TEMPERAMENT AND PREDICTION OF DROPOUT FROM EATING DISORDER TREATMENT AT EATING RECOVERY CENTER OF WASHINGTON PARTIAL HOSPITALIZATION PROGRAM

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Abstract

This study explores the possibility of temperament and character predicting dropout from partial hospitalization program (PHP) eating disorder treatment at Eating Recovery Center of Washington (ERCWA) in Bellevue, Washington. The hypotheses for this research were (a) significant differences in temperament and character scores on harm avoidance (HA), persistence (P), novelty seeking (NS), and reward dependence (RD) would predict dropout in all eating disorder diagnosis (b) significant differences in persistence and harm avoidance would predict dropout in anorexia nervosa (AN) (c) significant differences in persistence and novelty seeking would predict dropout in bulimia nervosa (BN). Archival data of 15 male and 153 female participants aged 18-65 years diagnosed with an eating disorder receiving treatment at ERCWA adult PHP during 2014 and 2015 were used in this study. Dropout was defined as participants who dropped out of treatment utilizing the 72-hour notice Commitment to Recovery (Appendix D) or who left treatment against medical advice (AMA) or against clinical advice (ACA). A Multiple Logistic Regression Analysis was conducted to determine the probability of predicting treatment dropout considering the Temperament and Character Inventory (TCI-3 v1) dimensions. Results indicated increased cooperativeness is associated with increased likelihood of treatment dropout and increased reward dependence is associated with increased treatment completion. Assessing temperament and character traits may be a useful tool in predicting and reducing treatment dropout.

Keywords: eating disorders, temperament, partial hospitalization, treatment dropout

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Chapter 1

Introduction

Eating disorders are complicated mental illnesses with various factors contributing to the development, maintenance and perpetuation of behavioral symptoms (Hudson, Hiripi, Pope, & Kessler, 2007; Keski-Rahkonen et al., 2007; Klump et al., 2004; Mond & Hay, 2007; Papadopoulos, Ekbom, Brandt, & Ekselius, 2009; Segura-García, Chiodo, Sinopoli, & De Fazio, 2013). Several aspects of a person's quality of life are often negatively impacted by an eating disorder including their physical health, psychological wellbeing, and connection to others (Abbate-Daga et al., 2014; Arcelus, Mitchell, Wales, & Nielsen, 2011; Baiano et al., 2014; Bohn et al., 2008; Crow et al., 2009; de la Rie, Noordenbos, & van Furth, 2005; Franko et al., 2004; Franko et al., 2013; Mitchison et al., 2013; Pollack, McCune, Mandal, & Lundgren, 2015; Vallance, Latner, & Gleaves, 2011). Eating disorders may also have a deleterious effect on family, friends, and support people (Bohn et al., 2008; Crow et al., 2009; Dejong et al., 2013). Current eating disorder treatment exists at a variety of levels of care to best serve patients according to the severity of illness an individual is experiencing in the moment (Brown & Keel, 2012; Hepburn & Wilson, 2014; Madden, Hay & Touyz, 2015).

An alarming number of eating disorder patients dropout or leave prior to completing the clinically recommended course of treatment (DeJong, Broadbent, & Schmidt, 2012; Fassino, Pierò, Tomba, & Abbate-Daga, 2009; Hubert et al., 2013; Mahon, 2000; Olfson, Mojtabai, Sampson, Hwang, & Kessler, 2009; Wallier et al, 2009) and the literature review on dropout rates in eating disorder treatment is limited with no consistent or coherent definition of what dropout from eating disorder treatment entails

(Cambell, 2009; Fassino et al., 2009; Hubert et al, 2013; Mahon, 2000; Stein et al., 2011). This creates a need for a coherent definition of dropout in eating disorder treatment as well as the factors that may predict it. Increasing retention of patients who drop out of treatment may allow the potential of improved health and quality of life for the individual and their families (de la Rie, Noordenbos, & van Furth, 2005; Dejong et al., 2013; Hepburn & Wilson, 2014; Keski-Rahkonen et al., 2007; Vallance et al., 2011; Vandereycken & Vansteenkiste, 2009; Zerwas et al., 2013).

Personality dimensions may be a factor in predicting dropout, although the literature review on the influence of personality on treatment dropout and treatment completion document that few studies have been completed in the partial hospitalization level of care (Abd Elbaky et al., 2014; Atiye, Miettunen, & Raevuori-Helkamaa, 2015; Jordan et al., 2014; Klump et al, 2004; Rodríguez-Cano, Beato-Fernandez, Moreno, & Vaz Leal, 2012; Rodríguez-Cano, Beato-Fernandez, Rojo-Moreno, & Vaz-Leal, 2014; Segura-García et al., 2013; Stein, Wing, Lewis, & Raghunathan, 2011; Woodside, Carter, & Blackmore, 2004). This study will help fill the need for current research on the impact of personality dimensions on eating disorder treatment dropout.

Literature Review

The following review of literature provides a summary of current eating disorder research including diagnoses and criteria, prevalence, mortality, chronicity and impact of quality of life. Research on personality profiles of people with eating disorders both recovered and ill, including the possible impact of personality on dropout of eating disorder treatment is offered.

Eating disorders. Severe disturbances in eating behavior may lead to a clinical mental health diagnosis of an eating disorder. There are three diagnostic classifications for eating disorders defined by specific criteria in the American Psychiatric Association (2000) fourth edition text revision of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR). The categories include Anorexia Nervosa (AN), Bulimia Nervosa (BN) and Eating Disorder Not Otherwise Specified (EDNOS). An update to the Diagnostic and Statistical Manual of Mental Disorders, the DSM-5 (American Psychiatric Association, 2013), was released in 2013 and clinically implemented at the end of 2015. However, due to the DSM-IV-TR being the primary clinical diagnostic manual being utilized during the time of assessment of the participants in this study in 2014 and 2015, this study will use the DSM-IV-TR eating disorder classifications.

The DSM-IV-TR diagnostic criteria for anorexia nervosa (AN) include:

A. Refusal to maintain body weight at or above minimally normal weight for age and height (e.g., weight loss leading to maintenance of body weight less than 85% of that expected or failure to make expected weight gain during period of growth, leading to body weight less than 85% of that expected).
B. Intense fear of gaining weight or becoming fat, even though underweight.
C. Disturbances in the way in which one's body weight or shape is (Segura Garcia et al., 2013); experienced, undue influence of body weight or shape on self-evaluation, or denial of the seriousness of current low body weight.

D. In postmenarcheal females, amenorrhea, i.e., the absence of at least three consecutive menstrual cycles (American Psychiatric Association, 2000, p.589).

The DSM-IV-TR diagnostic criteria for bulimia nervosa (BN) include:

A. Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following:
   (1) eating, in a discrete period of time (e.g., within any 2-hour period), a amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances.
   (2) a sense of lack of control over eating during the episode (e.g., a feeling that one cannot stop eating or control what or how much one is eating).
B. Recurrent inappropriate compensatory behavior in order to prevent weight gain, such as self-induced vomiting; misuse of laxatives, diuretics, enemas, or other medications; fasting; or excessive exercise.
C. The binge eating and inappropriate compensatory behaviors both occur, on average, at least twice a week for three months.
D. Self-evaluation is unduly influenced by body shape and weight.
E. The disturbance does not exclusively occur during episodes of Anorexia Nervosa (American Psychiatric Association, 2000, p. 594).

Eating disorder not otherwise specified (EDNOS) was the main diagnostic category for disordered eating behaviors not meeting criteria for anorexia nervosa or bulimia nervosa in the DSM-IV-TR.

1. For females, all of the criteria for Anorexia Nervosa are met except that the individual has regular menses.
2. All of the criteria for Anorexia Nervosa are met except that, despite significant weight loss, the individual's current weight is in the normal range.
3. All of the criteria for Bulimia Nervosa are met except that the binge eating and inappropriate compensatory mechanism occur at a frequency of less than twice a week or for a duration of less than 3 months.
4. The regular use of inappropriate compensatory behavior by an individual of normal body weight after eating a small amount of food (e.g., self-induced vomiting after the consumption of two cookies).
5. Repeatedly chewing and spitting out, but not swallowing, large amounts of food.
6. Binge-eating disorder: recurrent episodes of binge eating in the absence of the regular use of inappropriate compensatory behaviors characteristic of Bulimia Nervosa (American Psychiatric Association, 2000, p. 594-595).

Prevalence rates of eating disorders. According to Hudson et al. (2007), the lifetime prevalence estimates of DSM-IV anorexia in women and men in the United States are .9% and .3%, for bulimia 1.5% and .5%, and for binge eating disorder 3.5% and 2.0%. In the United States, it is estimated that 20 million women and 10 million men have had an eating disorder at some time in their life in a review of epidemiology research from 1993-2008 (Wade, Keski-Rahkonen, & Hudson, 2011). Findings in a study by Stice, Marti, and Rohde (2013) suggested that one in eight women are affected by eating pathology. A concerning 13% of female adolescents have experienced an eating

disorder in their teenage years (Stice et al., 2013). There is a question of whether the prevalence of eating disorders is increasing or if early treatment and detection is more available, resulting in an increased number of people seeking treatment (Smink, van Hoeken, & Hoek, 2012).

Mortality rates of eating disorders. People with eating disorder diagnoses have a higher mortality risk than the general population (Arcelus et al., 2011; Crow et al., 2009; Franko et al., 2013; Smink et al., 2012), with anorexia nervosa having the highest risk (Button, Chadalavada, & Palmer, 2010; Papadopoulos et al., 2009). Epidemiologists commonly use crude mortality rate, an estimate of the rate at which members of a particular population and specific geographic location die during a specified period divided by the entire population. According to a study by Crow et al., (2009) crude mortality rates (CMR) were: 4% for anorexia nervosa, 3.9% for bulimia nervosa, and 5.2% for eating disorder not otherwise specified with an increased risk of suicide across all eating disorders.

Franko et al. (2013) performed a longitudinal study examining eating disorder mortality rates over time from January 2007 to December 2010: in 246 treatment seeking women with AN or BN, they concluded that duration of AN, low body weight, alcohol abuse and poor social functioning increased risk of death. Rates of premature death were described by the "standard mortality ratio (SMR), calculated as the number of observed deaths during a period in a specific population of interest, divided by the number of deaths expected in the general population, matched for age, race and gender" using a 95% confidence interval (CI), a confidence interval is the percentage certain the population mean is contained in a range of values (Franko et al., 2014, p. 918). The SMR in this

study was 4.37 [95% CI=2.4-3.7] for AN and 2.33 [95% CI=0.3-8.4] for BN, while duration of AN for >15-30 years SMR 6.6 [95% CI=3.2-12.1] (Franko et al, 2014). In a Swedish retrospective study (Papadopoulos et al., 2009) of six thousand and nine women previously receiving inpatient eating treatment for AN, the standardized morality ratios (SMR) were found to be 6.2 (95% CI 5.5-7.0) a high lifetime mortality.

Chronicity of eating disorders. Some individuals struggle with chronic, treatment resistant eating disorders. There is no coherent definition of chronicity in eating disorders (Wonderlich et al., 2012). The presence of comorbidity may indicate the increased probability of earlier treatment while also contributing to chronicity of the illness (Baiano et al., 2014). Wonderlich et al. (2012) reviewed literature regarding chronicity and concluded that a significant number of chronic eating disorder patients exist; however there is a lack of standardized evidence-based treatments available to this poorly understood population. Minimal information is known about successfully treating chronic eating disorders and according to Wonderlich et al., (2012) focus has shifted to function, reducing harm and enhancing quality of life. In a study by Pollack et al. (2015), results indicated as the number of previous treatments increased, quality of life scores decreased.

Quality of life in eating disorders. Hudson et al. (2007) concluded that eating disorders are a health concern due to frequency of under-treatment, role impairment and association with other psychopathology. Several areas of a person's quality of life may be negatively impacted by an eating disorder. There is currently no assessment that focuses specifically on the quality of life impairment of eating disorder patients, however instruments designed specifically to evaluate the quality of life impairment of eating disorder patients are being developed (Mitchison et al., 2013; Biano et al., 2014). Despite

this lack of an eating disorder specific assessment tool, the following studies address the quality of life using the tools currently available.

In a study using the Clinical Impairment Assessment on 199 eating disorder diagnosed patients, results indicated quality of life was poor with an eating disorder compared to the general population and the more severe the illness the greater the impairment (DeJong et al., 2013). Several more studies support this finding, including research done by Pollack et al. (2015) and Crow et al. (2013). Bohn et al. (2008) has been able to confirm the utility and psychometric properties of the Clinical Impairment Assessment (CIA). This assessment tool allows for additional measure of impairment outside of and in addition to "health quality of life," which assesses physical impact of daily functioning (Pollack et al., 2015).

Functional impairment, emotional distress, suicidality, use of mental health treatment and unhealthy BMI may increase when someone has an eating disorder (Abbate-Daga et al., 2014). In a qualitative and quantitative study on quality of life by Pollack et al. (2015), forty-eight inpatient treatment-seeking individuals completed the Quality of Life Inventory (QOLI) that assessed satisfaction in 16 life domains. Patients with AN reported significantly less satisfaction with life domain of relatives, indicating worse quality of life in social relationships with family members compared to patients with BN (Pollack et al., 2015). Crow et al. (2013) found that quality of life significantly improved, according to results on the self-report Quality of Well Being Scale, after a stepped-care approach to treatment for 293 women with BN in a randomized control study at four clinical centers. Additionally, there was a reduced burden of time spent in

support of patients for the women's significant others and family members (Crow et al., 2013).

Eating disorders contribute to impaired cognitive performance (Baiano et al., 2014). There are limited eating disorder specific measures to assess the impairment of eating disorders on an individual's quality of life within the domains of social, cognitive, and personal function even though often a significantly negative impact exists (Baiano et al., 2014). Self-report of quality of life may be impacted by the compromised perception of self of individuals with anorexia nervosa including poor awareness of illness, the ego-syntonic nature of the illness and strong ambivalence towards recovery (Mitchison et al., 2013).

Personality correlates. According to Cloninger & Cloninger (2011) personality is the "dynamic organization within the individual of the psychobiological systems by which the person both shapes and adapts uniquely to an ever-changing internal and external environment" (p. 74). Personality is considered an important factor contributing to the development and maintenance of an eating disorder although not all of the results in the research are consistent.

Klump and colleagues (2004) conducted an international (North America and Europe) multi-site site study of personality characteristics of women: 122 with anorexia nervosa (AN), 279 with bulimia nervosa (BN), 267 with a lifetime history of both anorexia nervosa and bulimia nervosa (AN/BN), 63 with eating disorder not otherwise specified (EDNOS), and 507 without eating disorder pathology both before and after recovery from an eating disorder using the Temperament and Character Inventory (TCI) Version 9 (Cloninger, 1994). This was the largest published investigation of recovered

eating disorder women prior to 2004. Higher levels of harm avoidance (HA) and lower self-directedness (SD) and cooperativeness (C) scores were found in both recovered and ill women compared to normal control women (Klump et al., 2004).

Whether recovered or currently meeting the diagnostic criteria for an eating disorder, several personality profiles have been shown in the research (see Appendix F) (Klump et al., 2004). High perfectionism (P4) is indicative of anorexia nervosa, although this trait can remain in recovery. Personality profiles of recovered BN, AN/BN and EDNOS patients had higher harm avoidance (HA) scored than controls. Patients recovered from BN and AN/BN had lower self-directedness (SD) and cooperativeness (C) than controls, similar to those who remained ill. Recovered BN patients had higher novelty seeking (NS) and higher self-transcendence (ST) than controls, similar to ill patients. These results suggested novelty seeking (NS) may decrease with symptoms of AN, such as malnutrition, starvation and emaciation. Patients ill with BN have the highest scores in NS and those ill with AN have the lowest NS. Any form of anorexia nervosa (ill or recovered) had the highest harm avoidance (HA), while recovered anorexics had the highest harm avoidance (HA) and recovered bulimics the lowest harm avoidance (HA). Similar to other studies, those ill with BN and AN/BN had the lowest self-directedness (SD) scores of all eating disorder groups. Patients with AN had the lowest self-transcendence (ST) of all eating disorders and all eating disorder groups were similar on reward dependence (RD), persistence (P), cooperativeness (C) except EDNOS had higher cooperativeness (C) in recovered state. (Klump et al., 2004)

People with different eating disorder diagnoses have been well characterized by personality factors (see Appendix G) (Abbate-Daga et al., 2014; Atiye, Miettunen, &

Raevuori-Helkamaa, 2015; Fassino et al., 2002; Klump et al., 2004; Tanaka et al. 2015; Zerwas et al. 2013). High harm avoidance (HA), high persistence (P) and low novelty (NS) seeking are temperament traits associated with anorexia nervosa (Abbate-Daga et al., 2014; Klump et al., 2004; Tanaka et al., 2015). In a study in Italy of Temperament and Character profiles of 327 female outpatient eating disorder patients, Fassino et al. (2002) found low novelty seeking (NS), high harm avoidance (HA), high persistence (P), and low self-directedness (SD) in anorexia nervosa. High novelty seeking (NS), high harm avoidance (HA), and low self-directedness (SD) were found in bulimia nervosa (Fassino et al., 2002). In a retrospective multi-site genetic study of 680 women with anorexia nervosa, Zerwas et al. (2013) examined the association between prognostic factors of eating disorder features, personality traits, and psychiatric comorbidity. They found greater impulsivity (NS2) a subscale of novelty seeking, to be a positive prognostic factor for recovery among people who recovered quickly, this effect decreased as duration of anorexia nervosa increased. Trait anxiety (HA1), a subscale of harm avoidance, was found to be a negative prognostic factor, lowering the likelihood of recovery, possibly due to some the anxiety reduction function of some anorexia nervosa behaviors. High harm avoidance (HA), low novelty seeking (NS) and high reward dependence (RD) may improve treatment outcomes (Segura-Garcia et al., 2013).

Some personality factors precede treatment and endure in recovery and some remain some present independent of the disorder (see Appendix F) (Klump et al., 2004; Zerwas et al., 2013). Recovered anorexic patients had few significant differences in personality dimensions from those ill with AN, although strikingly, a significant difference in novelty seeking (NS) was found to be higher in recovered AN patients than

controls. This result is in contrast to the finding that those who were ill with AN had lower novelty seeking (NS) than controls. Recovered AN patients had higher reward dependence (RD) although it is unclear whether this was a result of treatment and recovery, or a positive prognostic factor. Recovered anorexic patients had lower harm avoidance (HA) and higher reward dependence (RD) than those who remained ill (Atiye et al., 2015). Although again, the research is unclear as to whether these results are a recovery consequence or are due to a better initial prognosis. In a study by Tanaka et al. (2015) of Japanese women with eating disorders who were living in Japan, harm avoidance (HA) and persistence (P) were found to be significantly higher in subjects with eating disorders versus healthy control subjects, while self-directedness (SD) was significantly lower in patients with eating disorders with severe malnutrition than in controls.

In summary, according to the research literature on personality dimensions of individuals diagnosed with any eating disorder, high harm avoidance (HA) (Abbate-Daga et al., 2014; Klump et al., 2004; Tanaka et al., 2015), low cooperativeness (C) (Klump et al., 2004) and low self-directedness (SD) (Fassino et al., 2002; Klump et al., 2004; Tanaka et al., 2015) were found. People diagnosed with anorexia nervosa were found to have high persistence (P) and low novelty seeking (NS) (Abbate-Daga et al., 2014; Fassino et al., 2002; Klump et al., 2004; Tanaka et al., 2014); the lowest self-transcendence (ST) of all eating disorder diagnoses (Klump et al., 2004); and higher novelty seeking (NS), higher reward dependence (RD) and lower harm avoidance (HA) than in people recovered from anorexia nervosa (Atiye et al., 2015; Zerwas et al., 2013). People diagnosed with bulimia nervosa were found to have higher novelty seeking (NS)

(Fassino et al., 2002; Klump et al., 2004). Finally, in contrast with other research Segura-Garcia et al. (2013) found high reward dependence (RD), high harm avoidance (HA) and low novelty seeking (NS) may have been positive factors in treatment outcomes for bulimia nervosa and anorexia nervosa.

Treatment. Current eating disorder treatment exists at a variety of levels of care to best serve patients according to the severity of their illness. A step-down approach to care allows patients to enter treatment with the appropriate degree of clinical, nutritional, psychiatric and medical support (APA, 2006). Patients then gradually return to life outside of treatment after learning, developing and practicing skills and behaviors necessary for recovery. Levels of care include Inpatient, Residential, Partial Hospitalization, Intensive Outpatient and Outpatient (APA, 2006). Within these levels of care there are therapeutic approaches aimed at equipping the individual with the tools to move into the next step towards recovery.

The American Psychological Association (2006) has defined both specific criteria for appropriate levels of care according to individual acuity as well as practice guidelines for the treatment of patients with eating disorders. Wonderlich et al. (2012) recommends a fully integrated treatment system where at each level of treatment a multi-disciplinary team coordinates during and across each step down in level of care.

In a review by Brown and Keel (2012), efficacy of current and emerging treatments for AN, BN and binge eating disorder (BED) was summarized. The review indicated no superior treatment exists for adults with AN while several novel psychosocial treatments are emerging and recommended a focus on emotion regulation and individualized stepped-care approaches for BN and BED in conjunction with

established effective cognitive behavioral therapy (CBT) and interpersonal psychotherapy (Brown & Keel, 2012).

Many treatments are able to improve quality of life, although it is unclear what improves quality of life within treatment (Baiano et al., 2014). Improved outcome of AN was associated with younger age and longer stays during first hospitalization treatment (Papadopoulos et al., 2009). Day treatment of adult eating disorders, evaluated in a review by Hepburn and Wilson (2014), improved variables of BMI, binge/purge, anxiety, depression, self-esteem and eating disorder pathology.

Partial hospitalization. Partial hospitalization, also known as day treatment, of eating disorders was acknowledged by the American Psychiatric Association (APA) when integrated into published guidelines on the treatment of eating disorders (American Psychiatric Association, 2006). In a naturalistic pre-post-follow-up design study of 86 women with anorexia nervosa and bulimia nervosa that examined the short-term effectiveness and stability of a day hospital treatment program, a significant reduction of binge eating and purging in BN patients, as well as statistically and clinically significant weight gain for patients with AN was reported (Fittig, Jacobi, Backmund, Gerlinghoff, & Wittchen, 2008). In a review of eating disorder treatment outcomes research, Madden et al. (2015), compared outcomes of inpatient and partial hospitalization treatment settings in the literature.

Factors affecting treatment dropout. Mahon (2000) defines dropout as 'the unilateral ending of treatment by a patient' (p. 203). In the research on eating disorder treatment there is a lack of common definition of dropout, many methodological flaws and limited sample sizes (Campell, 2009; DeJong et al., 2012; Fassino et al., 2009;

Wallier et al., 2009). In a review of research on eating disorder treatment by Fassino et al. (2009) dropout rates ranged 20.2% to 51% for inpatient treatment and 29% to 73% for outpatient treatment.

Campbell (2009) stated that there is a "Lack of theoretically driven interventions to target drop-out" and "clinical psychologists researching drop out need to consider those who drop out from pathways of care… clinicians need a clear picture of where we are going wrong"(p. 239). Many factors impacting dropout have been examined, however few have been replicated or repeated. In one review Wallier et al., (2009) concluded AN-BP to be a consistent indicator of dropout as well as AN, with absence of depression. In a quasi-experimental study by Vandereycken & Vansteenkiste (2009) of inpatient eating disorder treatment in Belgium, there was a significant reduction in dropout within the first month of treatment due to patients having maximum personal choice to stay or leave treatment after a five day commitment without any attempts to convince them to stay given medical stability.

In an outpatient randomized controlled study of psychological therapy of 63 adult women with severe and enduring AN the strongest predictors of drop out were the purging sub-type of anorexia and poor eating disorder quality of life (Abd Elbaky et al., 2014). Abd Elbaky (2014) goes on to say no association to attrition was found with pre-treatment BMI, severity of eating disorder symptoms or low level of motivation to change eating disorder features. Inconsistent predictors of drop out in the research indicate the need for a shared definition of dropout (Campbell, 2009; DeJong et al., 2012; Fassino et al., 2009; Mahon, 2000).

Temperament and character. In a study by Segura-Garcia et al. (2013) researchers evaluated if dimensions of the TCI-R predicted long-term outcomes of eating disorders. Although the TCI-R results failed to predict the absence of an eating disorder diagnosis after 5 years, harm avoidance (HA), novelty seeking (NS) and reward dependence (RD) predicted clinical improvements with the strongest predictor of a poor outcome being low novelty seeking (NS) (Segura-Garcia et al., 2013).

One review on the treatment of eating disorders concluded good evidence exists that psychological traits of high maturity fear and impulsivity as well as personality dimensions of low self-directedness (SD) and low cooperativeness (C) are factors associated with dropout (Fassino et al., 2009). These researchers suggested assessment and investigation of personality factors that increase the likelihood of dropout in order to create strategies to reduce this phenomenon.

In a study of 56 women with anorexia lower self-transcendence (ST) and higher prevalence of a personality disorder predicted drop out from outpatient eating disorder treatment (Jordan et al., 2014). According to research by Rodriguez-Cano et al. (2012), responsibility (SD1) and self-acceptance (SD4) two subscales of temperament dimension of self-directedness (SD) were found to be protective factors for stages of contemplation prone to drop out at any time in treatment.

In summary, the literature indicates that personality dimensions impact outcomes of eating disorder treatment and affect the likelihood of premature dropout from treatment. The strongest predictor of poor outcome is low novelty seeking (NS) (Segura-Garcia et al., 2013); and low self-directedness (SD) and low cooperation (C) may be

predictors of early treatment drop out (Fassino et al., 2009), while high self-directedness (SD) is a protective factor for remaining in treatment (Rodriguez-Cano et al., 2012).

Rationale

Relapse is common in eating disorders, with many individuals requiring several courses of treatment throughout a lifetime (Wonderlich et al., 2012; Baiano et al., 2014; Pollack et al., 2015). Some individuals struggle with chronic, treatment resistant eating disorders. An alarming number of eating disorder patients dropout or leave prior to completing the clinically recommended course of treatment. The literature on dropout documents there is no consistent definition of dropout from eating disorder treatment and research on dropout is limited (Campbell, 2009; DeJong et al., 2012; Fassino et al., 2009; Mahon, 2000). Increasing retention of these patients may allow the potential of improved health and quality of life for the individual and their families. Although there may be many factors affecting dropout rates, personality dimensions may be a factor in predicting dropout. This study will help fill the need for current research on the impact of personality dimensions on eating disorder treatment dropout. Specifically this research study will evaluate if temperament and character predict dropout in partial hospitalization program (PHP) treatment.

Research Question/Hypotheses

The scales hypothesized to be elevated or lowered were chosen based on the identification in the literature of those traits being found more consistently with eating disorder treatment dropout than completion. The research question was: Do temperament and character predict dropout in partial hospitalization program (PHP) treatment at Eating

Recovery Center of Washington (ERCWA). The following hypotheses were used in this study.

H1: There are significant differences in harm avoidance, novelty seeking, reward dependence and cooperativeness that will effectively discriminate individuals with eating disorders of any diagnosis who drop out of treatment in a PHP treatment program at ERCWA from individuals with eating disorders of any diagnosis who complete the program.

H2: There are significant differences in persistence and harm avoidance that will effectively discriminate individuals with anorexia nervosa who drop out of treatment in a PHP program at ERCWA from individuals with anorexia nervosa who complete the program.

H3: There are significant differences in persistence and novelty seeking that will effectively discriminate individuals diagnosed with bulimia nervosa who drop out of a PHP treatment program at ERCWA from individuals with bulimia nervosa who complete the program.

Chapter 2

Introduction

The purpose of this study was to find out if temperament and character of eating disorder patients in the Adult Partial Hospitalization Program (PHP) at Eating Recovery Center of Washington (ERCWA) predicted dropout. The study examined the following hypotheses.

H1: There are significant differences in harm avoidance, novelty seeking, reward dependence and cooperativeness that will effectively discriminate individuals with eating disorders of any diagnosis who drop out of treatment in a PHP treatment program at ERCWA from individuals with eating disorders of any diagnosis who complete the program.

H2: There are significant differences in persistence and harm avoidance that will effectively discriminate individuals with anorexia nervosa who drop out of treatment in a PHP program at ERCWA from individuals with anorexia nervosa who complete the program.

H3: There are significant differences in persistence and novelty seeking that will effectively discriminate individuals diagnosed with bulimia nervosa who drop out of a PHP treatment program at ERCWA from individuals with bulimia nervosa who complete the program.

Participants

This study included 226 patients diagnosed with an eating disorder and admitted to adult PHP treatment at ERCWA in the 24-month period during 2014 and 2015. Both male and female patients over 18 years old were included. Patients who did not complete a Temperament and Character Inventory during treatment or who did not have a signed consent for research were excluded from the sample and no other inclusion or exclusion criteria was used for participants. No compensation was offered to participants. All identifying information was removed from the database for the protection of patient confidentiality.

Procedure

This study utilized archival Temperament and Character Inventory-3 (v1) data of 226 males and females diagnosed with an eating disorder that had received treatment at Eating Recovery Center of Washington Adult Partial Hospitalization Program during 2014 and 2015. A medical chart review was conducted for each patient admitted to the ERCWA adult PHP during 2014 and 2015, the Physicians Admission Assessment, consent to research, TCI-3 (v1) self report assessment, type of discharge and Commitment to Recovery documents were accessed. Permission to access this data had been granted by Dr. Craig Johnson, PhD, CEDS, FAED, and Chief Science Officer at Eating Recovery Center. Drop out was defined as participants who signed themselves out of treatment utilizing the 72-hour notice Commitment to Recovery (Appendix C) or who left treatment against medical advice (AMA) or against clinical advice (ACA). Participants who left treatment by routine discharge or transfer, discontinued care due to

resources constraint and discontinued care due to administrative discharge were not considered as drop out.

Materials

Temperament and character inventory (TCI-3 v1). The Temperament and Character Inventory-3 version 1 (TCI-3 v1) is a 259 item self-report assessment (See Appendix A). Individual differences in the ways people act, feel or behave are expressed through scores on 7 personality dimensions containing 4 dimensions of Temperament, 3 dimensions of Character and 32 subscales (See Appendix B). The TCI-3 is designed for use with ages 14 and above with a 5-point Likert scale response format. There are five possible responses for each question: 1) Definitely False, 2) Mostly or Probably False, 3) Neither True nor False, or about Equally True or False, 4) Mostly or Probably True and 5) Definitely True. Temperament is considered significantly heritable and mostly consistent, while character is moderately heritable and may be developed across time (Cloninger et al., 1987; Cloninger, 1993; Cloninger, 1994; Cloninger, 2006).

The TCI-R has high internal consistency, good inter-tester reliability and test-retest reliability and has been validated in several other countries and languages (De la Rie, Duijsens, & Cloninger, 1998; Fassino et al., 2002; Giakoumaki et al., 2016; Goncalves & Cloninger, 2010, Gutierrez-Zotes et al., 2015; Hansenne, Delhez, & Cloninger, 2005; Martinotti et al., 2008; Pelissolo et al., 2005; Preiss, Kucharová, Novák, & Stepánková, 2007), although the TCI was originally developed in English, limited research has been conducted on the English version of the TCI-3(v1) (Farmer & Goldberg, 2008). There are two differences between the TCI-R and the TCI-3 are 1) the TCI-3(v1) has two additional subscales within the temperament dimension of self-

transcendence (ST) and 2) the TCI-3 v1 is 19 questions longer than the TCI-R (Cloninger & Cloninger, 2011).

Commitment to recovery. The Commitment to Recovery (Appendix D) is a document signed by each patient prior to admitting to treatment, agreeing to give 72-hour notice to leave/drop out of treatment. A copy is scanned into the patient electronic medical chart record and a copy is given directly to the patient. This agreement allows for discussion of this decision between the patient and their multi-disciplinary treatment members if a patient decides to leave treatment prior to clinical or medical advice. During the 72-hour period clinicians may seek feedback from and offer education to any identified family members and friends, communicate with any referring or outside providers and request appropriate referrals for the recommended level of care. The patient may at any time during the notice period decide to rescind the decision to leave treatment and remain in the program.

Physician admission assessment. This document (Appendix C) is completed on the day of admission by the psychiatrist on staff and becomes part of the electronic medical chart record. This includes demographic and clinical information including patient age, diagnosis, and gender.

Statistical Analysis

A Multiple Logistic Regression Analysis was conducted to determine the probability of predicting treatment dropout (treatment dropout = 1; treatment completion = 2), considering the TCI-3 (v1) dimensions (novelty seeking, harm avoidance, reward dependence, persistence, self-directedness, cooperativeness, self-transcendence) as independent predictors (continuous). Using this type of multivariate analysis allowed for

examination of each personality dimension for predictive ability, as well as the predictive ability of combinations of personality dimensions on predicting treatment dropout.

Summary

An analysis of archival data from 226 patients diagnosed with an eating disorder and admitted to ERCWA adult PHP during 2014 and 2015 was completed. A review of medical chart records was conducted for each admission, including the Commitment to Recovery, Physicians Admission Assessment, and TCI-3 (v1) self-report assessment. The temperament and character data was evaluated for prediction of dropout or completion of treatment.

Chapter 3

Data Analysis

A Multiple Logistic Regression Analysis was conducted to determine the probability of predicting treatment dropout (treatment dropout = 1; treatment completion = 2), considering TCI-3 v1 dimensions (novelty seeking, harm avoidance, reward dependence, persistence, self-directedness, cooperativeness, self-transcendence) as independent predictors (continuous).

Findings

Descriptive statistics. As seen in Appendix H, there were a total of 226 subjects included in this study, 58 subjects were excluded from the study due to missing TCI-3 v1 data, 7 (12.1%) of those subjects dropped out of treatment, leaving 168 subjects. Of the 168 subjects, there were 75 diagnosed with anorexia nervosa (44.6%), 50 diagnosed with bulimia nervosa (29.8%) and 43 diagnosed with EDNOS (25.6%). Of the 168 subjects, 15 (8.9%) identified as male and 153 (91.1%) identified as female. The age of subjects ranged from 18 to 65 ($\bar{x}$ = 31.76 and SD = 12.1). The number of treatment dropout subjects were 23 (13.7%) and 145 (86.3%) subjects were in the treatment completion category. There were 145 subjects in the treatment completion group, 13 were male and 132 were female, 62 diagnosed with AN, 46 diagnosed with BN and 37 diagnosed with EDNOS. There were 23 subjects in the treatment dropout group, 2 were male and 21 were female, 13 diagnosed with AN, 4 diagnosed with BN and 6 diagnosed with EDNOS.

Inferential Statistics. H1. A binomial logistic regression analysis was performed to ascertain whether a regression model comprised of harm avoidance, novelty seeking, reward dependence and cooperativeness as predictors would effectively discriminate individuals with eating disorders of any diagnosis who drop out of treatment in a PHP treatment program at ERCWA from individuals with eating disorders of any diagnosis who complete the program. Linearity of the continuous variables with respect to the logistic regression model of the categorical dependent variable was assessed via the Box-Tidwell (1962) procedure. A Bonferroni correction was applied using all eight terms in the model resulting in a more conservative critical value of statistical significance being accepted when $p < .006$ (Tabachnick & Fidell, 2007). Based on this assessment all the continuous independent variables were linearly related to the dependent variable. There were eighteen studentized residuals, outliers greater than 2.5 standard deviations (SD) from the population mean, with values ranging (SD = -2.40 to -7.16). Studentized residual is determined by the range of means, divided by the standard error of the mean for the specific samples being compared. These outliers were not included in the analysis.

The logistic regression model was statistically significant, χ^2 (4, N = 150) = 22.32, $p < .005$. The model explained between 13.8% (Cox and Snell R^2) and 54.6% (Nagelkerke R^2) of the variance in treatment completion and treatment dropout and correctly classified 96% of cases. The sensitivity of the model was 40%, meaning of people who dropped out were correctly predicted to dropout. The positive predictive value was 67.7%, indicating the percentage of the people predicted to dropout our model accurately picked 67.7%. The negative predictive value was 2%, meaning of the people predicted to complete treatment our model accurately picked 2% of them. Of the four

predictor variables cooperativeness was statistically significant (p = .013) with reward dependence approaching significance (p = .056) cooperativeness and reward dependence (Appendix I).

H2. A binomial logistic regression analysis was performed to ascertain whether a regression model comprised of persistence and harm avoidance as predictors would effectively discriminate individuals with anorexia nervosa who drop out of treatment in a PHP program at ERCWA from individuals with anorexia nervosa who complete the program. There were ten studentized residuals, outliers greater than 2.5 standard deviations (SD) from the population mean, with values ranging (SD = -2.51 to -4.09), these outliers were not included in the analysis. Linearity of the continuous variables with respect to the logistic regression model of the categorical dependent variable was assessed via the Box-Tidwell (1962) procedure. A Bonferroni correction was applied using all four terms in the model resulting in statistical significance being accepted when $p < .0125$ (Tabachnick & Fidell, 2007). Based on this assessment the continuous independent variable of persistence was linearly related to the dependent variable, and harm avoidance variable was not. Harm avoidance was non-normally distributed, with skewness of -.01 (SE = 0.30) and kurtosis of -1.34 (SE = 0.59). The logistic regression model was statistically significant, χ^2 (2, N = 65) = 15.87, $p < .005$. The model explained between 21.7% (Cox and Snell R^2) and 69.4% (Nagelkerke R^2) of the variance in treatment completion and treatment dropout and correctly classified 96.9% of cases. Neither predictor variable was significant within this model.

H3. A binomial logistic regression analysis was performed to ascertain whether a regression model comprised of persistence and novelty seeking as predictors would

effectively discriminate individuals diagnosed with bulimia nervosa who drop out of a PHP treatment program at ERCWA from individuals with bulimia nervosa who complete the program. Linearity of the continuous variables with respect to the logistic regression model of the categorical dependent variable was assessed via the Box-Tidwell (1962) procedure. A Bonferroni correction was applied using all four terms in the model resulting in statistical significance being accepted when $p < .0125$ (Tabachnick & Fidell, 2007). Based on this assessment, all continuous independent variables were found linearly related to the dependent variable. The logistic regression model was not statistically significant, χ^2 (2, N = 50) = 0.89, p = .640, indicating that the model was not a good fit to be able to distinguish between individuals who completed or did not complete treatment based on the predictor variables persistence and novelty seeking within individuals diagnosed with bulimia nervosa.

Exploratory analyses. Statistical analyses and visual assessment of histograms indicated mixed populations for treatment drop out and completion on several TCI-3 (v1) variables within different diagnosis (see Appendix J). This bimodal distribution, two distinct peaks or modes, indicates that another process may be a contributing cause of the present variation in the data and that additional future analysis is needed to identify the unique cause of the unusual pattern in the data (Field, 2009; Howell, 2007). Often, although rarely systematically evaluated (Evans, 2008), the two peaks contain separate important sets of information, which requires both understanding these separate populations of data apart and together (Freeman & Dale, 2013).

Self-directedness was observed as bimodal: within treatment completion across diagnoses AN (modes = 50, 115), BN (modes = 43, 120), EDNOS (modes = 46, 110),

and across gender for females (modes = 60, 110) and males (mode = 45,150); and for AN (mode = 70, 125) in treatment dropout. Persistence was observed as bimodal: within treatment completion overall (modes = 50, 125) and within gender for females (modes = 40, 130) and for males (modes = 55, 120); and within treatment dropout across diagnoses for AN (modes = 27, 130), for BN (modes = 90,130), for EDNOS (modes = 30, 110) and within females (modes = 30, 140). Reward dependence was observed as bimodal: in treatment completion overall (modes = 62, 97), and within females (modes = 55, 97); and for treatment dropout within AN (modes = 58, 95). Harm avoidance was observed as bimodal: within treatment completion across diagnoses for AN (modes = 56, 137), for BN (modes = 62, 118) and for females (modes = 56, 132); and in treatment dropout across all diagnosis for AN (modes = 52, 127), for BN (modes = 68, 130), for EDNOS (modes = 70, 130) and within females (modes = 50, 130). Novelty seeking was observed as bimodal: for treatment completion across all diagnoses for AN (modes = 75, 100), for BN (modes = 56, 106), for EDNOS (modes = 52, 100); and for treatment dropout within AN (modes = 65, 100). Cooperativeness was observed as bimodal: for treatment completion across diagnoses for AN (modes = 56,130), for BN (modes = 45, 137), for EDNOS (modes = 54, 156); and for treatment dropout within females (modes = 58,142).

Freeman and Dale (2013) proposed in social cognition 'a tandem operation of one process that is relatively fast, non-conscious, automatic, and coarse and a separate process that is relatively slow, conscious, deliberate, and fine-grained' (p. 83). This theory in social cognition implies that people initially evaluate themselves and others in a non-conscious, automatic fashion and that this rapid evaluation may be modified by a secondary conscious more deliberate assessment (Freeman & Dale, 2013; Evans, 2008).

It is hypothesized that these two independent processes may predict distributions of behavioral response measures that exhibit bimodality (Freeman & Dale, 2013; Evans, 2008).

An independent-samples t-test was run to determine if there were differences in TCI-3 (v1) variables between males and females. Although mean scores were lower on all TCI-3 (v1) variables in males than in females: cooperativeness (men: $M = 89.0$, $SD = 13.7$; women: $M = 112$, $SD = 3.84$), self-directedness (men: $M = 87.9$, $SD = 12.4$; women: $M = 97.5$, $SD = 3.18$), persistence (men: $M = 78.5$, $SD = 11.2$; women: $M = 99.3$, $SD = 3.45$), reward dependence (men: $M = 57.9$, $SD = 8.68$; women: $M = 84.0$, $SD = 2.46$), harm avoidance (men: $M = 71.4$, $SD = 6.68$; women: $M = 92.4$, $SD = 2.98$), and novelty seeking (men: $M = 73.3$, $SD = 5.48$; women: $M = 88.2$, $SD = 1.97$); these differences were only significant in: novelty seeking with $M = 73.3$, 95% CI [-27.83 to -2.02], $t(166) = -2.28$, $p = .024$; harm avoidance with $M = 71.4$, 95% CI [-27.83 to -2.02], $t(20.0) = -2.88$, $p = .009$; and reward dependence with $M = 57.9$, 95% CI [-27.83 to -2.02], $t(166) = -3.14$, $p = .002$.

An independent-samples t-test was run to determine if there were differences in age between males and females in treatment dropout and treatment completion. Lower mean age was observed in treatment dropout for males versus females (men: $M = 24.0$, $SD = 1.00$; women: $M = 33.9$, $SD = 3.60$), which was statistically significant with $M = 24$, 95% CI [3.74 to -17.68], $t(20.7) = -2.65$, $p = .015$. There was a 15-year gap of no male participants was noted from age 25-40.

An independent-samples t-test was run to determine if there were differences in age between treatment completion and treatment dropout for AN, BN, and EDNOS.

Although mean age was higher in treatment drop out versus treatment completion: for bulimia (dropout: $M = 35.5$, $SD = 9.56$; completion: $M = 29.8$, $SD = 1.37$), anorexia (dropout: $M = 33.7$, $SD = 4.82$; completion: $M = 29.5$, $SD = 1.23$), and a higher mean age in treatment completion for EDNOS (dropout: $M = 30.0$, $SD = 5.23$; completion: $M = 37.1$, $SD = 2.43$), none of these differences were statistically significant.

An independent-samples t-test was run to determine if there were differences in TCI-3 (v1) variables between females diagnosed with AN and BN. Although mean scores were lower in AN than BN in: NS with $M = -2.26$, 95% CI [-10.7 to 6.17], RD with $M = -6.59$, 95% CI [-7.57 to 25.1], C with $M = -.50$, 95% [-17.9 to 16.9], SD with $M = -1.58$, 95% CI [-16.8 to 13.6]; and higher in AN than BN in: HA with $M = 4.42$, 95% CI [-9.24 to 18.1], P with $M = 8.77$, 95% CI [-7.57 to 25.1], none of these differences were statistically significant.

Summary

Inferential analysis through binomial regression in the first hypothesis indicated that increasing cooperativeness is associated with the increased likelihood of dropout, recording an odds ratio of .86. The odds ratio of 1.08 for reward dependence is greater than 1, indicating that for every increase in reward dependence score individuals were .08 more likely to complete treatment. Descriptive statistical analyses and visual observation of the data in histograms indicated a bi-modal population within treatment dropout for self-directedness, persistence, reward dependence, novelty seeking and cooperativeness within anorexia diagnosis. Gender differences observed were lower scores on all TCI-3 (v1) variables for males versus females.

Chapter 4

The purpose of this study was to assess the possibility of using temperament and character dimensions in predicting treatment dropout or treatment completion of eating disorder treatment at Eating Recovery Center of Washington partial hospitalization program. Current research is limited regarding personality dimensions impact on treatment dropout.

Interpretation and Integration

The principle finding of our study is that higher levels of cooperativeness are associated with increased dropout in a partial hospitalization program for eating disorders. In contrast, a review of eating disorder treatment by Fassino et al. (2000) researchers found low cooperativeness to be associated with dropout. The results in this study of bimodal cooperativeness scores within both treatment completion and drop out, along with results from Fassino et al. (2000) prompt questions of if cooperativeness is associated as both protective and a risk in completing or dropping out of treatment.

The intriguing pattern of bimodal distribution of the data, meaning there are two populations within the resulting data, make it difficult to interpret the results as statistical analysis assumes a unimodal normal distribution (Field, 2009; Howell, 2007). Recent research has found evidence for bimodal distribution in human communication and within human reasoning, judgment, and social cognition (Evans, 2008; Wu et al., 2010). Many other variables may be impacting the resulting bimodal distribution of data. For example, participants with high cooperativeness and who are highly cooperative with rigid black and white thought patterns may be vulnerable to a disordered mindset (Biano et al., 2014; Mitchison et al., 2013). Some of these other variables may also include:

malnourishment and impaired cognitive performance in some of the individual whose responses in the study responses may have been affected, previous treatment history, comorbidity with other mental health diagnosis such as anxiety, depression or mood disorders, family dynamics and current or past treatment team dynamics.

Increased reward dependence associated with increased treatment completion was found to be approaching significance in results of this study. This result aligns with findings in a study by Segura-Garcia et al. (2013) where reward dependence predicted clinical improvements in individuals in eating disorder treatment. In a study by Atiye et al. (2015) lower harm avoidance and higher reward dependence are present in those with eating disorders both recovered and ill. Even with the addition of the current study results, it remains unclear if higher reward dependence is a result of treatment or present as a positive prognostic dimension.

Higher levels of harm avoidance (HA) and lower self-directedness (SD) and cooperativeness (C) scores were found in both recovered and ill women compared to normal control women (Klump et al., 2004). No evidence was found in this study in support of those previous findings. Discussion from Klump et al. (2004) also suggested separate genetic, behavioral and personality dimensions may influence anorexia and bulimia. The diversity within EDNOS diagnosis may contribute to unaccounted complexity within the data and results of this study.

Previous research in a study of inpatient Japanese women with severe malnutrition had shown high harm avoidance and persistence, and lower self-directedness was significant in eating disorder patients versus healthy controls (Tanaka et al., 2015). Our research did not support the significance of these previous findings. Similarly,

Zerwas et al. (2013) found trait anxiety (HA1), a subscale of harm avoidance, to be a negative prognostic factor lowering likelihood of recovery in anorexia with numbing out of internal emotional experiences and bodily sensations with increased malnourishment being a potentially desired outcome of individuals. Persistence and harm avoidance were not found significant for treatment dropout of participants diagnosed with anorexia in this study. Effective management of these temperament traits may be diminished with disordered mindset exacerbated by malnourishment, which may also have impacted individuals self-report. Varying levels of symptom acuity and therapeutic approaches may influence differences in personality dimensions in individuals who dropout of outpatient or inpatient treatment versus partial hospitalization treatment.

In this study novelty seeking was not found to be a strong predictor of treatment dropout or completion, which is in contrast to results from Segura-Garcia et al. (2013) on long-term outcome in which low novelty seeking was the strongest predictor of poor treatment outcome. Zerwas et al. (2013) found greater impulsivity (NS2) to be a positive prognostic factor in anorexia for quick recovery, while these results diminished with over time with age. In a review of eating disorder treatment by Fassino et al. (2000) researchers found low self-directedness to be associated with dropout. Rodriguez-Cano et al. (2012) found responsibility (SD1) and self-acceptance (SD4) subscales of self-directedness (SD) protective factors for dropout contemplation. A major difference in these studies and the present study would be the stability of nutrition at time of assessment.

When multicollinearity is present, predictor variables are highly correlated with each other, making it difficult to discern the role of each correlated variable. The

multicollinearity of the personality dimensions found to be present within the TCI-3 (v1) make it difficult to discern which variables may be influencing dropout (Farmer & Goldberg, 2008). A study by Klump et al. (2004) found significant personality disturbances during and after severity of illness and into recovery. Segura-Garcia failed to predict outcome in terms of DSM-IV TR, while able to predict clinical changes in patients. The theoretical three dimensional interrelated cube design of the TCI-3 (v1) assessment includes four areas of temperament novelty seeking, harm avoidance, reward dependence and persistence considered more long-standing traits while the three character dimensions of cooperativeness, self-directedness and self-transcendence are more malleable and may be intentionally developed in order to manage existing temperament traits. Therefore, dynamics within combination of subscales within the TCI-3 (v1) primary scales may lead to treatment dropout, this possibility is discussed further in future research recommendations.

Exploration

A notable strength of this study is the coherent definition of dropout, defined as individuals signing themselves out of treatment utilizing the 72-hour notice Commitment to Recovery (Appendix C), leaving treatment against medical advice (AMA) or against clinical advice (ACA). Individuals who left treatment administratively due to financial limitations, insurance coverage denial or non-compliance were not included in the treatment dropout group. Additionally, many previous studies (Abbate-Daga et al., 2014; Abd Elbaky et al., 2014; Hubert et al., 2013; Jordan et al., 2014; Tanaka et al., 2015; Zerwas et al., 2013) primarily focused on anorexia and women. This study explored male and female subjects diagnosed with anorexia, bulimia and EDNOS. A review of

research on eating disorder treatment found dropout rates ranging from 20.2% to 51% for inpatient treatment and 29% to 73% for outpatient treatment (Fassino et al., 2009). Results of the current study had a dropout rate of only 13.7% and of the 58 patients excluded from the study due to incomplete TCI-3 (v1) data only 7 (12.1%) dropped out of treatment.

This study also had a number of limitations. First, there were a low number of male participants and moderate to low numbers of subjects within each diagnosis group. Incorporating a multisite population would increase the number of male participants as well as increase the generalizability of any results. Second, this study used retrospective data, therefore any missing data was unable to be pursued and tracking of information on individuals with missing TCI data due to decline to take assessment was also not available. A study improvement would be collecting current data versus retrospective data could potentially reduce missing data and also including information about those who decline to complete a personality assessment or dropout prior to taking a personality assessment.

A third limitation, the personality self-report assessment (TCI-3 v1) was administered at the beginning of treatment (within two weeks of admission) when many individuals may have been experiencing significant malnutrition. This malnutrition may impair self –report observation, exacerbate rigid black and white thinking, as well as self-perception and body dysmorphia (Abbate-Daga et al., 2014; Biano et al., 2014). This may have influenced the bimodal population results and would need to be explored further. Adding a second time of assessment at time of discharge would provide information on any shifts in temperament and character dimensions during the course of treatment.

Establishing a way to measure the degree of malnourishment, as well as exploring the impact of that malnourishment on temperament and character dimensions would be another useful addition to this study. Therapeutic work patients had completed with outpatient providers to access a higher level of care may have been a mediator in development of character dimensions of self-directedness that otherwise may not have been present in lower levels of care. External pressure from family and friends with concern for an individual's severity of symptoms or vocational issues may have influenced enrollment into a higher level of care without high internal motivation or cooperativeness. Inclusion of control group with concurrent real time data collection versus use of retrospective data would be a noted improvement from the present study.

Finally, this study did not control for other psychiatric diagnosis that may have impacted personality dimensions. Either excluding or accounting for other pathology through methodical categorization may elucidate differences in these populations.

Future Directions/Recommendations

The work done in this study has various impacts including practical applications to clinical, administrative and research sectors of eating disorder treatment. The information collected was clinically valuable in improving the treatment program to increase retention and allow for consideration of more appropriate alternative care for some individuals. There is a greater understanding of the data collection organization necessary to conduct research at Eating Recovery Center of Washington, as well as streamlining of the assessment process and incorporation of additional measures to augment information collected on all individuals admitted. The information collected was clinically valuable in improving the treatment program to increase retention and allow for

consideration of more appropriate alternative care for some individuals. The study results may influence consideration of using multiple or different personality assessments to evaluate patients that may be at risk for dropout and to develop a greater understanding of individuals that are or are not a good fit for the treatment program. Use of additional personality assessments to corroborate findings from research utilizing TCI dimensions and to uncover any novel factors of personality associated with eating disorders outside of this assessments focus.

Early identification of risk factors associated with dropout may influence the direction of treatment focus and goals, including awareness of what dimension of temperament and character may or may not improve. The focus clinicians take in the therapeutic process and restructuring at the programmatic level may result from this study. Further research of dropout is a concern for many individuals and their families leaving treatment. Exploring the question, is there something else in common with the dropout subgroup? Exploration of the subscales within TCI-3 (v1) temperament and character dimensions may establish clarity on the impact of these scales on the split populations seen in the results of this study.

Limited research exists on personality across a range of psychopathologies. Future research exploring eating disorders versus other pathology is needed to decipher specificity of personality dimensions related to eating disorders. A longitudinal study, with follow-up on recovery status and re-assessment of personality dimensions is recommended.

Many patients are administratively asked to leave treatment due to non-compliance. This group was not evaluated within the current study and further

exploration of this subgroup may provide novel insight into another understudied population within eating disorders. Adaption of treatment programs and approaches to accommodate various individual personality temperaments could ameliorate conditions towards greater retention of these subgroups.

Future studies are recommended to explore the current curious pattern of bimodal distributions in the data, particularly concerning the variables of self-directedness, persistence, harm avoidance, novelty seeking and cooperativeness. These bimodal distributions of the data indicate another factor(s) may be contributing to the variation in temperament and character scores found in this study of this particular population. It would be prudent to consider the impact of factors such as level of malnourishment, comorbidity, previous treatment history, and family dynamics when conducting further research with this data.

Conclusions

In this study multiple logistic regression analyses were conducted to determine the probability of predicting treatment dropout when considering Cloninger's temperament and character traits TCI-3 (v1) dimensions of novelty seeking, harm avoidance, reward dependence, persistence, and self-transcendence as continuous independent predictors in diagnosed eating disorders (Cloninger & Cloninger, 2011). In summary, primary findings from our study suggest higher levels of cooperativeness are significantly associated with increased dropout and increased reward dependence may be associated with increased treatment completion. The bimodal scores on temperament dimensions: harm avoidance, novelty seeking, reward dependence and cooperativeness

within the treatment completion outcome support previous research that some temperament traits persist in recovery.

In conclusion, our results support that assessing temperament and character traits may be useful tool in predicting treatment dropout. Reduction of obstacles to treatment adherence may improve management of eating disorder recovery for the benefit of those experiencing disturbances in eating.

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Appendix A

Temperament and Character Inventory TCI-3 (v1)

Temperament and Character Inventory TCI-3 (v1)

TCI-3 (v1) INSTRUCTIONS

On this page you will find statements people might use to describe their attitudes, opinions, interests, and other personal feelings. For each of the following questions, please select the response that best describes the way you usually or generally act or feel (Select only one response for each question).
There are five possible responses for each question:

#	Possible Response
1	Definitely False
2	Mostly or Probably False
3	Neither True nor False, or about Equally True or False
4	Mostly or Probably True
5	Definitely True

Read each statement carefully, but don't spend too much time deciding on the answer. Most people can finish this test in a bit less than an hour. Please answer every statement, even if you are not completely sure of the answer. Try to describe yourself the way you usually or generally act and feel, not just how you are feeling right now. Remember there are no right or wrong answers -- just describe your own personal opinions and feelings.

I often try new things just for fun or thrills, even if most people think it is a waste of time.

Questions 1 / 259

I usually am confident that everything will go well, even in situations that worry most people.

Questions 2 / 259

I often feel that I am the victim of circumstances.

Questions 3 / 259

I can usually accept other people as they are, even when they are very different from me.

Questions 4 / 259

I like a challenge better than easy jobs.

Questions 5 / 259

I am more strongly guided by practical consideration than my moral ideas.

Questions 6 / 259

Often I feel that my life has little purpose or meaning.

Questions 7 / 259

I like to help find a solution to problems so that everyone comes out ahead.

Questions 8 / 259

I am usually eager to get going on any job I have to do.

Questions 9 / 259

I often feel tense and worried in unfamiliar situations, even when others feel there is little to worry about.

Questions 10 / 259

I often do things based on how I feel at the moment without thinking about how they were done in the past.

Questions 11 / 259

I usually do things my own way -- rather than giving in to the wishes of other people.

Questions 12 / 259

I often feel a strong sense of unity with all the things around me.

Questions 13 / 259

I would do almost anything legal in order to become rich and famous, even if I would lose the trust of many old friends.

Questions 14 / 259

I am much more reserved and controlled than most people.

Questions 15 / 259

I like to discuss my experiences and feelings openly with friends instead of keeping them to myself.

Questions 16 / 259

I have less energy and get tired more quickly than most people.

Questions 17 / 259

When I am in deep contemplation or prayer, I sometimes feel that I am directly connected to a supernatural source of love and peace.

Questions 18 / 259

I seldom feel free to choose what I want to do.

Questions 19 / 259

I don't seem to understand most people very well.

Questions 20 / 259

I often avoid meeting strangers because I lack confidence with people I do not know.

Questions 21 / 259

I like to please other people as much as I can.

Questions 22 / 259

I often wish that I was smarter than everyone else.

Questions 23 / 259

No job is too hard for me to do my best.

Questions 24 / 259

I often wait for someone else to provide a solution to my problems.

Questions 25 / 259

I often spend money until I run out of cash or get into debt from using too much credit.

Questions 26 / 259

My actions are determined largely by influences outside my control.

Questions 27 / 259

Often I have unexpected flashes of insight or understanding while relaxing.

Questions 28 / 259

I don't care very much whether other people like me or the way I do things.

Questions 29 / 259

I usually try to get just what I want for myself because it is not possible to satisfy everyone anyway.

Questions 30 / 259

I have no patience with people who don't accept my views.

Questions 31 / 259

I sometimes feel so connected to nature that everything seems to be part of one living process.

Questions 32 / 259

When I have to meet a group of strangers, I am more shy than most people.

Questions 33 / 259

I am more sentimental than most people.

Questions 34 / 259

I think that most things that are called miracles are just chance.

Questions 35 / 259

When someone hurts me in any way, I usually try to get even.

Questions 36 / 259

My personal and social activities are more important than prayer or religious activities.

Questions 37 / 259

Each day I try to take another step toward my goals.

Questions 38 / 259

Please click on "Mostly or Probably True", this is a validity question.

Questions 39 / 259

I am a very ambitious person.

Questions 40 / 259

I usually stay calm and secure in situations that most people would find physically dangerous.

Questions 41 / 259

I do not think it is smart to help weak people who cannot help themselves.

Questions 42 / 259

I cannot have any peace of mind if I treat other people unfairly, even if they are unfair to me.

Questions 43 / 259

People will usually tell me how they feel.

Questions 44 / 259

Sometimes I have felt like I was part of something with no limits or boundaries in time and space.

Questions 45 / 259

I sometimes feel a spiritual connection to other people that I cannot explain in words.

Questions 46 / 259

I like it when people can do whatever they want without strict rules and regulations.

Questions 47 / 259

When I fail at something, I become even more determined to do a better job.

Questions 48 / 259

Usually I am more worried than most people that something might go wrong in the future.

Questions 49 / 259

I usually think about all the facts in detail before I make a decision.

Questions 50 / 259

I have many bad habits that I wish I could break.

Questions 51 / 259

Other people control me too much.

Questions 52 / 259

I like to be of service to others.

Questions 53 / 259

I am usually able to get other people to believe me, even when I know that what I am saying is exaggerated or untrue.

Questions 54 / 259

Sometimes I have felt my life was being directed by a spiritual force greater than any human being.

Questions 55 / 259

I have a reputation as someone who is very practical and does not act on emotion.

Questions 56 / 259

I am strongly moved by sentimental appeals (like when asked to help crippled children).

Questions 57 / 259

I am usually so determined that I continued to work long after other people have given up.

Questions 58 / 259

I have had moments of great joy in which I suddenly had a clear, deep feeling of oneness with all that exists.

Questions 59 / 259

I know what I want to do in my life.

Questions 60 / 259

I often cannot deal with problems because I just don't know what to do.

Questions 61 / 259

I prefer spending money rather than saving it.

Questions 62 / 259

I have often been called an "eager beaver" because of my enthusiasm for hard work.

Questions 63 / 259

If I am embarrassed or humiliated, I get over it very quickly.

Questions 64 / 259

I like to strive for bigger and better things.

Questions 65 / 259

I usually demand very good practical reasons before I am willing to change my old ways of doing things.

Questions 66 / 259

I nearly always stay relaxed and carefree, even when nearly everyone else is fearful.

Questions 67 / 259

I find sad songs and movies pretty boring.

Questions 68 / 259

Circumstances often force me to do things against my will.

Questions 69 / 259

I usually enjoy being mean to anyone who has been mean to me.

Questions 70 / 259

I often follow my instincts, hunches, or intuition without thinking through all the details.

Questions 71 / 259

I often become so fascinated with what I'm doing that I get lost in the moment - like I'm detached from time and place.

Questions 72 / 259

I do not think I have a real sense of purpose for my life.

Questions 73 / 259

I often feel tense and worried in unfamiliar situations, even when others feel there is no danger at all.

Questions 74 / 259

I receive much comfort and support from my religious beliefs.

Questions 75 / 259

I love to excel at everything I do.

Questions 76 / 259

I often feel a strong spiritual or emotional connection with all the people around me.

Questions 77 / 259

I usually try to imagine myself "in other people's shoes", so I can really understand them.

Questions 78 / 259

Principles like fairness and honesty have little role in some aspects of my life.

Questions 79 / 259

I am more hard-working than most people.

Questions 80 / 259

Even when most people feel it is not important, I often insist on things being done in a strict and orderly way.

Questions 81 / 259

I feel very confident and sure of myself in almost all social situations.

Questions 82 / 259

My friends find it hard to know my feelings because I seldom tell them about my private thoughts.

Questions 83 / 259

I am good at communicating my feelings to others.

Questions 84 / 259

I am more energetic and tire less quickly than most people.

Questions 85 / 259

I often stop what I am doing because I get worried, even when my friends tell me every- thing will go well.

Questions 86 / 259

I often wish I was more powerful than everyone else.

Questions 87 / 259

Members of a team rarely get their fair share.

Questions 88 / 259

I don't go out of my way to please other people.

Questions 89 / 259

I am not shy with strangers at all.

Questions 90 / 259

I spend most of my time doing things that seem necessary but not really important to me.

Questions 91 / 259

I don't think that religious or ethical principles about what is right and wrong should have much influence in business decisions.

Questions 92 / 259

I often try to put aside my own judgments so that I can better understand what other people are experiencing.

Questions 93 / 259

Many of my habits make it hard for me to accomplish worthwhile goals.

Questions 94 / 259

I have made real personal sacrifices in order to make the world a better place -- like trying to prevent war, poverty and injustice.

Questions 95 / 259

It takes me a long time to warm up to other people.

Questions 96 / 259

It gives me pleasure to see my enemies suffer.

Questions 97 / 259

No matter how hard a job is, I like to get started quickly.

Questions 98 / 259

It often seems to other people like I am in another world because I am so completely unaware of things going on around me.

Questions 99 / 259

I usually like to stay cool and detached from other people.

Questions 100 / 259

I am more likely to cry at a sad movie than most people.

Questions 101 / 259

I recover more quickly than most people from minor illnesses or stress.

Questions 102 / 259

I often feel like I am a part of the spiritual force on which all life depends.

Questions 103 / 259

I like to explore new ways to do things.

Questions 104 / 259

I need much more practice in developing good habits before I will be able to trust myself in many tempting situations.

Questions 105 / 259

Please click on "Definitely False"; this is a validity item.

Questions 106 / 259

I like to make quick decisions so I can get on with what has to be done.

Questions 107 / 259

I am usually confident that I can easily do things that most people would consider dangerous (such as driving an automobile fast on a wet or icy road).

Questions 108 / 259

I am grateful for supernatural guidance.

Questions 109 / 259

I enjoy saving money more than spending it on entertainment or thrills.

Questions 110 / 259

I have had personal experiences in which I felt in contact with a divine and wonderful spiritual power.

Questions 111 / 259

I have so many faults that I don't like myself very much.

Questions 112 / 259

Most people seem more resourceful than I am.

Questions 113 / 259

I often break rules and regulations when I think I can get away with it.

Questions 114 / 259

Even when I am with friends, I prefer not to "open up" very much.

Questions 115 / 259

The harder a job is the more I like it.

Questions 116 / 259

I like to think about things for a long time before I make a decision.

Questions 117 / 259

Often when I look at an ordinary thing, something wonderful happens -- I get the feeling that I am seeing it fresh for the first time.

Questions 118 / 259

I usually feel tense and worried when I have to do something new and unfamiliar.

Questions 119 / 259

I am eager to start work on any assigned duty.

Questions 120 / 259

If there is any supernatural force in the universe, I don't think it affects me personally one way or the other.

Questions 121 / 259

My will power is too weak to overcome very strong temptations, even if I know I will suffer as a consequence.

Questions 122 / 259

If I am feeling upset, I usually feel better around friends than when left alone.

Questions 123 / 259

I often accomplish more than people expect of me.

Questions 124 / 259

Religious experiences have helped me understand the real purpose of my life.

Questions 125 / 259

I usually push myself harder than most people do because I want to do as well as I possibly can.

Questions 126 / 259

Please click on "Definitely True", this is a validity item.

Questions 127 / 259

I usually feel much more confident and energetic than most people, even after minor illnesses or stress.

Questions 128 / 259

When nothing new is happening, I usually start looking for something that is thrilling or exciting.

Questions 129 / 259

I like to do practical things more than praying or thinking about the mysteries of the universe.

Questions 130 / 259

People involved with me have to learn how to do things my way.

Questions 131 / 259

I make a warm personal connection with most people.

Questions 132 / 259

I am often described as an overachiever.

Questions 133 / 259

I would rather read a book than talk about my feelings with another person.

Questions 134 / 259

I enjoy getting revenge on people who hurt me.

Questions 135 / 259

If something doesn't work as I expected, I am more likely to quit than to keep going for a long time.

Questions 136 / 259

It is easy for other people to get close to me emotionally.

Questions 137 / 259

I feel an ever-increasing awe of the beauty in all things.

Questions 138 / 259

I would probably stay relaxed and outgoing when meeting a group of strangers, even if I were told they are unfriendly.

Questions 139 / 259

Please click on "Mostly or Probably False"; this is a validity item.

Questions 140 / 259

I generally don't like people who have different ideas from mine.

Questions 141 / 259

I often drag my heels a while before starting any project.

Questions 142 / 259

I can usually do a good job of stretching the truth to tell a funnier story or to play a joke on someone.

Questions 143 / 259

It is extremely difficult for me to adjust to changes in my usual way of doing things because I get so tense, tired, or worried.

Questions 144 / 259

I am more of a perfectionist than most people.

Questions 145 / 259

Other people often think that I am too independent because I won't do what they want.

Questions 146 / 259

I am better at saving money than most people.

Questions 147 / 259

I often give up on a job if it takes much longer than I thought it would.

Questions 148 / 259

Faith provides my greatest sense of fulfillment and contentment.

Questions 149 / 259

Whether something is right or wrong is just a matter of opinion.

Questions 150 / 259

I often learn a lot from people.

Questions 151 / 259

I believe that all life depends on some spiritual order or power that cannot be completely explained.

Questions 152 / 259

Things often go wrong for me unless I am very careful.

Questions 153 / 259

I am slower than most people to get excited about new ideas and activities.

Questions 154 / 259

I could probably accomplish more than I do, but I don't see the point in pushing myself harder than is necessary to get by.

Questions 155 / 259

I usually stay away from social situations where I would have to meet strangers, even if I am assured that they will be friendly.

Questions 156 / 259

I often feel so connected to the people around me that it is like there is no separation between us.

Questions 157 / 259

In most situations my natural responses are based on good habits that I have developed.

Questions 158 / 259

I often have to stop what I am doing because I start worrying about what might go wrong.

Questions 159 / 259

I am often called "absent-minded" because I get so wrapped up in what I am doing that I lose track of everything else.

Questions 160 / 259

I often consider another person's feelings as much as my own.

Questions 161 / 259

I try with all of my heart to understand and obey the moral ideals of universal love and harmony.

Questions 162 / 259

I am often described as an underachiever.

Questions 163 / 259

Most of the time I would prefer to do some- thing a little risky (like riding in a automobile over steep hills and sharp turns) -- rather than having to stay quiet and inactive for a few hours.

Questions 164 / 259

Some people think I am too stingy or tight with my money.

Questions 165 / 259

I cannot get any comfort from religious preaching because no one really knows what happens after we are dead.

Questions 166 / 259

I like old "tried and true" ways of doing things much better than trying "new and improved" ways.

Questions 167 / 259

I often do things to help protect animals and plants from extinction.

Questions 168 / 259

I often push myself to the point of exhaustion or try to do more than I really can.

Questions 169 / 259

I feel it is foolish and impractical to strive for truth and harmony in all things.

Questions 170 / 259

I am not very good at talking my way out of trouble when I am caught doing something wrong.

Questions 171 / 259

Repeated practice has given me good habits that are stronger than most momentary impulses or persuasion.

Questions 172 / 259

I think I will have very good luck in the future.

Questions 173 / 259

I open up quickly to other people, even if I don't know them well.

Questions 174 / 259

When I fail to master something at first, it becomes my personal challenge to succeed.

Questions 175 / 259

You don't have to be dishonest to succeed in business.

Questions 176 / 259

In conversations I am much better as a listener than as a talker.

Questions 177 / 259

I would not be happy in a job where I did not communicate with other people.

Questions 178 / 259

My attitudes are determined largely by influences outside my control.

Questions 179 / 259

I have so much to do most days that I don't usually have time for contemplation or prayer.

Questions 180 / 259

I often wish I was stronger than everyone else.

Questions 181 / 259

I often need naps or extra rest periods because I get tired so easily.

Questions 182 / 259

I have trouble telling a lie, even when it is meant to spare someone else's feelings.

Questions 183 / 259

I have trouble telling a lie, even when it is meant to spare someone else's feelings.

Questions 183 / 259

Regardless of any temporary problem that I have to overcome, I always think it will turn out well.

Questions 185 / 259

It is hard for me to enjoy spending money on myself, even when I have saved plenty of money.

Questions 186 / 259

I often do my best work under difficult circumstances.

Questions 187 / 259

I am often described as a dreamer because I place moral ideals before practical considerations.

Questions 188 / 259

I like to keep my problems to myself.

Questions 189 / 259

I have a vivid imagination.

Questions 190 / 259

I like to stay at home better than to travel or explore new places.

Questions 191 / 259

Warm friendships with other people are very important to me.

Questions 192 / 259

I often wish I could stay young forever.

Questions 193 / 259

I like to read everything when I am asked to sign any papers.

Questions 194 / 259

I think I would stay confident and relaxed when meeting strangers, even if I were told they are angry at me.

Questions 195 / 259

I feel it is more important to be sympathetic and understanding of other people than to be practical and tough-minded.

Questions 196 / 259

When I am in deep contemplation or prayer, I sometimes feel warmth and tingling like a powerful current is flowing through my body.

Questions 197 / 259

I often wish I had special powers like Superman.

Questions 198 / 259

I like to share what I have learned with other people.

Questions 199 / 259

I usually look at a difficult situation as a challenge or opportunity.

Questions 200 / 259

Most people I know look out only for themselves, no matter who else gets hurt.

Questions 201 / 259

I need much extra rest, support, or reassurance to recover from minor illnesses.

Questions 202 / 259

I know there are principles for living that no one can violate without suffering in the long run.

Questions 203 / 259

I don't want to be richer than everyone else.

Questions 204 / 259

I like to go slow in starting work, even if it is easy to do.

Questions 205 / 259

I would gladly risk my own life to make the world a better place.

Questions 206 / 259

When my work goes unnoticed, I become even more determined to succeed.

Questions 207 / 259

I often wish I could stop the passage of time.

Questions 208 / 259

I hate to make decisions based only on my first impressions.

Questions 209 / 259

I would rather be alone than deal with other people's problems.

Questions 210 / 259

I don't want to be more admired than everyone else.

Questions 211 / 259

I think it is foolish to depend on supernatural guidance to understand the mysteries of life.

Questions 212 / 259

I need a lot of help from other people to train me to have good habits.

Questions 213 / 259

I like to do a job quickly and then volunteer for more.

Questions 214 / 259

It is hard for me to tolerate people who are different from me.

Questions 215 / 259

I would rather be kind than to get revenge when someone hurts me.

Questions 216 / 259

The moral ideals within me fill my heart with awe and admiration.

Questions 217 / 259

I really enjoy keeping busy.

Questions 218 / 259

I try to cooperate with others as much as possible.

Questions 219 / 259

I am often successful because of my ambition and hard work.

Questions 220 / 259

It is usually easy for me to like people who have different values from me.

Questions 221 / 259

Good habits have become "second nature" to me -- they are automatic and spontaneous actions nearly all the time.

Questions 222 / 259

I hate to change the way I do things, even if many people tell me there is a new and better way to do it.

Questions 223 / 259

I think it is unwise to believe in things that cannot be explained scientifically.

Questions 224 / 259

I am willing to make many sacrifices to be a success.

Questions 225 / 259

I like to imagine my enemies suffering.

Questions 226 / 259

Please click on "Neither True nor False, or about Equally True or False"; this is a validity question.

Questions 227 / 259

I like to pay close attention to details in everything I do.

Questions 228 / 259

I usually am free to choose what I will do.

Questions 229 / 259

Often I become so involved in what I am doing that I forget where I am for a while.

Questions 230 / 259

I like other people to know that I really care about them.

Questions 231 / 259

Most of the time I would prefer to do something risky (like hang-gliding or parachute jumping) -- rather than having to stay quiet and inactive for a few hours.

Questions 232 / 259

Because I so often spend too much money on impulse, it is hard for me to save money -- even for special plans like a vacation.

Questions 233 / 259

I often give in to the wishes of friends.

Questions 234 / 259

I never worry about terrible things that might happen in the future.

Questions 235 / 259

People find it easy to come to me for help, sympathy, and warm understanding.

Questions 236 / 259

Most of the time I quickly forgive anyone who does me wrong.

Questions 237 / 259

I think my natural responses now are usually consistent with my principles and long-term goals.

Questions 238 / 259

I prefer to wait for someone else to take the lead in getting things done.

Questions 239 / 259

It is fun for me to buy things for myself.

Questions 240 / 259

I have had experiences that made my role in life so clear to me that I felt very excited and happy.

Questions 241 / 259

I usually respect the opinions of others.

Questions 242 / 259

My behavior is strongly guided by certain goals that I have set for my life.

Questions 243 / 259

It is usually foolish to promote the success of other people.

Questions 244 / 259

I often wish I could live forever.

Questions 245 / 259

When someone points out my mistakes, I work extra hard to correct them.

Questions 246 / 259

I won't give up what I am doing just because of a long run of unexpected failures.

Questions 247 / 259

I usually have good luck in whatever I try to do.

Questions 248 / 259

I wish I were better looking than everyone else.

Questions 249 / 259

Reports of mystical experiences are probably just wishful thinking.

Questions 250 / 259

Individual rights are more important than the needs of any group.

Questions 251 / 259

Dishonesty only causes problems if you get caught.

Questions 252 / 259

Good habits make it easier for me to do things the way I want.

Questions 253 / 259

Other people and conditions are often to blame for my problems.

Questions 254 / 259

I usually can stay "on the go" all day without having to push myself.

Questions 255 / 259

I want to be the best at everything I do.

Questions 256 / 259

I nearly always think about all the facts in detail before I make a decision, even when other people demand a quick decision.

Questions 257 / 259

I am quick to volunteer when there is something to be done.

Questions 258 / 259

I often ask for supernatural forgiveness for violating the absolute ideals of truth and harmony in all things.

Questions 259 / 259

Appendix B

Temperament and Character Inventory TCI-3 (v1) Scales

Temperament and Character Inventory TCI-3 (v1) Scales

Temperament

Novelty seeking (NS)

- Exploratory excitability (NS1)
- Impulsiveness (NS2)
- Extravagance (NS3)
- Disorderliness (NS4)

Harm avoidance (HA)

- Anticipatory worry (HA1)
- Fear of uncertainty (HA2)
- Shyness (HA3)
- Fatigability (HA4)

Reward dependence (RD)

- Sentimentality (RD1)
- Openness to warm communication (RD2)
- Attachment (RD3)
- Dependence (RD4)

Persistence (PS)

- Eagerness of effort (PS1)
- Work hardened (PS2)
- Ambitious (PS3)
- Perfectionist (PS4)

Character

Self-directedness (SD)

- Responsibility (SD1)
- Purposeful (SD2)
- Resourcefulness (SD3)
- Self-acceptance (SD4)
- Self-actualization (SD5)

Cooperativeness (C)

- Social acceptance (C1)
- Empathy (C2)
- Helpfulness (C3)
- Compassion (C4)
- Pure-hearted conscience (C5)

Self-transcendence (ST)

- Self-forgetful (ST1)
- Transpersonal identification (ST2)
- Spiritual acceptance (ST3)
- Contemplation (ST4)
- Idealism (ST5)

Appendix C

Sample Physicians Admission Assessment

Sample Physicians Admission Assessment

IDENTIFYING DATA
Patient Name:
Date of Birth:
Date of Admission:
Age:
Gender:
Residence:
Marital Status:
Education/Employment:
Religion:
Race:
Handicaps:
Applied for Disability or Public Assistance?
Advance Directives:
Guardian/Power of Attorney:
Referral Source:

BEHAVIORS AND ATTITUDE:

CHIEF COMPLAINT:

REASON FOR SEEKING TREATMENT (why now?):

JUSTIFICATION FOR ADMISSION:

AGE ED BEGAN:

HISTORY OF PRESENT ILLNESS (onset and course):

WEIGHT HISTORY:
High weight:
Low weight:
Recent weight loss/gain:
Historical stable weight:
Patient's fear weight:
Personal weight goal:

Current height:
Patient estimated current weight:
Weight on admission:
% of IBW:

EATING DISORDERED BEHAVIORS:
Restriction/Binging:

Purging Types/Other Behaviors:

	First Onset	Current Use	Past Use/Last Use
Vomiting			
Laxatives			
Diuretics			
Diet Pills			
Enemas/Suppository			
Exercise			
Medications (Thyroid/Adderall/Insulin/etc.)			
Gum			
Other Caffeine			

BODY IMAGE (fear of weight gain, preoccupations, focus, attitudes, feelings):

DIETARY:
Current Caloric Intake:

Do you count calories?

Fluid intake (including caffeine intake):

Dietary Restrictions (need documentation for any major intolerances or allergies):

How frequently does patient weigh?

Psychiatric Review of Systems:
Depression (rank 1-10, age of symptoms, age of diagnosis):

Anxiety (rank 1-10, history of panic attacks, agoraphobia):

OCD Behaviors (focus):

Mood stability (periods of mania - need for less sleep, excess talking, and spending, sexual activity):

Hallucinations (visual vs. auditory, feel paranoid? How do they cope?):

Delusions (patient coping strategies):

Suicidality (past attempts and current)**:**

Self Harm (history, current, and urges):

Homicidal:

Anti-Social Behaviors:

ADD/ADHD:

Learning Disability:

TRAUMA/ABUSE HISTORY:
Physical trauma/abuse:

Emotional trauma/abuse:

Sexual trauma/abuse:

Post-Traumatic Symptoms:

LEGAL HISTORY:

SUBSTANCE ABUSE HISTORY:

	First Onset	Current Use	Past Use/Last Use
Alcohol			
Stimulants (cocaine/meth/adhd meds/etc.)			
Marijuana			
Opiates/Pain Meds			
Tobacco			
Other			

HISTORY OF PSYCHOLOGICAL TESTING (not standardized testing, batteries for specific results. i.e. IQ):

HISTORY OF OUTPATIENT/INPATIENT TREATMENT (list all treatment episodes, where and when):

 # OF PREVIOUS ED HOSPITAL ADMISSIONS (overnight stay):

 # OF PREVIOUS PSYCH HOSPITAL ADMISSIONS (overnight stay):

Current Treatment:
Therapist:
Phone:
Notes:
Psychiatrist:
Phone:
Notes:
Physician:
Phone:
Notes:
Dietician:
Phone:
Notes:

Other Providers (Neuro, Cardio, Endo, etc):

FAMILY PSYCHIATRIC HISTORY:
Depression:

Anxiety:

OCD:

Bipolar Disorder:

Schizophrenia:

Alcoholism/substance dependence:

Obesity/Eating Disorders:

FAMILY MEDICAL HISTORY:
Denies: Celiac Disease; Inflammatory Bowel Disease (Crohn's, Ulcerative Colitis); Food allergies; Prolonged QT Syndrome; Sudden Cardiac Deaths; Arrhythmias; Mitral Valve Prolapse; Dyslipidemia (elevated cholesterol or triglycerides); Thyroid disease; Addison's disease; Osteopenia/Osteoporosis; Kidney disease; Diabetes; Liver disease.

ALLERGIES/ALLERGIC REACTIONS:

PAST MEDICAL HISTORY:
Chronic Illnesses:

History of Medical Issues:

Any Indwelling Medical Devices (G tubes, J tubes, PEG tubes, ports, catheters):

Medical Hospitalizations:

Have you had any infectious disease related issues in the last year which required prolonged antibiotics or isolation? (For example, MRSA, VRE, C Diff)":

Have you recently traveled outside of the United States (If Yes, Where and do they have any current illness)?

ER Visits:

Surgeries:

Dental Care:

Flu Shot:

Sleep:

Menarche:

LMP (including menstrual threshold if ever stopped)

History of pregnancies:

Past DEXA bone scans:

Personal or Family History of Diabetes (if yes, pump?):

CURRENT MEDICAL COMPLICATIONS/COMPLAINTS (dental, incontinence, cardiac, blood, stomach, skin, metabolic, endocrine, seizures, lanugo, syncope, fall, head injury, seizures):

CURRENT MEDICATIONS (name, dosage and what they are for. Make sure we have correct spelling. LET THEM KNOW THAT WE NEED TO CONSULT WITH PHARMACY AND WE MAY OR MAY NOT ASK THEM TO BRING THEIR OWN):

Compliant with Medications?:

PAST PSYCHIATRIC MEDICATIONS:

PSYCHOSOCIAL HISTORY:
Current Living Situation:

Family Composition:

Family Relationships:

Social History/Support System (friends, interests, relations, outgoing, shy, impulsive):

Romantic Partners and Sexual Identity:

Extra-curricular Activities:

Work History:

Education History:

What is your learning style (ex-visual/audio)?

Strengths:

MENTAL STATUS EXAMINATION:
General appearance: *Unremarkable, appropriately groomed and dressed.*

Orientation: *oriented to time, place, person, and situation.*
Behavior and Awareness: *Eye contact and relatedness good. Cooperative with interview.*
Mood and affect:
Speech: *Normal tone and volume. Vocabulary consistent with developmental age.*
Motor activity: *No evidence of tics, tremor, rigidity, or abnormal movements.*
Fund of information: *appropriate for age and developmental stage*
Attention span: *adequate*
Thought Content: *No evidence of hallucinations, delusions, or ideas of reference. Centers on weight, shape, and eating issues. Analogy: A rolling stone gathers no moss:*
Thought Process: *Organized and reality based, linear and goal directed.*
Concentration: *spells WORLD backwards correctly, performs serial 7 subtractions*
Memory: *Able to register and recall three items immediately and after several minutes (House, Red, Baseball). Remote memory is intact.*
Insight: *Intact outside of ED*
Judgment: *Intact outside of ED*
Suicidal Ideation:
Self-harm urges:

***DIAGNOSTIC IMPRESSION**:

TREATMENT GOALS:
Family:
Patient:

PRELIMINARY TREATMENT PLAN: Patient will admit at the ____ level of care. A meal plan will be instituted and advanced as necessary to promote weight recovery and nutritional rehabilitation. Additionally, patient will participate in individual, family, and group therapy.

Completed by:

Appendix D

Sample Commitment to Recovery

Sample Commitment to Recovery

Commitment to Recovery Residential Program

Patients admitting into the Residential level of care at Eating Recovery Center of Washington (hereinafter ERCWA) are encouraged to be active participants in their treatment and discharge planning process. Each patient's treatment progress and discharge or transition plan is staffed weekly in treatment team meetings, based on the collaborative treatment plan created by providers and patient.

Patients considering a discharge against medical and or clinical advice who are admitted to the Residential level of care are asked to notify their Primary Therapist. Due to the importance of thorough discharge planning for patient safety and recovery, Eating Recovery Center requires that patients make carefully planned decisions regarding this integral part of the therapeutic process. As a behavioral treatment center advocating for physical and mental health, it is the intention of the staff at ERCWA to work with patients at every level of the treatment plan. This includes stepping down treatment levels and/or discharging in a safe manner.

In order to support patient wellness and health, we ask patients to emotionally and financially invest in appropriate treatment and discharge planning. The following guidelines and policies have been instituted as a means of ensuring safety if you shall make a decision to leave the Residential level of care AGAINST the advice of your treatment team (i.e. AMA or ACA):

1. I, _____, understand that I am making a commitment to treatment and to ERCWA through the admission process.
2. I understand that due to the level of care I am seeking, this commitment includes both time and financial resources by both me and the treatment team at ERCWA.
3. I agree that should I decide to leave treatment against the advice of my treatment team I will provide notice of this decision (as discussed with my therapist) to Dr. Jenna Flagg (Adult program) or Lisa Geraud (Adolescent program) or the covering clinician in writing.
4. I agree I will remain in treatment for 3 business days (72 business hours) following this notice in order to allow for proper discharge planning.
5. I also understand that if I leave ERCWA prior to the fulfillment of this required 72 business hours, the credit card listed below will be charged for three treatment days at the rate negotiated for the specific level of care at the time of the initial notification.
6. I further understand that my insurance company (if applicable) is not responsible for this fee, that I am solely responsible for this payment, and that this fee is a consequence of not remaining present and involved in the 72 business hour discharge against medical advice planning process, which is provided to me to facilitate a safe and therapeutic transition to follow-up treatment or post-treatment living arrangements.

Patient Signature Date

Guarantor Signature Date

CREDIT CARD # ON FILE IN BUSINESS OFFICE

To be Completed After Patient has admitted into treatment and decides to give 72-hour notice

Notice Given: _____ _____
Patient Signature Date/Time

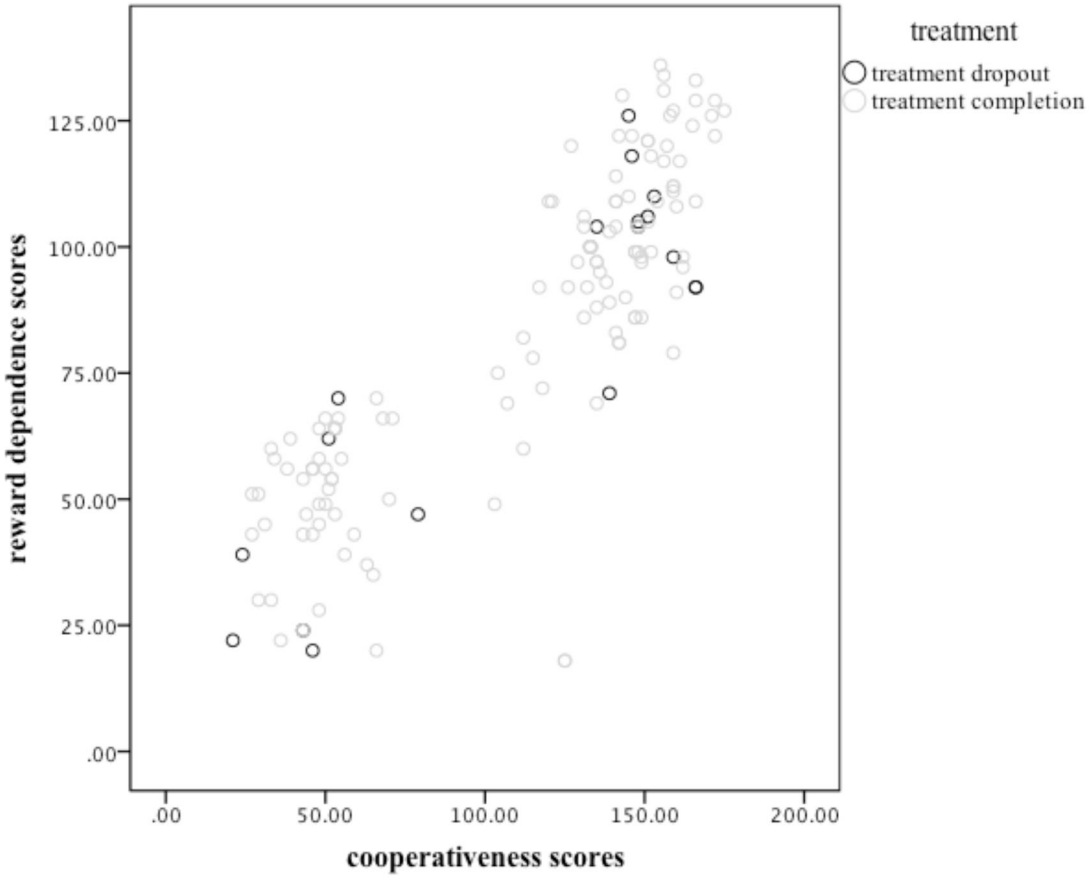
_____ _____
Clinical Director Date/Time

Rescinded: _____ _____
Patient Signature Date

Appendix E

Reward Dependence and Cooperativeness Scores Figure

Reward Dependence and Cooperativeness Scores Figure



Appendix F

Summary of Eating Disorder Temperament in Ill and Recovered Patients

Summary of Eating Disorder Temperament in Ill and Recovered Patients

	novelty seeking	harm avoidance	reward dependence	cooperativeness	self directedness	self transcendence
AN ill*	low	higher	high			lowest
AN recovered**	high	+highest	higher			
BN ill	highest	+++lowest		lower	++lower	higher
BN recovered	higher	~higher		lower	lower	higher
EDNOS ill						
EDNOS recovered		higher		higher		
History of AN/BN		higher		lower	lowest	

Note. *High perfectionism (subscale of persistence) in ill AN, **high perfectionism in AN recovered, +lower HA than ill (Atiye et al., 2015), ++lowest SD of all eating disorders diagnosis, +++higher HA than controls

Appendix G

Summary of Temperament Traits and Eating Disorder Diagnosis

Summary of Temperament Traits and Eating Disorder Diagnosis

	novelty seeking	harm avoidance	self directedness	persistence
Anorexia nervosa	low	high	low	high
Bulimia nervosa	high	high	low	

Note. High reward dependence, high harm avoidance and low novelty seeking were positive factors in treatment outcomes for AN and BN

Appendix H

Summary of Participants by Eating Disorder Diagnosis and Gender

Summary of Participants by Eating Disorder Diagnosis and Gender

	Anorexia nervosa	Bulimia nervosa	EDNOS	Male	Female
Treatment completion	62	46	37	13	132
Treatment Dropout	13	4	6	2	21
Total	75	50	43	15	153

Note. 226 initial subjects, 58 excluded with missing data with 7 (12.1%) who dropped out, leaving 168 total subjects included in the study

Appendix I

Logistic Regression Predicting Likelihood of Treatment Dropout

Logistic Regression Predicting Likelihood of Treatment Dropout

	B	SE	Wald	*df*	*p*	Odds Ratio	95% CI for Odds Ratio	
							Lower	Upper
Novelty seeking	.03	.03	.66	1	.417	1.03	.96	1.10
Harm avoidance	-.06	.03	2.54	1	.111	.95	.88	1.01
Reward dependence	.08	.04	3.66	1	.056	1.08	1.00	1.17
Cooperativeness	-.15	.06	6.20	1	.013	.86	.76	.97
Constant	22.8	11.2	4.14	1	.042	8.62E+9		

Appendix J

Summary of Bimodal Populations Results

Summary of Bimodal Populations Results

TCI-3 v1 variable	Anorexia nervosa	Bulimia nervosa	EDNOS	Male	Female
Self-directedness					
Treatment completion	50, 115	43, 120	46, 110	45, 150	60, 110
Treatment Dropout	70, 125				
Persistence * 50, 125					
Treatment completion				55, 120	40, 130
Treatment Dropout	27, 130	90, 130	30, 110		30, 140
Reward Dependence ** 62, 97					
Treatment completion					55, 97
Treatment Dropout	58, 95				
Harm Avoidance					
Treatment completion	56, 137	62, 118			56, 132
Treatment Dropout	52, 127	68, 130	70, 130		50, 130
Novelty Seeking					
Treatment completion	75, 100	56, 106	52, 100		
Treatment Dropout	65, 100				
Cooperativeness					
Treatment completion	56, 130	45, 137	54, 156		
Treatment Dropout					58, 142

Note. *persistence bimodal overall, **reward dependence bimodal overall