnosis, ethnicity, gender, parental education and insurance coverage are found in Tables 12 - 15, respectively. Due to the high frequency of mood and anxiety disorders as a secondary diagnosis in the sample (Table 14), it was decided not to control for comorbid diagnosis when conducting hypothesis testing.

### ***Study Completers Versus Non-Completers***

Seven participants, five of whom were females, discontinued treatment against the advice of the treatment team. Comparisons between non-completers and completers were assessed by chi square and one-way analysis of variance (ANOVA) to determine possible differences between these two groups. For this particular analysis, completers are defined as those individuals who were discharged from the hospital as a result of successfully completing treatment (n = 28) excluding the five participants who continue to be in active treatment at this time and the two participants who were transferred to another treatment facility. Non-completers are defined as those whose parents discharged them from the hospital against the recommendation of the treatment team (n = 5). As seen in Tables 16 and 17 study completers did not differ significantly from study non-completers by chi-squares on ethnicity or diagnosis. As expected, completers had

longer hospitalizations and higher body weights at discharge, though age and admission body weight percentage were not significantly different (Table 18). As seen in Table 19, no differences were observed between these two groups on psychological variables obtained at admission.

### *Assessment of the Data*

The assumptions for each statistical analysis were assessed by examining the distribution characteristics of all independent and dependent variables. Consequently, one participant was removed from the second hypothesis analysis as her duration of hospitalization was beyond three standard deviations from the overall sample mean (Appendix E, Figure 3). The sample distribution for length of days to 85 percent ideal body weight was found to be skewed in Hypothesis 1A, as was the discharge ANSOCQ distribution in Hypothesis 1B and suitable log transformations were completed. However, using these transformations did not change the results from the analyses and therefore, were not used. A bivariate correlation matrix of all admission psychological measures revealed significant correlations between many of the variables (Table 20). To assess for multicollinearity, tolerance values were computed on admission and discharge predictor variables. All obtained tolerance values were found to be greater than 0.10 and were therefore not anticipated to influence statistical analyses.

**Hypothesis 1A: Predicting Time to Reach 85 Percent Ideal Body Weight**

*Patients who have lower self-esteem, less self-efficacy, less readiness to change and increased perfectionism, difficulties with emotion regulation and more cognitive distortions, as measured by the Rosenberg Self-Esteem Scale (RSES), General Self Efficacy Scale (GSES), and Anorexia Nervosa Stages of Change Questionnaire (ANSOCQ), Child and Adolescent Perfectionism Scale (CAPS), Difficulty in Emotion Regulation Scale (DERS), and Mizes Anorectic Cognitions – Revised (MAC-R), will take a longer time to achieve 85 percent of ideal body weight.*

A bivariate Cox regression survival analysis was run with all predictors as independent variables and time to achieve 85 percent of ideal body weight as the dependent variable. Percent of ideal body weight at time of admission served as a covariate. As shown in Table 21, self-efficacy ( $\chi^2 = 6.03$ ,  $df = 1$ ,  $p = .01$ ), emotion regulation ( $\chi^2 = 4.06$ ,  $df = 1$ ,  $p = .04$ ), and self-esteem ( $\chi^2 = 5.79$ ,  $df = 1$ ,  $p = .02$ ) scores at admission were found to significantly predict length of time to 85 percent ideal body weight. Specifically, those with lower self-efficacy and self-esteem and greater difficulties with emotion regulation took longer to reach 85 percent of ideal body weight. These three variables were then entered into a multivariate Cox regression analysis with percent of ideal body weight at admission entered as a covariate (Table 22). When entered into the analysis simultaneously, no variables were found to significantly predict time to reach 85

percent ideal body weight ( $p = .07$ ). In a forward conditional stepwise Cox regression, only the GSES was selected as a significant predictor.

**Hypothesis 1B: Predicting Duration of Hospitalization**

*Patients who have lower self-esteem, less self-efficacy, less readiness to change and more perfectionism, more difficulties with emotion regulation and more cognitive distortions, as measured by the RSES, GSES, ANSOCQ, CAPS, DERS and MAC-R, will have a longer overall hospital stay.*

First, Cox proportional hazards regression analyses were performed separately for each psychological measure with length of hospitalization as the outcome variable. Percent of ideal body weight at admission was entered as a covariate. Results are displayed in Table 23. Readiness to change scores ( $\chi^2 = 9.94$ ,  $df = 1$ ,  $p = .002$ ) scores at admission significantly predicted time to discharge while self-esteem scores fell just short of significance ( $\chi^2 = 3.60$ ,  $df = 1$ ,  $p = .06$ ). This indicates that individuals with higher readiness to change scores at admission will have a shorter hospital stay. At the trend level, results suggest that higher self-esteem scores at admission predict shorter duration of hospitalization.

Admission scores from the ANSOCQ and RSES were then entered in a multiple Cox regression analysis to find the variance associated with the combination of these two measures. Again, percent of ideal body weight at admission was entered as a covariate. When these psychological measures were

simultaneously entered as independent variables, only baseline readiness for change scores were found to significantly predict duration of hospitalization ( $\chi^2 = 11.22, df = 2, p = .004$ ). Even more than admission ideal body weight percent, readiness to change was found to significantly predict treatment length as demonstrated by non-overlapping confidence intervals (Table 24).

**Hypothesis Two: Psychological Change During Treatment**

*Patients will show improvement in their self-esteem, self-efficacy, perfectionism, cognitive distortions, emotion regulation, and readiness to change as measured by the RSES, GSES, CAPS, MAC-R, DERS, and ANSOCQ by time of discharge.*

A repeated measures multivariate analysis of variance (MANOVA) was run to examine change in self-esteem, self-efficacy, emotion regulation, perfectionism, cognitive distortions, and readiness to change from time of admission to discharge. Admission and discharge means and standard deviations are reported in Table 25. As shown in Table 26, the psychological variables were found to differ significantly at the multivariate level. Univariate results showed that over the course of hospitalization there were significant decreases in perfectionism and cognitive distortions, and significant increases in readiness to change.

**Hypothesis Three: Weight Gain and Psychological Change**

*Amount of weight gain will positively correlate with changes in self-esteem, self-efficacy, and desire to change as measured by the RSES, GSES and ANSOCQ, and negatively correlate with perfectionism, emotion regulation, and cognitive distortions, as measured by the CAPS, DERS, and MAC-R.*

The relationship between change in body weight and change in psychological variables was assessed by correlating residual values. Residuals were obtained for each variable and for weight after regressing the discharge value on the admission value. Results revealed that there was no correlation between change in body weight and change in psychological variables (Table 27), though there was a small effect size found for emotion regulation. This finding suggests that there is no relationship between the amount of weight gained and the amount of psychological improvement during treatment. Despite the lack of findings, the small effect size on the DERS indicates that a relationship might be found between change in body weight and change in emotion regulation if the sample size were larger.

**Exploratory Analyses**

In addition to the proposed hypotheses, exploratory analyses were conducted to further evaluate the data gathered from the study. The following analyses assess the relationship between admission percent ideal body weight and

psychological variables, the presence of additional predictors and improvement in psychological variables from time of admission to reaching 85 percent ideal body weight.

### ***Effect of Admission IBW on Admission Psychological Variables***

When assessing which psychological variables predicted time to reach 85 percent ideal body weight, percent admission body weight was used as a control as those with higher weights were expected to reach 85 percent at a faster rate. However, the question then surfaced as to whether those closer to 85 percent of their ideal body weight had better scores on admission psychological variables as compared to those who were admitted with lower percent ideal body weight. Individuals admitted closer to their ideal body weight might not be as entrenched in their eating disorder, thus reflecting healthier scores on admission measures. Should these psychological differences exist, it would be expected that they would influence the dependent variable, number of days to reach 85 percent of ideal body weight. To assess possible differences, the median ideal body weight was determined through descriptive statistics (median = 78.8) and participants were divided into two groups based on admit weight. A between-subjects one-way analysis of variance was conducted to determine whether these two groups differed on admit psychological variables. Results revealed that there were no significant differences between these two groups (Table 28), thus indicating no

relationship between admission ideal body weight and scores on psychological measures at admission.

In addition to evaluating this information through a categorical analysis, a continuous analysis was also performed. A bivariate correlation was conducted to evaluate the relationship between all admission psychological variables and percent ideal body weight at admission. Results revealed that there were no significant correlations between these two variables, though a small effect size was found for self-efficacy and readiness to change (Table 29). This small effect suggests that a relationship between higher body weight and higher readiness to change and self-efficacy scores might be found if the sample were larger.

### ***Psychological Improvement from Admission to 85 Percent IBW***

Further exploratory analyses were conducted to determine whether psychological variables improved from admission to reaching 85 percent ideal body weight. A repeated measures MANOVA was conducted to examine change scores in self-esteem, self-efficacy, emotion regulation, perfectionism, cognitive distortions, and readiness to change. Admission and 85 percent IBW time point means and standard deviations are reported in Table 30. As shown in Table 31, the psychological variables fell short of significance at the multivariate level. Though the multivariate analysis was short of significance, the univariate results were assessed to evaluate whether there were findings at the trend level.



Evaluation of these results showed that only readiness to change significantly improved from admission to 85 percent ideal body weight.

### ***Predictive Value of the Subscales of Psychological Measures***

Stepwise linear regression was conducted independently on measures that contained subscales: DERS, ANSOCQ, CAPS, and MAC-R. Time to achieve 85 percent ideal body weight again served as the dependent variable and percent of ideal body weight at admission was entered as a covariate. As shown in Table 32, results revealed that only the Lack of Emotional Clarity subscale of the DERS was found to predict time to reach 85 percent IBW, indicating that those with more emotional difficulties take longer to reach 85 percent IBW.

To evaluate the predictive value of subscales on treatment length, a stepwise linear regression was again performed separately on each measure's subscales. Duration of hospitalization served as the dependent variable and percent of ideal body weight at admission was again entered as a covariate. The Ego Alien Aspects subscale of the ANSOCQ (Table 33) and the Lack of Emotional Awareness subscale of the DERS (Table 34) were found to significantly predict duration of treatment, indicating that those with lower scores on each subscale had longer lengths of stay.

## **CHAPTER SIX**

### **DISCUSSION**

#### **Overview of the Study**

The present study was designed to evaluate the predictive value of certain psychological factors and to determine how these factors change over the course of acute treatment within a sample of underweight adolescents hospitalized for an eating disorder. While some investigators have researched the predictive value of weight gain rapidity on rehospitalization, few studies have evaluated the impact of psychological variables in weight gain rapidity. This information would help in identifying psychological severity of eating disorder, potential weight gain prognosis in treatment, and determining specific treatment goals. The first aim of this study was to examine the prediction offered by psychological variables obtained at baseline to rapidity of weight gain response to 85 percent ideal body weight and duration of hospitalization. The second aim of this study was to explore which psychological variables related to eating disturbances change during the course of hospitalization. The last aim of this study was to evaluate the relationship between change in psychological variables and weight as determined by change from admission to discharge.

***Length of Time to 85 Percent Ideal Body Weight (Hypothesis 1A)***

The first hypothesis posited that patients who have lower self-esteem, less self-efficacy, less readiness to change, more perfectionism, more difficulties with emotion regulation, and more cognitive distortions will take longer to reach 85 percent of their ideal body weight. Of these psychological variables, self-efficacy, emotion regulation and self-esteem scores at admission significantly predicted time to reach 85 percent ideal body weight. Specifically, individuals who have lower self-esteem and self-efficacy and greater difficulties with emotion regulation take longer to reach 85 percent of ideal body weight.

Significant findings from the GSES are consistent with Bandura's (1996) theory of self-efficacy, implying that individuals with more self-efficacy are able to "execute the course of action required to manage prospective situations." These patients appear to have greater confidence in their abilities to effectively utilize strategies that will meet desired goals. Consequently, these patients are more likely to consume the recommended amount of calories and stop engaging in behaviors that lead to weight loss. However, due to the general nature of this particular measure, it is unclear whether patients are gaining weight as a means to a faster discharge or if they are gaining weight with the intention of maintaining these behaviors.

Another study evaluating eating disorder recovery self-efficacy was found to predict rate of weight gain for patients in partial hospitalization (Pinto,

Heinberg, Coughlin, Fava, & Guarda, 2008). However, the authors did not evaluate inpatient weight gain, citing that the behavioral techniques employed in the inpatient program created similar weight gain rates among patients. In contrast, results from the current study, which also included a program that used standard behavioral techniques to ensure adequate calorie consumption, suggests the presence of sufficient variability in weight gain rates in this specific sample. Though the GSES does not measure self-efficacy specific to eating disorder recovery, both instruments presumably capture the general domain of self-efficacy, and have shown predictive value with regards to rate of weight gain.

Results confirmed the hypothesis of an inverse relationship between admission emotion regulation scores and time to reach 85 percent body weight. It was anticipated that those who struggle with awareness, identification and modulation of negative emotions would have an increased tendency to displace their emotions on eating disordered behaviors. This implies that individuals with eating disorders have difficulty identifying or coping with distressing emotions and utilize eating disordered behaviors as a way to alleviate these feelings. These individuals may be particularly resistant within recovery as the treatment process requires them to confront uncomfortable emotions and use alternative, non-eating disordered coping techniques. Additionally, individuals with emotion regulation difficulties are likely hesitant to engage in behaviors that lead to weight gain as this will most likely produce more negative feelings.

Consistent with the proposed hypothesis, global self-esteem was predictive of weight gain response and suggests that an individual's feelings of self-worth influence the behaviors that lead to weight gain. Individuals that endorse higher levels of self-esteem upon admission may derive these feelings from aspects unrelated to their eating disorder. These patients may have internalized positive schema from adaptive interpersonal relationships or accomplishments as opposed to basing their self-value on weight and physical appearance. Thus, individuals with lower self-esteem are more apt struggle with engaging in a treatment process that they perceive as decreasing the source of their self-esteem. These individuals may view treatment as an annihilation of their accomplishments, particularly with regards to weight loss, and personal fulfillment as they terminate the eating disorder behaviors.

Readiness to change and self-efficacy are highly related constructs that have been found to predict future behaviors (Rieger et al., 2002). Though researchers cite self-efficacy in the initiation and maintenance of health behaviors, it is interesting to note that a similar construct, readiness to change, lacked predictive value within this study. This discrepancy may best be explained by the fact that readiness to change is evaluated by a measure that is specific to eating disorder recovery. While the ANSOCQ includes aspects of self-efficacy, it also contains questions regarding eating disorder behaviors and readiness to achieve a healthy weight. Patients may express feeling that they have the internal

means to effectively meet a goal, but remain hesitant to execute change associated with terminating their eating disorder.

This finding is not consistent with a previous study that found readiness to change predicted weight gain within the first four weeks of admission (Rieger et al., 2000). However, results from the current study are consistent with research by McHugh (2007), who found that level of readiness to change at admission did not predict ability to attain 85 percent ideal body weight by time of discharge. Differences between these results might best be explained by variability in length of time between admission and outcome measures. To ascertain the influence of time and additional variables that might have impacted these scores, additional studies are warranted.

Patients with more cognitive distortions at admission were hypothesized to take longer to achieve 85 percent of their health weight as these distortions were thought to stymie caloric intake. Surprisingly, results from this study suggest that the intensity of cognitive distortions have little impact on rate of weight gain. While distortions may not have prevented patients from eating meals and snacks, these distortions may have negatively impacted individuals in alternative ways: increased body image distortions, feelings of guilt directly after eating meals, etc. Thus, cognitive distortions might not directly affect weight gain, but might influence improvement of additional psychological variables over the course of hospitalization. Additionally, this finding might be explained by the treatment

program's emphasis on challenging cognitive distortions through cognitive-behavioral interventions. Confronting these distortions may lessen their effect on weight gain, though they may indirectly affect other psychological factors as previously noted.

At the trend level, higher perfectionism scores were found to negatively impact weight gain response to 85 percent ideal body weight. Individuals with higher perfectionism scores at admission were thought to gain weight at a slower pace as these individuals are believed to have stringent standards and rules surrounding weight and body image. In the individual's outside environment, perfectionistic tendencies may provide a sense of control as they respond to the rules associated with their eating disorder. Engaging in behaviors that lead to weight gain would violate these personal rules and diminish their sense of control. As such, those with less perfectionistic tendencies are thought to place less emphasis on eating disorder rules and therefore, have less difficulty consuming calories.

Overall, these findings suggest that a patient's self-esteem, self-efficacy, and emotion regulation upon admission to treatment have important implications for rapidity of weight gain response, specifically in attaining 85 percent ideal body weight. Additionally, perfectionism may also have predictive value in determining weight gain rapidity. Globally, this implies that individuals who value and believe in themselves and their abilities are more likely to effectively

handle stressful events and engage in behaviors that produce positive results. While all patients in the treatment program were familiar with the behaviors needed to gain weight, only those who exhibited this positive sense of self were able to perform these behaviors in an efficient manner. These individuals appear to have greater confidence in their ability to confront cognitive distortions, challenge eating disorder standards, and handle the difficulties that arise from consuming calories and gaining weight. This suggests that these individuals have the coping means with which to effectively deal with unforeseen difficulties, whereas other patients may lack these skills. This finding may inform treatment in that teaching individuals the coping skills needed to handle the difficulties associated with weight gain as well as helping patients recognize their ability to better utilize their skills would allow patients to utilize these psychological resources.

### ***Duration of Hospitalization (Hypothesis 1B)***

The second part of the first hypothesis states that patients who have lower self-esteem, less self-efficacy, less readiness to change, more perfectionism, more difficulties with emotion regulation, and more cognitive distortions will have a longer overall hospital duration. Results from this study found that higher readiness to change scores at admission significantly predicted shorter lengths of



stay. At the trend level, higher self-esteem at admission suggested shorter duration of hospitalization.

Given the ego-syntonic nature of eating disorders and ambivalence towards recovery, it is not surprising that higher readiness to change scores at admission predicted shorter duration of hospitalization. This is also consistent with previous findings which identified readiness to change as a predictor of treatment length (McHugh, 2007). The ANSOCQ evaluates a variety of recovery dimensions including: weight gain readiness, readiness to alter perceptions that happiness and fulfillment are weight and shape dependent, and readiness to change interpersonal difficulties. This suggests that individuals who have contemplated “letting go” of their eating disorder are more likely to terminate the behaviors and ideals of an eating disorder and more actively engage in the recovery process. Readiness to change was even found to predict duration of hospitalization above and beyond admission body weight, a variable that has historically been associated with poor treatment outcome (Pike, 1998). These results suggest that in addition to admission body weight, readiness to change may reflect a more accurate degree of eating disorder entrenchment and prognosis.

At the trend level, this study found that higher self-esteem scores at baseline predicted shorter duration of hospitalization. Though this study did not specifically evaluate what contributes to an individual’s self-esteem, this construct

is formed by experiences that promote a sense of accomplishment and self-fulfillment. When these experiences produce negative emotions of which the individual feels they cannot control or change, they then resort to controlling physical factors. Consequently, individuals who base their sense of self-worth on their body image are more likely to derive feelings of accomplishment from engaging in behaviors that alter weight and physical appearance. Alternatively, individuals with higher self-esteem may derive emotional fulfillment from non-physical factors, thus placing less importance on body image and idealization of this physique. Subsequently, these individuals are thought to more easily change or stop the eating disorder behaviors that prevented them from gaining weight and more actively engage in the treatment process. Future studies should evaluate whether self-esteem is derived from the eating disorder itself or from other factors in order to grasp a better understanding of how this construct relates to weight gain rapidity.

Discharge from eating disorder treatment reflects more than the patient's ability to attain a healthy body weight. As opposed to reaching a particular body weight, the outcome variable of discharge is determined by a variety of factors, including: decrease in eating disorder behaviors, normalized eating, parental education and support, and improvement in mood symptoms. The psychological variables used to predict duration of hospitalization may impact these external factors and, subsequently, length of hospitalization. Alternatively, duration of

hospitalization may be impacted by factors outside of the patient's control, irrelevant of the patient's psychological variables. Since many of these variables were not assessed within this study, it is difficult to determine their impact upon the outcome variable. Consequently, certain psychological variables may not have emerged as significant predictors of duration of hospitalization variables.

Whereas general self-efficacy was found to predict time to reach 85 percent ideal body weight, a person's self-efficacy may be irrelevant when confronted with external dilemmas beyond the patient's control. While a person's perceived ability to initiate behaviors impacts weight gain rapidity, this might have little impact upon other discharge criterion such as alleviation of mood symptoms or family conflict. Additionally, this construct might only emerge when the patient has clear and quantifiable treatment goals as opposed to ambiguous tasks such as improving family relationships.

Consistent with previous research conducted at Children's Medical Center, eating disorder cognitions scores at admission did not predict duration of hospitalization. While lower scores were expected to reflect degree of entrenchment and subsequent influence on behaviors and hospital stay, scores were independent of weight gain response. Additionally, admission perfectionism and emotion regulation scores were not found to significantly predict duration of hospitalization. Considering results of previous studies that have clearly denoted higher levels of cognitive distortions, perfectionism and emotion difficulties

within the eating disorder population, it is possible that these variables are predictive of long-term outcome as opposed to acute treatment. As previously mentioned, it is also possible that length of hospital stay was lengthened by external factors that interfere when assessing these psychological variables as predictor variables.

Findings for this hypothesis reveal that readiness to change predicts duration of hospitalization while self-esteem, at the trend level, also has predictive value for length of hospital stay. These results suggest that individuals endorsing more self-worth and those who are ready to change their eating disordered behaviors will have shorter lengths of stay. While research has shown low self-esteem recovery within the eating disorder population (Halvorsen & Heyerdahl, 2006), improving this variable is typically a long-term goal given its ingrained nature. These results suggest that clinicians assess the patient's level of motivation upon admission so that they can utilize techniques appropriate for the patient's readiness level. Whereas one patient may benefit from exploring the advantages of disadvantages of their eating disorder, another individual may need help in identifying the obstacles that prevent them from actively engaging in change. Understanding the progression of stages and acknowledging the patient's level of readiness has important implications for treatment, particularly within a population that is typically ambivalent about recovery.

### ***Improvement in Psychological Variables (Hypothesis 2)***

The second hypothesis stated that patients will show improvement in self-esteem, self-efficacy, emotion regulation, perfectionism, cognitive distortions, and readiness to change by time of discharge. Determining which variables are amenable or resistant to acute treatment has important implications for clinicians who must effectively and efficiently treat these individuals. Additionally, variables resistant to change in acute treatment may impact the course of recovery and possible relapse. Results revealed that perfectionism, readiness to change, and cognitive distortions were found to significantly change over the course of hospitalization.

Of the three “maintaining mechanisms” evaluated from Fairburn’s Transtheoretical Model, only one, perfectionism, was found to significantly improve over the course of treatment. Previous research has found higher levels of perfectionism within eating disorder populations as compared to normative samples, suggesting higher scores upon hospital admission. It is believed that individuals with eating disorders adhere to strict standards associated with ideal weight and shape as a way to manage negative self-appraisal and evaluation fears. As the factors driving perfectionism, and the standards themselves, are challenged within the treatment process, individuals may decrease these rigid rules and principles. Consequently, they are more apt to accept realistic ideas of body image, eating, and weight. Consistent with other studies (Bastiani et al., 1995;

Castro-Fornieles, Gual et al., 2007), patients had higher self-oriented perfectionism as opposed to socially-prescribed perfectionism at admission, suggesting that strict standards are imposed by the individual's own self-critical nature. This suggests that treatment should focus on understanding the purpose behind these self-imposed standards and helping the patient recognize how such standards are maladaptive.

Lack of improvement in both self-esteem and general self-efficacy may be because these characteristics are "traits." As such, these variables are well ingrained within the individual's personality and are considered to be particularly resistant to change. In addition, this study used measures that captured these constructs as general domains, not as they related specifically to eating disorders. This most likely explains why no improvement was found in general self-efficacy whereas self-efficacy associated with eating disorder recovery was found to significantly change over the course of hospitalization in a different study (Pinto et al., 2008). Therefore, it would be expected that such well-established variables would change well after acute treatment, an event that was not measured in this study.

Given the treatment program's emphasis on identification and expression of emotion, it is surprising that emotion regulation did not significantly improve as result of treatment. Patients who previously displaced their emotions on eating behaviors or who avoided emotions altogether are challenged to actively process

their feelings in a variety of ways. However, given this population's difficulties with emotion identification and modulation, this construct may not change within the short time period of acute treatment. Additionally, it is possible that lack of emotional awareness during the early treatment phase may have caused patients to underreport difficulties upon admission, thus leaving little room for improvement. Unfortunately, it is not possible to compare the scores of this sample with another eating disorder group at this time since this measure has not been used in underweight adolescents with eating disorders.

As hypothesized, readiness to change scores improved significantly over the course of hospitalization, a finding that is consistent with a study by Castro-Fornieles and colleagues (2007). Surprisingly, results revealed that patients were already in the Preparation stage upon admission. This suggests that when patients entered treatment, they had already contemplated changing their eating disorder behaviors, but had not yet acted on these thoughts. As expected, patients were discharged while in the Action stage, meaning that they were actively changing and engaging in new, non-eating disordered behaviors. Due to the ego-syntonic nature of this disorder and the fact that patients were signed into treatment by their parents, most patients were assumed to be within the Precontemplation or Contemplation stage upon admission. Though patients were assured that their answers would remain confidential and would in no way affect treatment, it is possible that high admission scores were a result of demand characteristics.

Results showing significant improvement in eating disorder cognitions on the MAC-R, contrasts with the results of an earlier study conducted by Hetrick (2006) at Children's Medical Center. This difference may be explained by the fact that the earlier study included patients who were admitted above 93 percent of their ideal body weight. These individuals may have reported less cognitive distortions when compared to underweight patients, thus affecting the overall mean of the sample upon admission. It was assumed that patients, particularly patients who were admitted below their healthy weight, would improve eating disorder cognitions as a result of the treatment program. Since these distortions often manifest behaviorally as they cause the patient to engage in eating disorder actions, they are directly confronted from the beginning of treatment. Improvement is likely a result of the incorporation of cognitive behavioral techniques to help patients challenge and cope with cognitive distortions.

These results suggest that psychological variables related specifically to eating disorder are more amenable to change when compared to variables that are well ingrained within an individual's personality structure. Though perfectionism is often considered an entrenched characteristic as well, it is possible that components of this construct are associated primarily with eating disorder behaviors within this population. As a result, the strict standards and rules associated with eating and weight management decrease as a result of treatment. This reveals that patients need long-term treatment to continue addressing the



psychological variables that are resistant to change within acute treatment.

Determining how and when this change occurs as well as how this change impacts other areas has important implications regarding outcome and relapse.

### ***Relationship Between Change in Weight and Psychological Variables***

The third hypothesis posits that change in weight gain will positively correlate with changes in self-esteem, self-efficacy, emotion regulation, and desire to change as measured by the RSES, GSES, DERS, and ANSOCQ and negatively correlate with perfectionism and cognitive distortions, as measured by the CAPS and MAC-R. While weight gain and certain psychological measures were found to significantly change over the course of treatment, these change scores were not correlated (Table 27). This finding reveals that the amount of psychological improvement an individual experiences do not necessarily correspond to the amount of weight the person will gain during the course of hospitalization.

It is important to note that evaluating change scores as outcome variables decreases reliability due to compounded error variance. In fact, Cronbach stated, “It appears that investigators who ask questions regarding gain scores would ordinarily be better advised to frame their questions in other ways (Cronbach & Furby, 1970).” Three ways of evaluating change are typically used within research studies: raw change scores, percent change scores, and residual gain scores. The current study used residual gain scores to decrease measurement

error associated with the change scores. However, researchers cite that residual gain scores are best used when evaluating larger amounts of change (Smolak, Levine, & Striegel-Moore, 1996). Since the self-report measures used within this study had a limited range as a result of using Likert scales, it is possible that change scores did not produce enough variance. Thus, smaller amounts of change would not be detected by the analyses. To bypass this dilemma, future research should evaluate the process of change by studying mediators and using regression analysis.

While results revealed no significant correlations between these variables, the hypothesis poses important questions about the process of change within acute treatment. Though models proposing how this change occurs are discussed in an earlier section, the current study lacks the data needed to appropriately evaluate these models. Nonetheless, the current study does provide some results that might be beneficial in guiding researchers.

Researchers reporting that physical recovery occurs at a faster rate than psychological recovery in anorexia (Fennig et al., 2002), raise the question of whether weight gain acts as a mediating variable. Consistent with the first model, this would assume that psychological change is dependent upon attaining a particular body weight. Results from this study, suggest that weight gain occurs prior to improvement in most psychological variables as only readiness to change was found to improve by the time patients reached 85 percent of their ideal body

weight. This demonstrates that weight gain is not dependent upon change in psychological factors and illustrates that readiness to change increases prior to change in other psychological variables. This raises the question of whether improvement in readiness to change occurred simultaneously with change in weight and whether change in these variables might be dependent upon readiness to change levels. Despite these conjectures, the current study cannot precisely determine whether psychological change occurs as the direct result of weight gain or concurrently with certain variables as the psychological variables were not assessed at multiple time points.

Finally, the means by which weight gain occurs might also have important implications for those evaluating whether it influences psychological variables. Whether individuals are given autonomy in deciding food consumption versus consuming calories through a nasogastric tube could signify degree of eating disorder pathology as well as readiness to change. Alternatively, one wonders if the process by which this occurs alter the patient's ability to effectively cope with and challenge the cognitions associated with their eating disorder. While the treatment program in the current study provided the patient with the opportunity to consume their food, patients were supported by means of a nasogastric tube if they were unable to consume an adequate calorie amount. Despite the caloric consumption of all treatment patients, variability in weight gain rates was still observed. This weight gain raises the question of whether patients consumed

food as a means to recovery, as a product of psychological change, or with the intention of “getting out” of the hospital more quickly.

Since both weight and certain psychological variables improved by date of discharge, but were not found to significantly correlate, perhaps this change is best explained by the influence of more than one causal factor. Consistent with the fourth model proposed earlier in this study, this would suggest that different factors impact weight and psychological variables. In the current study, perhaps the behavioral techniques employed by the treatment program promoted weight gain as patients were restricted in their ability to engage in behaviors that previously led to weight loss, such as: purging, exercising, and restricting. Alternately, the therapeutic techniques utilized by staff may have supported psychological change as patients engaged in individual and family therapy, group therapies, and learned ways to challenge and alter the thoughts and feelings associated with their eating disorder.

While measuring the direct relationship between these variables might seem rather straightforward from a statistical perspective, it raises implications that are clinically questionable. Endorsing the fourth model proposed in this study suggests that the forces driving psychological and weight changes are independent of one another. Yet, overlap between these driving forces seems inevitable as the intent of teaching cognitive behavioral interventions is for patients to utilize them for both the physical and mental symptoms associated

with their eating disorder. Thus, the behavioral and cognitive strategies used in treatment most likely impact psychological functioning as well as weight gain.

Perhaps it would be more advantageous for researchers to evaluate the degree treatment strategies influence both weight and psychological variables and ascertain whether there are mediating variables that enhance this relationship. Evaluating possible mediators in treatment would provide insight into what effects positive outcomes such as weight gain or improvement in eating disorder symptoms. To adequately assess such a relationship, psychological variables should be assessed at multiple time points during and after the treatment process. It would also be interesting to evaluate differences in weight gain and psychological improvement in lenient versus strict treatment programs. It would be assumed that less rigid treatment programs would promote greater degrees of autonomy and that this might influence weight gain rates and the detection of mediating variables.

### **Exploratory Analyses**

Additional analyses were conducted to explore the effects of admission percent ideal body weight on psychological variables as this information has important implications for determining treatment needs. Additionally, psychological change from admission to time to reach 85 percent ideal body weight was assessed. Findings may reveal what psychological variables change during shorter intervals of treatment and whether longer hospitalizations produce

greater psychological change. Finally, individual subscales were evaluated to determine potential predictive value.

Exploratory analyses were also conducted to determine whether the admission psychological scores of patients closer to reaching 85 percent ideal body weight were different than those who were admitted at a lower percent ideal body weight. This assumption was evaluated as those with a higher percent ideal body weight at admission might be less entrenched in eating disorder behaviors. Thus, these individuals may report less eating disorder cognitions and have less rigid standards about weight and eating. With less eating disorder symptoms, these individuals may also endorse greater readiness to change and higher levels of self-efficacy as they are less influenced by these cognitive distortions. However, results from the analyses reveal no relationship between admission percent ideal body weight and scores on admission psychological variables. This suggests that assessment alone of a patient's admission percent ideal body weight does not accurately reflect the severity of the eating disorder as it does not account for psychological symptoms.

While research has shown associations between low weight at admission and poor outcomes (Pike, 1998), focusing on the psychological health of the patient at admission might better indicate the patient's treatment needs. Unfortunately, individuals with higher body weights who are medically stable, but psychologically struggling, might not be as noticeable to clinicians as they do not

manifest the physical symptom of emaciation. It would be interesting to investigate why these individuals are closer to their percent ideal body weight despite struggles with the psychological aspects of this disorder. Perhaps these individuals engage in eating disorder behaviors that do not necessarily lead to profound weight loss, such as bingeing and purging as opposed to restricting food intake. If the onset of the eating disorder is recent or if there was an early intervention, weight loss progression might have also been impacted. Additional studies should evaluate these variables to determine their effect on psychological variables specific to eating disorders.

Improvement in psychological variables from time of admission to reaching 85 percent ideal body weight was also assessed. Though the multivariate analysis was not significant, univariate analysis revealed that readiness to change significantly improved. As the first and only psychological variable to change upon reaching 85 percent ideal body weight, this has significant implications for treatment providers and insurance agencies. By date of discharge, an event that takes roughly twice the time that it takes to reach 85 percent ideal body weight (Table 12), patients endorse improvement in two other areas: perfectionism and cognitive distortions. Thus, patients who are discharged from treatment after meeting 85 percent of their ideal body weight may experience little improvement in psychological symptoms. Subsequently, these patients remain vulnerable to relapse as they may not have the coping abilities

needed to challenge the cognitions and emotions associated with their eating disorder.

The use of stepwise linear regression is currently a controversial topic given that it is a “data-driven” method as opposed to a “theory-driven” analysis. However, this method was employed with the intent of performing purely exploratory analyses and with the purpose of evaluating the variance of independent subscales. Thus, all measures that included subscales were evaluated separately to assess whether they contributed any unique variance in predicting both time to reach 85 percent ideal body weight and duration of hospitalization. Higher scores on a different subscale of the DERS, Lack of Emotional Clarity, were found to significantly predict longer time to reach 85 percent ideal body weight, suggesting that those who have difficulty identifying their feelings take longer to gain weight. This suggests that individuals who are unable to accurately determine their feelings most likely have difficulty utilizing consistent coping strategies. As a result, when these individuals experience internal distress, they may use their eating disorder as a way to control and alleviate these negative emotions.

Upon evaluating duration of hospitalization, higher scores on the Lack of Emotional Awareness subscale were found to significantly predict longer hospital stay. This finding reveals that patients who struggle with acknowledging their emotions will have a longer hospital stay. This suggests that patients may have



difficulty perceiving events as negative because of their inability to appropriately recognize emotions. When coupled with defense mechanisms such as avoidance, denial, or displacement, difficulties with emotions only become compounded further. These findings reveal that the ability to recognize emotions and perceive negative emotions as distressing influences the factors associated with discharge, such as weight gain, alleviation of mood symptoms and eating disorder behaviors, and family relationships.

Interestingly, as evidenced by the Ego Alien Aspects subscale of the ANSOCQ, individuals who report less readiness to change events or experiences that are emotionally distressing will also have longer treatment lengths. This subscale includes statements that refer to “certain emotional problems (such as feeling depressed, anxious, or irritable), “certain characteristics (such as perfectionism, low self-esteem or feeling a sense of lack of control over your life) and “relationship problems (such as with family or friends).” This suggests that individuals who are less emotionally distressed by the impact of their eating disorder are more resistant to change. It is interesting to consider whether these patients have less insight into their own emotional and relational difficulties or if the advantages of keeping their eating disorder outweigh such difficulties. This finding also suggests that the ego-syntonic nature of eating disorders fosters ambivalence about recovery and negatively impacts an individual’s readiness to change. This information proposes that patients might benefit from identifying

the negative and pervasive impact of their eating disorder as a way of increasing motivation to change.

### **Methodological Considerations**

There are several limitations to this study that warrant discussion. First, the small sample size and lack of power may not adequately detect the psychological predictors that significantly predict rapidity of weight gain. Additionally, this study included a mostly homogenous sample of participants with regards to gender and ethnicity. While this sample is relatively consistent with other studies that have evaluated eating disorder populations, the results of this study are not generalizable to males and non-Caucasian ethnicities. Furthermore, all psychological measures consisted exclusively of self-report questionnaires. Due to the denial and ambivalence involved in this disorder, participants may have underreported their symptoms and difficulties. While patients were assured that their measures would remain confidential, they may have responded with the belief that their answers would impact their treatment or length of stay.

Another methodological limitation of this study pertains to the use of duration of hospitalization as a measure of outcome. Though the treatment program involved in this study delineates the same treatment goals and discharge criterion for each patient, a patient's discharge date is sometimes influenced by

additional factors such as insurance or family conflict. Thus, duration of hospitalization is not only dependent upon the psychological and physical health of the patient, but includes factors that are beyond the patient's control. This study did not evaluate external factors that might have impacted duration of hospitalization and was therefore unable to control for such occurrences.

### **Areas for Future Research**

The current study should continue collecting eligible participants in order to get an appropriate sample size that provides statistical power for all hypotheses. While the results of this study are generalizable to the demographic population most commonly served in this treatment program, future research should evaluate how these variables and rapidity of weight gain may differ with males and minorities. A larger and more diverse sample would also allow researchers to evaluate potential psychological differences between those admitted below 85 percent of their body weight and those admitted above 85 percent. Distinguishing possible psychological differences between gender, ethnicity, and body weight might have important implications for determining methods of intervention and treatment focus.

Additionally, future research should gather information about the patient's psychological functioning from the patient and from individuals that work closely with the patient, such as the family therapist, physician or dietician. Including

additional informants would provide more information about the patient's progress in multiple areas of treatment. The patient's reports could also be compared to those offering more objective perspectives of the patient's behaviors. In addition, research has identified the importance of the family within the maintenance and recovery process of eating disordered adolescents. Including self-report and parent-report measures that capture family dynamics might also have important findings with regards to weight gain rapidity and duration of hospitalization.

While the data currently captures change occurring from time of admission to discharge, it would be helpful to assess psychological variables at multiple times points during treatment to evaluate the process of change. This would provide both clinicians and researchers the information needed to determine the relationship between psychological improvement and weight gain rapidity. Collecting this information through the outpatient process and after treatment would also allow researchers to evaluate whether additional psychological variables change and whether this improvement is maintained.

Finally, future research should consider quantifying discharge criteria to either minimize or account for external variables that may impact time of discharge. This would include evaluating whether family conflict prolongs hospital duration or whether limits on insurance plans promote a "faster" treatment plan. Though discharge from the hospital might reflect at a minimum

that the patient is medically stabilized, it does not necessarily signify improvement in all eating disorder areas. While certain discharge criterion was proposed by this treatment program, including: attain and maintain a healthy weight, alleviation of mood symptoms, and parent education, it would be helpful to quantify these variables. This may help researchers and clinicians determine if improvement actually occurred within treatment, how long it took before this improvement occurred and appropriately address research questions relating to length of hospital stay.

### **Clinical Implications**

There are several important clinical implications that emerge from the findings of this study. First, Faiburn's (2003) theory that self-esteem acts as the core psychopathology of eating disorders seems to be supported within the results of this study as self-esteem predicted weight gain rapidity, length of hospital stay (at the trend level) and did not change significantly from admission to discharge. These findings illustrate the ingrained nature of this psychological factor and challenge clinicians to consider the benefits of focusing on this construct in the treatment process. Since eating disorder patients generally have lower self-esteem, perhaps clinicians should focus on this construct at the start of the treatment phase with the knowledge that improvement is a long-term goal. It might also be helpful for clinicians to challenge where the patient derives feelings

of worth and esteem and confront positive feelings that are elicited as the result of the eating disorder.

Results also indicate that characteristics such as self-esteem and self-efficacy have much more influence upon weight gain rapidity as opposed to “trait” characteristics. This suggests that individuals who have positive feelings of self-worth and can effectively initiate solutions to problems are more likely to engage in behaviors that lead to weight gain. Perhaps patients with healthier self-esteem and self-efficacy also engage in coping techniques that are more adaptive and beneficial. This would suggest that clinicians find ways to bolster such “state” characteristics by helping patients utilize positive feelings of self-worth and by teaching them coping skills that reinforce feelings of self-efficacy.

Considered an ego-syntonic disorder that is difficult to treat, assessing readiness to change at admission can help clinicians gauge where the patient might be within the recovery process. Patients with eating disorder typically endorse ambivalent feelings about recovery and may have distorted views about recovery, themselves, and how their eating disorder has affected their life. Determining the patient’s readiness to change could help guide clinicians as the treatment protocol and techniques would change depending upon whether the patient is still contemplating “letting go” of the eating disorder versus actively engaging in behavioral modifications.

Results from this study indicate that there is not a relationship between psychological variables at admission and admission ideal body weight percent, suggesting that clinicians not base severity of a patient's illness by their weight. Instead, clinicians should evaluate severity and entrenchment of the eating disorder by more objective means, such as a clinical interview of self-report measures. If those who are more psychologically ill do not necessarily have a lower body weight, perhaps eating disorder symptoms are manifesting in different ways, such as purging, cognitions, or emotional restriction. It would be important to assess the pervasiveness of the eating disorder and how, besides through food restriction, the eating disorder is negatively impacting the individual.

The fact that some psychological variables such as cognitive distortions, readiness to change and perfectionism, did significantly improve over the course of hospitalization demonstrates the effectiveness of treatment programs that provide psychological interventions. It is questionable whether patients that participate in treatment programs that focus solely on weight gain would psychologically benefit. Though psychological change is apparent from this study, results clearly illustrate that psychological change takes longer to occur when compared to weight change. Even for those reaching 85 percent of their ideal body weight, only readiness to change had significantly improved from time of admission. This finding suggests that psychological recovery takes time to

occur and that patients will most likely need continued care after being discharged from acute treatment.



## APPENDIX A

### Consent Form

The University of Texas Southwestern Medical Center at Dallas  
Children's Medical Center of Dallas

#### CONSENT TO PARTICIPATE IN RESEARCH

Title of Research: "Psychological Variables Involved in the Rapidity of Weight Gain in Children and Adolescents Diagnosed with Anorexia Nervosa"		
Sponsor: Sunita Stewart, Ph.D.		
Investigators:	Telephone No. (regular office hours)	Telephone No. (other times)
Renee Phillips	214-648-4438	817-999-1358
Deanna Liss, Ph.D.	214-456-6929	214-456-6929
Jacqueline Rosckes	214-456-6929	

**PURPOSE:** The primary purpose of this research is to increase knowledge about the thoughts and feelings involved in improving weight gain in adolescents with eating disorders. The first aim of this study will be to explore what thoughts and feelings are quickly changed and which ones take longer to change during treatment. The second aim is to see whether certain patient characteristics can predict length of time for a patient to achieve 85% of their ideal body weight and time of discharge. The third aim is to determine if patients that gain weight faster show improvement in thoughts and feelings by time of discharge.

This research is being done because there is a need to further understand what thoughts, feelings and behaviors impact weight gain in patients with eating disorders. The results of this research may determine the treatments needs and means for recovery in young patients with eating disorders.

**PROCEDURES:** Upon admission (today), one of the members of the research team will describe the study procedures. If you agree to participate, you and your child will sign the consent/assent form. Next, your child will be asked to complete a questionnaire about their thoughts, feelings, behaviors and eating disorder symptoms. These questionnaires typically take about 20 minutes to complete. Your child will complete these questionnaires again when she or he reaches 85% of their ideal body weight and again at the time of their discharge. If your child is discharged from the hospital before reaching 85% of their ideal body weight, they will complete a questionnaire at time of discharge. Should they continue through the intensive outpatient level of care at Children's, they may be asked to complete the questionnaires when meeting 85% of their body weight at an outpatient appointment. We will also obtain information from your child's chart regarding his or her weight, medical history, demographics and psychiatric diagnosis. Follow-up assessments of your child may be conducted at 6 months and 12 months after discharge from partial hospitalization. A researcher would contact you and your child by telephone to ask about this information and would mail the questionnaires to you.

**POSSIBLE RISK(S):** It is possible that completing the questionnaires may cause some discomfort as they ask for information about thoughts, feelings and eating disorders issues. Your child may stop his or her participation at any time, and can refuse to answer any questions.

**POSSIBLE BENEFITS:** There is no specific benefit to your child for their participation, though the information gained from this research may help eating disorder patients in the future.

**Benefit to others:** The information gained from this research may help in informing researchers about the factors involved in treatment response and recovery, which may help other young people with eating disorders. However, your child's study doctor will not know whether there are benefits to other young people with eating disorders until all of the information obtained from this research has been collected and analyzed.

**ALTERNATIVES TO PARTICIPATION IN THIS RESEARCH:** Your child does not have to participate in this research to receive care for their medical problem. Your child's participation will not affect his or her medical care in any way.

**PAYMENT TO TAKE PART IN THIS RESEARCH:** Subjects will not be paid for participation in this research.

**COSTS TO YOU:** You will not be charged for the expenses for any tests that are not part of your child's routine medical care. Expenses related to standard medical care for your child's eating disorder are your responsibility (or the responsibility of your insurance provider or government program).

**VOLUNTARY PARTICIPATION IN RESEARCH:** You have the right to agree or refuse to participate in this research. If you decide to participate and later change your mind, you are free to discontinue participation in the research at any time.

Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. Refusal to participate will not affect your legal rights or the quality of health care that you receive at this center.

**RECORDS OF YOUR PARTICIPATION IN THIS RESEARCH:** You have the right to privacy. Any information about you that is collected for this research will remain confidential as required by law. In addition to this consent form, you will be asked to sign an "Authorization for Use and Disclosure of Protected Health Information for Research Purposes," which will contain more specific information about who is authorized to review, use, and/or receive your protected health information for the purposes of this study.

**YOUR QUESTIONS:** Renee Phillips is available to answer your questions about this research at 214-648-4438. The Chairman of the IRB is available to answer questions about your rights as a participant in research. You may telephone the Chairman of the IRB during regular office hours at 214-648-3060.

**YOU WILL HAVE A COPY OF THIS CONSENT FORM TO KEEP.**

Your signature below certifies the following:

- You have read (or been read) the information provided above.
- You have received answers to all of your questions.
- You have freely decided to participate in this research.
- You understand that you are not giving up any of your legal rights.

\_\_\_\_\_  
Participant's Name (printed)

\_\_\_\_\_  
Participant's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Legally authorized representative's name (printed)  
(if applicable)

\_\_\_\_\_  
Legally authorized representative's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Name (printed) of person obtaining Consent

\_\_\_\_\_  
Signature of person obtaining consent

\_\_\_\_\_  
Date

ASSENT OF A MINOR: (if applicable)

I have discussed my participation in this research with my mother or father or legal guardian and my study doctor, and I agree to participate in this research.

\_\_\_\_\_  
Signature (participants from 9 to 18 years old)

\_\_\_\_\_  
Date

**APPENDIX B****HIPPA Notification**

**The University of Texas Southwestern Medical Center at Dallas  
Children's Medical Center of Dallas, Parkland Health & Hospital System  
Retina Foundation of the Southwest, Texas Scottish Rite Hospital for  
Children  
The University of Texas Southwestern Moncrief Cancer Center**

**Authorization for Use and Disclosure of  
Health Information for Research Purposes**

NAME OF RESEARCH PARTICIPANT: \_\_\_\_\_

**What is the purpose of this form?**

This authorization describes how information about you and your health will be used and shared by the researcher(s) when you participate in the research study: **“Psychological Variables Involved in the Rapidity of Weight Gain in Children and Adolescents with Anorexia Nervosa.”**

The primary purpose of this study is to evaluate the emotions, thoughts and behaviors of patients with eating disorders and determine whether these variables influence speed of weight gain. Health information is considered “protected health information” when it may directly identify you as an individual. By signing this form you are agreeing to permit the researches and other others (described in detail below) to have access to and share this information. If you have questions, please ask a member of the research team.

**Who will be able use or share my health information?**

Children's Medical Center of Dallas may use or share your health information with Renee Phillips and her staff at UT Southwestern Medical Center (“Researchers”) for the purpose of this research study.

**Will my protected health information be shared with someone other than the Researchers?**

Yes, the Researchers may share your health information with others who may be working with the Researchers on the Research Project (“Recipients”) for purposes directly related to the conduct of this research study or as required by law. These other people or entities include:

- Dr. Sunita Stewart. The sponsor includes any people, entities, groups or companies working for or with the sponsor or owned by the sponsor. The sponsor will receive written reports about your participation in the research. The sponsor may look at your health information to assure the quality of the information used in the research.
- The UT Southwestern Institutional Review Board (IRB). This is a group of people who are responsible for assuring that the rights of participants in research are respected. Members and staff of the IRB at UT Southwestern may review the records of your participation in this research. A representative of the IRB may contact you for information about your experience with this research. If you do not want to answer their questions, you may refuse to do so.
- Representatives of domestic and foreign governmental and regulatory agencies may be granted direct access to your health information for oversight, compliance activities, and determination of approval for new medicines, devices, or procedures.

**How will my health information be protected?**

Whenever possible your health information will be kept confidential as required by law. Federal privacy laws may not apply to other institutions, companies or agencies collaborating with UT Southwestern on this research project. UT Southwestern cannot guarantee the confidentiality of your health information after it has been shared with the Recipients.

**Why is my personal contact being used?**

Your personal contact information is important for the UT Southwestern Medical Center research team to contact you during the study. However, your personal contact information will not be released without your permission.

**What health information will be collected, used and shared (disclosed)?**

The Researchers will collect information gathered during the evaluations including questionnaires, information regarding your child's eating disorder, information related to your child's psychiatric history, such as previous diagnosis, substance abuse history, previous psychiatric hospitalizations and your children's progress notes from the psychiatry inpatient unit. These will be obtained from your child's medical record.

**Will my health information be used in a research report?**

Yes, the research team may fill out a research report. (This is sometimes called "a case report"). The research report will not include your name, address, or telephone or social security number. The research report may include your date of birth, initials, dates you received medical care and a tracking code. The research report will also include information the research team collects for the study.

**Will my health information be used for other purposes?**

Yes, the Researchers and Recipients may use your health information to create research data that does not identify you. Research data that does not identify you may be used and shared by the Researchers and Recipients in a publication about the results of the Research Project or for other research purposes not related to the Research Project.

**Do I have to sign this authorization?**

No, this authorization is voluntary. Your health care providers will continue to provide you with health care services even if you choose not to sign this authorization. However, if you choose not to sign this authorization, you cannot take part in this Research Project.

**How long will my permission last?**

This authorization has no expiration date. You may cancel this authorization at any time. If you decide to cancel this authorization, you will no longer be able to take part in the Research Project. The Researchers may still use and share the health information that they have already collected before you canceled the authorization. To cancel this authorization, you must make this request in writing to:

Renee Phillips  
1935 Motor Street – 5<sup>th</sup> floor (Psychiatry)  
Dallas, TX 75235  
Phone: 817-999-1358

**Will I receive a copy of this authorization?**

Yes, a copy of this authorization will be provided to you.

**Signatures:**

By signing this document you are permitting UT Southwestern Medical Center to use and disclose health information about you for research purposes as described above.

\_\_\_\_\_  
Signature of Research Participant

\_\_\_\_\_  
Date

**For Legal Representatives of Research Participants (if applicable):**

Printed Name of Legal Representative: \_\_\_\_\_

Relationship to Research Participant: \_\_\_\_\_

*I certify that I have the legal authority under applicable law to make this Authorization on behalf of the Research Participant identified above. The basis for this legal authority is:*

\_\_\_\_\_  
(e.g. parent, legal guardian, person with legal power of attorney, etc.)

\_\_\_\_\_  
Signature of Legal Representative

\_\_\_\_\_  
Date



**APPENDIX C**  
**Psychological Measures**  
**Anorexia Nervosa Stages of Change Questionnaire**

DIRECTIONS: Each of the items below is made up of five statements. For each item, please read the five statements carefully. Then select the statement (or statements) which best describe/s your *current* attitude or behaviour (not how you have been in the past or how you would like to be). If you have any problems, please ask for assistance. Your answers are completely confidential.

**1. The following statements refer to gaining weight:**

- As far as I am concerned I do not need to gain weight.
- In some ways I think that I might be better off if I gained weight.
- I have decided that I will attempt to gain weight.
- At the moment I am putting in a lot of effort into gaining weight.
- I am working to maintain the weight gains I have made.

**2. The following statements refer to body weight:**

- As far as I am concerned I do not need to be in my healthy weight range.
- In some ways I think that I might be better off if I was in my healthy weight range.
- I have decided that I will attempt to reach the minimum weight within my healthy weight range.
- At the moment I am putting in a lot of effort in to reaching my healthy weight range.
- I am working to maintain a weight that is within my healthy weight range.

**3. The following statements refer to parts of your body which may particularly concern you in terms of weight gain (such as hips, thighs, stomach or buttocks):**

- There is no way I would be prepared to gain weight on these body parts.
- Sometimes I think I would be prepared to gain weight on these body parts.
- I have decided that I am prepared to gain weight on these body parts.
- I am presently trying to gain weight on these body parts.
- I am working to maintain the weight I gained on these body parts.

**4. The following statements refer to your appearance:**

- I do not want to be a normal weight because I would be less satisfied with my appearance when my weight is in my healthy weight range.
- I have occasionally thought about being a normal weight because in some ways I would be more satisfied with my appearance if my weight was within my healthy weight range.
- I have decided to reach a normal weight because I would be more satisfied with my appearance if my weight was within my healthy weight range.
- I am presently trying to reach a normal weight because I will be more satisfied with my appearance at a weight that is in my healthy weight range.
- I am working to maintain a normal weight because I am more satisfied with my appearance at a weight that is in my healthy weight range.

**5. The following statements refer to your health:**

- I do not need to be a normal weight because there are no risks to my health when I weigh below my healthy weight range.
- I have occasionally thought about being a normal weight because of the risks to my health when I weigh below my healthy weight range.
- I have decided to reach a normal weight because of the risks to my health when I weigh below my healthy weight range.
- I am presently trying to reach a normal weight because of the risks to my health when I weigh below my healthy weight range.
- I am working to maintain a normal weight because of the risks to my health when I weigh below my healthy weight range.

**6. The following statements refer to the importance of body shape and weight:**

- I do not exaggerate the importance of my body shape or weight in determining my happiness and success.
- Sometimes I think that I exaggerate the importance of my body shape or weight in determining my happiness and success.
- I have decided that I need to reduce the importance that I place on my body shape or weight in determining my happiness and success.
- I often try to challenge the importance that I place on my body shape or weight in determining my happiness and success.
- I have succeeded in reducing my tendency to place too much importance on my body shape or weight in determining my happiness and success and want to stay this way.

**7. The following statements refer to fear of fatness:**

- My fear of becoming fat is not excessive.
- I occasionally think that my fear of becoming fat is excessive.
- I have decided that I need to do something about the fear I have of becoming fat because it is controlling me.
- I know that my fear of becoming fat has caused problems and I am now trying to correct this.
- I have succeeded in reducing my fear of becoming fat and want it to stay this way.

**8. The following statements refer to weight loss:**

- I would prefer to lose more weight.
- Sometimes I think that it might be time to stop losing weight.
- I have decided that it is time to stop losing weight.
- I am trying to stop losing weight.
- I have managed to stop losing weight and hope to stay this way.

**9. The following statements refer to body fat versus muscle:**

- I might think about gaining muscle on purpose, but I would never think of gaining fat on purpose.
- Sometimes I think that I may need to gain some fat even though I would prefer to have only muscle.
- I have decided that to be healthy I need to have some fat on my body.
- I realize that I need to have some fat on my body and am working to achieve this.
- I have managed to increase the level of fat on my body which I am trying to maintain.

**10. The following statements refer to the rate of weight gain:**

- There is no way I would be prepared to gain at least 1 kg a week.
- Sometimes I think I would be prepared to gain at least 1 kg a week.
- I have decided that in general it would be best for me to gain at least 1 kg a week.
- I am putting in a lot of effort to gain at least 1 kg a week.
- I am working to maintain my weight but would be prepared to gain at least 1 kg a week if necessary.

**11. The following statements refer to certain shape and weight standards which you may have for evaluating your body (such as only being satisfied with your body when your thighs are not touching, when specific bones can be seen, when your stomach is flat, when you are below a certain weight or when you fit into certain clothes):**

- The standards I use to evaluate my body are not too strict.
- Sometimes I think that the standards I use to evaluate my body may be too strict.
- I have decided that the standards I use to evaluate my body are too strict and need to be changed.
- I am putting in a lot of effort to change the strict standards which I use to evaluate my body.
- I have managed to let go of the strict standards which I used in the past to evaluate my body and am hoping to keep it this way.

**12. The following statements refer to certain foods which you may avoid eating (such as foods high in calories or fat, red meat, dairy products or food where the caloric content is not known):**

- There are certain foods which I strictly avoid and would not even consider eating.
- There are certain foods which I try to avoid, although sometimes I think that it might be okay to eat them occasionally.
- I think that I am too strict in the foods which I allow myself to eat and have decided that I will attempt to eat foods which I usually avoid.
- I am putting in a lot of effort to regularly eat foods which I usually avoid.
- I used to avoid eating certain foods which I now eat regularly.

**13. The following statements refer to daily food consumption:**

- There is no need for me to eat 3 standard-size meals and a snack each day.
- Sometimes I think that I should eat 3 standard-size meals and a snack each day.
- I have decided that I need to eat 3 standard-size meals and a snack each day.
- I am putting in a lot of effort to eat 3 standard-size meals and a snack each day.
- I am working to maintain a current eating pattern which includes 3 standard-size meals and a snack each day.

**14. The following statements refer to time spent thinking about your weight (such as thoughts about becoming fat, counting the calories or fat content of food, or calculating the amount of energy used when exercising):**

- There is nothing wrong with the amount of time I spend thinking about my weight.
- The amount of time I spend thinking about my weight is a problem sometimes.
- I have decided that I need to use strategies to help me reduce the amount of time I spend thinking about my weight.
- I am using strategies to help me reduce the amount of time I spend thinking about my weight.
- I used to spend too much time thinking about my weight which I have managed to reduce and hope to keep it this way.

**15. The following statements refer to certain eating behaviours (such as needing to eat food at a specific rate or time, being unable to eat from a full plate, moving food around on the plate, being unable to eat all the food on a plate, taking longer than others to eat meals, having difficulty eating with others, needing to chew food a certain number of times, not allowing food to touch your lips, needing to eat food in a specific order or needing to stick to the same food plan each day):**

- There is nothing that I need to change about the way I eat my meals.
- I sometimes think that I need to change aspects of the way I eat my meals.
- I have decided that I will try to change aspects of the way I eat my meals.
- I am putting in a lot of effort to change aspects of the way I eat my meals.
- I have succeeded in changing aspects of the way I eat my meals and want it to stay this way.

**16. The following statements refer to feelings associated with eating (such as feeling guilty, anxious or bloated) and not eating (such as feeling successful, in control or spiritually stronger):**

- There is no need for me to change the feelings I associate with eating and not eating.
- I sometimes think that I need to change the feelings I associate with eating and not eating.
- I have decided that I will try to change the feelings I associate with eating and not eating.
- I am putting in a lot of effort to change the feelings I associate with eating and not eating.
- I have succeeded in changing the feelings I associate with eating and not eating and want it to stay this way.

**17. The following statements refer to methods which you may use to control your weight (such as restricting your eating, exercising, vomiting, taking laxatives or other pills). You may select more than one statement for the different methods you use to control your weight. Please indicate which weight control method/s you are referring to in the blank space/s provided.**

- There is nothing seriously wrong with the methods ( \_\_\_\_\_ ) I use to control my weight.
- I have been thinking that there may be problems associated with the methods ( \_\_\_\_\_ ) I use to control my weight.
- I have decided that I will attempt to stop using certain methods ( \_\_\_\_\_ ) to control my weight.
- I am putting in a lot of effort to stop using certain methods ( \_\_\_\_\_ ) to control my weight.
- I have managed to stop using certain methods ( \_\_\_\_\_ ) to control my weight and I would like to keep it this way.



**18. The following statements refer to certain emotional problems (such as feeling depressed, anxious or irritable):**

- I do not have any emotional problems which I need to work on.
- I sometimes think that I may have certain emotional problems which I need to work on.
- I have certain emotional problems which I have decided to work on.
- I am actively working on my emotional problems.
- My emotional problems have improved and I am trying to keep it this way.

**19. The following statements refer to certain characteristics (such as perfectionism, low self esteem or feeling a sense of lack of control over your life):**

- I do not have any problems in the way I approach life which I need to work on.
- I sometimes think that I may have certain problems in the way I approach life which I need to work on.
- I have certain problems in the way I approach life which I have decided to work on.
- I am actively working on problems in the way I approach life.
- The problems in the way I approach life have improved and I am trying to keep it this way.

**20. The following statements refer to relationship problems (such as relationships with family or friends):**

- I do not have any problems in my relationships with others which I need to work on.
- I sometimes think that I may have certain problems in my relationships with others which I need to work on.
- I have certain problems in my relationships with others which I have decided to work on.
- I am actively working on problems in my relationships with others.
- The problems in my relationships with others have improved and I am trying to keep it this way.

When answering questions 2, 4, 5 – what weight did you have in mind as your “healthy body weight?” \_\_\_\_\_

## MAC-R QUESTIONNAIRE

This is an inventory of beliefs and attitudes about eating and weight. There are a number of statements with which you may tend to agree or disagree. On your answer sheet, there is one of five possible answers for each item. For each statement, you should circle one of the numbers, according to your own reaction to the item:

Circle over #1 if you **STRONGLY DISAGREE** (for example 1 2 3 4 5)

Circle over #2 if you **MODERATELY DISAGREE**

Circle over #3 if you **NEITHER AGREE NOR DISAGREE**

Circle over #4 if you **MODERATELY AGREE**

Circle over #5 if you **STRONGLY AGREE**

It is not necessary to think over any item very long. Mark your answer quickly and go on to the next statement. Be sure to mark how you actually feel about the statement, not how you think you should feel. Try to avoid the neutral or “3” response as much as possible. Select this answer only if you really cannot decide whether you tend to agree or disagree with the statement.

	<u>SD</u>	<u>MD</u>	<u>N</u>	<u>MA</u>	<u>SA</u>
1. I feel victorious over my hunger when I am able to refuse sweets.....	1	2	3	4	5
2. No matter how much I weigh, fats, sweets, breads, and cereals are bad food because they always turn into fat.....	1	2	3	4	5
3. No one likes fat people; therefore, I must remain thin to be liked by others.....	1	2	3	4	5
4. I am proud of myself when I control my urge to eat.....	1	2	3	4	5
5. When I eat desserts, I get fat. Therefore, I must never eat desserts so I won't be fat .....	1	2	3	4	5
6. How much I weigh has little to do with how popular I am.....	1	2	3	4	5
7. If I don't establish a daily routine, everything will be chaotic and I won't accomplish anything.....	1	2	3	4	5
8. My friends will like me regardless of how much I weigh.....	1	2	3	4	5

	<u>SD</u>	<u>MD</u>	<u>N</u>	<u>MA</u>	<u>SA</u>
9. When I am overweight, I am not happy with my appearance. Gaining weight will take away the happiness I have with myself.....	1	2	3	4	5
10. People like you because of your personality, not whether you are overweight or not.....	1	2	3	4	5
11. When I eat something fattening, it doesn't bother me that I have temporarily let myself eat something I'm not suppose to.....	1	2	3	4	5
12. If I eat a sweet, it will be converted instantly into stomach fat.....	1	2	3	4	5
13. If my weight goes up, my self-esteem goes down.....	1	2	3	4	5
14. I can't enjoy anything because it will be taken away	1	2	3	4	5
15. It is more important to be a good person than it is to be thin.....	1	2	3	4	5
16. When I see someone who is overweight, I worry that I will be like him/her.....	1	2	3	4	5
17. All members of the opposite sex want a mate who has a perfect, thin body.....	1	2	3	4	5
18. Having a second serving of a high calorie food I really like doesn't make me feel guilty.....	1	2	3	4	5
19. If I can cut out all carbohydrates, I will never be fat..	1	2	3	4	5
20. When I overeat, it has no effect on whether or not I feel like a strong person.....	1	2	3	4	5
21. Members of the opposite sex are more interested in "who" you are rather than whether or not you are thin.....	1	2	3	4	5
22. If I gain one pound, I'll go on and gain a hundred pounds, so I must keep precise control of my weight, food, and exercise.....	1	2	3	4	5
23. I rarely criticize myself if I have let my weight go up a few pounds.....	1	2	3	4	5
24. I try to attract members of the opposite sex through my personality rather than by being thin	1	2	3	4	5

### Difficulties in Emotion Regulation Scale (DERS)

**Please indicate how often the following statements apply to you by writing the appropriate number from the scale below on the line beside each item:**

---

1-----	2-----	3-----	4-----	-----5
almost never (0-10%)	sometimes (11-35%)	about half the time (36-65%)	most of the time (66-90%)	almost always (91-100%)

---

- \_\_\_\_\_ 1) I am clear about my feelings.
- \_\_\_\_\_ 2) I pay attention to how I feel.
- \_\_\_\_\_ 3) I experience my emotions as overwhelming and out of control.
- \_\_\_\_\_ 4) I have no idea how I am feeling.
- \_\_\_\_\_ 5) I have difficulty making sense out of my feelings.
- \_\_\_\_\_ 6) I am attentive to my feelings.
- \_\_\_\_\_ 7) I know exactly how I am feeling.
- \_\_\_\_\_ 8) I care about what I am feeling.
- \_\_\_\_\_ 9) I am confused about how I feel.
- \_\_\_\_\_ 10) When I'm upset, I acknowledge my emotions.
- \_\_\_\_\_ 11) When I'm upset, I become angry with myself for feeling that way.
- \_\_\_\_\_ 12) When I'm upset, I become embarrassed for feeling that way.
- \_\_\_\_\_ 13) When I'm upset, I have difficulty getting work done.
- \_\_\_\_\_ 14) When I'm upset, I become out of control.
- \_\_\_\_\_ 15) When I'm upset, I believe that I will remain that way for a long time.
- \_\_\_\_\_ 16) When I'm upset, I believe that I'll end up feeling very depressed.
- \_\_\_\_\_ 17) When I'm upset, I believe that my feelings are valid and important.
- \_\_\_\_\_ 18) When I'm upset, I have difficulty focusing on other things.

---

1-----2-----3-----4-----5
almost never    sometimes    about half the time    most of the time    almost always
(0-10%)    (11-35%)    (36-65%)    (66-90%)    (91-100%)

---

- \_\_\_\_\_ 19) When I'm upset, I feel out of control.
- \_\_\_\_\_ 20) When I'm upset, I can still get things done.
- \_\_\_\_\_ 21) When I'm upset, I feel ashamed with myself for feeling that way.
- \_\_\_\_\_ 22) When I'm upset, I know that I can find a way to eventually feel better.
- \_\_\_\_\_ 23) When I'm upset, I feel like I am weak.
- \_\_\_\_\_ 24) When I'm upset, I feel like I can remain in control of my behaviors.
- \_\_\_\_\_ 25) When I'm upset, I feel guilty for feeling that way.
- \_\_\_\_\_ 26) When I'm upset, I have difficulty concentrating.
- \_\_\_\_\_ 27) When I'm upset, I have difficulty controlling my behaviors.
- \_\_\_\_\_ 28) When I'm upset, I believe that there is nothing I can do to make myself feel better.
- \_\_\_\_\_ 29) When I'm upset, I become irritated with myself for feeling that way.
- \_\_\_\_\_ 30) When I'm upset, I start to feel very bad about myself.
- \_\_\_\_\_ 31) When I'm upset, I believe that wallowing in it is all I can do.
- \_\_\_\_\_ 32) When I'm upset, I lose control over my behaviors.
- \_\_\_\_\_ 33) When I'm upset, I have difficulty thinking about anything else.
- \_\_\_\_\_ 34) When I'm upset, I take time to figure out what I'm really feeling.
- \_\_\_\_\_ 35) When I'm upset, it takes me a long time to feel better.
- \_\_\_\_\_ 36) When I'm upset, my emotions feel overwhelming.

### General Self Efficacy

Please circle the number to show your level of agreement with each statement.

	Not at all true	Barely true	Moderately true	Exactly true
1. I can always manage to solve difficult problems if I try hard enough.	1	2	3	4
2. If someone opposes me, I can find means and ways to get what I want.	1	2	3	4
3. It is easy for me to stick to my aims and accomplish my goals.	1	2	3	4
4. I am confident that I could deal efficiently with unexpected events.	1	2	3	4
5. Thanks to my resourcefulness, I know how to handle unforeseen situations.	1	2	3	4
6. I can solve most problems if I invest the necessary effort.	1	2	3	4
7. I can remain calm when facing difficulties because I can rely on my coping abilities.	1	2	3	4
8. When I am confronted with a problem, I can usually find several solutions.	1	2	3	4
9. If I am in a bind, I can usually think of something to do.	1	2	3	4
10. No matter what comes my way, I'm usually able to handle it.	1	2	3	4

**ROSENBERG SELF-ESTEEM SCALE**

		strongly agree	agree	disagree	strongly disagree
1.	On the whole, I am satisfied with myself.	SA	A	D	SD
2.	At time I think I am no good at all.	SA	A	D	SD
3.	I feel that I have a number of good qualities.	SA	A	D	SD
4.	I am able to do things as well as most other people.	SA	A	D	SD
5.	I feel I do not have much to be proud of.	SA	A	D	SD
6.	I certainly feel useless at times.	SA	A	D	SD
7.	I feel that I'm a person of worth, at least on an equal plane with others.	SA	A	D	SD
8.	I wish I could have more respect for myself.	SA	A	D	SD
9.	All in all, I am inclined to feel that I am a failure.	SA	A	D	SD
10.	I take a positive attitude toward myself.	SA	A	D	SD



## APPENDIX D

### Tables

Table 1

*Sample Descriptive Statistics for ANSOCQ*

ANSOCQ Subscales	Admit (n = 38)		Discharge (n = 28)	
	M (SD)	Range	M (SD)	Range
Weight Gain	2.61 (1.01)	1.00 – 4.71	3.89 (1.20)	1.21 – 5.00
Eating, Shape, Weight Concerns	2.72 (.85)	1.42 – 5.00	3.90 (.99)	1.00- 5.00
Ego Alien Aspects	2.70 (.86)	1.25 – 5.00	4.06 (1.00)	1.83 – 5.00
Total Score	2.68 (.86)	1.37 – 4.90	3.95 (1.00)	1.65 – 5.00

*Note:* Higher scores on the ANSOCQ denote greater readiness to change.

Table 2

*Sample Descriptive Statistics for MAC-R*

MAC-R Subscales	Admit (n = 37)		Discharge (n = 28)	
	M (SD)	Range	M (SD)	Range
Self-Control	3.75 (.86)	1.50 – 5.00	3.07 (.98)	1.25 – 5.00
Rigid Weight-Regulation	2.82 (.79)	1.38 – 4.50	2.22 (.98)	1.00 – 5.00
Weight and Approval	2.41 (.75)	1.38 – 4.50	2.50 (.87)	1.13 – 4.75
Total Score	2.99 (.70)	1.50 – 4.42	2.59 (.82)	1.13 – 4.92

*Note:* Higher scores on the MAC-R denoted the presence of more eating disorder cognitions.

Table 3

*Sample Descriptive Statistics for CAPS*

CAPS Subscales	Admit (n = 38)		Discharge (n = 28)	
	M ( <i>SD</i> )	Range	M ( <i>SD</i> )	Range
Self-oriented	3.63 (1.13)	1.42 – 5.00	3.21 (1.17)	1.17 – 5.00
Socially-prescribed	2.70 (1.07)	1.00 – 5.00	2.33 (1.04)	1.00 – 5.00
Total Score	3.19 (.97)	1.27 – 5.00	2.81 (1.01)	1.09 – 5.00

*Note:* Higher scores on the CAPS denote higher levels of perfectionism.

Table 4

*Sample Descriptive Statistics for DERS*

DERS Subscales	Admit (n = 38)		Discharge (n = 27)	
	M (SD)	Range	M (SD)	Range
Emotional Responses	2.44 (1.12)	1.00 – 5.00	2.11 (1.15)	1.00 – 5.00
Goal Directed Behavior	3.24 (1.11)	1.00 – 5.00	2.95 (1.00)	1.00 – 4.80
Impulse Control	2.17 (.80)	1.17 – 5.00	2.16 (1.15)	1.00 – 5.00
Emotion Awareness	2.82 (1.00)	1.00 – 5.00	2.41 (1.08)	1.00 – 4.67
Regulation Strategies	2.42 (.95)	1.00 – 4.75	2.47 (1.04)	1.13 – 4.50
Emotional Clarity	2.78 (.83)	1.00 – 4.80	2.01 (.87)	1.00 – 4.60
Total Score	2.61 (.42)	1.14 – 4.03	2.35 (.88)	.33 – 4.33

*Note:* Higher scores on the DERS denote more difficulties with emotion regulation.

Table 5

*Sample Descriptive Statistics for GSES*

GSES	Admit (n = 38)		Discharge (n = 27)	
	M (SD)	Range	M (SD)	Range
Total Score	2.97 (.48)	2.10 – 4.00	3.06 (.38)	2.30 – 3.90

*Note:* Higher scores on the GSES denote greater self-efficacy.

Table 6

*Sample Descriptive Statistics for RSES*

RSES	Admit (n = 38)		Discharge (n = 27)	
	M ( <i>SD</i> )	Range	M ( <i>SD</i> )	Range
Total Score	1.58 (.69)	.20 – 3.00	1.79 (.67)	.30 – 3.00

*Note:* Higher scores on the RSES denote greater self-esteem.

Table 7

*Comparison of ED Group at Admission (n = 38) to Eating Disorder Sample (n = 115) on the ANSOCQ*

ANSOCQ	ED Group	ED Sample	<i>p</i>
	M (SD)	M (SD)	
Weight Gain	18.34 (7.07)	15.20 (6.85)	.01
Eating, Shape, Weight Concerns	19.04 (5.95)	18.79 (6.62)	<i>ns</i>
Ego Alien Aspects	16.20 (5.16)	16.71 (5.68)	<i>ns</i>
Total Score	53.58 (18.18)	50.70 (19.15)	<i>ns</i>

*Note:* Higher scores on the ANSOCQ denote greater readiness to change. Eating disorder sample scores for ANSOCQ taken from Rieger & Touyz, 2006.

Table 8

*Comparison of ED Group at Admission (n = 38) to Non-Clinical Sample (n = 213) on the CAPS*

CAPS	ED Group	Normative Sample	<i>p</i>
	M (SD)	M (SD)	
Self-oriented	43.56 (13.56)	35.4 (6.50)	.001
Socially-prescribed	27.00 (11.50)	25.2 (6.60)	<i>ns</i>
Total Score	70.56 (25.06)	60.6 (11.40)	.01

*Note:* Higher scores on the CAPS denote higher levels of perfectionism. Non-clinical sample scores for CAPS taken from Castro-Fornieles et al, 2007.



Table 9

*Comparison of ED Group at Admission (n = 38) to an American Non-Clinical Sample and a German Non-Clinical Sample (n = 3,494 and n = 63) on the GSES*

GSES	Normative Sample (n = 3,494)		Normative Sample (n = 63)		
	ED Group	M (SD)	<i>p</i>	M (SD)	<i>p</i>
Total Score	29.70 (4.8)	29.60 (4.0)	<i>ns</i>	27.42 (5.00)	.006

*Note:* Higher scores on the GSES denote greater self-efficacy. American non-clinical sample scores for GSES taken from Steese et al, 2006 and German non-clinical sample scores for GSES taken from Schwarzer, 2008.

Table 10

*Comparison of ED Group at Admission (n = 38) to Normative Sample on RSES (n=63)*

RSES	ED Group	Normative Sample	<i>p</i>
	M (SD)	M (SD)	
Total Score	15.8 (6.9)	22.94 (2.58)	<.001

*Note:* Higher scores on the RSES denote greater self-esteem. Normative sample scores for RSES taken from Steese et al, 2006.

Table 11

*Demographic Characteristics of Sample*

Variable	n	Mean	SD	Range
Age in Years and Months	38	15.81	1.58	12.33 - 17.83
Admission IBW	38	79.08	7.34	62.80 - 90.28
Discharge IBW	33	95.86	6.45	73.49 – 107.61
Time to 85% IBW in Days	29	31.03	17.07	14 - 71
Length of Treatment in Days	33	62.68	19.69	37 - 117

*Note:* 5 subjects that are currently participating in treatment were not included in the calculation of length of treatment in days or discharge ideal body weight.

Table 12

*Gender/Ethnicity Frequency Table*

Ethnicity	Frequency (%)		
	Male	Female	Total
Caucasian	4	28	32
Hispanic	--	4	4
Asian	--	4	4
Other	--	2	2
Total	4	37	42

Table 13

*DSM-IV Eating Disorder Diagnosis (n = 38)*

ED Diagnosis	Frequency	Percent
AN, Restricting	21	55.3
AN, Purging	7	18.4
ED NOS	9	23.7
Bulimia Nervosa	1	2.6
Total	38	100.0

Table 14

*Frequency of Comorbid DSM-IV Diagnoses (n = 38)*

DSM-IV Diagnosis	Frequency	Percent
<b>Mood Disorder</b>	<b>26</b>	<b>68.4</b>
Depression NOS	15	39.5
Major Depression	8	21.1
Mood Disorder NOS	1	2.6
Dysthymia	3	12.7
<b>Anxiety Disorder</b>	<b>2</b>	<b>5.3</b>
Anxiety NOS	2	5.3
<b>Mood &amp; Anxiety Disorder</b>	<b>6</b>	<b>15.8</b>
None	3	7.9
Total	38	100.0

Table 15

*Paternal Education and Insurance Information (n = 38)*

	Maternal		Paternal	
	Frequency	Percent	Frequency	Percent
High school or less	5	13.2	9	23.7
Some college	14	36.8	8	21.1
College graduate	10	26.3	5	13.2
Graduate degree	6	15.8	13	34.2
Missing	3	7.9	3	7.9

<u>Insurance Coverage</u>	
	Percent
Medicaid	13.2
Private Insurers	78.9
Self-pay	7.9

Table 16

*Comparison of Completers versus Non-Completers on Descriptive Variables*

Demographic Variable		Completer (n=29)	Non- completer (n=5)	Chi Square	<i>p</i> - value
Ethnicity	Caucasian	24	5	1.21	<i>ns</i>
	Hispanic	3	0		
	Asian	3	0		
Diagnosis	AN, Restricting	18	3	6.85	<i>ns</i>
	AN, Purging	5	0		
	ED NOS	7	1		
	Bulimia	0	1		



Table 17

*Condensed Comparison of Completers versus Non-Completers on Descriptive Variables*

Demographic Variable		Completer (n=29)	Non-completer (n=6)	Chi Square	<i>p</i> -value
Ethnicity	Caucasian	24	6	1.21	<i>ns</i>
	Other	5	0		
Diagnosis	AN, Restricting	18	3	0.00	<i>ns</i>
	Other	12	2		

*Note:* Ethnicity – “Other” includes: Hispanics and Asians. Diagnosis – “Other” includes: AN, Purging, ED NOS and BN

Table 18

*ANOVA of Demographic Variables and Completers versus Non-completers*

Demographic Variable	Completers (n=30)		Non-completers (n=5)		<i>F</i>	<i>df</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Age	15.57	1.62	15.98	1.83	.27	1	<i>ns</i>
Admission IBW	79.24	7.67	80.02	4.66	.05	1	<i>ns</i>
Discharge IBW	96.37	4.80	84.42	8.05	18.73	1	<.001
Length of Hospitalization	64.59	24.21	16.60	8.39	18.85	1	<.001

*Note:* Discharge IBW for non-completers (n = 4) did not include the discharge weight of one participant

Table 19

*ANOVA of Admission Psychological Variables of Completers versus Non-completers*

Psychological Variable	Completers (n=30)		Non-completers (n=5)		<i>F</i>	<i>df</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
RSES (self-esteem)	1.53	.67	2.02	.81	2.12	1	<i>ns</i>
GSES (self-efficacy)	2.96	.50	3.10	.48	.32	1	<i>ns</i>
CAPS (perfectionism)	3.25	1.02	2.79	.46	1.00	1	<i>ns</i>
ANSOCQ (readiness to change)	2.65	.91	3.11	.62	1.20	1	<i>ns</i>
DERS (emotion regulation)	2.63	.68	2.58	.39	.03	1	<i>ns</i>
MAC-R (cognitive distortions)	3.05	.71	2.74	.67	.80	1	<i>ns</i>

*Note:* Higher scores on the RSES, GSES, and ANSOCQ indicate greater self-esteem, greater self-efficacy and more readiness to change, respectively. Lower scores on the CAPS, MAC-R, and DERS indicate less perfectionism, fewer cognitive distortions and fewer difficulties with emotion regulation.

Table 20

*Correlation Matrix of All Psychological Variables at Admission*

		ANSOCQ	MAC-R	CAPS	DERS	GSES	RSES
ANSOCQ	Pearson Sig. N	1 38					
MAC-R	Pearson Sig. N	-.56 <.001 37	1 37				
CAPS	Pearson Sig. N	-.30 .07 38	.40 .01 37	1 38			
DERS	Pearson Sig. N	-.32 .05 38	.42 .01 37	.60 <.001 38	1 38		
GSES	Pearson Sig. N	.18 <i>ns</i> 38	-.27 .10 37	-.24 <i>ns</i> 38	-.47 .003 38	1 38	
RSES	Pearson Sig. N	.39 .02 38	.59 <.001 37	-.48 .002 38	-.77 <.001 38	.63 <.001 38	1 38

*Note:* Higher scores on the RSES, GSES, and ANSOCQ indicate greater self-esteem, greater self-efficacy and more readiness to change, respectively. Lower scores on the CAPS, MAC-R, and DERS indicate less perfectionism, fewer cognitive distortions and fewer difficulties with emotion regulation.

Table 21

*Hypothesis 1A: Admission Psychological Variables and Time to Reach 85 Percent Ideal Body Weight (n = 29)*

Psychological Variable	OR	CI	<i>p</i>
RSES (self-esteem)	2.11	1.13 – 3.94	.02
GSES (self-efficacy)	3.41	1.27 – 9.16	.02
CAPS (perfectionism)	.67	.43 – 1.05	.08
ANSOCQ (readiness to change)	1.34	.79 – 2.28	<i>ns</i>
DERS (emotion regulation)	.51	.27 – 1.00	.05
MAC-R (cognitive distortions)	.59	.30 – 1.16	<i>ns</i>

*Note:* All scores are in the expected direction.

Table 22

*Hypothesis 1A: Multivariate Analysis of Admission Psychological Variables and Time to Reach 85 Percent Ideal Body Weight (n = 29)*

Psychological Variable	OR	CI	<i>p</i>
RSES (self-esteem)	1.76	.55 – 5.63	<i>ns</i>
GSES (self-efficacy)	2.39	.56 – 10.27	<i>ns</i>
DERS (emotion regulation)	1.27	.37 – 4.37	<i>ns</i>

*Note:* The RSES and GSES are in the expected direction.

Table 23

*Hypothesis 1B: Admission Psychological Variables and Duration of Hospitalization (n = 33)*

Psychological Variable	OR	CI	<i>p</i>
RSES (self-esteem)	1.58	.99 – 2.51	.054
GSES (self-efficacy)	1.48	.73 – 3.03	<i>ns</i>
CAPS (perfectionism)	.91	.62 – 1.34	<i>ns</i>
ANSOCQ (readiness to change)	2.11	1.34 – 3.34	.001
DERS (emotion regulation)	.74	.43 – 1.27	<i>ns</i>
MAC-R (cognitive distortions)	.65	.39 – 1.10	<i>ns</i>

*Note:* All scores are in the expected direction.

Table 24

*Hypothesis 1B: Multivariate Cox Regression for Admission Variables and Duration of Hospitalization (n = 33)*

	OR	CI	<i>p</i>
Admit IBW	1.01	.96 – 1.06	<i>ns</i>
RSES (self-esteem)	1.35	.81 – 2.26	<i>ns</i>
ANSOCQ (readiness to change)	1.95	1.22 – 3.13	.005

*Note:* All scores are in the expected direction.



Table 25

*Hypothesis 2: Pairwise Comparisons of Psychological change from Admission to Discharge*

Psychological Variable	Admit		Discharge		Mean Difference	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
RSES (self-esteem)	1.56	.14	1.79	.13	-.23	<i>ns</i>
GSES (self-efficacy)	2.99	.10	3.06	.07	-.07	<i>ns</i>
CAPS (perfectionism)	3.68	.23	3.20	.23	.48	.01
ANSOCQ (readiness to change)	2.65	.18	3.92	.20	1.27	<.001
DERS (emotion regulation)	2.59	.13	2.35	.17	.24	<i>ns</i>
MAC-R (cognitive distortion)	3.03	.14	2.60	.16	.43	.03

*Note:* All changes in scores are in the expected direction.

Table 26

*Hypothesis 2: Repeated Measures MANOVA for Psychological Change from Admit to Discharge (n = 27)*

Multivariate Effects	Wilks' Lambda	<i>F</i>	<i>df</i>	<i>p</i>	$\eta_p^2$
<i>Within Subjects:</i>					
Time	.37	5.85	6	.001	.63
Univariate Effects		<i>F</i>	<i>df</i>	<i>p</i>	$\eta_p^2$
RSES (self-esteem)		2.4	1	<i>ns</i>	.08
GSES (self-efficacy)		.68	1	<i>ns</i>	.03
CAPS (perfectionism)		7.69	1	.01	.23
ANSOCQ (readiness to change)		31.58	1	<.001	.55
DERS (emotion regulation)		2.83	1	<i>ns</i>	.10
MAC-R (cognitive distortions)		5.30	1	.03	.17

*Note:* All scores are in the expected direction.

Table 27

*Hypothesis 3: Bivariate Pearson Correlations Between Change in Psychological Measures and Change in Ideal Body Weight*

Psychological Variable	Ideal Body Weight Residuals		
	n	Pearson r	<i>p</i>
RSES Residuals	27	.07	<i>ns</i>
GSES Residuals	27	-.02	<i>ns</i>
CAPS Residuals	28	.05	<i>ns</i>
ANSOCQ Residuals	28	.14	<i>ns</i>
DERS Residuals	27	-.25	<i>ns</i>
MAC-R Residuals	28	.14	<i>ns</i>

*Note:* Only the RSES, ANSOCQ, and DERS are in the expected direction.

### EXPLORATORY ANALYSES

Table 28

*One-way ANOVA of Psychological Variables and Percent Admission Ideal Body Weight (n = 30)*

Psychological Variable	Above Median		Below Median		<i>F</i>	<i>df</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
RSES (self-esteem)	1.61	.74	1.79	.77	.40	1	<i>ns</i>
GSES (self-efficacy)	2.91	.49	3.18	.41	2.53	1	<i>ns</i>
CAPS (perfectionism)	3.09	.94	3.15	.95	.03	1	<i>ns</i>
ANSOCQ (readiness to change)	2.70	.86	3.00	.87	.89	1	<i>ns</i>
DERS (emotion regulation)	2.54	.61	2.53	.76	.00	1	<i>ns</i>
MAC-R (cognitive distortions)	2.83	.75	2.87	.61	.02	1	<i>ns</i>

Table 29

*Bivariate Pearson Correlations Between Psychological Variables and Percent Admission Ideal Body Weight*

Psychological Variable	Percent of Ideal Body Weight at Admission		
	n	Pearson r	<i>p</i>
RSES (self-esteem)	31	.09	<i>ns</i>
GSES (self-efficacy)	31	.31	.09
CAPS (perfectionism)	31	.04	<i>ns</i>
ANSOCQ (readiness to change)	31	.31	.09
DERS (emotion regulation)	31	.03	<i>ns</i>
MAC-R (cognitive distortions)	30	-.06	<i>ns</i>

*Note:* Only the RSES, GSES, ANSOCQ, and MACR are in the expected direction.

Table 30

*Pairwise Comparisons of Psychological Change from Admit to 85 Percent Ideal Body Weight*

Psychological Variable	Admit		85 Percent IBW		Mean Difference	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
RSES (self-esteem)	1.66	.14	1.62	.11	.05	<i>ns</i>
GSES (self-efficacy)	3.02	.09	2.96	.09	.06	<i>ns</i>
CAPS (perfectionism)	3.10	.19	3.10	.19	-.01	<i>ns</i>
ANSOCQ (readiness to change)	2.77	.19	3.39	.20	-.62	.002
DERS (emotion regulation)	2.49	.13	2.51	.14	-.02	<i>ns</i>
MAC-R (cognitive distortion)	2.88	.14	2.86	.15	.02	<i>ns</i>

*Note:* Only the ANSOCQ and the MAC-R are in the expected direction.

Table 31

*Repeated Measures MANOVA for Psychological Change from Admit to 85 Percent Ideal Body Weight (n= 25)*

Multivariate Effects	Wilks' Lambda	<i>F</i>	<i>df</i>	<i>p</i>	$\eta_p^2$
<i>Within Subjects:</i>					
Time	.59	2.19	6	.09	.41
Univariate Effects		<i>F</i>	<i>df</i>	<i>p</i>	$\eta_p^2$
RSES (self-esteem)		.28	1	<i>ns</i>	.01
GSES (self-efficacy)		.86	1	<i>ns</i>	.04
CAPS (perfectionism)		.01	1	<i>ns</i>	.00
ANSOCQ (readiness to change)		10.49	1	.003	.30
DERS (emotion regulation)		.06	1	<i>ns</i>	.00
MAC-R (cognitive distortions)		.02	1	<i>ns</i>	.00

Table 32

*Stepwise Linear Regression for Subscales of the DERS and Length of Time to 85 Percent Ideal Body Weight*

DERS Subscale	$\beta$	S.E.	t	<i>p</i>
Emotion Clarity	3.83	1.27	3.02	.006

*Note:* The subscale score is in the expected direction.



Table 33

*Stepwise Linear Regression for Subscales of the ANSOCQ and Duration of Hospitalization (n = 33)*

ANSOCQ Subscale	$\beta$	S.E.	t	p
Ego Alien Aspects	-11.71	3.41	-3.44	.002

*Note:* The subscale score is in the expected direction.

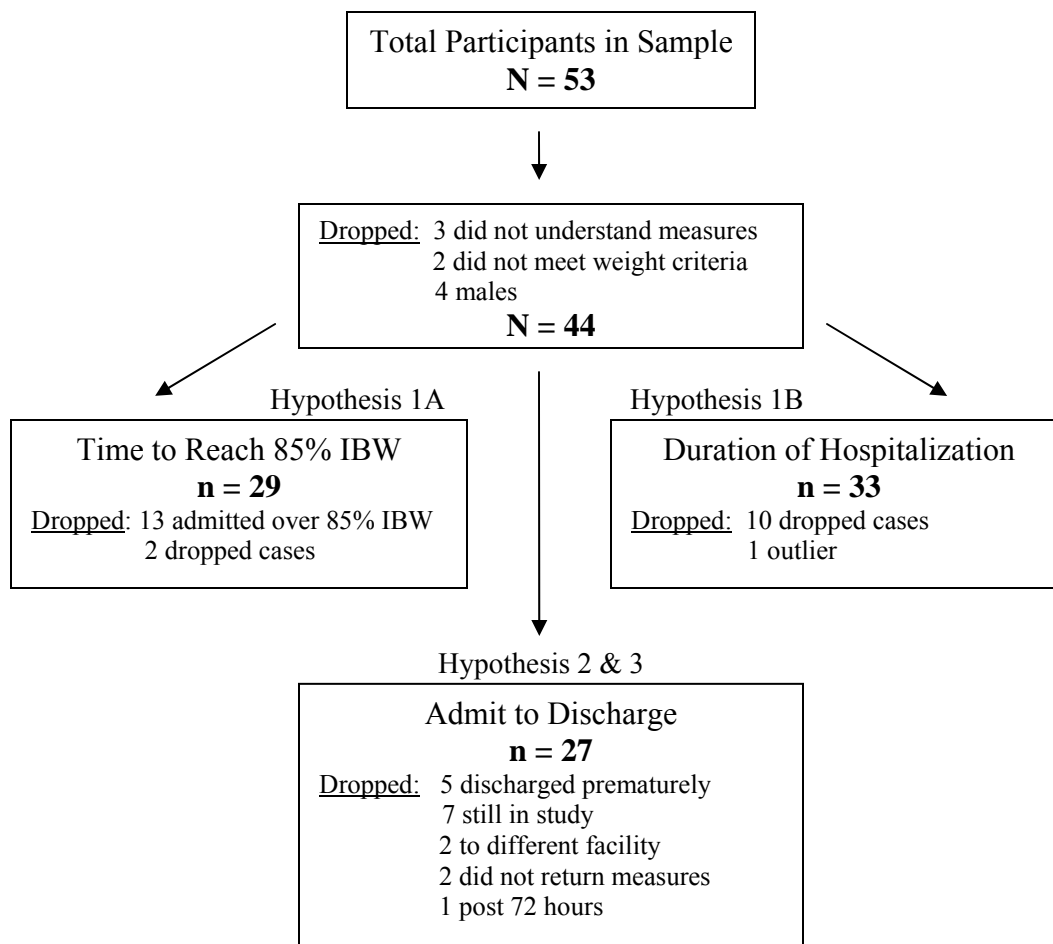
Table 34

*Stepwise Linear Regression for DERS Subscale and Duration of Hospitalization*

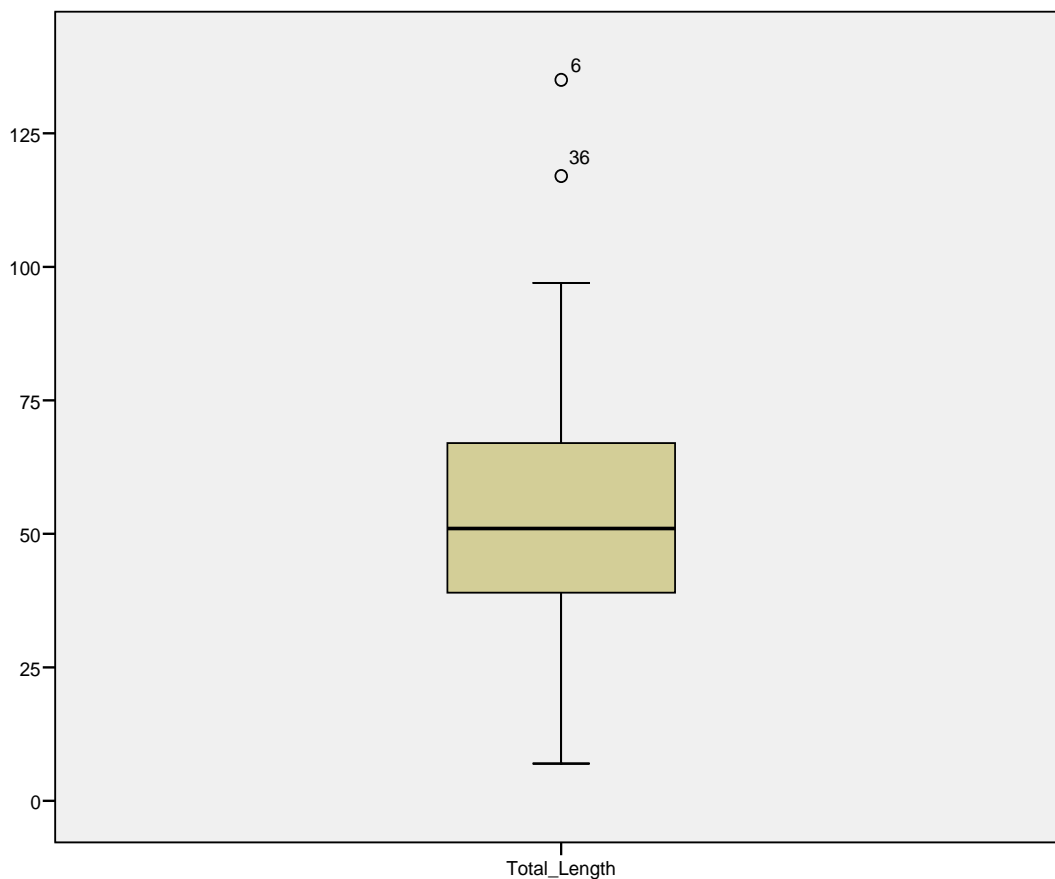
DERS Subscale	$\beta$	S.E.	t	p
Emotion Awareness	6.97	3.39	2.06	.05

*Note:* The subscale is in the expected direction.





**FIGURE 2.** Number of participants used in each hypothesis and reasons why participants were dropped from analyses.



**FIGURE 3. Boxplot showing outliers on length of hospital stay. The subject (#6) furthest from the mean was omitted when running the statistical analysis for Hypothesis 1B as her duration of hospitalization was three standard deviations from the mean of the sample.**

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