

IS MOTIVATION ENOUGH? CONFIDENCE AS A PREDICTOR OF OUTCOME IN
INPATIENT TREATMENT FOR EATING DISORDERS

by

MEGUMI M. IYAR

B.A., The University of British Columbia, 2012

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

in

THE FACULTY OF GRADUATE AND POSTDOCTORAL STUDIES

(Counselling Psychology)

THE UNIVERSITY OF BRITISH COLUMBIA

(Vancouver)

July 2018

© Megumi M. Iyar, 2018

The following individuals certify that they have read, and recommend to the Faculty of Graduate and Postdoctoral Studies for acceptance, a thesis/dissertation entitled:

Is motivation enough? Confidence as a predictor of outcome in inpatient treatment for eating disorders

submitted by Megumi M. Iyar in partial fulfillment of the requirements for

the degree of Master of Arts

in Counselling Psychology

Examining Committee:

Dr. Daniel W. Cox, Counselling Psychology
Supervisor

Dr. Josie Geller, Psychiatry
Supervisory Committee Member

Dr. Dave Kealy, Psychiatry
Supervisory Committee Member

Abstract

While motivation has been shown to be a robust predictor of eating disorder treatment outcome, little attention has been paid to the role of confidence. This study sought to better understand the role of confidence and the possible interaction it may have with motivation in promoting eating disorder symptom change. Participants were adult women ($N = 159$) in inpatient treatment for eating disorders. They completed measures of readiness and motivation for change, which assessed precontemplation, action, confidence and internality (changing for oneself vs. for others) and eating disorder symptom severity at pre- and post-treatment. Medical variables (e.g. height and weight) were also recorded. Precontemplation and confidence had significant effects on pre- and post-treatment symptom severity, while action only had a significant effect on pre-treatment symptoms. Confidence was also shown to moderate relations between both measures of readiness (i.e., precontemplation and action) and change in symptoms. Follow up analyses indicated that high precontemplation (low readiness) was associated with poor outcome, irrespective of confidence, however, low precontemplation (high readiness) was associated with better outcome at high levels of confidence. The interaction between confidence and action was significant only at very high levels of confidence. Among individuals who had high action at baseline, those with lower confidence had significantly poorer outcomes relative to those with high levels of confidence. Findings indicate that readiness *and* confidence are important prognostic factors and suggest that early behaviour change in the absence of confidence does not guarantee best outcomes in inpatient eating disorder treatment.

Lay Summary

While inpatient care plays an important role in the treatment of eating disorders, only a minority of patients treated achieve remission. These conditions have both negative psychological and physical consequences. In an effort to inform our practices, this study examined factors that predict treatment outcome. Specifically, this study explored the role of one's readiness to make changes to their eating disorder and their beliefs in their ability to do so. Participants completed a research package upon admission and discharge of a Canadian specialized eating disorders inpatient treatment program. Study findings indicate that readiness *and* confidence are important to consider in treatment. Findings also suggest that actively working on reducing eating disorder symptoms at the beginning of treatment in the absence of confidence does not guarantee best outcomes.

Preface

This thesis is the unpublished and original work by the author, Megumi M. Iyar. This research project was approved by the University of British Columbia Providence Health Care Research Ethics Board (H11-03272). Data collection was supported by Dr. Josie Geller at St. Paul's Hospital Eating Disorders Program. Statistical support and manuscript edits were provided by Dr. Daniel W. Cox, Dr. Josie Geller and Dr. David Kealy.

Table of Contents

| | |
|---|------|
| Abstract..... | iii |
| Lay Summary..... | iv |
| Preface..... | v |
| Table of Contents..... | vi |
| List of Tables..... | viii |
| List of Figures..... | ix |
| Acknowledgements..... | x |
| Dedication..... | xi |
| CHAPTER 1 Introduction..... | 1 |
| 1.1 Rationale..... | 1 |
| 1.2 Readiness for change..... | 2 |
| 1.3 Internal Motivation for Change..... | 2 |
| 1.4 Confidence to Change..... | 3 |
| 1.5 Current Study..... | 5 |
| CHAPTER 2 Methods..... | 6 |
| 2.1 Participants..... | 6 |
| 2.2 Measures..... | 6 |
| 2.2.1 Demographic Information..... | 6 |
| 2.2.2 Readiness and Motivation Questionnaire..... | 6 |
| 2.2.3 Eating Disorder Inventory – 3 | 7 |
| 2.3 Procedure..... | 8 |
| 2.4 Statistical Analyses..... | 9 |

| | |
|---|----|
| CHAPTER 3 Results..... | 11 |
| 3.1 Direct Effects..... | 11 |
| 3.1.1 Pre-treatment symptom severity..... | 11 |
| 3.1.2 Change in symptom severity..... | 11 |
| 3.2 Interactive Effects..... | 12 |
| 3.2.1 Pre-treatment symptom severity..... | 12 |
| 3.2.2 Change in symptom severity..... | 12 |
| CHAPTER 4 Conclusion..... | 15 |
| 4.1 Study Limitations..... | 17 |
| Tables and Figures..... | 19 |
| References..... | 25 |

List of Tables

| | | |
|---------|--|----|
| Table 1 | Bivariate correlations among primary study variables..... | 19 |
| Table 2 | Hierarchical multiple regression models predicting pre-treatment symptom severity and change in eating disorder symptom severity from pre-treatment precontemplation, and confidence | 20 |
| Table 3 | Hierarchical multiple regression models predicting pre-treatment symptom severity and change in eating disorder symptom severity from pre-treatment action, and confidence | 21 |
| Table 4 | Hierarchical multiple regression models predicting pre-treatment symptom severity and change in eating disorder symptom severity from pre-treatment internality, and confidence | 22 |

List of Figures

- Figure 1 Interaction between precontemplation and confidence (at the mean and plus and minus one standard deviation around the mean) with post-treatment eating disorder symptom severity while controlling for pre-treatment symptom severity..... 23
- Figure 2 Interaction between action and confidence (at the mean and plus and minus one standard deviation around the mean) with post-treatment eating disorder symptom severity while controlling for pre-treatment symptom severity.....24

Acknowledgements

I would like to thank my supervisors for their insight, encouragement and guidance throughout this process. Thank you, Dr. Daniel W. Cox and Dr. David Kealy, for helping me navigate through graduate studies. I would like to extend my appreciation and owe particular thanks to Dr. Josie Geller and Dr. Suja Srikameswaran. Your unconditional support was essential for my development as a beginning researcher and in fostering self-confidence for my next steps.

My deepest gratitude to my friends and family for being my source of motivation. Your curiosity, enthusiasm, and compassion helped more than you know. It takes a village!

To my darling Kai

Chapter 1: Introduction

1.1 Rationale

While inpatient eating disorder treatment plays an important role in the continuum of care, only a minority of patients treated achieve remission (Keel & Brown, 2010). For instance, research has indicated nearly 50% of those who complete treatment remain symptomatic (Steiger, 2017). Ambivalence to make changes to eating disordered thoughts and behaviours are well documented among inpatients and is often cited as one factor contributing to poor treatment outcome. By identifying predictors of outcome that distinguish patients unlikely to benefit from treatment, interventions can be tailored to improve outcome (Vall & Wade, 2017). One predictor that has been associated with behaviour change and outcome in a number of health behaviours (e.g. smoking cessation, and physical activity in multiple sclerosis), is confidence in the ability to change (Diclemente, Prochaska, & Gibertini, 1985; Motl, McAuley, Doerksen, Hu, & Morris, 2009). Further understanding the role of confidence in predicting outcome may help to explain the lack of responsiveness to inpatient eating disorders treatment.

Individuals with eating disorders often report perceiving their symptoms and behaviours as serving a positive function (e.g., emotion regulation). This positive appraisal may inhibit motivation to change and recover (Serpell & Treasure, 2002). One proposed explanation for the modest outcomes of intensive treatment is the mismatch between treatment goals and motivation to change eating disorder behaviours (Geller, Cockell, & Drab, 2001; Vitousek, Watson, & Wilson, 1998). Research has indicated that motivation is multifaceted and can be conceptualized and further understood in the context of models of behaviour change. Two such models are: a) the transtheoretical model of change (i.e., readiness), and b) self-determination theory (i.e., internal motivation).

1.2 Readiness for Change

The transtheoretical model of change provides a framework for conceptualizing readiness for making changes to behaviour (Miller & Rollnick, 2002; Prochaska & DiClemente, 1982). Within the model, change occurs gradually in a series of progressive stages (Norcross, Krebs, & Prochaska, 2011). The five stages are: precontemplation (not ready and unwilling to make changes), contemplation (thinking about making changes), preparation (having the intention to make changes), action (actively working on changing behaviour), and maintenance (working on maintaining behaviour change).

Given that individuals with eating disorders are often ambivalent about making changes to their eating, a number of studies have examined the associations between readiness and treatment outcome (e.g., Ackard, Cronemeyer, Richter, & Egan, 2015; Bewell & Carter, 2008; Castro-Fornieles et al., 2007; Castro-Fornieles et al., 2011; Geller et al., 2001; Geller et al., 2004; Geller et al., 2008; Mchugh, 2007; Wade, Frayne, Edwards, Robertson, & Gilchrist, 2009). A recent systematic review and meta-analysis found that baseline readiness to recover was a robust predictor of treatment outcome (Vall & Wade, 2015). Higher readiness has been shown to be associated with better treatment engagement (Treasure, Katzman, Schmidt, Troop, Todd, & de Silva, 1999), enrollment (Geller et al., 2001), lower drop-out rates, and decreased eating pathology over the course of treatment (Wade et al., 2009). In sum, there is substantial evidence that focusing on readiness to make change can increase treatment effectiveness.

1.3 Internal Motivation for Change

Another model of motivation is self-determination theory (Ryan & Deci, 2008). As opposed to motivation being conceptualized as a series of stages as in the transtheoretical model of change, self-determination theory highlights the internalization of motivation (Steiger, 2017).

Within self-determination theory, behaviour regulation is conceptualized as being on a continuum ranging from behaviours that are externally motivated to behaviours that are internally motivated (Ryan & Deci, 2017). Externally motivated behaviours are externally mandated (e.g., being told to change; Ryan & Deci, 2008) and internally motivated behaviours are personally desired.

There is evidence in the eating disorder literature that cultivating internal motivation, hereafter referred to as internality, can positively influence outcome. For instance, high internality has been associated with increased body mass index in inpatients with anorexia nervosa (Kapp-Deeder et al., 2014). In a study of individuals with bulimia nervosa receiving group therapy, pretreatment internality predicted lower preoccupation with shape and weight, binge eating symptoms, and general psychiatric distress at discharge (Mansour et al., 2012). Finally, changing dietary restriction for oneself as opposed to others was associated with the maintenance of symptom change at 6-month follow-up of intensive residential treatment (Geller et al., 2004). Taken together, research indicates that individuals with high internality experience better treatment outcomes, and thus may be a critical factor to evaluate prior to treatment.

1.4 Confidence to Change

Confidence refers to the expectation in one's ability to make changes or execute a behaviour (Bandura, 1977; Treasure & Schmidt, 2001). Individuals with high levels of confidence are more likely to persevere in challenging situations and feel more optimistic even after encountering failure, relative to individuals with low levels of confidence (Prat-Sala & Redford, 2010). Thus, confidence may be particularly helpful in treating eating disorders, as recovery is often punctuated with low moments and demanding challenges. Several studies have indicated the importance of confidence within treatment for individuals with eating disorders.

One study found that in individuals with bulimia nervosa enrolled in a guided self-help treatment, confidence was the strongest predictor of treatment outcome, explaining more variance in post-treatment eating disorder symptoms and psychopathology than readiness (Steel, Bergin, & Wade, 2011). In a study of individuals with anorexia and bulimia nervosa seeking inpatient care, confidence predicted the length of treatment, and post-treatment drive for thinness, and body dissatisfaction (Pinto, Heinberg, Coughlin, Fava, & Guarda, 2008).

Given the association between confidence and persistence to modify behaviour (Bandura, 1977), the associations between confidence and motivation (e.g., readiness and internality) may be linked. In fact, confidence has been incorporated into research examining both the transtheoretical model of change and self-determination theory (e.g., Armstrong, Sallis, Hovell, & Hofstetter, 1993; DiClemente, Prochaska & Gilbertini, 1985; Marcus, B., & Owen, N., 1992; Kadzikowska-Wrzosek, 2016; Plotnikoff, Hotz, Birkett, & Courneya, 2001; Sweet, Fortier, Strachan, & Blanchard, 2012). Confidence has been described as influencing individuals' behaviour through their motivation (Bandura, 1997; Senecal, Nouwen, & White, 2000) and described as a contributing factor in influencing the progression through the stages of change (Prochaska & Velicer, 1997; Woerner, King, & Costa, 2016). It should be noted that levels of motivation and confidence do not solely occur in fixed combinations (e.g., high motivation with high confidence and low motivation with low confidence). For instance, patients may present in treatment ready to make changes to their eating yet may not be confident in their ability to do so. Given the predictive utility of readiness and internality in the eating disorders, examining the role of confidence in the context of other known motivational variables in predicting outcome may be particularly relevant for informing treatment. Moreover, in recognizing the complexity of

patient presentations, exploring whether motivation and confidence interact to predict outcome will further increase our understanding of the role of confidence in treatment.

1.5 Current Study

Given that inpatient eating disorder treatments produce only modest outcomes (Keel & Brown, 2010), the identification of factors that enhance treatment response and that are amenable to change, such as confidence, may be particularly helpful for informing treatment. Thus, the objective of this research was to understand the role of confidence in the context of other known predictors of symptom change in inpatient treatment. First, we hypothesized that readiness (precontemplation and action), internality, and confidence would be associated with pre-treatment eating disorder symptom severity. Specifically, we predicted that pre-treatment symptom severity would be positively associated with pre-treatment precontemplation and inversely associated with action, internality and confidence. Our second hypothesis was an extension of our first such that we predicted that pre-to post-treatment symptom change would be negatively associated with pre-treatment precontemplation and positively associated with action, internality and confidence. Third, we hypothesized that confidence moderated the association between motivation and pre-treatment symptom severity. Finally, we predicted that confidence would moderate the association between motivation and change in symptom severity.

Chapter 2: Methods

2.1 Participants

Participants were 159 adult women with eating disorders seeking inpatient care. The mean age was 31.11 years ($SD = 10.22$), with a range of 18 to 61 years. Ninety percent of the participants identified as Caucasian and socioeconomic status was middle class as indicated by the Blishen index (Blishen, Carroll, & Moore, 1987). Mean duration of illness was 17.70 years ($SD = 12.95$) and their mean body mass index (BMI) for those underweight ($BMI \leq 18.5$), was 15.99 Kg/m^2 ($SD = 1.53$), and for those normal weight and above ($BMI > 18.5$) mean BMI was 22.23 Kg/m^2 ($SD = 3.66$). DSM-V eating disorder diagnoses were made and charted by medical internists. Seventy-eight (50%) participants were diagnosed as having anorexia nervosa, 48 (30%) of the binge/purge subtype and 30 (19%) of the restricting subtype. Forty-four (28%) were diagnosed as having bulimia nervosa and 34 (21%) as having other specified feeding or eating disorder. Diagnostic criteria were unavailable for three study participants. Fifty-nine participants completed assessments at post-treatment.

2.2 Measures

2.2.1 Demographic Information. At admission, participants indicated their age, ethnicity, age of eating disorder onset, highest level of education, and occupation.

2.2.2. Readiness and Motivation Questionnaire. (RMQ; Geller et al., 2013). The RMQ is a self-report measure that assesses stages of change (precontemplation and action), internality, and confidence for each of four eating disorder symptom domains (dietary restriction, bingeing, and cognitive and compensatory behaviours). For example, for the symptom dietary restriction, the precontemplation item reads, “*In the past two weeks, how much of you has wanted to restrict your eating?*”; the action item reads, “*In the past two weeks, how much of you has been actively*

working to eat more?”; the internality item reads, “If you were to reduce your restriction (i.e. eat more), how much of this would be for you (versus for others)?”; finally, the confidence item reads, “If you decided to reduce your restriction (i.e. eat more), how confident are you in your ability to do so?”.

While the RMQ yields global and domain-specific readiness scores, the global precontemplation, action, internality, and confidence scores were used in this research. RMQ scores are continuous and range from 0 to 100. For instance, the precontemplation ratings ranged from 0 (*a small part of me*) to 100 (*most of me*). Higher scores on precontemplation indicate lower readiness, while higher scores on action, indicate higher readiness. If a symptom is not relevant for a respondent, they are instructed to skip the follow-up questions; thus, both total and symptom domain scores are based only on the symptoms that are relevant to the individual respondent.

The RMQ has demonstrated good convergent (i.e., the Readiness and Motivation Interview, Stages of Change Questionnaire, the Brief-Symptom Inventory and the Eating Disorder Inventory-2), discriminant (i.e., Balanced Inventory of Desirable Responding), and criterion validity (i.e., Anticipated Difficulty of Recovery Activities and Completion of Recovery activities) in previous research (Geller et al., 2013). Given that participants only completed questions to symptoms that they were currently endorsing, expectation maximization correlations were inputted to determine reliability (Weaver & Maxwell, 2014). The internal consistencies in this study were .72, .81, .90, and .88, for precontemplation, action, internality and confidence, respectively.

2.2.3 Eating Disorder Inventory-3. (EDI-3; Garner, 2004). The EDI-3 consists of 91 items that assess psychological traits and symptoms relevant to the development and

maintenance of anorexia nervosa, bulimia nervosa, and eating disorder not otherwise specified. Participants responded on a Likert scale ranging from 1 (*always*) to 6 (*never*). In this study, the total symptom severity symptom score was used, which is the sum of the drive for thinness, bulimia, and body dissatisfaction subscales. The EDI-3 has demonstrated excellent psychometric properties in both clinical and non-clinical populations (Cumella, 2006). For instance, correlations among EDI-3 subscale and composite scores with measures of psychiatric distress (i.e., the Brief-Symptom Inventory) exhibit acceptable discriminant validity (Cumella, 2006). The internal consistency for the total symptom score was .90 and .94 at pre- and post-treatment, respectively.

2.3 Procedure

This research was conducted in a tertiary care eating disorders inpatient unit at a large Canadian hospital. The inpatient unit provided services for adults with severe eating disorders. The program offered treatment that addressed the following goals: (a) symptom interruption, (b) preparation for recovery-oriented residential or outpatient care, and (c) medical stabilization. Treatment was voluntary and consisted of individual and group therapy facilitated by a multidisciplinary team (e.g. nursing, psychiatry, dietetics, occupational therapists, social worker). Treatment utilized evidence-based approaches such as cognitive behavioural techniques such as attending to maladaptive thinking, skills training, and incorporated components of motivational interviewing.

At admission, the unit clerk liaised with a research assistant to inform them about admission and discharge dates. After providing informed consent, participants completed a research package at pre- and post-treatment. Data collection and study methodology were approved by the University of British Columbia Providence Health Care Research Ethics Board.

2.4 Statistical Analyses

Prior to addressing study objectives, all predictor variables were transformed to z-scores to reduce possible multicollinearity between independent variables (Cohen, 2003). To examine whether pre-treatment predictor variables (precontemplation, action, or internality) were associated with baseline symptom severity, three separate hierarchical regressions were conducted; one for each of the three predictors. In the first step of each regression, we included confidence and the interaction term was entered in the second step. Interaction terms were created by multiplying each of the predictor variables with confidence (e.g., precontemplation x confidence).

Three additional hierarchical regressions were conducted to assess whether pre-treatment predictor variables (precontemplation, action, or internality) were associated with pre- to post-treatment changes in eating disorder symptom severity. For each regression, pre-treatment symptom severity was included as a covariate in the first step. Each of the predictor variables and confidence were entered in the second step, followed by the interaction term in the third. Analyses were conducted using SPSS version 23. Moderation analyses were conducted using the SPSS PROCESS macro (Hayes, 2013). Conditional effects were estimated using the pick-a-point approach at plus and minus one standard deviation around the mean of confidence. To further probe the interactions, the Johnson-Neyman technique (D'Alonzo, 2004) was used to determine the precise point in the confidence score distribution that was significantly related to the predictor variables. Finally, analyses of covariances were conducted to interpret significant interactions, with pre-treatment eating disorder symptom severity as the covariate. For these follow-up analyses, predictor variables (precontemplation, action, or internality) were dichotomized into “low” and “high” scores and confidence scores were transformed into “low,”

“medium,” and “high” scores (given that conditional effects for the interactions were estimated at plus and minus one standard deviation around the mean of confidence). Post hoc tests following significant interactions were conducted for each 2 x 3 ANCOVA.

Chapter 3: Results

All study variables were examined for skewness and kurtosis. Visual inspection and analyses indicated all scores were normally distributed. All correlations were significant and in the expected direction with the exception of internality and post-treatment symptom severity, which was not significant (see Table 1).

3.1 Direct effects

3.1.1 Pre-treatment symptom severity. Our first hypothesis was that pre-treatment symptom severity would be positively associated with pre-treatment precontemplation and inversely associated with action, internality and confidence. Consistent with our hypothesis, precontemplation was positively associated with pre-treatment symptom severity (see Table 2; Model A, Step 1). Action scores were also associated with pre-treatment symptom severity (see Table 3; Model A, Step 1). Together, these results indicated that readiness was associated with eating disorder severity at admission. Inconsistent with our hypothesis, though in the expected direction, internality was not associated with symptom severity, indicating that symptom severity at pre-treatment was not dependent on whether change to eating disorder behaviours were for internal, or external reasons (see Table 4; Model A, Step 1). Finally, supporting our hypothesis, confidence was inversely associated with pre-treatment symptoms severity, such that lower confidence in the ability to change was associated with severe symptoms pre-treatment.

3.1.2 Change in symptom severity. Our second hypothesis was that pre-to post-treatment symptom change would be negatively associated with precontemplation and positively associated with action, internality and confidence. Supporting our hypothesis, precontemplation was negatively associated with change in symptom severity (see Table 2; Model B, Step 2). These results indicated that entering the program not ready to make changes impeded

improvement in severity of symptoms. Inconsistent with our hypothesis, action was not associated with symptom change (see Table 3; Model B, Step 2). That is, improvements in severity of symptoms were not dependent on whether patients were actively working to make changes at admission. Internality was also not associated with pre- to post-treatment change in symptom severity (see Table 4; Model B, Step 2). This result indicates that change in severity of symptoms was not contingent on whether patients felt they were making changes for themselves versus for others. Finally, confidence was significantly associated with pre- to post-change in symptom severity, indicating that confidence in the ability to change was associated with greater reductions in symptoms.

3.2 Interactive effects

3.2.1. Pre-treatment symptom severity. Our third hypothesis was that confidence would moderate the association between motivation (e.g., readiness and internality) and pre-treatment symptom severity. We examined if confidence interacted with precontemplation, action, or internality. Our hypothesis was not supported as none of these interactions were statistically significant (see Tables 2 – 4; Model A, Step 2).

3.2.2 Change in symptoms. Our fourth hypothesis was that confidence would moderate the association between motivation and change in symptom severity. We examined if confidence interacted with precontemplation, action, or internality. The interaction between internality and confidence was not significant, $t(54) = -1.45, p = .152$. However, the interactions with readiness (precontemplation and action) and confidence were significant.

As shown in Figure 1, the interaction term precontemplation x confidence was significant $t(54) = 1.98, p < .05$, such that confidence significantly moderated the association between precontemplation and change in symptom severity. Probing using the pick-a-point approach at

plus and minus one standard deviation around the mean of confidence revealed that precontemplation was significantly associated with change in symptom severity when confidence was one standard deviation above the mean $b = 7.77, t(54) = 3.41, p = 0.001$ and at the mean $b = 4.64, t(54) = 2.30, p = 0.26$. However, precontemplation was not significantly associated with change in symptom severity when confidence was one standard deviation below the mean, $b = 1.51, t(54) = 0.53, p = 0.60$. The Johnson-Neyman technique showed that the association between precontemplation and pre- to post-treatment changes in symptom severity was statistically significant when confidence was ± 1.12 standard deviations below and above the mean. This result indicated that when confidence was low, precontemplation did not predict change in severity of symptoms. However, medium and high levels of confidence interacted with level of precontemplation to predict post-treatment symptoms, after controlling for pre-treatment symptom severity. Post hoc pairwise comparisons examining mean post-treatment symptom severity while controlling for pre-treatment symptom severity scores indicated that among individuals with low precontemplation, those with high confidence ($M = 45.25, SE = 4.53$) fared significantly better following treatment than did those with low ($M = 66.24, SE = 4.69, p = .003$) but not medium ($M = 59.95, SE = 6.34, p = .071$) confidence scores. Moreover, significant differences in post-treatment symptom severity were found between low ($M = 45.25, SE = 4.53$) and high ($M = 63.40, SE = 5.82$) precontemplation scores ($p = .014$) only among individuals with high levels of confidence (See Figure 1). This finding indicates that readiness (precontemplation) was only predictive of outcome in individuals with high levels of confidence.

The interaction term action x confidence was also significant, $t(54) = -2.00, p < .05$. As shown in Figure 2, confidence significantly moderated the association between action and change in symptom severity. Probing using the pick-a-point approach showed that action was not

significantly associated with symptom change when confidence was one standard deviation above the mean $b = 1.00, t(54) = -1.69, p = 0.09$, at the mean $b = -0.54, t(54) = -0.25, p = 0.80$, or one standard deviation below the mean, $b = 3.85, t(54) = 1.19, p = 0.24$. Further probing using the Johnson-Neyman technique however, showed that the association between action and change in symptom severity was statistically significant when confidence was 1.95 standard deviations above the mean. Results indicate that low or medium levels of confidence did not interact with action scores to predict change in symptom severity. However, exceptionally high levels of confidence interacted with action to predict change in symptom severity. Post hoc pairwise comparisons indicated that among individuals with high action scores, those with high confidence ($M = 48.96, SE = 4.66$) fared significantly better post-treatment than did those with medium ($M = 69.14, SE = 4.80$) or low ($M = 66.33, SE = 7.16$) confidence scores (all p 's $< .05$). This finding indicates that individuals with high action at baseline have significantly worse outcomes post-treatment when confidence is low or medium relative to those with high confidence (see Figure 2).

Chapter 4: Conclusion

This research examined the role of confidence and other motivation variables as they relate to eating disorder symptoms. We evaluated the associations between readiness (e.g. precontemplation and action), internality, and confidence on pre-treatment symptom severity and pre- to post-treatment changes in symptom severity. We also examined if confidence moderated the effect of readiness and internality on pre-treatment and eating disorder symptom severity and pre- to post-treatment changes in symptom severity.

The utility of readiness and confidence as predictors of treatment outcome found in this study is similar to previous research (Geller et al., 2008; Geller et al., 2013; Pinto et al., 2008; Vall & Wade, 2015). Study findings also indicate the importance of understanding the mechanisms by which readiness and confidence interact to influence change. For instance, whereas early behavior change has been emphasized as critical in eating disorder treatment (i.e., Waller, 2012), findings in this research suggests that patients' stance regarding early behavior change (including such an emphasis from clinicians) might be counter therapeutic in the absence of patient confidence. Further research examining relations among action and confidence, and that explores the best means to enhance both of these variables, is warranted.

Though readiness was found to be a predictor of eating disorder symptoms, similar to previous research, our findings indicate that internality may only predict symptoms as a function of time. Research has shown that internality is associated with greater long-term change than is external motivation (e.g., financial rewards, changing for others; Deci & Ryan, 1985). For example, in a residential treatment program, baseline internality was most strongly related to the maintenance of reductions in drive for thinness and healthy body weight at 6-month follow-up (Geller et al., 2004). In the current study, while precontemplation and action were associated

with pre-treatment symptom severity and precontemplation was associated with change in symptom severity, internality was not associated with pre-treatment or change in symptom severity. Given that the average length of stay was approximately 30 days, our findings were consistent with the literature in that internality may not be associated with short-term change. While precontemplation and action may be essential to target prior to or during treatment, internality may be more essential in patients who are no longer subject to eating disorder programs' non-negotiables. Thus, while internality may not be predictive of change that takes place in the context of treatment, it may be pertinent post discharge when patients are without the behavioral expectations required by a program.

In support of the role of confidence in the treatment of eating disorders, the present study found that confidence moderated the association between precontemplation and change in symptom severity. This finding indicates that in individuals who are ready to make changes to their eating disorders, having high levels of confidence may assist them in reducing eating disorder symptoms during treatment. Similarly, we found that the association between action and change in symptom severity was moderated by confidence. Given that recovery is often punctuated with episodes of relapse, one explanation for individuals with both high levels of readiness and confidence having lower post-treatment symptom severity is that these individuals might be more likely to persevere after a failed attempt at improving their eating. Notably, in individuals who are *not* ready to make changes, confidence may be less important in predicting change in severity. In contrast for individuals who *are* ready, having low or even medium confidence can result in poor treatment outcomes relative to those with high confidence. These findings indicate that caution should be exercised in treating individuals who show early behavior change yet experience low confidence in their ability to change.

Another notable finding was that confidence moderated the role of readiness on change in symptom severity and not on pre-treatment symptom severity. This finding indicates that confidence may be most influential in the change process. This is congruent with previous research demonstrating that individuals with high levels of confidence are more likely to persevere in challenging situations, relative to individuals with low levels of confidence (Pratt-Sala & Redford, 2010). Taken together, these results indicate that preparatory treatments that support and cultivate confidence *and* readiness may be particularly beneficial for individuals seeking inpatient care. Ways in which health care professionals could increase confidence might include; reinforcing and validating attempts to make change in an effort to foster a sense mastery, acknowledging that change is challenging and often not linear, and role modelling a healthy relationship with food via meal support.

4.1 Study Limitations

This study had several limitations. First, the sample size decreased from pre- to post-treatment. Future research is needed to capture data from patients who drop-out to better reflect the motivational profile of patients seeking inpatient care. Second, study constructs were assessed using self-report measures. Incorporating different evaluation methods, such as use of clinical interviews (e.g., Readiness and Motivation Interview; Geller, Cockell, & Drab, 2001), may provide a more comprehensive assessment of patient readiness and motivation to change. Third, the sample was relatively homogenous. Future research examining the role of motivation and confidence in more diverse groups will facilitate better understanding of the generalizability of our findings. Similarly, given that this research was conducted in an inpatient treatment setting, future research may examine the role of confidence in other levels of care (e.g., outpatient/residential treatment). Statistical analyses were informed by our sample size, such that

all analyses were conducted with a mixed sample of diagnoses and regressions for each predictor were conducted separately. Future research with a larger sample size may be warranted to overcome these power limitations. Finally, given that this study only assessed participants at pre- and post-treatment, future research is needed to investigate the predictive utility of readiness, internality, and confidence on long-term treatment outcome. Assessing internality may be particularly informative to assess after discharge when there are no program behavioral constraints, where changing for oneself may be more important for the continued reductions in symptom severity and the maintenance of change. Despite these limitations, the study highlights the need for researchers and clinicians to further consider the roles of confidence and readiness among patients entering intensive treatment for eating disorders.

Table 1. Bivariate correlations among primary study variables

| Variables | 1 | 2 | 3 | 4 | 5 | 6 |
|--|---------|---------|---------|---------|--------|-------|
| 1. Precontemplation | -- | | | | | |
| 2. Action | -0.39** | -- | | | | |
| 3. Internality | -0.28** | 0.47** | -- | | | |
| 4. Confidence | -0.36** | 0.54** | 0.50** | -- | | |
| 5. Pre-treatment eating disorder symptom severity | 0.44** | -0.33** | -0.26** | -0.38** | -- | |
| 6. Post-treatment eating disorder symptom severity | 0.54** | -0.33** | -0.17 | -0.50** | 0.65** | -- |
| <i>M</i> | 63.38 | 39.34 | 66.69 | 39.49 | 65.74 | 58.14 |
| <i>SD</i> | 18.03 | 19.83 | 21.92 | 18.64 | 18.71 | 22.03 |

Note. ** $p < .01$.

Table 2. Hierarchical multiple regression models predicting pre-treatment symptom severity and change in eating disorder symptom severity from pre-treatment precontemplation, and confidence

| Predictors | Model A: Pre-treatment eating disorder symptom severity | | | | Predictors | Model B: Post-treatment eating disorder symptom severity ($n = 59$) | | | |
|-------------------------------|---|---------|------|-------|--|---|--------|------|-------|
| | ΔR^2 | b | SE | t | | ΔR^2 | b | SE | t |
| Step 1 | .25*** | | | | Step1 | .47*** | | | |
| Precontemplation | | 6.55*** | 1.40 | 4.69 | Pre-treatment eating disorder symptoms | | .74*** | .10 | 7.07 |
| Confidence | | -4.72** | 1.37 | -3.44 | Step 2 | .11** | | | |
| Step 2 | .02 | | | | Precontemplation | | 5.51** | 2.02 | 2.73 |
| Precontemplation | | 5.73*** | 1.46 | 3.92 | Confidence | | -5.02* | 2.15 | -2.33 |
| Confidence | | -4.18** | 1.40 | -3.00 | Step 3 | .03* | | | |
| Precontemplation x Confidence | | 1.99 | 1.11 | 1.80 | Precontemplation | | 4.58* | 2.03 | 2.26 |
| | | | | | Confidence | | -4.19 | 2.14 | -1.96 |
| | | | | | Precontemplation x Confidence | | 3.21* | 1.63 | 1.97 |
| Total R^2 | .27*** | | | | Total R^2 | .61*** | | | |

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 3 Hierarchical multiple regression models predicting pre-treatment symptom severity and change in eating disorder symptom severity from pre-treatment action, and confidence

| Predictors | Model A: Pre-treatment eating disorder symptom severity | | | | Predictors | Model B: Post-treatment eating disorder symptom severity (<i>n</i> = 59) | | | |
|---------------------|---|----------|-----------|----------|--|---|----------|-----------|----------|
| | ΔR^2 | <i>b</i> | <i>SE</i> | <i>t</i> | | ΔR^2 | <i>b</i> | <i>SE</i> | <i>t</i> |
| Step 1 | .17*** | | | | Step1 | .47*** | | | |
| Action | | -3.17* | 1.61 | -1.96 | Pre-treatment eating disorder symptoms | | .74*** | .10 | 7.07 |
| Confidence | | -5.27** | 1.62 | -3.25 | Step 2 | .06* | | | |
| Step 2 | .01 | | | | Action | | -.98 | 2.21 | -.45 |
| Action | | -2.91 | 1.62 | -1.79 | Confidence | | -5.39* | 2.50 | -2.16 |
| Confidence | | -5.01** | 1.64 | -3.06 | Step 3 | .03* | | | |
| Action x Confidence | | -1.53 | 1.22 | -1.25 | Action | | -.45 | 2.17 | -.21 |
| | | | | | Confidence | | -5.13* | 2.44 | -2.10 |
| | | | | | Action x Confidence | | -4.50* | 2.24 | -2.00 |
| Total R^2 | .18*** | | | | Total R^2 | .56*** | | | |

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4. Hierarchical multiple regression models predicting pre-treatment symptom severity and change in eating disorder symptom severity from pre-treatment internality, and confidence

| Model A: Pre-treatment eating disorder symptom severity | | | | | Model B: Post-treatment eating disorder symptom severity (<i>n</i> = 59) | | | | |
|---|--------------|----------|-----------|----------|---|--------------|----------|-----------|----------|
| Predictors | ΔR^2 | <i>b</i> | <i>SE</i> | <i>t</i> | Predictors | ΔR^2 | <i>b</i> | <i>SE</i> | <i>t</i> |
| Step 1 | .15*** | | | | Step 1 | .47*** | | | |
| Internality | | -1.68 | 1.61 | -1.05 | Pre-treatment eating disorder symptoms | | .74*** | .10 | 7.07 |
| Confidence | | -6.19*** | 1.59 | -3.90 | Step 2 | .06* | | | |
| Step 2 | .00 | | | | Internality | | 1.55 | 2.18 | .71 |
| Internality | | -1.86 | 1.69 | -1.11 | Confidence | | -6.48** | 2.42 | -2.68 |
| Confidence | | -6.04*** | 1.64 | -3.67 | Step 3 | .02 | | | |
| Internality x Confidence | | -.47 | 1.26 | -.37 | Internality | | .75 | 2.23 | .34 |
| | | | | | Confidence | | -5.06 | 2.59 | -1.96 |
| | | | | | Internality x Confidence | | -3.03 | 2.08 | -1.45 |
| Total R^2 | .15*** | | | | Total R^2 | .55*** | | | |

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

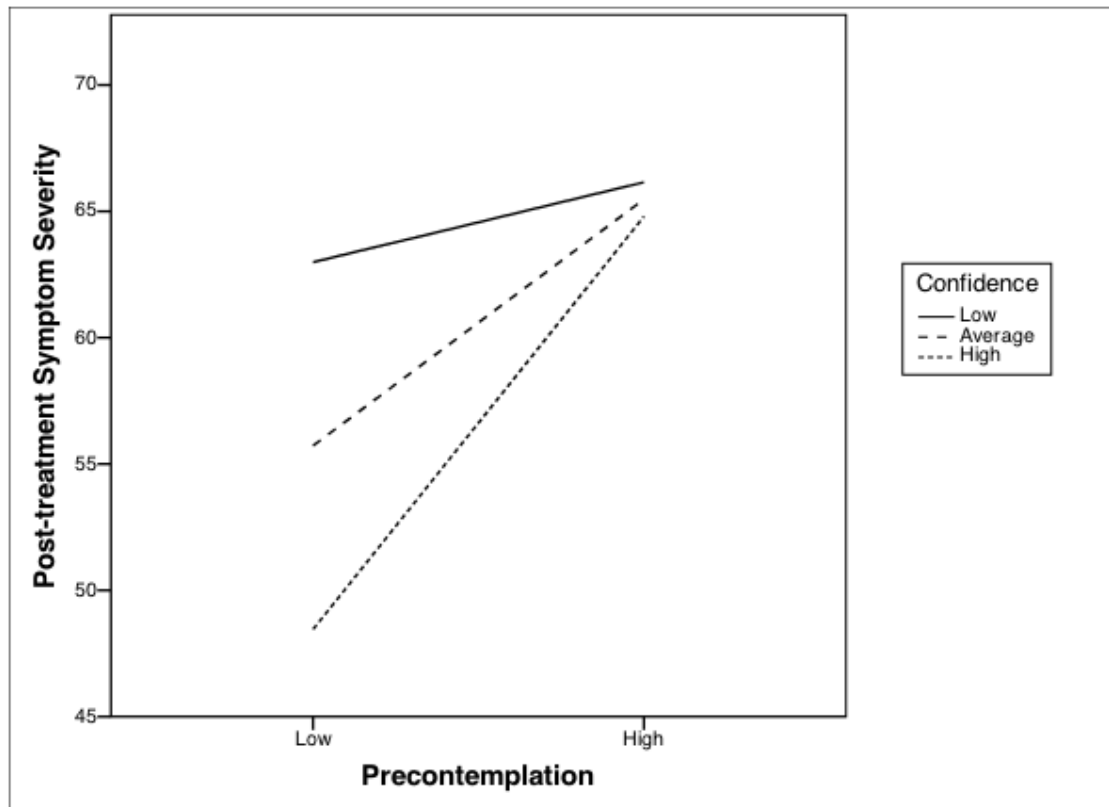


Figure 1. Interaction between precontemplation and confidence (at the mean and plus and minus one standard deviation around the mean) with post-treatment eating disorder symptom severity while controlling for pre-treatment symptom severity.

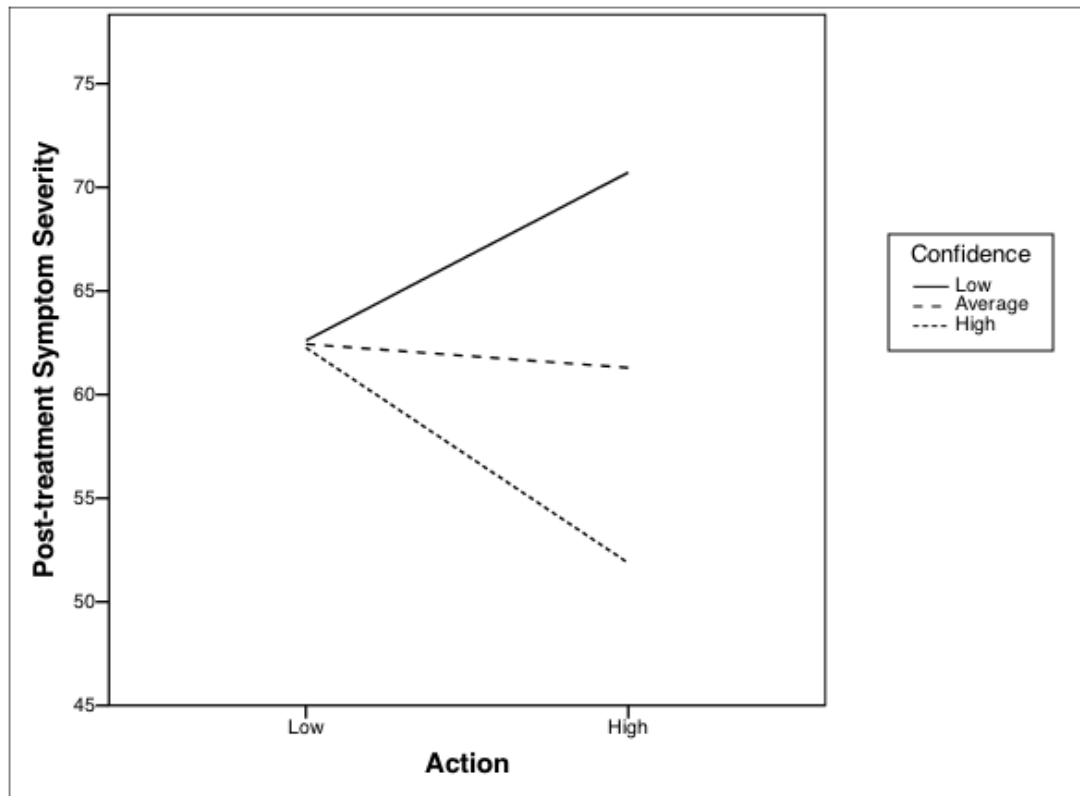


Figure 2. Interaction between action and confidence (at the mean and plus and minus one standard deviation around the mean) with post-treatment eating disorder symptom severity while controlling for pre-treatment symptom severity.

References

- Ackard, D. M., Cronemeyer, C. L., Richter, S., & Egan, A. (2015). Do symptom-specific stages of change predict eating disorder treatment outcome? *Eating and Weight Disorders – Studies on Anorexia, Bulimia and Obesity*, *20*(1), 49-62. doi:10.1007/s40519-014-0153-0
- Armstrong, C., Sallis, J., Hovell, M., & Hofstetter, C. (1993). Stages of change, self-efficacy, and the adoption of vigorous exercise - a prospective analysis. *Journal of Sport & Exercise Psychology*, *15*(4), 390-402. <https://doi.org/10.1123/jsep.15.4.390>
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191-215. doi: 10.1037/0033-295X.84.2.191
- Bewell, C. V., & Carter, J. C. (2008). Readiness to change mediates the impact of eating disorder symptomatology on treatment outcome in anorexia nervosa. *International Journal of Eating Disorders*, *41*(4), 368-371. doi:10.1002/eat.20513
- Blishen, B. R., Carroll, W. K., & Moore, C. (1987). The 1981 socioeconomic index for occupations in Canada. *Canadian Review of Sociology/Revue Canadienne de sociologie*, *24*(4), 465-488. <https://doi.org/10.1111/j.1755-618X.1987.tb00639.x>
- Castro-Fornieles, J., Bigorra, A., Martinez-Mallen, E., Gonzalez, L., Moreno, E., Font, E., & Toro, J. (2011). Motivation to change in adolescents with bulimia nervosa mediates clinical change after treatment. *European Eating Disorders Review*, *19*(1), 46-54. doi: 10.1002/erv.1045
- Castro-Fornieles, J., Casulà, V., Saura, B., Martínez, E., Lazaro, L., Vila, M., . . . Toro, J. (2007). Predictors of weight maintenance after hospital discharge in adolescent anorexia nervosa. *International Journal of Eating Disorders*, *40*(2), 129-135. doi:10.1002/eat.20340

- Cohen, J. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, N.J: L. Erlbaum Associates.
- Cumella, E. J. (2006). Review of the eating disorder inventory-3. *Journal of Personality Assessment, 87*(1), 116-117. doi: 10.1207/s15327752jpa8701_11
- D'Alonzo, K. T. (2004). The Johnson-Neyman procedure as an alternative to ANCOVA. *Western Journal of Nursing Research, 26*(7), 804-812. doi:10.1177/0193945904266733
- Deci, E. L., & Ryan, R. M. (1985). The general causality orientations scale: Self-determination in personality. *Journal of Research in Personality, 19*(2), 109-134. doi: 10.1016/0092-6566(85)90023-6
- DiClemente, C. C., Prochaska, J. O., & Gibertini, M. (1985). Self-efficacy and the stages of self-change of smoking. *Cognitive Therapy and Research, 9*(2), 181-200.
doi:10.1007/BF01204849
- Garner, D. M. (2004). *EDI-3, Eating Disorder Inventory-3: Professional Manual*. Lutz, Florida: Psychological Assessment Resources, Incorporated.
- Geller, J., Brown, K. E., Srikameswaran, S., Piper, W., & Dunn, E. C. (2013). The psychometric properties of the readiness and motivation questionnaire: A symptom-specific measure of readiness for change in the eating disorders. *Psychological Assessment, 25*(3), 759-768.
doi: 10.1037/a0032539
- Geller, J., Brown, K. E., Zaitsoff, S. L., Menna, R., Bates, M. E., & Dunn, E. C. (2008). Assessing readiness for change in adolescents with eating disorders. *Psychological Assessment, 20*(1), 63-69. doi: 10.1037/1040-3590.20.1.63

- Geller, J., Cockell, S. J., & Drab, D. L. (2001). Assessing readiness for change in the eating disorders: The psychometric properties of the readiness and motivation interview. *Psychological Assessment, 13*(2), 189-198. doi: 10.1037/1040-3590.13.2.189
- Geller, J., Drab-Hudson, D. L., Whisenhunt, B. L., & Srikameswaran, S. (2004). Readiness to change dietary restriction predicts outcomes in the eating disorders. *Eating Disorders, 12*(3), 209-224. doi: 10.1080/10640260490490438
- Kaap-Deeder, J., Vansteenkiste, M., Soenens, B., Verstuyf, J., Boone, L., & Smets, J. (2014). Fostering self-endorsed motivation to change in patients with an eating disorder: The role of perceived autonomy support and psychological need satisfaction. *International Journal of Eating Disorders, 47*(6), 585-600. doi: 10.1002/eat.22266
- Kadzikowska-Wrzosek, R. (2016). Autonomous motivation, self-efficacy, and psychophysical wellbeing in a group of polish breastfeeding mothers- preliminary communication. *Archives of Psychiatry and Psychotherapy, 18*(3), 58-67. doi:10.12740/APP/64712
- Keel, P. K., & Brown, T. A. (2010). Update on course and outcome in eating disorders. *International Journal of Eating Disorders, 43*(3), 195-204. doi: 10.1002/eat.20810
- Hayes, A. F. (2013). *Introduction to mediation, moderations and conditional process analyses: A regression-based approach*. New York: Guilford Press.
- Mansour, S., Bruce, K. R., Steiger, H., Zuroff, D. C., Horowitz, S., Anestin, A. S., & Sycz, L. (2012). Autonomous motivation: A predictor of treatment outcome in bulimia-spectrum eating disorders: Autonomous motivation predicts outcome in bulimia. *European Eating Disorders Review, 20*(3), 116-122. doi: 10.1002/erv.2154

- Marcus, B. H., & Owen, N. (1992). Motivational readiness, self-efficacy and decision-making for exercise. *Journal of Applied Social Psychology, 22*(1), 3-14.
<https://doi.org/10.1111/j.1559-1816.1992.tb01518.x>
- McHugh, M. D. (2007). Readiness for change and short-term outcomes of female adolescents in residential treatment for anorexia nervosa. *International Journal of Eating Disorders, 40*(7), 602-612. doi: 10.1002/eat.20425
- Miller, W. R., & Rollnick, S. (2002). Motivational interviewing: Preparing people for change (2nd ed.). New York, NY: Guilford Press.
- Motl, R. W., McAuley, E., Doerksen, S., Hu, L., & Morris, K. S. (2009). Preliminary evidence that self-efficacy predicts physical activity in multiple sclerosis. *International Journal of Rehabilitation Research, 32*(3), 260-263. doi:10.1097/MRR.0b013e328325a5ed
- Norcross, J. C., Krebs, P. M., & Prochaska, J. O. (2011). Stages of change. *Journal of Clinical Psychology, 67*(2), 143-154. doi:10.1002/jclp.20758
- Pinto, A. M., Heinberg, L. J., Coughlin, J. W., Fava, J. L., & Guarda, A. S. (2008). The eating disorder recovery self-efficacy questionnaire (EDRSQ): Change with treatment and prediction of outcome. *Eating Behaviors, 9*(2), 143-153. doi:
10.1016/j.eatbeh.2007.07.001
- Plotnikoff, R. C., Hotz, S. B., Birkett, N. J., & Courneya, K. S. (2001). Exercise and the transtheoretical model: A longitudinal test of a population sample. *Preventive Medicine, 33*(5), 441-452. doi:10.1006/pmed.2001.0914
- Prat-Sala, M., & Redford, P. (2010). The interplay between motivation, self-efficacy, and approaches to studying. *The British Journal of Educational Psychology, 80*(2), 283-305.
doi: 10.1348/000709909X480563

- Prochaska, J. O., & DiClemente, C. C. (1982). Transtheoretical therapy: Toward a more integrative model of change. *Psychotherapy: Theory, Research & Practice, 19*(3), 276-288. doi:10.1037/h0088437
- Prochaska, J. O., & Velicer, W. F. (1997). The transtheoretical model of health behavior change. *American Journal of Health Promotion, 12*(1), 38-48. doi: 10.4278/0890-1171-12.1.38
- Ryan, R. M., & Deci, E. L. (2008). A self-determination theory approach to psychotherapy: The motivational basis for effective change. *Canadian Psychology/Psychologie Canadienne, 49*(3), 186–193. doi:10.1037/a0012753
- Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. New York: Guilford Press.
- Senécal, C., Nouwen, A., & White, D. (2000). Motivation and dietary self-care in adults with diabetes: Are self-efficacy and autonomous self-regulation complementary or competing constructs? *Health Psychology, 19*(5), 452-457. doi: 10.1037//0278-6133.19.5.452
- Serpell, L., & Treasure, J. (2002). Bulimia nervosa: Friend or foe? The pros and cons of bulimia nervosa. *International Journal of Eating Disorders, 32*(2), 164-170. doi:10.1002/eat.10076
- Steele, A. L., Bergin, J., & Wade, T. D. (2011). Self-efficacy as a robust predictor of outcome in guided self-help treatment for broadly defined bulimia nervosa. *International Journal of Eating Disorders, 44*(5), 389-396. doi:10.1002/eat.20830
- Steiger, H. (2017). Evidence-informed practices in the real-world treatment of people with eating disorders. *Eating Disorders, 25*(2), 173-181. doi: 10.1080/10640266.2016.1269558

- Sweet, S. N., Fortier, M. S., Strachan, S. M., & Blanchard, C. M. (2012). Testing and integrating self-determination theory and self-efficacy theory in a physical activity context. *Canadian Psychology/Psychologie Canadienne*, 53(4), 319-327. doi: 10.1037/a0030280
- Treasure, J. L., Katzman, M., Schmidt, U., Troop, N., Todd, G., & de Silva, P. (1999). Engagement and outcome in the treatment of bulimia nervosa: First phase of a sequential design comparing motivation enhancement therapy and cognitive behavioural therapy. *Behaviour Research and Therapy*, 37(5), 405-418. doi:10.1016/S0005-7967(98)00149-1
- Treasure, J., & Schmidt, U. (2001). Ready, willing and able to change: Motivational aspects of the assessment and treatment of eating disorders. *European Eating Disorders Review*, 9(1), 4-18. doi: 10.1002/erv.390
- Vall, E., & Wade, T. D. (2015). Predictors of treatment outcome in individuals with eating disorders: A systematic review and meta-analysis. *International Journal of Eating Disorders*, 48(7), 946-971. doi: 10.1002/eat.22411
- Vall, E., & Wade, T. D. (2017). Predictors and moderators of outcomes and readmission for adolescent inpatients with anorexia nervosa: A pilot study. *Clinical Psychologist*, 21(2), 143-152. doi:10.1111/cp.12091
- Vitousek, K., Watson, S., & Wilson, G. T. (1998). Enhancing motivation for change in treatment-resistant eating disorders. *Clinical Psychology Review*, 18(4), 391-420. doi: 10.1016/S0272-7358(98)00012-9
- Wade, T. D., Frayne, A., Edwards, S., Robertson, T., & Gilchrist, P. (2009). Motivational change in an inpatient anorexia nervosa population and implications for treatment. *Australasian Psychiatry*, 43(3), 235-243. doi:10.1080/00048670802653356

- Waller, G. (2012). The myths of motivation: Time for a fresh look at some received wisdom in the eating disorders? *International Journal of Eating Disorders*, *45*(1), 1-16. doi: 10.1002/eat.20900
- Weaver, B., & Maxwell, H. (2014). Exploratory factor analysis and reliability analysis with missing data: A simple method for SPSS users. *Tutorials in Quantitative Methods for Psychology*, *10*(2), 143-152.
- Woerner, J., King, R., & Costa, B. (2016). Development of readiness to change and self-efficacy in anorexia nervosa clients: Personal perspectives. *Advances in Eating Disorders*, *4*(1), 99-111. doi: 10.1080/21662630.2015.1118641