

MEDIATORS OF WEIGHT GAIN IN ACUTE TREATMENT  
OF PATIENTS WITH ANOREXIA NERVOSA

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*For my beloved husband and to the Lord who made all of this possible*

MEDIATORS OF WEIGHT GAIN IN ACUTE TREATMENT  
OF PATIENTS WITH ANOREXIA NERVOSA

by

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Anorexia Nervosa has been associated with low levels of readiness to recover since the earliest accounts of the disorder. Given the motivational deficiency and egosyntonic quality, anorexia nervosa is among the most difficult types of psychological disorders to treat. Recent empirical and theoretical investigations have focused on the long-term outcome of weight gain from readiness to change. However, few studies have analyzed the bidirectional

relationship of readiness to change and weight gain during the course of hospitalization. The aims of the present study were to analyze the short-term bidirectional relationship between readiness to change and weight gain at multiple time points during acute hospitalization, and to evaluate the influence of stronger cognitive distortions at admission on the relationship between recent weight gain and readiness to change. The sample consisted of 30 females and 3 males diagnosed with anorexia nervosa, bulimia nervosa, or eating disorder not otherwise specified, with weight below 93 percent of their healthy weight range, and who were admitted to an inpatient facility. At admission, the patients were administered self-report measures assessing readiness to change and cognitive distortions. Additionally, patients completed a self-report measure evaluating readiness to change every two weeks following admission. This study found that during the last weeks of hospitalization, readiness to change predicted weight gain one day following the completion of the self-report measure. However, despite the expectation that greater prior weight gain would predict lower readiness to change, no such relationship emerged. Additionally, the severity of cognitive distortions at admission was not found to predict a stronger negative relationship between prior weight gain and readiness to change. These results suggest that readiness to change can be utilized to predict short-term weight gain at multiple time points during the latter part of hospitalization for treatment of anorexia



nervosa. This information has implications for the clinical care of severely underweight patients with eating disorders

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## LIST OF ABBREVIATIONS

AN: Anorexia Nervosa

ANSOCQ: Anorexia Nervosa Stages of Change Questionnaire

BN: Bulimia Nervosa

MAC-R: Mizes Anorectic Cognition Scale-Revised



# **CHAPTER ONE**

## **INTRODUCTION**

### **Significance of the Problem**

Although anorexia nervosa (AN) was first described in medical literature over one hundred years ago (Lock & Gowers, 2005), it wasn't until the 1950's that the occurrence markedly increased (Polivy & Herman, 2002). With alarming psychological and medical consequences, anorexia nervosa continued to rise until the 1970's (Hoek & van Hoeken, 2003). Prevalence and incidence estimates vary largely due to the fact that only one third of the individuals with anorexia nervosa in the community seek mental health services. Epidemiologic studies yield a prevalence rate of .03 percent. Incidence rates of anorexia nervosa are the highest among females between the ages of 15 and 19, comprising of approximately 40 percent of all identified cases.

Individuals with anorexia nervosa account for less than one percent of the population, posing a challenge for risk factor and predictor outcome research (Bulik, Reba, Siega-Riz, & Reichborn-Kjennerud, 2005). However, recent research literature revealed body weight, amenorrhea, age of onset, duration of illness, duration and number of hospitalization, comorbid psychiatric disorders,

and psychological and social functioning were predictive of outcome (Tozzi, Sullivan, Fear, McKenzie, & Bulik, 2003). In contrast, Lock & Litt (2003) failed to find admission weight or length of initial hospital stay to be a predictor of improved outcomes. Similarly, a study by Castro-Fornieles and colleagues (2007) concluded that longer hospitalization does not prevent readmission or increase weight maintenance, and rapid weight restoration does not lead to poorer outcome. Although the majority of studies conclude there is a relationship between weight gain and treatment outcomes, a consistent relationship has not emerged due to methodological issues posed such as varying diagnostic criteria, inconsistent definitions of outcome, and variable follow-up periods (Pike, 1998).

Inpatient hospitalization may be medically necessary and perhaps lifesaving (Colton & Pistrang, 2004). Acute inpatient hospitalization is successful in managing the imminent physical danger and restoration of patients' weight (Fennig, Fennig, & Roe, 2002; Colton & Pistrang, 2004). However, relapse rates following treatment are a staggering 30 percent, suggesting weight restoration alone is not indicative of a full recovery (Strober, Freeman, & Morrell, 1997). Current research posits that psychological and physical symptoms do not remit simultaneously (Clausen, 2004; Hetrick, 2006). Clausen (2004) in a recent study

found cognitive symptoms including body perception, fear of gaining weight, and obsession with shape and weight remit secondary to weight restoration.

Similarly, Hetrick (2006) concluded that although weight and eating attitudes (in relation to current eating behaviors) appear to improve significantly over the course of hospitalization, pathological eating cognitions (i.e., general worldviews about food, weight, and eating habits) do not improve and continue to remain extremely unhealthy at discharge.

The core cognitive distortions that underlie restricted eating in underweight patients do not dramatically change over the course of hospitalization, despite weight gain (Clausen, 2004). The construct “motivation to change” has been conceptualized as an important factor in entrenched and difficult to change behaviors, such as those in drug addiction (Prochaska, DiClemente, & Norcross, 1992). With the onset of anorexia nervosa occurring during adolescence, research within the pediatric population is needed to examine psychological variables, specifically readiness to change, and its influence on weight gain during hospitalization. The primary purpose of this study was to assess the bidirectional relationship of the psychological variable motivation to change, and weight gain in adolescents with anorexia nervosa. Knowledge regarding the relationship between fluctuations in motivation to change and

weight gain would inform inpatient treatment strategies to reduce the length of hospitalization, and outpatient treatment when maintenance of weight gain is frequently difficult.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **Background**

##### ***Diagnosing Anorexia Nervosa***

The Diagnostic and Statistical Manual Fourth Edition (DSM-IV) postulates that to attain a diagnosis of anorexia nervosa, the individual must meet the four following criteria: 1) refusal to maintain a body weight above 85 percent of expected weight, 2) intense fear of gaining weight or becoming fat, 3) distorted perception of one's body weight or shape, or denial of the seriousness of the current low body weight, and 4) in post menarcheal females, amenorrhea (American Psychiatric Association, 2000). A restricting subtype or binge-eating/purging subtype can be used to specify the absence or presence of regular binge eating or purging.

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

Although rare in the general population, eating disorders are widespread among adolescent girls and young women (Hoek & van Hoeken, 2003). An upward trend in the incidence of anorexia nervosa has been observed among

females 15 to 24 years of age from 1935 to 1989. Additionally, incidence rates among girls 10 to 14 years of age have been on the rise since the 1950's. The incidence of anorexia nervosa is the highest among females aged 15 to 19 years, comprising 40 percent of all identified cases (Lucas, Crowson, O' Fallon, & Melton, 1999). Hoek and van Hoeken (2003) reported the average prevalence of anorexia nervosa to be 0.3 percent among young females and the overall incidence of AN to be 8 per 100,000 population per year. However, the incidence of anorexia nervosa among young males appears less common, with rates below 1.0 per 100,000 populations per year (Lucas, Crowson, O' Fallon, & Melton, 1999).

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

Although the precise etiology of anorexia nervosa is unknown, three theories have emerged: sociocultural, family, and individual personality characteristics (Tozzi, Sullivan, Fear, McKenzie, & Bulik, 2003). Sociocultural theories emphasize the pressure in Western societies on young females to be thin. The pressure to be thin forces many young women to diet. Research has indicated dieting is the most important predictor of the development of an eating disorder in

young females (Maxmen & Ward, 1986/1995; Tozzi, Sullivan, Fear, McKenzie, & Bulik, 2003).

Studies have shown very high heritability coefficients indicating the influence of genetic factors to eating disorders; however the evidence is inconclusive (Polivy & Herman, 2002). Anorectic females have been observed to be more likely to have family members with anorexia nervosa or issues regarding weight, and other psychiatric disorders (i.e., depression or anxiety disorders) (Tozzi, Sullivan, Fear, McKenzie, & Bulik, 2003). Familial interactional patterns including rigidity, overprotectiveness, enmeshment, excessive control, and marital discord have been implicated in anorectic families. Individual personality characteristics such as perfectionism, obsessionality, excessive compliance, and low self-esteem have also been found to contribute to anorexia nervosa (Fairburn, Cooper, Doll, & Welch, 1999).

### ***Psychiatric Comorbidity***

Anorexia Nervosa has been associated with depressive symptoms such as depressed mood, social withdrawal, and irritability (American Psychiatric Association, 2000). These symptoms may remit after partial or complete weight restoration. Major depression disorder is the most commonly diagnosed

comorbid disorder among individuals with anorexia nervosa (Herzog, Keller, N. R., C. J., & Lavori, 1992). A sample of women with anorexia nervosa revealed a depression comorbid rate of 86 percent (O'Brien & Vincent, 2003). In addition, obsessive compulsive disorder has been associated with anorexia nervosa. Most anorectics are preoccupied with thoughts of food. The obsessions or compulsions individuals with anorexia nervosa experience related to food may be caused by under nutrition. Research findings show that when obsessive compulsive disorder (OCD) is present in individuals with anorexia nervosa, most individuals report the onset of OCD to have occurred prior to their anorexia. Abuse of drugs such as laxatives, diet pills, and diuretics is common among females with anorexia nervosa. These drugs are commonly used with the primary purpose for weight control.

### ***Medical Complications***

Anorexia nervosa (AN) is a life threatening disease with a mortality rate estimated to be 5 percent per decade due to suicide or medical complications secondary to the disorder (Bulik, Reba, Siega-Riz, & Reichborn-Kjennerud, 2005). The vast majority of anorectic individuals experience starvation which can affect every organ system, result in anemia, cause cardiovascular problems,



osteoporosis, irreversible linear growth, and structural and functional brain damage (Katzman, 2005). The most commonly reported cardiovascular complications present among adolescents with anorexia nervosa are electrocardiographic abnormalities. Sinus bradycardia, a type of electrocardiographic abnormality, is reported to be present in 35 to 95 percent of adolescents with anorexia nervosa and is caused by decreased metabolic rate and increased vagal tone. Orthostatic heart rate and blood pressure changes are also common among adolescents with anorexia nervosa. In severely malnourished anorectics, refeeding syndrome is a particular concern and is associated with significant morbidity and mortality.

### ***Transtheoretical Theory***

The transtheoretical model of stages of change offers a framework for conceptualizing readiness to change in treatment resistant individuals, such as those with anorexia nervosa. The concept of stages of change was developed in efforts to explain what processes individuals utilize to change their maladaptive behavior (Prochaska & DiClemente, 1982). The transtheoretical model assumes that individuals regress at times as well as progress through the different stages, representing a cyclical rather than a linear sequence. Individuals move through a

series of stages during the course of change: Pre-Contemplation (unaware or under aware of their problem regardless of others recognizing them as having a problem), Contemplation (aware a problem exists and begin to contemplate changing behavior), Preparation (determined to change their behavior), Action (actively changing their maladaptive behavior), and Maintenance (maintaining their changed behaviors) (Prochaska, DiClemente, & Norcross, 1992). A precontemplator is either unaware of the consequences of his or her behavior, or resists recognizing that he or she has a problem (Prochaska & DiClemente, 1982). As long as the individual remains in the pre-contemplation stage, his or her behavior is unlikely to change. For individuals in the maintenance stage, the risk of relapse remains real; anxiety and stress may be present as they attempt to maintain their change.

Researchers have attempted to investigate what processes influence individuals to begin contemplating changing their behaviors (Prochaska, DiClemente, & Norcross, 1992). Studies reveal that individuals begin to contemplate changing behaviors when aspects of their internal development or environment change. Those that do not respond to environmental or internal changes utilize selective processing of information and become defensive. Research studies have investigated the variables related to successful maintenance

of changed behaviors and found that the more effective an individual viewed his or her self in dealing with external and internal pressures, the more likely the individual was to resist relapse. Successful change must include restructuring of both patterns of behavior and key cognitions.

The application of the stages of change model is useful in motivational deficient disorders and has been increasingly utilized to investigate the role of readiness to change in those with anorexia nervosa (Touyz, Thornton, Rieger, George, & Beumont, 2003). Individuals with eating disorders have been shown to use change strategies that correspond to their stage of change. One study found individuals who were classified in the action stage made more improvements to their binge eating symptoms than those individuals in the contemplation stage (Treasure et al., 1999). High levels of readiness to change have been found to be associated with positive behavioral change and favorable short-term outcome in patients with anorexia nervosa (McHugh, 2007). In fact, a study by Castro-Fornieles and colleagues (2007) found motivation to change to be the variable that best predicts weight maintenance in adolescents with anorexia nervosa. Despite the recent interest and application of readiness to change among individuals with anorexia nervosa, very few studies have analyzed this variable in relation to short-term weight gain. In particular, it is possible that there is a bidirectional

relationship between readiness to change and weight gain. Knowledge regarding the relationship between fluctuations in readiness to change and weight gain would inform treatment providers of strategies to reduce the length of hospitalization and improve long-term outcomes where maintenance of weight is frequently difficult to achieve.

## **Treatment of Anorexia Nervosa**

### ***Recovery from Anorexia Nervosa***

The ability to treat anorexia nervosa effectively remains tenuous, with the average length patients seek treatment being 5 years (Tozzi, Sullivan, Fear, McKenzie, & Bulik, 2003). Predictors of outcome include low body mass index at admission and discharge, age of onset and duration of illness, comorbid psychiatric disorders, psychological factors (such as abnormal eating attitudes, resistance to weight gain, and low motivation to change), and duration and number of hospitalizations (Howard, Evans, Quintero-Howard, Bowers, & Andersen, 1999; Baran, Weltzin, & Kaye, 1995; Castro-Fornieles et al., 2007). Lock and Litt (2003) examined outcomes of adolescents with anorexia nervosa at one year after discharge and found that weight recovery of 85 percent of their ideal body weight at discharge predicted better outcomes at 12 months. Baran and colleagues (1995) found individuals with anorexia nervosa who were discharged while still severely underweight experienced higher re-hospitalization rates compared to those who achieved normal body weight prior to discharge. Of those 30 to 50 percent of individuals that relapse, most do so during the first 1 to 2 years after treatment (Ecker, Halmi, Marchi, Grove, & Crosby R, 1995; Pike, 1998).

Recovery is the most frequently reported outcome in studies of anorexia nervosa with rates varying 0 to 92 percent (Herzog, Keller, & Lavori, 1992). Most studies suggesting a recovery rate of 50 to 70 percent (Pike, 1998). Patients with a history of anorexia nervosa, even if recovered, maintain characteristics such as perfectionism and cognitive restraint, and continue to retain a body mass index below the population (Tozzi, Sullivan, Fear, McKenzie, & Bulik, 2003; Couturier & Lock, 2006). During hospitalization for anorexia nervosa, Castro-Fornieles and colleagues (2007) found that inpatients hospitalized for anorexia nervosa improved in body mass index, eating attitudes, depressive symptoms, and motivation to change.

## **CHAPTER THREE**

### **RATIONALE, AIMS, AND HYPHOSSES**

#### **Rationale and Aims**

Weight gain is an important goal in the treatment of patients with anorexia nervosa. Under structured conditions such as inpatient hospitalization, most anorexic patients do gain weight. However, few studies have analyzed the psychological variables that might influence weight gain during the course of inpatient hospitalization. The core cognitive distortions that underlie restricted eating in underweight patients do not dramatically change over the course of hospitalization, despite weight gain (Clausen, 2004). The construct “motivation to change” has been conceptualized as an important factor in entrenched and difficult to change behaviors, such as those in drug addiction (Prochaska, DiClemente, & Norcross, 1992). The primary purpose of the current study was to assess whether the psychological variable, motivation to change, influences and is influenced by weight gain in adolescents with anorexia nervosa. Knowledge regarding the relationship between fluctuations in motivation to change and weight gain would inform inpatient treatment strategies to reduce the length of hospitalization, and outpatient treatment when maintenance of weight gain is frequently difficult.

1. The primary aim of this study was to examine the bidirectional relationship between weight gain/calories consumed, and patients' readiness to change.
2. The secondary aim was to examine whether patients who exhibit more anorectic cognitions and pathological eating attitudes associated with weight restriction at admission show different patterns in the relationship between readiness to change and weight gain.



### **Hypotheses**

1. Patients, who express greater readiness to gain weight will gain more weight (and consume more calories) in the next two days compared to those who express lower readiness to gain weight. By corollary, patients who express a lower readiness to change will gain less weight the following two days in contrast to those who expressed greater readiness to change.
2. Weight gain will negatively influence readiness to change. Large weight increases in the two days prior to the assessment will be associated with decreased readiness to change.
3. Patients with more cognitive distortions at baseline will show a stronger negative relationship between previous weight gain and readiness to change than those with less cognitive distortions.

## **CHAPTER FOUR**

### **METHODOLOGY**

#### **Participants**

The study included 38 participants who were admitted to inpatient or partial hospitalization at Children's Medical Center, for the treatment of Anorexia Nervosa, Bulimia Nervosa, or Eating Disorder Not Otherwise Specified. This study was approved by the Institutional Review Board of the University of Texas Southwestern Medical Center at Dallas with the title "Psychological Variables Involved in the Rapidity of Weight Gain in Children and Adolescents with Eating Disorders."

#### **Inclusion Criteria**

1. Participants must have been between the ages of 12 and 18 years of age at the time of hospital admission.
2. Participants must have been living with at least one parent or legal guardian who could provide consent for his or her child to participate in the study.
3. Participants and one parent or legal guardian must have had adequate English language skills.

4. Participants must have had a primary DSM-IV diagnosis of Anorexia Nervosa, Bulimia Nervosa, or Eating Disorder Not Otherwise Specified at the time of admission to the psychiatric unit. Patients with the primary diagnosis of bulimia nervosa must have been admitted to the unit with a treatment goal of weight gain.

#### Exclusion Criteria

1. Patients were excluded from this study if they had a diagnosis of a psychotic disorder or Conversion Disorder.
2. Patients who had below normal intellectual functioning (i.e., IQ lower than 80) as clinically assessed by the patient's history provided by the primary caregiver, observations, or intellectual testing were excluded from this study.

## **Setting**

The Center for Pediatric Psychiatry at Children's Medical Center offers a multidisciplinary team consisting of psychiatrists, psychologists, family therapists, nurses, dieticians, teachers, and milieu therapists. The multidisciplinary team assesses children for a variety of psychiatric disorders. Children's Medical Center offers a continuum of services that allows the patient to be admitted at the least restrictive level of care necessary. The treatment levels provided are: outpatient, intensive outpatient, day treatment, partial hospitalization, and inpatient hospitalization. Recruited participants for this study were seeking inpatient or partial hospitalization and had a goal of weight restoration.

The eating disorder program at the Center for Pediatric Psychiatry is structured to help patients with normalization of eating attitudes and behaviors, gradual weight restoration, stabilization of weight once in a healthy weight range, and resolution of distorted cognitions. Patients engage in individual, group and family psychotherapy, nutrition counseling, and medical management. Cognitive-behavioral strategies are used in therapy to help patients identify and improve maladaptive behaviors and cognitive distortions. In addition to family therapy, family members' participation is encouraged in meal education sessions, during

which they learn techniques for modeling and monitoring healthy eating habits while maintaining appropriate social interactions.

Structure and support is provided by the program with the utilization of a point system. Patients are assigned three individualized goals each morning and are encouraged to practice and/or achieve each of these throughout the day. Typical behavioral goals for patients in the eating disorder program are meal plan, ask for support, identify and express feelings, take care of self, and coping plan. Coping plans include identifying triggers commonly experienced by the individual in regards to his or her eating disorder, the steps taken to address the behavior caused by these triggers, and implementing appropriate distractions. The total points earned for the assigned daily goals determine the activities and privileges the patient will have the opportunity to participate in the following day.

All patients in the eating disorder program are assigned an individualized meal plan and are expected to consume three snacks and three meals daily. Caloric intake requirements are evenly distributed throughout the day and increase over the course of treatment approximately 50 to 200 calories per day. Multiple factors determine caloric levels such as the patient's weight prior to admission, activity levels, level of care, and ability to meet the assigned caloric goal. Healthy weight ranges are assigned to each patient in the program by the multidisciplinary team and are formulated based on age, height, and current

weight. The low end of the healthy weight range is attained when the patients obtain 93 percent of their ideal body weight. In consideration of the program's goal of normalizing eating attitudes and behaviors, patients are not given a numeric weight goal due to the tendency for individuals with eating disorders to become preoccupied with numbers.

## **Design and Procedure**

Patients were recruited upon admission to the Center for Pediatric Eating Disorder at Children's Medical Center. All patients in the study were undergoing inpatient or partial hospitalization for their eating disorder. Eligible patients and their guardians were notified by their treatment team within 72 hours of admission about the study. The eligible patient and guardian were asked if they would be interested in learning more about the study. If the family expresses a desire to learn more, the treatment team provided the researcher with the patient's name and a time was scheduled to inform the patient and parent/guardian about the study.

While obtaining consent, the researcher explained the purpose, procedures, possible risks and benefits, and the confidentiality involved in the study. Patients were informed that the participation in the study would not alter their treatment in any way. At the time of consent, patients and their guardians were given the opportunity to ask questions. Patients were also informed that he or she may withdraw from the study at any time. All aspects of the study were understood by participants and their guardians before they were consented to the study. The patients and their guardians who voluntarily chose to participate in the study signed an informed consent (See Appendix A) and a HIPAA Authorization

form (See Appendix B). All original consents were retained at UT Southwestern Medical Center, and a signed copy of the consent was given to the patient's guardian. The following demographic variables were attained from patients' medical record: age, gender, date of birth, ethnicity, date of admission and discharge, height, weight and prior psychiatric hospital admissions.

Patients were asked to complete the Anorexia Nervosa Stages of Change Questionnaire (ANSOCQ) within 72 hours of admission, and then every one to two weeks following admission until discharged from the hospital. The Mizes Anorectic Questionnaire-Revised (MAC-R) was administered at admission as a part of the patients' standard clinical care. Each patient was weighed daily in the morning after he or she micturated. At the time of discharge, the patient's weights during hospitalization were obtained from the patient's medical record. All data and indentifying information was retained in a locked file within a locked room at the University of Texas Southwestern Medical Center, Psychology Division.



## Measures

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

The Anorexia Nervosa Stages of Change Questionnaire (ANSOCQ) is a 20-item self-report questionnaire that evaluates readiness to recover in individuals with anorexia nervosa (Rieger et al., 2000; Rieger, Touyz, & Beumont, 2002). Based on Prochaska and DiClemente's Transtheoretical Model, the ANSOCQ addresses core properties of anorexia nervosa including weight and body shape, eating behaviors, weight control strategies, and emotional and interpersonal difficulties. Individuals are asked to choose the statement (or statements) that they feel best reflects their current attitudes and behavior, which represents their overall level of readiness to change: pre-contemplation, contemplation, preparation, action, and maintenance. Total item scores on the ANSOCQ range from 20 to 100, with higher scores indicating a greater level of motivation. The ANSOCQ generates three subscales of motivation to recover in anorexia nervosa: Weight Gain (motivation to achieve a normal body weight), Eating, Shape and Weight Concerns (motivation to change preoccupations with eating, shape, and weight), and Ego-Alien Aspects (motivation to improve interpersonal and emotional difficulties) (Rieger & Touyz, 2006). Research of the ANSOCQ has demonstrated good internal consistency (0.90) and test-retest reliability (0.89).

***Mizes Anorectic Cognition-Revised (MAC-R)***

The 24-item Mizes Anorectic Cognitions Scale-Revised (MAC-R) assesses the dysfunctional cognitions that have been shown as the core psychopathology of eating disorders (Mizes, 2000). The self-report questionnaire is a revised version of the 33-item Mizes Anorectic Cognitions Scale and measures three domains of eating disorder cognitions: strict weight regulation and fear of weight gain, self-control as the basis of self-esteem, and weight and eating behavior as the basis of approval (Mizes, 1990; Mizes, 1992). The MAC-R is written at a sixth grade level and is appropriate for individuals in middle school through adulthood (Mizes, 2000). The items are rated on a five-point Likert scale with higher scores indicative of more severe levels of eating disorder cognitions (Mizes, 2004). Internal consistency was demonstrated with Cronbach's alpha of 0.90 for the total score, 0.85 for the approval subscale, 0.84 for the self-control subscale, and 0.82 for the rigid weight regulation subscale (Mizes, 2000). The instrument revealed concurrent validity when correlated with the Eating Disorder Inventory ( $r=0.69$ ) and the Restraint Scale ( $r=0.62$ ).

***Weight Gain***

All patients were weighed daily in the morning after he or she micturated, as a part of the psychiatry unit's clinical care.

## **Statistical Methods**

The assumptions for each statistical analysis were assessed to ensure that the assumptions of these statistics were fulfilled. Graphs of residuals were examined to determine that there was normal distribution and no outliers were present. A mixed effects analysis (SAS PROC Mixed) was used for all hypotheses and exploratory analyses. Covariates of age, weight at admission, and readiness to change at admission were included in all analyses. Descriptive statistics for the Anorexia Nervosa Stages of Change Questionnaire (ANSOCQ) and the Mizes Anorectic Scale-Revised Questionnaire (MAC-R) at admission were examined. On the ANSOCQ, two sample *t*-tests were conducted to compare the current sample admission mean scores to the mean admission scores of a clinical sample of 115 inpatients (Rieger & Touyz, 2006). The MAC-R mean admission scores could not be compared to another sample, as no normative data have been published.

## **CHAPTER FIVE**

### **RESULTS**

#### **Description of the Sample**

##### ***Demographic and Illness Variables***

A total of 38 consecutive patients were approached and consented to participate in the study at the time of admission into the Children's Medical Center Psychiatric Inpatient unit. Of these patients, two participants reported that they did not understand the questions comprising the Anorexia Nervosa Stages of Change Questionnaire and Mizes Anorectic Scale-Revised Questionnaire, one participant was found to be in his/her healthy weight range after being consented, and two participants were discharged from the unit precipitously with no post-baseline data. These five participants were excluded, while the remaining 33 patients were included in the statistical analyses.

A summary of demographic variables (age, percent of ideal body weight, length of treatment, and weekly weights from weeks 1 to 6) are provided in Appendix E, Tables 1-3. Additionally, frequency tables detailing specific DSM-IV eating disorder and comorbid diagnoses, parental education, and insurance coverage are provided in Appendix E, Tables 4-6.

### ***Descriptive Statistics***

A summary of descriptive statistics for the Anorexia Nervosa Stages of Change Questionnaire (ANSOCQ) and the Mizes Anorectic Scale-Revised Questionnaire (MAC-R) at admission are provided in Appendix E, Tables 7 and 9. Additionally, weekly ANSOCQ total and Weight Gain subscale mean scores from admission to week six are displayed in Appendix E, Table 8. Please refer to the footnote on Tables 7 and 8 for the stages of change yielded by the mean ANSOCQ scores. Mean admission scores of the ANSOCQ were compared by two sample *t*-tests to the mean scores of an eating disorder sample of 115 inpatients (Rieger & Touyz, 2006). As seen in Appendix E, Table 10, the Weight Gain subscale was significantly higher in the current sample, though there were no significant differences found between other subscales or the total score. Given the absence of normative data, MAC-R admission scores could not be compared to another sample.

### **Statistical Analyses**

***Hypothesis One: Readiness to Change as a Predictor of Weight Gain***

*Patients, who express greater readiness to change as measured by the Anorexia Nervosa Stages of Change Questionnaire (ANSOCQ), will gain more weight in the next two days compared to those who express lower readiness to change. By corollary, patients who express a lower readiness to change will gain less weight the following two days in contrast to those who expressed greater readiness to change.*

To evaluate the influence of readiness to change on weight gain during the first six weeks of hospitalization, a mixed effects analysis (SAS PROC Mixed) was performed using weight gain two days following the administration of the ANSOCQ as the outcome variable, and the ANSOCQ total score as the predictor variable. Covariates included age, weight at admission, and readiness to change at admission. Readiness to change was not a significant predictor of weight gain two days following the administration of the ANSOCQ (Table 11). This analysis was repeated with weight gain over the first four weeks of hospitalization instead of the first 6 weeks. Similarly, there was no significant prediction from readiness to change (Table 12).

The mixed effects analysis was repeated with a) weight gain one day following the administration of the ANSOCQ, b) weight gain one week following the administration of the ANSOCQ, and c) weight gain two weeks following the administration of the ANSOCQ serving as the outcome variable. However, none

of these analyses yielded a significant prediction from readiness to change to weight gain (Tables 11 and 12).

The Anorexia Nervosa Stages of Change Questionnaire (ANSOCQ) includes a number of items unrelated to weight gain. Therefore, a mixed effects analysis was performed using the Weight Gain subscale score of ANSCOQ during the first six weeks of hospitalization and the Weight Gain subscale score of ANSCOQ score during the first four weeks of hospitalization as the predictor. The outcome variables in the analyses were a) weight gain two days following the administration of the ANSOCQ, b) weight gain one day following the administration of the ANSOCQ, c) weight gain one week following the administration of the ANSOCQ, and d) weight gain two weeks following the administration of the ANSOCQ (Tables 13 and 14). The Weight Gain subscale score of the ANSOCQ over the first six weeks of hospitalization trended toward significance as a predictor of weight gain one day following the administration of the ANSOCQ at  $p < .10$  (Table 13).

***Hypothesis Two: Weight Gain as a Predictor of Readiness to Change***

*Patients with greater weight increases in the two days prior to the administration of the Anorexia Nervosa Stages of Change Questionnaire will express a lower readiness to change (as measured by the ANSOCQ).*



The effect of weight gain on readiness to change during the first six weeks of hospitalization was assessed by a mixed effects analysis (SAS PROC Mixed) with a) ANSOCQ total score, and b) Weight Gain subscale score as the outcome variable, and weight gain two days prior to the administration of the ANSOCQ as the predictor. Covariates included age, weight at admission, and readiness to change at admission. As seen in Tables 15 and 17, weight gain two days prior to the administration of the ANSOCQ did not significantly predict readiness to change total score or the Weight Gain subscale. These analyses were repeated examining readiness to change over the first four weeks of hospitalization, but there was no significant prediction from weight gain (Tables 16 and 18).

A mixed effects analysis was also conducted using weight gain one day prior to the administration of the ANSOCQ over the first six weeks and four weeks of hospitalization as the predictor. However, none of these analyses yielded a significant prediction from weight gain to readiness to change (Tables 15-18).

***Hypothesis Three: Cognitive Distortions as a Predictor of Stronger Relationship***

*Patients with greater cognitive distortions at admission, as measured by the Mizes Anorectic Scale-Revised Questionnaire (MAC-R), will show a stronger relationship between weight gain in the two days prior to the administration of the Anorexia Nervosa Stages of Change Questionnaire (ANSOCQ) and lower*

*readiness to change (as measured by the ANSOCQ) than those with less cognitive distortions at admission.*

To determine the influence of greater cognitive distortions on the relationship between previous weight gain and readiness to change over the first six weeks of hospitalization, a mixed effects analysis (SAS PROC Mixed) was performed with a) ANSOCQ total score, and b) Weight Gain subscale score as the outcome variable, and weight gain two days prior to the administration of the ANSOCQ as the predictor. Covariates included age, weight at admission, and readiness to change at admission. The median MAC-R score at admission of 2.9 served to differentiate between the patients with greater and less cognitive distortions. Patients with MAC-R scores equal to or above the median were categorized as those with severe cognitive distortions, and patients with MAC-R scores below the median were deemed to have less cognitive distortions at admission.

Patients with severe cognitive distortions at admission did not demonstrate a significant negative relationship between weight gain in the two days prior to the administration of the ANSOCQ and readiness to change, as measured by the ANSOCQ total score (Table 21). Additionally, a significant negative relationship was not found between weight gain in the two days prior to the administration of the ANSOCQ and the Weight Gain subscale for those with severe cognitive distortions at admission (Table 22). Patients with less cognitive distortions also

failed to show a significant negative relationship between weight gain two days before the administration of the ANSOCQ and readiness to change, as measured by the ANSOCQ total score and the Weight Gain subscale (Tables 19-20). Given the lack of a negative relationship found between these two variables in both groups of patients, a stronger relationship for those with severe cognitive distortions was not found. When these analyses were repeated with weight gain one day prior to the administration of the ANSOCQ as the independent variable, none yielded a significant relationship (Tables 19-22). The influence of prior weight gain (i.e., one and two days before the ANSOCQ) on readiness to change (i.e., ANSOCQ total and Weight Gain subscale) was not significantly different between patients with greater and less cognitive distortions.

## **Exploratory Analyses**

Given the limited findings of the bidirectional relationship between readiness to change and weight gain, exploratory analyses were conducted to further evaluate the data gathered from the study. Mean weekly readiness to change scores were examined to investigate whether there is a period of time during hospitalization that patients express a change (i.e., greater or lower scores) in readiness to change. Results in Table 8 reveal a trend in increasing scores of readiness to change until week 4 of hospitalization. At week 4, readiness to change, as measured by the ANSOCQ total and Weight Gain subscale, begins to decrease. In terms of stages of change, the mean ANSOCQ total score in week 3 shows patients are in the Action stage, but the following week patients drop back into the previous stage of Preparation. However, by week 5 of hospitalization patients' readiness to change begins to increase again, similar to the trend of increase in scores during weeks 1 to 3. To examine whether the relationship between readiness to change and weight gain is influenced by this decrease in readiness to change from week 3 to week 4, a mixed effects analysis (SAS PROC Mixed) was conducted using data from weeks 4 to 6 of hospitalization. Covariates included age, weight at admission, and readiness to change at admission. As seen in Tables 23 and 24, the ANSOCQ total score and the Weight

Gain subscale significantly predicted weight gain one day following the administration of the ANSOCQ.

In addition to evaluating this information at a micro-level, an analysis was performed to examine the stability of the ANSOCQ over a longer length of time during hospitalization. A bivariate correlation was conducted to evaluate the relationship between admission ANSOCQ total score and ANSOCQ total score at week 6 of hospitalization. Results revealed no significant correlations between these two variables (Table 25). The same analysis was performed with admission Weight Gain subscale and Weight Gain subscale at week 6 of hospitalization. Similarly, no significant relationship was found (Table 26).

## **CHAPTER SIX**

### **DISCUSSION**

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

The present study was designed to evaluate the bidirectional relationship between readiness to change and weight gain within a sample of adolescents hospitalized for Anorexia Nervosa. Although current ED literature indicates a relationship between readiness to change and weight gain, the bidirectional relationship of these two variables has yet to be examined. Additionally, the existing literature appears to focus on the evaluation of the long-term outcome (i.e., from admission to discharge) of weight gain from readiness to change. As such, the first aim of the current study was to analyze the bidirectional relationship between readiness to change and weight gain at multiple time points during acute hospitalization. The second aim of this study was to evaluate the influence of stronger cognitive distortions at admission on the relationship between previous weight gain and readiness to change.

### ***Readiness to Change as a Predictor of Weight Gain***

The first hypothesis posited that patients who express greater readiness to change will gain more weight compared to those who express lower readiness to change. Although this hypothesis was not supported, greater readiness to change (as measured by the Weight Gain subscale) predicted at trend level weight gain one day following the administration of the ANSOCQ during the first six weeks of hospitalization. Given the small sample size of the study, the absence of finding on this hypothesis may be related to power.

This finding is not consistent with a previous study that found readiness to change predicted weight gain during the first four weeks of hospitalization (Rieger et al., 2000). Differences between these results may be explained by the time points between measures. This study examined multiple time point observations over several weeks rather than investigating a single observation from admission to four weeks of hospitalization. Additionally, this difference might be explained by the ages of participants used in the studies. Though this study involved participants aged 12 to 18, research by Rieger (2000) included participants ranging from ages 14 to 37. It is possible that adolescent participants exhibit a mood labile and unstable level of readiness to change. Frequent fluctuation in the level of readiness to change possibly observed in adolescents with AN may make it difficult to accurately measure their readiness to recover.

On the other hand, these results may reflect the role of calorie control during the hospitalization. Weight gain may not be primarily controlled by the patient but instead determined by the required caloric consumption given by the treatment team. Because rapid weight gain may be a health hazard for patients who have been on starvation diets, calories allowed for consumption are controlled during the early part of hospitalization. For patients who are unable to consume their required caloric amount, support may be provided by means of a nasogastric tube. Thus, whether patients consume calories willingly or if they are supported by means of a nasogastric tube, weight gain is still achieved in a standardized fashion in the early weeks of hospitalization. Alternatively, it is possible that patients willingly gain weight in the short term with the intention of “getting out” of the hospital more quickly, and regaining control of their weight. As a result, all patients would be expected to show weight increases capped by the amount of calories they are given, without reflecting their desire (or absence of desire) to recover from their eating disorder. Perhaps it would be more advantageous for researchers to evaluate the amount of calories consumed by patients rather than the amount of weight gain. Metabolism rates and the percent of ideal body weight at admit differed across patients in this study. These variables likely influence weight gain during hospitalization and may obscure the relationship between readiness to change and weight gain in this study. To



enhance the detection of this relationship, the amount of calories consumed should be assessed at multiple time points during hospitalization.

### ***Weight Gain as a Predictor of Readiness to Change***

The second hypothesis theorized that patients with greater weight gain prior to the administration of the ANSOCQ will express lower readiness to change. The present study failed to find a significant relationship between greater weight increases and lower readiness to change.

In retrospect, the hypothesis that weight change would *decrease* future readiness to change may not accurately depict the process over the course of hospitalization. However, it is possible that a negative relationship would exist during the first few weeks of treatment as patients' stage of change reflects an unwillingness to actively change their maladaptive behaviors. Or it may reflect the possibility that by the time an individual with an eating disorder becomes an inpatient s/he might have some motivation to increase her own weight.

Individuals with eating disorders have been shown to use change strategies that correspond to their stage of change (Touyz, Thornton, Rieger, George, & Beumont, 2003). Surprisingly, patients in this study were in the Preparation stage and were aware that they had a problem with eating and indicated some readiness to change their maladaptive behaviors at the time of admission (Table 8).

Furthermore, it is likely that patients' psychological improvement and increased

readiness to change during hospitalization resulted in less resistance to weight gain. As patients progressed from the Preparation stage to the Action stage, meaning they were actively changing and engaging in new, non-eating disordered behaviors, weight gain may be seen increasingly as a positive rather than a negative event.

### ***Cognitive Distortions as a Predictor of Stronger Relationship***

The final hypothesis posited that patients with severe cognitive distortions at admission will show a stronger relationship between previous weight gain and lower readiness to change than those with less cognitive distortions at admission. Severity of cognitive distortions at admission lacked predictive value of the strength of the relationship between these variables.

Similar to the earlier consideration of findings in relation to hypotheses, both patients with greater and less cognitive distortions were given a caloric consumption amount by the treatment team that likely influenced the amount of weight gained. Lack of results may be attributed to the lack of control both groups of patients had over their weight gain, and the possibility of patients gaining weight with intention of “getting out” of the hospital more quickly. Patients’ improvement of readiness to change by the latter part of treatment, specifically weeks four and six may obscure results relevant to the third

hypothesis as well. As a result of the incorporation of cognitive behavioral strategies, patients' resistance to weight gain may have significantly decreased compared to the early stages of treatment when patients were in the beginning stages of change. To ascertain whether the influence of time and patients' improvement in readiness to change might have impacted this relationship, additional studies examining earlier weeks of treatment are warranted.

### **Exploratory Analyses**

Additional analyses were conducted to explore the relationship between readiness to change and weight gain during the latter half of hospitalization, specifically from week 4 to 6 of hospitalization (Table 8). The ANSOCQ total score and the Weight Gain subscale significantly predicted weight gain one day following the administration of the ANSOCQ (Tables 23-24). Interestingly, readiness to change did not predict weight gain two days, one week, or two weeks following the administration of the ANSOCQ. As such, it can be assumed that the influence of readiness to change is short-term.

This suggests that while patients gain weight during treatment, they are not psychologically ready to autonomously take charge of their weight gain until four weeks of hospitalization. Though patients go through a cyclical rather than a

linear sequence of stages of change, by the latter part of treatment patients gain the desire to increase in weight in order to recover from anorexia nervosa. Prior to week 4, patients may have gained weight in order to comply with the treatment program or to simply “get out” of the hospital quickly. Response related to the factors that influence weight gain, does not appear to occur until week 4 of hospitalization. As patients internally change and progress through the stages of change, external forces (i.e., the treatment team determining calories consumed) no longer guide their decisions to gain weight. This information proposes that patients potentially need several weeks for psychological improvement and readiness to change to occur before it affects their desire to gain weight as they recover from anorexia nervosa.

### **Methodological Considerations**

The present study has a number of methodological limitations that warrant discussion. For instance, the sample size may not adequately detect the bidirectional relationship of readiness to change and weight gain. Additionally, this study included a mostly homogenous sample of participants with regards to gender and ethnicity. Although the demographic makeup of the sample is quite consistent with other studies investigating the eating disorder literature, the ability to generalize these results to ethnic minorities and males is limited.

Another methodological limitation of this study pertains to the use of self-report measures to assess readiness to change and severity of cognitive distortions. It is possible that participants may have underreported their eating disorder symptoms due to the denial and ambivalence involved in this disorder. Underreporting may also be due to patients' belief that their answers would influence their treatment or length of hospitalization, though the confidentiality of the measures was explained.

The structure of the dietary system is also an issue that must be addressed. The patients' lack of autonomy in caloric consumption, and consequently weight gain, suggests that all patients will show weight increases despite their desire to recover from their eating disorder. For patients that are unable to consume their required caloric amount, support is provided by means of a nasogastric tube, as deemed medically necessary. This raises the concern of the validity of evaluating the relationship between readiness to change and weight gain.

### **Clinical Implications and Areas for Future Research**

Findings from the present study provide important clinical implications for the acute treatment of individuals with anorexia nervosa. First, results indicate that while patients gain weight during treatment, they are not psychologically ready to autonomously take charge of their weight gain until four weeks of

hospitalization. Given this length of time to achieve readiness to gain weight, adapting treatment protocols and techniques to reflect the patients' level of readiness to change during initial treatment could help to accelerate the process of weight gain as a result of increased readiness to change. Specifically, the stages of change model suggests alternative strategies to work with patients whose readiness to change is not optimal to make use of opportunities to change (Miller & Rollnick, 2002). These strategies include motivational interviewing techniques.

Furthermore, since readiness to change predicts weight maintenance in adolescents with anorexia nervosa, patients discharged prior to week four may be vulnerable to relapse (Fornieles, 2007). To avoid discharging patients who have not yet achieved readiness to gain weight, treatment programs could determine the patient's relationship between readiness to change and weight gain prior to discharge.

Although the current data capture readiness to change as a predictor of weight gain, prior weight gain was not found to predict readiness to change during admission to four and six weeks of hospitalization. Future studies should examine the initial stages of hospitalization as patients have not yet responded to cognitive and behavioral techniques and are likely resistant to weight gain. Additionally, investigating patients' weekly stage of change may indicate a time interval of hospitalization that patients are resistant to weight gain.

## **APPENDICES**

### **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	214-648-4438
Deanna Liss, Ph.D.	214-456-6929	214-456-6929
Jacqueline Rosckes	214-648-1750	214-648-1750

**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. Patients will be asked to complete one of these questionnaires on a weekly basis during their treatment on the inpatient unit. In addition, patients will also be asked to answer a written question on a weekly basis to evaluate how their weight impacts their thinking. 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**

### **HIPAA 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: 214-648-4438

**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**

### **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 behaviors (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?” \_\_\_\_\_



## Appendix D

### Mizes Anorectic Cognition-Revised

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 |

## Appendix E

### Tables

Table 1

*Demographic Characteristics of Sample*

Variable	n	Mean	SD	Range
Age (years)	33	15.52	1.42	12-17
Percent of Ideal Body Weight at Admission	33	81.15	7.03	67.60-94.44
Percent of Ideal Body Weight at Week 6	15	92.05	5.08	82.40-101.19
Percent of Ideal Body Weight at Discharge	33	95.58	6.68	73.49-107.47
Length of Treatment (days)	33	53.23	21.95	15-117

Table 2

*Sample Descriptive Statistics of Weekly Weights from Week 1 to Week 6*

	n	Mean	SD	Range
Week 1	31	44.20	5.58	34.00-55.45
Week 2	30	45.66	5.74	35.00-56.95
Week 3	28	47.27	5.88	36.65-57.95
Week 4	25	49.11	6.06	38.70-60.75
Week 5	22	50.25	6.12	39.40-61.20
Week 6	17	50.58	5.57	41.00-62.90

Table 3

*Gender/Ethnicity Frequency Table*

Ethnicity	Frequency (%)		
	Male	Female	Total
Caucasian	3	24	27
Hispanic	--	2	2
Asian	--	3	3
Other	--	1	1
Total	3	30	33

Table 4

*DSM-IV Eating Disorder Diagnosis (n = 33)*

ED Diagnosis	Frequency	Percent
AN, Restricting	17	51.5
AN, Purging	5	15.2
ED NOS	10	30.3
Bulimia Nervosa	1	3.0
Total	33	100.0

Table 5

*Frequency of Comorbid DSM-IV Diagnoses (n = 33)*

DSM-IV Diagnosis	Frequency	Percent
<b>Mood Disorder</b>	<b>23</b>	<b>69.7</b>
Depression NOS	8	24.2
Major Depression	9	27.3
Mood Disorder NOS	3	9.1
Dysthymia	3	9.1
<b>Anxiety Disorder</b>	<b>3</b>	<b>9.1</b>
Anxiety NOS	2	6.1
Generalized Anxiety Disorder	1	3.0
<b>Mood &amp; Anxiety Disorder</b>	<b>4</b>	<b>12.1</b>
None	3	9.1
Total	33	100.0



Table 6

*Maternal and Paternal Education and Insurance Information (n = 33)*

	Maternal		Paternal	
	Frequency	Percent	Frequency	Percent
High school or less	2	6.1	6	18.2
Some college	13	39.4	5	15.2
College graduate	9	27.3	8	24.2
Graduate degree	5	15.2	10	30.3
Missing	4	12.1	4	12.1

  

	Insurance Coverage	
	Frequency	Percent
Medicaid	1	3.0
Private Insurers	28	84.4
Self-pay	4	12.1

Table 7

*Sample Descriptive Statistics for ANSOCQ at Admission (for all available data)*

Subscales	(n = 33)	
	M (SD)	Range
Weight Gain	2.77 (.98)	1.00-4.71
Eating, Shape, Weight Concerns	2.89 (.83)	1.50-5.00
Ego Alien Aspects	2.81 (.84)	1.33-5.00
Total Score	2.83 (.82)	1.45-4.90

*Note:* Higher scores on the ANSOCQ denote greater readiness to change. ANSOCQ mean scores yield the following stages of change: Pre-contemplation = < 1.5, Contemplation = 1.5 - 2.4, Preparation = 2.5 - 3.4, Action = 3.5 – 4.4, and Maintenance =  $\geq 4.5$

Table 8

*Sample Descriptive Statistics of Scores for Weekly ANSOCQ Total and Weight Gain Subscale from Admission to Week 6*

	n	ANSOCQ Total		Weight Gain Subscale	
		M (SD)	Range	M (SD)	Range
Admission	33	2.83 (.82)	1.45-4.90	2.77 (.98)	1.00-4.71
Week 1	13	2.92 (1.11)	1.45-5.00	2.82 (1.16)	1.00-5.00
Week 2	26	3.27 (1.00)	1.75-5.00	3.04 (1.10)	1.29-5.00
Week 3	16	3.58 (1.00)	1.45-5.00	3.34 (1.23)	1.14-5.00
Week 4	20	3.38 (1.11)	1.25-5.00	3.19 (1.27)	1.07-5.00
Week 5	19	3.87 (.91)	2.10-5.00	3.66 (1.18)	1.14-5.00
Week 6	17	3.87 (.90)	2.43-5.00	3.87 (1.02)	2.14-5.00

*Note:* Higher scores on the ANSOCQ denote greater readiness to change. ANSOCQ mean scores yield the following stages of change: Pre-contemplation = < 1.5, Contemplation = 1.5 - 2.4, Preparation = 2.5 - 3.4, Action = 3.5 – 4.4, and Maintenance = ≥ 4.5

Table 9

*Sample Descriptive Statistics for MAC-R at Admission (for all available data)*

Subscales	(n = 33)	
	M (SD)	Range
Self-Control	3.64 (.87)	1.50-5.00
Rigid Weight-Regulation	2.72 (.75)	1.38-4.13
Weight and Approval	2.36 (.75)	1.25-4.25
Total Score	2.91 (.69)	1.50-4.21

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

Table 10

*Comparison of ED Group at Admission (n = 33) to Eating Disorder Sample (n = 115) on the ANSOCQ (for all available data)*

Subscales	ED Group	ED Sample	<i>p</i>
	M (SD)	M (SD)	
Weight Gain	19.36 (6.93)	15.20 (6.85)	.01
Eating, Shape, Weight Concerns	19.92 (6.07)	18.79 (6.62)	<i>ns</i>
Ego Alien Aspects	16.74 (4.98)	16.71 (5.68)	<i>ns</i>
Total Score	56.02 (16.45)	50.70 (19.15)	<i>ns</i>

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

Table 11

Hypothesis 1: *Mixed Model Analysis of ANSOCQ Total as a Predictor of Weight Gain from Admit to 6 Weeks*

Variable	<i>n</i>	Estimate	SE	<i>df</i>	<i>t</i>	<i>p</i>
Weight gain 1 day after ANSOCQ	28	.04	.07	27.7	.63	<i>ns</i>
Weight gain 2 days after ANSOCQ	29	-.07	.10	20.5	-.74	<i>ns</i>
Weight gain 1 week after ANSOCQ	25	-.04	.14	27.5	-.28	<i>ns</i>
Weight gain 2 weeks after ANSOCQ	24	-.20	.21	35.1	-.98	<i>ns</i>

Table 12

Hypothesis 1: *Mixed Model Analysis of ANSOCQ Total as a Predictor of Weight Gain from Admit to 4 Weeks*

Variable	<i>n</i>	Estimate	SE	<i>df</i>	<i>t</i>	<i>p</i>
Weight gain 1 day after ANSOCQ	28	-.07	.08	32.3	-.85	<i>ns</i>
Weight gain 2 days after ANSOCQ	28	-.05	.11	12.3	-.44	<i>ns</i>
Weight gain 1 week after ANSOCQ	25	-.07	--	--	--	--
Weight gain 2 weeks after ANSOCQ	24	-.30	.20	24.1	-1.53	<i>ns</i>

Table 13

Hypothesis 1: *Mixed Model Analysis of Weight Gain Subscale as a Predictor of Weight Gain from Admit to 6 Weeks*

Variable	<i>n</i>	Estimate	SE	<i>df</i>	<i>t</i>	<i>p</i>
Weight gain 1 day after ANSOCQ	28	.11	.05	28.1	2.01	<.10
Weight gain 2 days after ANSOCQ	29	-.04	.09	23.4	-.40	<i>ns</i>
Weight gain 1 week after ANSOCQ	25	-.11	.13	28.4	-.86	<i>ns</i>
Weight gain 2 weeks after ANSOCQ	24	-.27	.19	27	-1.40	<i>ns</i>



Table 14

Hypothesis 1: *Mixed Model Analysis of Weight Gain Subscale as a Predictor of Weight Gain from Admit to 4 Weeks*

Variable	<i>n</i>	Estimate	SE	<i>df</i>	<i>t</i>	<i>p</i>
Weight gain 1 day after ANSOCQ	28	-.06	.08	35.6	-.75	<i>ns</i>
Weight gain 2 days after ANSOCQ	28	-.06	.12	17.3	-.53	<i>ns</i>
Weight gain 1 week after ANSOCQ	25	-.05	.16	15.2	-.34	<i>ns</i>
Weight gain 2 weeks after ANSOCQ	24	-.30	.19	19.3	-1.60	<i>ns</i>

Table 15

Hypothesis 2: *Mixed Model Analysis of Weight Gain as a Predictor of ANSOCQ Total from Admit to 6 Weeks*

Variable	<i>n</i>	Estimate	SE	<i>df</i>	<i>t</i>	<i>p</i>
Weight gain 1 day before ANSOCQ	27	.06	.13	47.7	.45	<i>ns</i>
Weight gain 2 days before ANSOCQ	28	.002	.10	56.6	0.02	<i>ns</i>

Table 16

Hypothesis 2: *Mixed Model Analysis of Weight Gain as a Predictor of ANSOCQ Total from Admit to 4 Weeks*

Variable	<i>n</i>	Estimate	SE	<i>df</i>	<i>t</i>	<i>p</i>
Weight gain 1 day before ANSOCQ	27	.12	.14	26.2	.87	<i>ns</i>
Weight gain 2 days before ANSOCQ	27	.08	.11	33.3	.71	<i>ns</i>

Table 17

Hypothesis 2: *Mixed Model Analysis of Weight Gain as a Predictor of Weight Gain Subscale from Admit to 6 Weeks*

Variable	<i>n</i>	Estimate	SE	<i>df</i>	<i>t</i>	<i>p</i>
Weight gain 1 day before ANSOCQ	27	.14	.14	49.2	1.04	<i>ns</i>
Weight gain 2 days before ANSOCQ	28	.05	.11	58.9	.48	<i>ns</i>

Table 18

Hypothesis 2: *Mixed Model Analysis of Weight Gain as a Predictor of Weight Gain Subscale from Admit to 4 Weeks*

Variable	<i>n</i>	Estimate	SE	<i>df</i>	<i>t</i>	<i>p</i>
Weight gain 1 day before ANSOCQ	27	.24	.18	33.5	1.35	<i>ns</i>
Weight gain 2 days before ANSOCQ	27	.07	.13	38	.56	<i>ns</i>

Table 19

Hypothesis 3: *Mixed Model Analysis of Weight Gain of Patients Exhibiting Less Cognitive Distortions as a Predictor of ANSOCQ Total from Admit to 6 Weeks*

Variable	<i>n</i>	Estimate	SE	<i>df</i>	<i>t</i>	<i>p</i>
Weight gain 1 day before ANSOCQ	13	.08	.14	28.4	.54	<i>ns</i>
Weight gain 2 days before ANSOCQ	14	.004	.13	25	.03	<i>ns</i>

*Note:* Scores below the median at baseline on the MAC-R denote the presence of less cognitive distortions.

Table 20

Hypothesis 3: *Mixed Model Analysis of Weight Gain of Patients Exhibiting Less Cognitive Distortions as a Predictor of Weight Gain Subscale from Admit to 6 Weeks*

Variable	<i>n</i>	Estimate	SE	<i>df</i>	<i>t</i>	<i>p</i>
Weight gain 1 day before ANSOCQ	13	.12	.15	26.6	.81	<i>ns</i>
Weight gain 2 days before ANSOCQ	14	.08	.12	28	.65	<i>ns</i>

*Note:* Scores below the median at baseline on the MAC-R denote the presence of less cognitive distortions.

Table 21

Hypothesis 3: *Mixed Model Analysis of Weight Gain of Patients Exhibiting Severe Cognitive Distortions as a Predictor of ANSOCQ Total from Admit to 6 Weeks*

Variable	<i>n</i>	Estimate	SE	<i>df</i>	<i>t</i>	<i>p</i>
Weight gain 1 day before ANSOCQ	14	.11	.30	19.9	.38	<i>ns</i>
Weight gain 2 days before ANSOCQ	14	.03	.22	26	.12	<i>ns</i>

*Note:* Scores equal to or above the median at baseline on the MAC-R denote the presence of severe cognitive distortions.



Table 22

Hypothesis 3: *Mixed Model Analysis of Weight Gain of Patients Exhibiting Severe Cognitive Distortions as a Predictor of Weight Gain Subscale from Admit to 6 Weeks*

Variable	<i>n</i>	Estimate	SE	<i>df</i>	<i>t</i>	<i>p</i>
Weight gain 1 day before ANSOCQ	14	.30	.33	21.7	.91	<i>ns</i>
Weight gain 2 days before ANSOCQ	14	.16	.23	26.4	.70	<i>ns</i>

*Note:* Scores equal to or above the median at baseline on the MAC-R denote the presence of severe cognitive distortions.

## EXPLORATORY ANALYSES

Table 23

*Mixed Model Analysis of ANSOCQ Total as a Predictor of Weight Gain from Week 4 to Week 6*

Variable	<i>n</i>	Estimate	SE	<i>df</i>	<i>t</i>	<i>p</i>
Weight gain 1 day after ANSOCQ	19	.21	.10	14.9	2.19	<.05
Weight gain 2 days after ANSOCQ	19	-.01	.12	13.6	-.09	<i>ns</i>
Weight gain 1 week after ANSOCQ	18	-.05	.19	16.8	-.24	<i>ns</i>
Weight gain 2 weeks after ANSOCQ	16	-.34	.31	19.6	-1.13	<i>ns</i>

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

Table 24

*Mixed Model Analysis of Weight Gain Subscale as a Predictor of Weight Gain from Week 4 to Week 6*

Variable	<i>n</i>	Estimate	SE	<i>df</i>	<i>t</i>	<i>p</i>
Weight gain 1 day after ANSOCQ	19	.29	.08	18.6	3.82	<.001
Weight gain 2 days after ANSOCQ	19	.05	.11	15.8	.48	<i>ns</i>
Weight gain 1 week after ANSOCQ	18	-.18	.18	17.5	-.97	<i>ns</i>
Weight gain 2 weeks after ANSOCQ	16	-.41	.27	11.5	-1.52	<i>ns</i>

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

Table 25

*Bivariate Pearson Correlation Between Admission ANSOCQ Total and Week 6 ANSOCQ Total*

Variable	Week 6 ANSOCQ Total		
	<i>n</i>	Pearson r	<i>p</i>
Admit ANSOCQ Total	17	.28	<i>ns</i>

Table 26

*Bivariate Pearson Correlation Between Admission Weight Gain Subscale and Week 6 Weight Gain Subscale*

Variable	Week 6 Weight Gain Subscale		
	<i>n</i>	Pearson r	<i>p</i>
Admit Weight Gain Subscale	17	.21	<i>ns</i>

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