

Florida State University Libraries

Electronic Theses, Treatises and Dissertations

The Graduate School

Body Attitudes and Experiences, Capability for Suicide, and Suicide Attempts in Individuals with Eating Disorders

Mary E. Duffy

FLORIDA STATE UNIVERSITY
COLLEGE OF ARTS AND SCIENCES

BODY ATTITUDES AND EXPERIENCES, CAPABILITY FOR SUICIDE, AND SUICIDE
ATTEMPTS IN INDIVIDUALS WITH EATING DISORDERS

By

MARY E. DUFFY

A Thesis submitted to the
Department of Psychology
in partial fulfillment of the
requirements for the degree of
Master of Science

2020

Mary Duffy defended this thesis on March 3, 2020.

The members of the supervisory committee were:

Thomas E. Joiner
Professor Directing Thesis

N. Brad Schmidt
Committee Member

Jon K. Maner
Committee Member

The Graduate School has verified and approved the above-named committee members and certifies that the thesis has been approved in accordance with university requirements.

TABLE OF CONTENTS

List of Tables	iv
Abstract	v
1. INTRODUCTION	1
2. METHODS	5
3. RESULTS	11
4. DISCUSSION	15
APPENDICES	21
A. STUDY IRB APPROVAL.....	21
B. STUDY IRB RE-APPROVALS.....	23
C. INFORMED CONSENT FORM USED DURING DATA COLLECTION.....	29
D. TABLES.....	33
References.....	45
Biographical Sketch.....	50

LIST OF TABLES

1	Participant Demographics.....	33
2	Bivariate Correlations and Descriptive Statistics for Indirect Effects Analysis Variables.....	34
3	Direct and Indirect Effects of Body Protection on Suicide Attempt Lethality and Frequency.....	35
4	Bivariate Correlations and Descriptive Statistics for Body Attitudes and Experiences Variables	36
5	Results of MANOVA Comparing Body Attitudes and Experiences Among Suicide Attempt, Suicidal Ideation, and Non-Suicidal Groups	37
6	Dunnett T3-Corrected Post-Hoc Pairwise Comparisons of Body Attitudes and Experiences Among Suicide Attempt, Suicidal Ideation, and Non-Suicidal Groups	38
7	Direct and Indirect Effects of Body Attitudes on Suicide Attempt Lethality and Frequency .	39
8	Direct and Indirect Effects of Comfort with Touch on Suicide Attempt Lethality and Frequency.....	40
9	Direct and Indirect Effects of Body Care on Suicide Attempt Lethality and Frequency	41
10	Direct and Indirect Effects of Lack of Familiarity on Suicide Attempt Lethality and Frequency.....	42
11	Reversed Paths: Including FAD as Predictor and Body Protection as a Mediating Variable .	43
12	Reversed Paths: Including Pain Tolerance as Predictor and Body Protection as a Mediating Variable.....	44

ABSTRACT

Research evidences a link between eating disorders and suicidal behaviors, and capability for suicide has been proposed as a mechanism underlying this relationship. Negative body attitudes and experiences (BAE) are another promising set of explanatory variables, central to eating disorder pathology and theoretically aligned with capability for suicide. This study investigated direct pathways between BAE, particularly body protection, and lethality and frequency of past suicide attempts, as well as indirect pathways through capability for suicide (pain tolerance, fearlessness about death) and severity of eating pathology. The study also evaluated whether BAE differentiated among suicide attempt, ideation, and non-suicidal groups. Adults currently receiving eating disorder treatment (N = 352; 55.5% outpatient; 92.8% female; mean age 28.1 years) completed self-report measures of BAE, eating pathology, capability for suicide, and suicide-related variables. The PROCESS macro was utilized to test proposed direct and indirect pathways, and a Dunnett's T3-corrected MANOVA evaluated differences in BAE across suicide groups. Results indicated low body protection was significantly directly associated with increased lethality and quantity of past suicide attempts. Only the indirect pathway through pain tolerance in predicting attempt frequency was significant. Further, body protection and lack of body familiarity differentiated among all suicide groups, while body attitudes and comfort with touch differentiated attempters from non-attempters, and body care differentiated non-suicidal participants from those with attempt or ideation history. Findings suggest BAE, particularly low body protection and lack of body familiarity, may merit consideration in studying the propensity of those with eating disorders to engage in suicidal behavior.

CHAPTER 1

INTRODUCTION

The association between eating disorders and suicidal behavior is well-established. Suicide is a leading cause of death in eating disorders, with meta-analyses suggesting suicide standardized mortality rates for anorexia nervosa (AN) from 18-31, and those for bulimia nervosa (BN) falling around 7.5 (Arcelus, Mitchell, Wales, & Nielsen, 2011; Keshaviah et al., 2014; Preti, Rocchi, Sisti, Camboni, & Miotto, 2011). Suicide attempt rates differ by diagnosis, ranging from 9-29% in AN to 21-39% in BN (Bulik et al., 2008; Crow, Swanson, le Grange, Feig, & Merikangas, 2014; Favaro & Santonastaso, 1997; Franko & Keel, 2006). Individuals with BN are more likely to attempt suicide, but those with AN are more likely to die by suicide (Franko & Keel, 2006; Guillaume et al., 2011; Preti et al., 2011). Less work has investigated suicidal behavior in individuals with binge eating disorder, but studies suggest attempt rates of 13-15% in this group (Carano et al., 2012; Crow et al., 2014; Swanson, Crow, Le Grange, Swendsen, & Merikangas, 2011).

With awareness of these elevated rates of suicidal behavior in mind, researchers have attempted to develop an understanding of factors contributing to suicide risk in eating disorders. The Interpersonal-Psychological Theory of Suicide (IPT; Joiner, 2005; Van Orden et al., 2010) has been widely researched as a potential explanatory framework. The IPT suggests risk for suicide is conferred by the co-occurrence of three key constructs: thwarted belongingness, perceived burdensomeness, and capability for suicide. Elevations in thwarted belongingness and perceived burdensomeness, and the perception that these states are intractable, are posited to produce suicidal desire, but lethal or near-lethal suicide attempts are hypothesized to occur only if an individual also possesses capability for suicide, comprising pain tolerance and fearlessness about death. Capability for suicide has genetic components but is also thought to build over time through exposure to painful and provocative events, resulting in habituation to pain and fear (Chu et al., 2017).

Joiner (2005) suggested eating disorders may be associated with suicidal behavior due to elevations in capability for suicide, resulting from repeated engagement in painful eating

disorder behaviors such as starvation, purging, laxative abuse, and excessive exercise. Some research has supported this proposal (Selby et al., 2010; Smith et al., 2013; Witte et al., 2016). Findings are mixed, however, with other studies finding no association between eating disorder behaviors and capability for suicide (Witte et al., 2016; Zuromski & Witte, 2015).

A little-explored, but perhaps especially relevant, explanation for elevated suicidal behavior in eating disorders is the presence of negative and distorted body attitudes and experiences (BAE). Negative body image and experiences are key components of eating disorders (American Psychiatric Association, 2013; DuBois, Rodgers, Franko, Eddy, & Thomas, 2017; Riva & Dakanalis, 2018; Smith et al., 2018). Further, Orbach proposed that negative and detached feelings, attitudes, and experiences of the body have an integral role in the facilitation of suicide (Orbach, 1994; Orbach, 1996; Orbach et al., 2006). This concept of the “suicidal body” suggests suicide can only occur in the context of negative feelings towards and detachment from the physical body, as such processes shield individuals from the pain and horror otherwise inherent in suicide (Orbach, 1994; Orbach, 2003; Orbach et al., 2006). Body experience includes thresholds of physical sensation, awareness of bodily functions, responsiveness to internal and external stimuli, physical anhedonia, and bodily detachment, while body attitudes are composed of perceptions, beliefs, feelings, and care for the body (Orbach, 1996). Negative BAE are viewed as a facilitator of suicidal behaviors, as suicide is, at a basic level, an attack on the physical body (Orbach et al., 2006). Orbach suggests BAE are the basis for both self-preservation and self-destruction (Orbach, 1994; Orbach, 1996; Orbach et al., 2006). Self-preservation requires active attitudes of self-protection, self-care, and self-love, so the reverse: indifference, hate, and rejection towards, and detachment from, the body are believed to make it easier to harm the body and to face and tolerate the physical pain involved in doing so (Orbach, 1996; Orbach, 2003).

A relatively small, but consistent, body of work supports this theory. Studies comparing recent suicide attempters to non-suicidal psychiatric inpatients and community controls have repeatedly found lower self-reported body protection and care, more negative body attitudes, and higher levels of bodily dissociation in the suicide attempters than the other groups (Orbach et al., 2006; Orbach, Lotem-Peleg, & Kedem, 1995; Orbach & Mikulincer, 1998; Orbach, Stein, Shan-Sela, & Har-Even, 2001). More negative body attitudes have also been associated with greater dissociation, as well as suicidal tendencies (increased attraction to death, increased repulsion

from life, and reduced attraction to life)(Orbach et al., 1995; Orbach et al., 2001; Orbach et al., 2006; Orbach & Mikulincer, 1998).

In studies of individuals with eating disorders with and without a suicide attempt history, psychiatric inpatients with and without a suicide attempt history, and community controls, those with eating disorders and/or suicide attempts reported more negative attitudes towards the body and lower sensitivity to bodily cues than controls, but only suicide attempters reported reduced body protection (Stein et al., 2003; Stein et al., 2013). Drive for thinness and weight and shape dissatisfaction were unrelated to attitudes about life and death, suggesting there is a component of bodily disturbance common to both individuals with eating disorders and those with suicide attempts which is associated with suicide attitudes and goes beyond the body image constructs usually associated with eating disorders (Stein et al., 2013). The distorted body experience of individuals with eating disorders, as described by these studies, speaks to the pathological BAE Orbach identified as facilitating suicidal behavior. These studies also highlight body protection as an especially relevant component of BAE in both eating disorders and suicidal behavior.

Notably, the view of negative BAE as facilitators of suicide bears a striking resemblance to the mechanism of capability for suicide in the IPTS (Joiner, 2005; Van Orden et al., 2010). According to Orbach (1996), negative BAE interact with anguish, hopelessness, and stress to produce self-destruction (Orbach, 1996). Like BAE in Orbach's (1996) theory, capability for suicide is conceptualized as a facilitator of suicide, which increases suicide risk through interactions with suicidal desire (Joiner, 2005; Van Orden et al., 2010).

Regarding the components of capability for suicide, fearlessness about death is much like Orbach's (1996) description of indifference towards the body and bodily dissociation as negating the urge for self-preservation and shielding one from the horror inherent in death. Likewise, fearlessness about death may be conceptualized as similar to the death attitudes (i.e., increased attraction to death) which have been associated with negative body attitudes, low body protection, and bodily dissociation in previous studies (Orbach et al., 1995; Orbach et al., 2001; Orbach et al., 2006; Orbach & Mikulincer, 1998). Pain tolerance in the IPTS is analogous to the increased thresholds of sensation, bodily detachment, and reduced responsiveness to stimulation Orbach (1996) identified as pieces of bodily dissociation. Indeed, in an emergency room study of pain tolerance in recent suicide attempters more negative self-reported body attitudes were associated with more electric shocks endured and less pain reported as a result of those shocks

(Orbach et al., 1996). Due to the parallels in these theories and the centrality of negative BAE to eating disorders, it seems likely that BAE could be associated with suicidal behaviors in eating disorders through the mechanism of capability for suicide. Based on prior research in eating disordered and non-eating disordered samples, low body protection seems an especially promising candidate. Additionally, research on eating disorder behaviors, capability for suicide, and suicide attempts has yet to include BAE, making this a novel area of investigation.

Study Aims and Hypotheses

The purpose of the current study was to explore associations among BAE, capability for suicide, and suicide attempt history in an eating disorder sample. More specifically, the study tested (1) the direct relationship between body protection and lethality of most lethal suicide attempt and number of previous suicide attempts, and (2) indirect pathways by which these relationships were accounted for by capability for suicide (fearlessness about death and pain tolerance) or an alternate mediator (eating disorder symptom severity). Next, the study examined whether BAE differentiated among participants who have attempted suicide, those who reported history of suicidal ideation but denied history of attempt, and those with no history of suicidal ideation or attempts.

In additional exploratory analyses, the same direct and indirect pathways were investigated with other BAE constructs (body attitudes, comfort with touch, body care, and lack of familiarity with the body). Then, models with reversed paths were tested to examine whether fearlessness about death and pain tolerance may relate to suicide attempt lethality and frequency via body protection, in order to examine specificity of proposed pathways.

In the main analyses, it was hypothesized that there would be a significant direct association between body protection and (1) lethality of most lethal attempt and (2) number of past suicide attempts, and that these associations would be, in part, accounted for by capability for suicide, above inclusion of an alternate mediator. It was also predicted that body protection would significantly differentiate suicide groups in all pairwise comparisons (attempt vs. ideation vs. non-suicidal), while other components of BAE would not.

CHAPTER 2

METHODS

Participants

Participants (N = 352) were adult individuals currently receiving treatment for an eating disorder. Exclusion of participants who failed or did not respond to greater than 2 of 5 embedded attention checks (n = 33) yielded a sample size of 319 individuals who were included in analyses. The sample was predominantly female (92.8%) and White/Caucasian (93.4%), and the mean age was 28.1 years (SD = 9.3 years). Eating disorder diagnoses were as follows: 39.0% anorexia nervosa, restricting subtype; 20.8% anorexia nervosa, binge-purge subtype; 16.0% bulimia nervosa; 5.7% binge eating disorder; 17.3% other-specified feeding or eating disorder; and 1.3% avoidant-restrictive food intake disorder. Participants were recruited from eating disorder treatment and support organizations, with 55.2% reporting their current level of care as outpatient and 44.8% reporting current treatment at a higher level of care (i.e., intensive outpatient, partial hospitalization, residential, or inpatient) at time of participation. Overall, 38.4% (n = 122) reported having made at least one suicide attempt, and 81.8% (n = 261) reported lifetime suicidal ideation. Detailed characteristics of the study sample are presented in Table 1.

Procedures

Potential participants were informed of the study by physical and online flyers posted through eating disorder support and treatment organizations. They accessed the study via internet-enabled electronic device (e.g., tablet, computer, laptop, or mobile device). All participants provided informed consent by reviewing study procedures on an online informed consent document confirming their eligibility for the study (age 18 or older, diagnosed with and in treatment for an eating disorder, and fluent/literate in English), answering several multiple-choice comprehension questions to demonstrate understanding of the study, and electronically signing the informed consent document with a self-selected confidential ID. Next, they completed web-based self-report measures of BAE, capability for suicide, past and present

suicidality, eating pathology, and demographics. All procedures were completed utilizing Qualtrics, a HIPAA-compliant web-based survey platform. Participants were given the option to enter a drawing for a \$25 Amazon gift card upon completion of participation. All study materials and procedures received approval from Florida State University's Institutional Review Board and from research and/or clinical directors at treatment center sites prior to beginning data collection.

Measures

Demographics

Participants completed self-report items assessing age, race/ethnicity, family income, marital status, sexual orientation, gender, and eating disorder diagnosis and behaviors.

Acquired Capability for Suicide Scale – Fearlessness About Death (ACSS-FAD; Ribeiro et al., 2014)

The ACSS-FAD is a 7-item self-report measure designed to assess individuals' acquired capability of suicide, focusing on fearlessness about death. Items are rated on a scale from 0 ("Not at all like me") to 4 ("Very much like me"), and a total score is computed. Higher scores reflect higher levels of fearlessness about death. The ACSS-FAD has demonstrated adequate internal consistency in multiple samples (Ribeiro et al., 2014). The internal consistency of the ACSS-FAD was strong in the current study sample ($\alpha = .87$).

Body Attitude Test (BAT; Probst, Vandereycken, Coppinolle, & Vanderlinden, 1995)

The BAT is a 20-item self-report measure assessing participants' subjective body experience and attitudes. It was designed and initially validated for use in female eating disorder populations (Probst et al., 1995). The measure consists of four factors: negative appreciation of body size, lack of familiarity with one's body, general body dissatisfaction, and a 2-item rest factor. Items are scored on a 6-point scale ranging from 0 ("Never") to 5 ("Always"). Higher

scores reflect a more disturbed body experience. Items from Factor 2, “lack of familiarity with one’s body,” will be included in the current study (7 items). Psychometrics for the familiarity subscale of the BAT are strong, with high internal consistency and good test-retest demonstrated in multiple samples (Probst et al., 1995). In the current study, the internal consistency of this subscale was good ($\alpha = .83$).

Body Investment Scale (BIS; Orbach & Mikulincer, 1998)

The BIS is a 24-item self-report measure assessing participants’ emotional investment in their body. It consists of four subscales: body image, feelings, and attitudes (body attitudes); comfort in touch; body care; and body protection. Items are rated on a 5-point scale ranging from 1 (“Do not agree at all”) to 5 (“Strongly agree”). Higher scores indicate higher levels of body investment (e.g., positive body image and attitudes, positive feelings about touch, and higher levels of body care and protection, respectively). The BIS subscales show good to excellent internal consistency ($\alpha = .80$ to $.95$) (Orbach & Mikulincer, 1998). Additionally, the BIS has been validated for use in adult eating disorder samples (Marco et al., 2018). In the current study, the body protection subscale demonstrated poor internal consistency ($\alpha = .34$). Item-level analysis indicated removing the first item “It feels good to me to do something dangerous” improved internal consistency to the acceptable range ($\alpha = .70$). This modified subscale was utilized for analyses (the overall pattern of results was largely unchanged when the original scoring was used). Other subscales demonstrated fair internal consistency in the current study sample (α s = $.66$ to $.87$).

Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994)

The EDE-Q is a 36-item self-report measure of eating disorder symptomology over the past 28 days. It is derived from the EDE (Fairburn & Cooper, 1993) clinical interview for DSM-IV eating disorders. Each item is taken directly from a corresponding EDE item, with modifications to wording as required. Items addressing eating disorder attitudes are scored using a 7-point, forced-choice rating scheme. Subscale and global scores are derived in the same way as for the EDE, with subscale scores of four or higher considered to lie in the clinical range.

Frequencies of key behaviors are assessed in terms of the number of episodes of each behavior occurring during the past 4 weeks. This measure has demonstrated good psychometric properties previously (Berg, Peterson, Frazier, & Crow, 2012; Fairburn & Beglin, 1994). The EDE global score ($\alpha = .89$) was utilized in the current study to reflect eating disorder symptom severity.

Items Assessing History of Suicidal Ideation and Attempts

To assess for history of suicidal ideation, participants will be asked, “Have you ever had thoughts of killing yourself? Thoughts of killing yourself include thinking about, considering, or planning suicide” and were allowed to select “Yes” or “No” in response. Two items were included to assess participants’ suicide attempt history. First, participants were asked, “Have you ever made a suicide attempt with at least some intent to die? A suicide attempt is defined as: A self-directed, potentially injurious behavior with any intent to die as a result of the behavior. A suicide attempt may or may not result in injury” and could select “Yes” or “No” in response. Those who indicated that they had made a suicide attempt were then asked, “How many times have you attempted suicide with at least some intent to die?” and allowed to enter any numeric value. The wording of these items is consistent with recommendations for maximizing validity of single-item assessments of suicide-related constructs (Hom, Joiner, & Bernert, 2016) through the inclusion of standardized definitions (Crosby, Ortega, & Melanson, 2011).

Objective Lethality of Most Lethal Suicide Attempt

All participants who reported at least one lifetime suicide attempt on previous measures were asked to provide a written narrative describing the details of the plan and method used for their most lethal suicide attempt. They also indicated the level of medical attention required for this suicide attempt (0 = no medical attention, 1 = primary care doctor or nurse visit, 2 = emergency room visit, 3 = hospital admission to a general medical floor, 4 = hospital admission to an intensive care unit) and rated the attempt on a 0-2 scale with regard to isolation, timing, precautions against intervention, acting to get help, expectations of fatality, conception of lethality, conception of medical rescuability, and intent and desire to die at that time. This information was utilized to rate the objective lethality of the suicide attempt with a 0 –10 rating

scheme adapted from the Lethality of Suicide Attempt Rating Scale-II (LSARS-II; Berman, Shepherd, & Silverman, 2003) and the Suicide Intent Scale (SIS; Beck et al., 1974) by Witte and colleagues (2017). Participants with no history of suicide attempt received a score of 0. Additionally, participants were given a score of 0 if the narrative description indicated that a suicide attempt did not actually occur (e.g., the individual described suicidal ideation or a suicide plan that was not enacted). The primary investigator rated all descriptions, and 50% of descriptions were rated by a second, trained rater to confirm reliability. Inter-rater reliability for ratings, assessed with a 2-way mixed effects model, was determined to be excellent ($\alpha = .952$, $r = .914$).

Pain Tolerance Assessment

Subjective pain tolerance was assessed using the pain tolerance item of the Acquired Capability for Suicide Scale (ACSS; Ribeiro et al., 2014). This self-report item (“I can tolerate a lot more pain than most people”) is rated on a scale from 0 (“Not at all like me”) to 4 (“Very much like me”). Self-report items similar to this have been shown to load onto a factor representing ability to tolerate pain and discomfort in previous research (Schmidt, Richey, & Fitzpatrick, 2006). This particular item has been used in past research on eating disorders, capability for suicide, and suicide attempts (e.g., Dodd et al., 2017).

Data Analytic Plan

Descriptive statistics and bivariate correlations were computed to examine the normality and interrelatedness of study variables, and BAE variables were tested for presence of multicollinearity. Parallel mediation analyses with 10,000 bootstrapped resamples, using the SPSS PROCESS macro (Hayes, 2013), were employed to examine the direct relationship between body protection and suicide attempt history (lethality and number of attempts), as well as indirect pathways through fearlessness about death, pain tolerance, and eating disorder symptom severity (alternate mediator). Level of care (outpatient vs. higher level of care) was included as a covariate, as this variable was associated with pain tolerance, eating disorder symptom severity, and suicide attempt variables. In exploratory analyses, the same direct and

indirect pathways were tested in models with other BAE variables (body attitudes, comfort with touch, body care, and lack of familiarity with the body) substituted for body protection as the predictor variable. Additionally, specificity of the proposed indirect pathways was tested in exploratory models with reversed paths: examining indirect effects of fearlessness about death and pain tolerance on suicide attempt lethality and frequency, through body protection, with other variables entered as in the original models. Next, a MANOVA was utilized to test whether BAE differentiated among individuals with a history of suicide attempt, those with suicidal ideation only, and those with no history of suicidality. The independent (grouping) variable was history of suicidal thoughts and behaviors (attempter [n = 122], ideator [n = 139], or non-suicidal [n = 55]), and dependent variables were BAE (body protection, body attitudes, body care, comfort with touch, and lack of familiarity with the body). Follow-up post-hoc tests of all pairwise comparisons utilized Dunnett-T3 corrected critical values to control for Type I error due to multiple comparisons in analyses with unequal group sizes. Missing data were handled with listwise deletion. All analyses were conducted in SPSS version 22.0.

Power Analysis

Based on prior research, paths from body protection to capability and attempt history were expected to have medium effects (Stein et al., 2013) and paths from capability to attempt history to have small to medium effects (Chu et al., 2017). A power analysis using the SIMSEM package in R indicated a sample size of N = 254 would be necessary to detect the expected effects in the proposed parallel mediation model. Analyses with G*Power indicated this sample size was also adequately powered (.80) to detect medium effects (Stein et al., 2013) in a MANOVA with 3 groups and 5 response variables.

CHAPTER 3

RESULTS

Preliminary Analyses

Bivariate correlations and descriptive statistics for variables included in indirect effects analyses are presented in Table 2. All variables were significantly correlated, with the exception that the EDE global score was not significantly associated with pain tolerance or suicide attempt frequency ($ps > .05$). Variables of interest were normally distributed (skewness < 2 and kurtosis < 4), apart from suicide attempt frequency, which was both skewed and kurtotic. Repeating primary analyses with a normally distributed binary (yes/no) suicide attempt variable produced an unchanged pattern of results, so the original attempt frequency variable was retained in analyses. Correlations and descriptive statistics for BAE variables are presented in Table 4. All BAE variables were significantly correlated. Further, these variables were normally distributed in this study sample, so no data transformations were conducted. Evaluation of tolerance and variance inflation statistics indicated absence of problematic multicollinearity (tolerance values $> .2$ and variance inflation factor < 5) for BAE variables (O'Brien, 2007).

Direct and Indirect Effects of Body Protection on Suicide Attempt Outcomes

Results from a parallel mediation model indicated low body protection was significantly directly associated with increased lethality of suicide attempt, both before (c path: $B = -.77, p < .001$, CI -1.11 to -.44) and after (c' path: $B = -.59, p = .001$, CI -.96 to -.24) accounting for indirect effects through fearlessness about death, pain tolerance, and severity of eating pathology. All indirect paths were nonsignificant (all confidence intervals crossed zero) in this analysis. The full model accounted for 10.2% of the variance (R^2) in suicide attempt lethality, while the total effect of body protection accounted for 8.2% of the variance (R^2) in suicide attempt lethality. Detailed results are presented in Table 3.

In a model examining attempt frequency as the outcome, low body protection was significantly directly associated with increased quantity of suicide attempts, both before (c path:

$B = -.62, p = .001, CI -.96 \text{ to } -.27$) and after (c' path: $B = -.46, p = .018, CI -.84 \text{ to } -.08$) accounting for indirect effects through fearlessness about death, pain tolerance, and severity of eating pathology. The indirect effect through pain tolerance was significant ($CI -.17 \text{ to } -.01$), while the indirect paths through fearlessness about death and severity of eating pathology were not ($CI s -.22 \text{ to } .06$ and $-.18 \text{ to } .06$, respectively). The full model accounted for 7.2% of the variance (R^2) in suicide attempt frequency, while the total effect of body protection accounted for 5.4% of the variance (R^2) in suicide attempt frequency. See Table 3 for full results of this model.

Exploratory Models: Direct and Indirect Effects of BAE on Suicide Attempt Outcomes

Full results of the following exploratory models are presented in Tables 7-10, with a brief summary of significant pathways described here. In the first of these models, body attitudes were directly related to both suicide attempt lethality (c path $B = -.59, p = .001, CI -.93 \text{ to } -.25$) and suicide attempt frequency (c path $B = -.42, p = .018, CI -.78 \text{ to } -.07$), not accounting for indirect pathways. After adding indirect pathways, body attitudes retained a significant direct effect on attempt lethality (c' path $B = -.53, p = .016, CI -.96 \text{ to } -.10$), and the indirect effect through fearlessness about death on attempt lethality was also statistically significant ($CI -.16 \text{ to } -.01$).

In the next model, comfort with touch had a significant direct on attempt lethality before (c path $B = -.50, p = .002, CI -.82 \text{ to } -.18$) and after (c' path $B = -.35, p = .037, CI -.68 \text{ to } -.02$) accounting for the tested indirect effects, which were all non-significant. Likewise, the direct effects of comfort with touch on attempt frequency were statistically significant before (c path $B = -.51, p = .002, CI -.84 \text{ to } -.19$) and after (c' path $B = -.40, p = .020, CI -.74 \text{ to } -.06$) inclusion of indirect effects, all of which were non-significant.

Next, body care was significantly related to suicide attempt lethality before inclusion of indirect pathways (c path $B = -.53, p = .011, CI -.93 \text{ to } -.12$), but the indirect effect through fearlessness about death entirely accounted for this association ($CI -.27 \text{ to } -.01$). In contrast, body care was significantly directly associated with attempt frequency (c path $B = -.55, p = .007, CI -.95 \text{ to } -.15$), and this relationship remained statistically significant (c' path $B = -.42, p = .049, CI -.83 \text{ to } -.001$) above the inclusion of indirect effects, all non-significant.

The final tested BAE variable was lack of familiarity with the body, which was significantly related to suicide attempt lethality both before (c path $B = .09, p < .001, CI .04$ to $.13$) and after (c' path $B = .07, p = .010, CI .02$ to $.12$) inclusion of indirect pathways, of which only the indirect effect through fearlessness about death was statistically significant ($CI .001$ to $.02$). Lack of familiarity with the body was also significantly associated with suicide attempt frequency both before (c path $B = .08, p = .001, CI .03$ to $.12$) and after (c' path $B = .07, p = .019, CI .01$ to $.12$) accounting for the tested indirect pathways, of which only the indirect pathway through pain tolerance was statistically significant ($CI .001$ to $.02$).

Exploratory Models: Reversed Paths

In a model examining the direct and indirect effects of fearlessness about death on attempt lethality, the direct effect of fearlessness about death was significant before (c path $B = .06, p = .002, CI .02$ to $.10$), but not after (c' path $B = .03, p = .148, CI -.01$ to $.07$), inclusion of indirect effects through body protection, pain tolerance, and severity of eating pathology. The indirect effect through body protection was significant ($CI .01$ to $.04$), while the indirect paths through pain tolerance and severity of eating pathology were not ($CI s -.004$ to $.02$ and $-.001$ to $.01$, respectively).

Similarly, in a model predicting attempt frequency, the direct effect of fearlessness about death was significant before (c path $B = .05, p = .028, CI .01$ to $.09$), but not after (c' path $B = .02, p = .241, CI -.03$ to $.06$), inclusion of indirect effects through body protection, pain tolerance, and severity of eating pathology. Here, indirect effects through body protection and pain tolerance were significant ($CI s .01$ to $.04$ and $.002$ to $.02$, respectively), while the indirect path through severity of eating pathology was not ($CI -.003$ to $.01$).

In a model examining the direct and indirect effects of pain tolerance on attempt lethality, the direct effect of pain tolerance was significant before (c path $B = .28, p = .026, CI .03$ to $.52$), but not after (c' path $B = .12, p = .335, CI -.13$ to $.37$), inclusion of indirect effects through body protection, fearlessness about death, and severity of eating pathology. The indirect effect through body protection was significant ($CI .04$ to $.19$), while the indirect paths through fearlessness about death and severity of eating pathology were not ($CI s -.01$ to $.13$ and $-.004$ to $.07$, respectively).

Likewise, in a model predicting attempt frequency, the direct effect of pain tolerance was significant before (c path $B = .32, p = .011, CI .07$ to $.57$), but not after (c' path $B = .21, p = .109, CI -.05$ to $.47$), inclusion of indirect effects through body protection, fearlessness about death, and severity of eating pathology. Again, the indirect effect through body protection was significant ($CI .02$ to $.15$), while the indirect paths through fearlessness about death and severity of eating pathology were not (CI s $-.03$ to $.11$ and $-.01$ to $.08$, respectively).

Detailed results of these exploratory models are reported in Tables 11-12.

Differences in BAE Among Suicide Attempt, Suicidal Ideation, and Non-Suicidal Groups

Results of MANOVA indicated the overall between-groups difference in BAE was statistically significant, Wilks' Lambda = $.759, F(10,600) = 8.884, p < .001$. Table 5 summarizes individual group comparisons (mean and SD) for each BAE variable ($F = 9.56$ to 26.64 , all significant at the $p < .001$ level). Full results of follow-up pairwise comparisons with Dunnett T3-corrected critical values are presented in Table 6. In these analyses, body protection and lack of familiarity with the body differentiated all suicide groups from one another ($p < .001$ to $p = .001$). Body attitudes and body touch differentiated the attempt group from ideation ($ps = .002$) and non-suicidal groups ($ps < .001$). Ideation and non-suicidal groups did not significantly differ on body attitudes ($p = .101$) or comfort with touch ($p = .344$). Last, body care differentiated attempt and ideation groups from the non-suicidal group ($p < .001$ and $p = .003$, respectively), but not from one another ($p = .457$). On every BAE variable, suicide attempters reported the poorest mean BAE and non-suicidal participants the best mean BAE, with the mean value for the ideation group falling in between.

CHAPTER 4

DISCUSSION

Eating disorders are highly lethal mental illnesses, with many of these deaths attributed to suicide (Smith, Zuromski, & Dodd, 2018). Capability for suicide (Joiner, 2005; Smith et al., 2016), as well as BAE (Stein et al., 2003, 2013), have been proposed as potential explanatory mechanisms for this connection, though there has been little integration of these constructs in past work. Thus, the purpose of the current study was to explore associations among BAE, capability for suicide, and suicide attempt history in an eating disorder sample.

As expected, results indicated low body protection was significantly directly associated with increased lethality and quantity of past suicide attempts. This is consistent with past work highlighting the connection between low body protection and increased ability to engage in suicidal behavior (Orbach et al., 2001; Orbach et al., 2006; Stein et al., 2013). Importantly, this is the first work to show body protection as significantly related to both frequency and severity of suicidal behavior, not simply whether or not suicidal behavior occurs. In partial fulfillment of hypotheses, only the indirect pathway of body protection through pain tolerance in predicting attempt frequency was significant, while those through fearlessness about death and severity of disordered eating symptomology were not, and no indirect effects were significant in predicting attempt lethality. Thus, pain tolerance may be important in understanding how low body protection relates to higher frequency of suicide attempts, perhaps through increased engagement in dangerous, painful activities like non-suicidal self-injury, reckless behaviors, or suicide attempts themselves. This would be in line with the proposal of the IPTS that pain tolerance, in part, is built over time, enhancing ability to confront the pain of suicidal behavior (Joiner, 2005; Van Orden et al., 2010). Future, longitudinal work could assess patterns over time among relevant variables to further explore this possibility, as extant work has not evaluated the role of body protection in engagement in painful and provocative events that may increase pain tolerance.

Further, it is notable that the direct effect of pain tolerance on both attempt lethality and attempt frequency remained significant even after accounting for the contributions of theoretically robust explanatory variables (i.e., fearlessness about death, pain tolerance, and

severity of eating pathology). Additionally, exploratory analyses with reversed paths found that body protection accounted for a significant portion of the association between both capability variables and both attempt outcomes. Prospective analyses over multiple time points are needed to draw directional, potentially causally-relevant conclusions, but this provides initial evidence that body protection may be important in understanding how capability for suicide translates to more lethal and more frequent suicide attempts. Overall, body protection merits further evaluation as a suicide attempt-related construct, as it appears to have both distinct effects above capability and eating pathology, and perhaps also an important role in the contributions of capability constructs.

Exploratory analyses of BAE other than body protection indicated all BAE were significantly, directly related to both suicide attempt lethality and suicide attempt frequency. These effects largely remained significant above indirect pathways, though several indirect pathways were significant. A pattern emerged in which fearlessness about death accounted for a significant portion of the connection between BAE (body attitudes, body care, and lack of familiarity with the body) and attempt lethality, while pain tolerance accounted for the association between BAE (body touch and lack of familiarity with the body) and attempt frequency. This is an interesting pattern, which could show that fearlessness about death allows individuals with dysfunctional bodily experiences to approach methods of suicide that are more destructive, while pain tolerance enhances ability to engage in suicidal behavior of any lethality more frequently. However, confidence intervals for these findings were very close to zero, so results should be interpreted with caution and are in particular need of replication. Again, no pathways through severity of eating pathology were significant, suggesting BAE represent distinct, and possibly more strongly suicide-related, constructs from disordered eating and body image.

In this study's final analyses, BAE were compared across suicide groups (attempters, ideators, and no suicide-related history) to determine which BAE distinguished among these groups. Body protection was hypothesized to be the only BAE which would distinguish among all pairwise group comparisons. Analyses revealed that body protection and lack of familiarity with the body differentiated among all suicide groups, while body attitudes and comfort with touch differentiated attempters from non-attempters, and body care differentiated non-suicidal participants from those with history of attempt or ideation. Again, all BAE demonstrated

relevance for suicide-related outcomes, however body protection (as expected) and lack of familiarity with the body (not expected), emerged as most broadly and strongly relevant. Lack of research, rather than previous null findings, were the reason lack of familiarity with the body was not included in the initial hypotheses, so these results suggest need to direct more attention to this construct. Increasing alienation from the body appears to relate to increased likelihood of having experienced suicidal thoughts, then behaviors. This aligns with work suggesting detachment from the physical body enables consideration of and engagement in suicidal behavior (Orbach, 1994, 1996), though lack of familiarity with the body has not been assessed in most of the extant literature.

MANOVA findings have potential clinical and research utility, suggesting low body protection and lack of familiarity with the body are able to distinguish suicide attempters from ideators, in addition to differentiating suicidal from non-suicidal individuals, at least among those with eating disorders. This is notable, as the field has identified need to focus on factors related specifically to suicidal behavior, not simply suicidal ideation (Klonsky & May, 2014). All BAE except body care demonstrated ability to make this distinction, and body protection and lack of familiarity with the body appear to have relevance in differentiating across the continuum of suicidal thoughts and behaviors. Suicide death would be an important outcome for future work to include, in order to determine whether certain aspects of BAE can also distinguish between those who enact lethal versus non-lethal suicide attempts.

Importantly, the current analyses were retrospective, so causal and directional conclusions cannot be drawn, though initial findings are promising. It would be useful for future work to examine whether BAE fluctuate over time and in concert with suicidal thoughts and behaviors to determine whether they have predictive validity for suicide related outcomes. If so, it may be possible to determine clinically useful cut-points which can be evaluated and monitored in order to assist with assessment and management of risk, as well as disordered eating and body image disturbance. Should BAE prove relevant to the incidence and severity of suicidal thoughts and behaviors, interventions seeking to improve the relationship between those with eating disorders and their physical bodies would be a clinically relevant future direction. As discussed previously, BAE appear to operate distinctly from body image and disordered eating behavior (Stein et al., 2003, 2013), so targeting constructs like lack of familiarity with the body and body protection, rather than simply seeking to increase aesthetic body acceptance and

decrease eating pathology, may be important to consider in interventions. Existing and emerging approaches to eating disorder treatment, like interoceptive exposure (Boswell, Anderson, & Anderson, 2015), somatic interventions (Payne, Levine, & Crane-Godreau, 2015), and virtual reality (Clus, Larsen, Lemey, & Berrouiguet, 2018) may be promising candidates, though their ability to affect suicide-related outcomes through the mechanism of BAE is an open empirical question at this time.

Strengths and Limitations

As alluded to above, this project had several limitations which are important to consider. First, the cross-sectional, retrospective design precludes determinations of directionality or causality. We believe disturbed BAE enable engagement in more frequent and more lethal suicidal behaviors, in line with existing theory (Orbach, 1994, 1996), but it is also possible that engagement in such behavior results in disconnection from the physical body or that these perpetuate one another. Indirect effects analyses were also based on cross-sectional data, so we cannot definitively say whether negative BAE “lead to” changes in capability, vice versa, or whether they operate in parallel and are both influenced by unincluded third variables (e.g., non-suicidal self-injury, agitation). Our findings suggest BAE are likely to operate separately from capability and eating pathology, and that BAE may also underlie the connection between capability and suicidal behavior frequency and severity, but this cannot be firmly established without well-powered, prospective designs which account for changes in and interactions among all included variables over time. That many significant confidence intervals came very close to zero suggests additional need for caution with interpretation of findings. Further, all variables were evaluated with self-report questions. Though we followed best practices by including standardized definitions for suicide-related constructs (Hom et al., 2016), and the open-ended answer format of attempt lethality assessment allowed a second layer of review (and re-classification if needed), future evaluations may benefit from inclusion of clinician interview assessment of history of suicidal thoughts and behaviors in addition to simple self-report items. Other variables, such as those related to BAE and capability, are most frequently assessed with self-report items as done here. However, additional levels and methods of assessment are an emerging area to be considered in future designs. BAE are particularly difficult to capture, as

reflected by less-than-ideal internal consistencies for the scales in this study. Novel methods involving physiological assessment of arousal and interoceptive ability, virtual reality paradigms, and/or integration of related constructs like body trust may enhance future work.

Despite some limitations, this study was novel and had a number of strengths. First, the design utilized a relatively large clinical sample of individuals with eating disorders. Prior work in this area relied on much smaller samples, a norm in the field of eating disorders, but one that limits statistical power. Further, this sample had a high representation of suicidality, with over 80% of participants reporting lifetime suicidal ideation and nearly 40% at least one lifetime suicide attempt. Suicidal thoughts and behaviors are fairly common amongst those with eating disorders (Smith et al., 2018). This, combined with a large sample, allowed examination of characteristics of suicide attempts (i.e., lethality and frequency) rather than simple presence or absence of attempts, increasing novelty and potential clinical relevance of findings. Further, the sample comprised nearly the full range of possible values on all assessed variables. This is particularly important regarding BAE and suicide attempt lethality, as low base rates of those who have survived very lethal suicide attempts and those with extremely disturbed BAE present a barrier to studies in this area. Restricted range would have markedly limited ability to interpret results, but the current effort managed this issue by recruiting a large and clinically severe sample. Overall, this was a novel study, the first to our knowledge to integrate the IPTS and multiple BAE, as described in theories of the suicidal body, with testable hypotheses. As such, findings that BAE were relevant to several suicide-related outcomes, largely independently of capability constructs, represent an intriguing step. This study points to need for further attention to BAE by those who research suicidality among those with eating disorders.

Conclusions

This study evaluated associations among BAE, capability for suicide, eating pathology, and suicide-related outcomes among individuals with eating disorders. Results indicated low body protection was significantly directly associated with increased lethality and quantity of past suicide attempts. Only the indirect pathway through pain tolerance in predicting attempt frequency was significant. Further, body protection and lack of familiarity with the body differentiated among suicide attempters, ideators, and non-suicidal individuals. Findings suggest

BAE, particularly low body protection and lack of familiarity with the body, may be useful factors to consider when studying the propensity of those with eating disorders to engage in suicidal behavior. The current effort supports theoretical propositions that a disturbed relationship with the physical body may enable engagement in suicidal behavior, and also suggests this connection may operate, at least in part, separately from fearlessness about death, pain tolerance, and severity of eating pathology. Findings point to a need for greater empirical consideration of the connection between BAE and suicide-related outcomes among those with eating disorders.

APPENDIX A

STUDY IRB APPROVAL



Office of the Vice President for Research Human Subjects Committee
Tallahassee, Florida 32306-2742
(850) 644-8673 · FAX (850) 644-4392

APPROVAL MEMORANDUM

Date: 04/10/2018

To: Mary Duffy

Address: 1107 W Call St, Tallahassee, Fl 32304

Dept.: PSYCHOLOGY DEPARTMENT

From: Thomas L. Jacobson, Chair

Re: Use of Human Subjects in Research

Body Attitudes and Experiences, Capability for Suicide, and Suicidality in Individuals with Eating Disorders

The application that you submitted to this office in regard to the use of human subjects in the research proposal referenced above has been reviewed by the Human Subjects Committee at its meeting on 02/14/2018. Your project was approved by the Committee.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals, which may be required.

If you submitted a proposed consent form with your application, the approved stamped consent form is attached to this approval notice. Only the stamped version of the consent form may be used in recruiting research subjects.

If the project has not been completed by 02/13/2019 you must request a renewal of approval for continuation of the project. As a courtesy, a renewal notice will be sent to you prior to your

expiration date; however, it is your responsibility as the Principal Investigator to timely request renewal of your approval from the Committee.

You are advised that any change in protocol for this project must be reviewed and approved by the Committee prior to implementation of the proposed change in the protocol. A protocol change/amendment form is required to be submitted for approval by the Committee. In addition, federal regulations require that the Principal Investigator promptly report, in writing any unanticipated problems or adverse events involving risks to research subjects or others.

By copy of this memorandum, the chairman of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Human Research Protection. The Assurance Number is IRB00000446.

Cc: Thomas Joiner, Advisor
HSC No. 2018.23026

APPENDIX B

STUDY IRB RE-APPROVALS



Office of the Vice President for Research Human Subjects Committee
Tallahassee, Florida 32306-2742
(850) 644-8673 · FAX (850) 644-4392

APPROVAL MEMORANDUM

Date: 11/01/2018

To: Mary Duffy

Address: 1107 W Call St, Tallahassee, FL 32304

Dept.: PSYCHOLOGY DEPARTMENT

From: Thomas L. Jacobson, Chair

Re: Use of Human Subjects in Research

Body Attitudes and Experiences, Capability for Suicide, and Suicidality in Outpatient
Individuals with Eating Disorders

The application that you submitted to this office in regard to the use of human subjects in the research proposal referenced above has been reviewed by the Human Subjects Committee at its meeting on 10/10/2018. Your project was approved by the Committee.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals, which may be required.

If you submitted a proposed consent form with your application, the approved stamped consent form is attached to this approval notice. Only the stamped version of the consent form may be used in recruiting research subjects.

If the project has not been completed by 10/09/2019 you must request a renewal of approval for continuation of the project. As a courtesy, a renewal notice will be sent to you prior to your expiration date; however, it is your responsibility as the Principal Investigator to timely request renewal of your approval from the Committee.

You are advised that any change in protocol for this project must be reviewed and approved by the Committee prior to implementation of the proposed change in the protocol. A protocol change/amendment form is required to be submitted for approval by the Committee. In addition, federal regulations require that the Principal Investigator promptly report, in writing any unanticipated problems or adverse events involving risks to research subjects or others.

By copy of this memorandum, the chairman of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Human Research Protection. The Assurance Number is IRB00000446.

Cc: Thomas Joiner, Advisor
HSC No. 2018.25859



Office of the Vice President for Research Human Subjects Committee
Tallahassee, Florida 32306-2742
(850) 644-8673 · FAX (850) 644-4392

APPROVAL MEMORANDUM

Date: 03/27/2019

To: Mary Duffy

Address: 1107 W Call St, Tallahassee, FL 32304
Dept.: PSYCHOLOGY DEPARTMENT
From: Thomas L. Jacobson, Chair

Re: Use of Human Subjects in Research

Body Attitudes and Experiences, Capability for Suicide, and Suicidality in Individuals with Eating Disorders

The application that you submitted to this office in regard to the use of human subjects in the research proposal referenced above has been reviewed by the Human Subjects Committee at its meeting on 01/09/2019. Your project was approved by the Committee.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals, which may be required.

If you submitted a proposed consent form with your application, the approved stamped consent form is attached to this approval notice. Only the stamped version of the consent form may be used in recruiting research subjects.

If the project has not been completed by 01/08/2020 you must request a renewal of approval for continuation of the project. As a courtesy, a renewal notice will be sent to you prior to your expiration date; however, it is your responsibility as the Principal Investigator to timely request renewal of your approval from the Committee.

You are advised that any change in protocol for this project must be reviewed and approved by the Committee prior to implementation of the proposed change in the protocol. A protocol

change/amendment form is required to be submitted for approval by the Committee. In addition, federal regulations require that the Principal Investigator promptly report, in writing any unanticipated problems or adverse events involving risks to research subjects or others.

By copy of this memorandum, the chairman of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Human Research Protection. The Assurance Number is IRB00000446.

Cc: Thomas Joiner, Advisor
HSC No. 2018.26538

FLORIDA STATE UNIVERSITY
OFFICE *of the* VICE PRESIDENT *for* RESEARCH



APPROVAL

October 21, 2019

Mary Duffy

Dear Mary Duffy:

On 10/21/2019, the IRB staff reviewed the following submission:

Type of Review: Exempt

(2)(ii) Tests, surveys, interviews, or observation (low risk);

(2)(iii) Tests, surveys, interviews, or observation (identifiable); and for which limited IRB review was conducted via expedited review

Title: Body Attitudes and Experiences, Capability for Suicide, and Suicidality in Outpatient Individuals with Eating Disorders

Investigator: Mary Duffy

Submission ID: STUDY00000527

Study ID: STUDY00000527

Funding: None

IND, IDE, or HDE: None

Documents Reviewed: • Duffy_information-sheet_thesis.pdf, Category: Information Sheet;
• DuffyquestionnairesAlliance.pdf, Category: Survey/Questionnaire;
• BAE Capability OP ED Flyer, Category: Recruitment Materials;

The IRB staff approved the protocol, effective on 10/15/2019.

You are advised that any modification(s) to the protocol for this project must be reviewed and approved prior to implementation of the proposed modification(s).

Federal regulations require that the Principal Investigator promptly report any new information related to this protocol (see Investigator Manual (HRP-103)).

In conducting this protocol, you are required to follow the requirements listed in the Investigator Manual (HRP-103), which can be found by navigating to the IRB Library within the IRB system.

Sincerely,

Human Subjects Research Office
humansubjects@fsu.edu

APPENDIX C

INFORMED CONSENT FORM USED DURING DATA COLLECTION

PROJECT TITLE: Body Attitudes and Experiences, Capability for Suicide, and Suicide Attempts in Outpatient Individuals with Eating Disorders

Principal Investigator: Mary E. Duffy, [REDACTED]

Faculty Advisor: Dr. Thomas E. Joiner, [REDACTED]

INFORMED CONSENT FORM

Thank you for considering participating in this research study. This study involves completing a series of computer-based questionnaires. You were selected as a possible participant because you are currently receiving outpatient treatment for an eating disorder. We ask that you read this form and contact the Primary Investigator regarding questions you may have before agreeing to be in the study.

Background Information:

The purpose of this study is to investigate the role of body awareness and connection in mental health. The results of this study will help mental health professionals to better understand what effect body attitudes and experiences, and other mental health variables, have on suicide, specifically.

Procedures:

If you agree to participate in this study, you will complete the following tasks. The study is estimated to take a total of 30-40 minutes.

- Eligibility/Baseline (30-40 minutes): Study eligibility will be determined by your confirmation that you are at least 18 years old and understand and agree to all study procedures. If you are deemed to be eligible and choose to participate in the study, you will then complete additional self-report surveys assessing your body attitudes and experiences, past and present suicidality, other mental health variables, and demographics.

Risks and Benefits of Being in the Study:

The risks of participating in this study are minimal. This study will be asking about sensitive personal topics, including mental health symptoms and past and present suicidality, and some people may experience anxiety or become emotionally upset while completing the questionnaires. If this occurs and you wish to discuss it, we strongly encourage you to seek support from your treatment team and support staff at the Alliance for Eating Disorders Awareness. You may also contact the Principal Investigator, Mary Duffy, to speak about any such concerns that might arise.

In the unusual event that any discomfort you might experience cannot be addressed adequately by the above resources, or those resources are unavailable for any reason and your concerns are urgent, you

can call the national suicide prevention hotline at 1-800-273-TALK for immediate assistance 24 hours a day.

If your responses indicate that you may be at imminent risk for suicide, one of the trainee clinicians working as research staff on this study will be notified and will contact you in order to provide beneficial information and further resources. Resources include self-help plans, crisis line numbers, referral information to mental health clinics, and if necessary for your safety, notification of emergency services.

You will also be allowed to skip any items or questions that you choose and/or to end your participation at any time you wish and for any reason, including personal discomfort. The only exception to this is that you will be required to enter a valid phone number in case the researchers need to contact you to make sure you are safe.

There are no direct benefits anticipated from participation in this study. Still, this research may be helpful to society at large and the scientific community's understanding of how body awareness relates to mental health, including suicidality.

Compensation:

If you complete the study, you may elect to enter a drawing for a \$25 Amazon gift card.

Confidentiality:

The records of this study will be kept private and confidential to the extent permitted by law. Research records will be stored securely, and only researchers will have access to the records. You will be identified only by a participant number (your initials and a four digit number of your choice). If you report that you are currently suicidal on study questionnaires, the researchers may follow up with you by phone to ensure you are safe, as described above. We cannot ensure immediate follow-up if you report suicidality on the questionnaires, so please do not use them as a way to seek help. If you are feeling suicidal, please tell your treatment team and/or support staff directly, or contact the Suicide Prevention Lifeline or 911 for assistance.

In any sort of report we might publish, we will not include any information that will make it possible to identify a subject. However, research information that identifies you may be shared with the FSU Institutional Review Board (IRB) and others who are responsible for ensuring compliance with laws and regulations related to research, including the Office for Human Research Protections (OHRP).

Voluntary Nature of the Study:

Participation in this study is entirely voluntary. Your decision whether or not to participate will not affect your current or future relations with Florida State University or the Alliance for Eating Disorders Awareness. If you decide to participate, you are free to not answer any question (except that you must provide a phone number) or withdraw at any time without affecting those relationships.

Contacts and Questions:

The Principal Investigator is Mary Duffy. If you have any questions now or later, you are encouraged to contact Mary Duffy by email at [REDACTED] or at [REDACTED]. You may also contact the Faculty Advisor for this study, Dr. Thomas Joiner, at [REDACTED] or at [REDACTED].

If you have any questions or concerns regarding this study and would like to talk to someone other than the researchers, you are encouraged to contact the FSU IRB at 2010 Levy Street, Research Building B, Suite 276, Tallahassee, FL 32306-2742, or 850-644-8633, or by email at humansubjects@fsu.edu

Comprehension Questions:

Please read the following questions and select the correct answer to demonstrate your understanding of the study. All answers can be found in the consent form throughout the previous pages.

1. What is your understanding of what you'll be doing during this study? (Response options: A pain tolerance task; Completing online questionnaires about family, emotions, and body image; Completing online questionnaires about body attitudes and experiences and suicide; An experiment about body movement and body image)
2. What are the risks of participating in this study, from your point of view? (Response options: Emotional discomfort or anxiety; Bodily harm; Monetary loss; Losing access to treatment if I don't complete the study)
3. What are the benefits or compensation for participating in this study, from your point of view? (Response options: Access to better groups; Chance to win a \$25 gift card; Free therapy; Special privileges)
4. Who can you contact if you have questions about the study or about your rights as a research participant (Select all that apply)? (Response options: Dr. Thomas Joiner, the faculty advisor; The National Institutes of Health; Mary Duffy, the Primary Investigator)

Statement of Consent:

By entering your ID below, you are acknowledging that you:

1. Have read the above information
2. Have had the opportunity to ask questions and, if appropriate, have received answers
3. Understand the nature of the research project
4. Are at least 18 years of age
5. Are currently receiving treatment for an eating disorder
6. Understand that your participation is voluntary
7. Consent to participate in the study

If you would like to participate, please enter your first and last initial and a four digit number of your choice below (e.g. Jane Smith, could enter JS1996). This will be your confidential ID. (Box provided to enter ID).

Please also provide your phone number in case we need to follow up with you (Box provided to enter phone number).

National Mental Health Resources

Alliance for Eating Disorders Awareness

Eating disorder support, education, and referral organization

Phone: (866) 662-1235

Website: <https://www.allianceforeatingdisorders.com/>

Hours: M-F: 9:00 AM to 5:00 PM

National Eating Disorders Association

Eating disorder support organization

Phone: (800) 931-2237

Website: <https://www.nationaleatingdisorders.org/>

Hours: M-Th 9:00AM to 9:00 PM, F 9:00 AM to 5:00 PM

National Suicide Prevention Lifeline

A national crisis hotline

Phone: 1-800-273-TALK (8255)

Hours: 24 hours, 7 days a week

Crisis Text Line

A national crisis textline

Phone: 741-741

Hours: 24 hours, 7 days a week

Police Department

For emergency or acute crisis situations

Phone: 911 or 891-4200

Hours: 24 hours, 7 days a week

**If you would like more information regarding these mental health resources
or types of mental health treatment available,
we encourage you to email Mary Duffy (REDACTED).**

APPENDIX D

TABLES

Table 1

Participant Demographics

	n (%) or M (SD)
Gender	
Female	295 (92.8%)
Male	9 (2.8%)
Transgender Female	2 (0.6%)
Transgender Male	3 (0.9%)
Other	9 (2.8%)
Age	M = 28.1 (SD = 9.3)
Race/Ethnicity	
White/Caucasian	297 (93.4%)
Non-White/Caucasian	21 (6.6%)
Sexual Orientation	
Heterosexual or Straight	222 (69.8%)
Gay or Lesbian	28 (8.8%)
Bisexual	34 (10.7%)
Pansexual	20 (6.3%)
Asexual	14 (4.4%)
Eating Disorder Diagnosis	
Anorexia Nervosa – Restricting Subtype	124 (39.0%)
Anorexia Nervosa – Binge/Purge Subtype	66 (20.8%)
Bulimia Nervosa	51 (16.0%)
Binge Eating Disorder	18 (5.7%)
Other-Specified Feeding and Eating Disorder	55 (17.3%)
Avoidant-Restrictive Food Intake Disorder	4 (1.3%)
Body Mass Index	M = 23.9 (SD = 9.0)
Current Level of Care	
Outpatient	177 (55.7%)
Intensive Outpatient	24 (7.5%)
Partial Hospitalization	50 (15.7%)
Residential	64 (20.1%)
Inpatient	3 (0.9%)
Lifetime Suicidal Ideation	
Yes	260 (81.8%)
No	57 (17.9%)
Lifetime Suicide Attempt	
Yes	122 (38.4%)
No	194 (61.0%)

Table 2

Bivariate Correlations and Descriptive Statistics for Indirect Effects Analysis Variables

Variable	1	2	3	4	5	6
1. Body Prot	1					
2. FAD	-.358***	1				
3. Pain Tol	-.219***	.231***	1			
4. EDE-Q	-.245***	.146*	.060	1		
5. Lethality	-.293***	.199***	.139*	.134*	1	
6. Attempts	-.230***	.144*	.166**	.102	.663***	1
Mean	3.42	14.07	2.82	3.85	1.34	1.08
SD	.86	7.11	1.20	1.36	2.22	2.21
Range	1.2-5.0	0-28.0	0-4.0	0.4-6.0	0-9.0	0-20.0
Skewness	-.30	-.10	-.85	-.56	1.82	4.14
Kurtosis	-.58	-.76	-.18	-.59	2.60	24.43
α	.70	.88	--	.88	--	--

Note: * $p < .05$, ** $p < .01$, *** $p < .001$; Body Prot = body protection; FAD = fearlessness about death; Pain Tol = pain tolerance; EDE-Q = Eating Disorder Examination-Questionnaire Global score; Lethality = lethality of most lethal suicide attempt; Attempts = number of previous suicide attempts; SD = Standard Deviation; α = internal consistency

Table 3

Direct and Indirect Effects of Body Protection on Suicide Attempt Lethality and Frequency

Outcome	Mediator	Path	<i>B</i>	SE	<i>p</i>	CI
Attempt Lethality	--	<i>c</i>	-0.77	.17	< .001	-1.11, -.44
		<i>c'</i>	-.59	.18	.001	-.96, -.24
	FAD	<i>a</i>	-2.97	.51	< .001	-3.98, -1.96
		<i>b</i>	.03	.02	.148	-.01, .07
		<i>ab</i>	-.09	.07	--	-.26, .03
	Pain Tol	<i>a</i>	-.32	.09	< .001	-.49, -.15
		<i>b</i>	.12	.13	.335	-.13, .37
		<i>ab</i>	-.04	.04	--	-.13, .03
	EDE-Q	<i>a</i>	-.38	.10	< .001	-.58, -.18
		<i>b</i>	.13	.11	.231	-.08, .34
		<i>ab</i>	-.05	.04	--	-.15, .02
	Attempt Frequency	--	<i>c</i>	-.62	.18	.001
<i>c'</i>			-.46	.19	.018	-.84, -.08
FAD		<i>a</i>	-3.02	.51	< .001	-4.03, -2.00
		<i>b</i>	.02	.02	.461	-.03, .06
		<i>ab</i>	-.05	.07	--	-.22, .06
Pain Tol		<i>a</i>	-.32	.09	< .001	-.49, -.15
		<i>b</i>	.21	.13	.109	-.05, .47
		<i>ab</i>	-.07	.04	--	-.17, -.01
EDE-Q		<i>a</i>	-.40	.10	< .001	-.60, -.20
		<i>b</i>	.10	.11	.356	-.12, .32
		<i>ab</i>	-.04	.06	--	-.18, .06

Note: *c* = total effect of body protection on outcome; *c'* = direct effect of body protection on outcome after addition of mediating variables; *a* = effect of body protection on mediating variable; *b* = effect of mediating variable on outcome; *ab* = indirect effect of body protection on outcome through mediating variable, *B* = unstandardized path coefficient; SE = standard error of the estimate; CI = bias-corrected bootstrapped 95% confidence interval; FAD = fearlessness about death; Pain Tol = pain tolerance; EDE-Q = Eating Disorder Examination-Questionnaire Global score; statistically significant (CI does not cross zero) paths are bolded for ease of interpretation; level of care was included as a covariate.

Table 4

Bivariate Correlations and Descriptive Statistics for Body Attitudes and Experiences Variables

Variable	1	2	3	4	5
1. Body Protection	1				
2. Lack of Familiarity	-.473***	1			
3. Body Attitudes	.302***	-.647***	1		
4. Body Touch	.336***	-.418***	.345***	1	
5. Body Care	.325***	-.325***	.291***	.425***	1
Mean	3.42	19.44	1.90	2.88	3.54
SD	.86	6.58	.88	.92	.73
Range	1.2-5.0	2.0-35.0	1.0-4.7	1.0-5.0	1.7-5.0
Skewness	-.30	-.05	.96	.16	-.18
Kurtosis	-.58	-.32	.23	-.57	-.29
α	.70	.83	.67	.87	.68

Note: *** $p < .001$; SD = Standard Deviation; α = internal consistency

Table 5

Results of MANOVA Comparing Body Attitudes and Experiences Among Suicide Attempt, Suicidal Ideation, and Non-Suicidal Groups

Dependent Variable	F	R ²	Attempt (n = 121)		Ideation (n = 131)		Non-Suicidal (n = 55)	
			Mean	SD	Mean	SD	Mean	SD
Body Protection	26.643	.159	3.0	0.8	3.5	0.8	4.0	0.7
Lack of Familiarity	32.324	.175	22.2	6.1	18.8	5.9	14.6	5.8
Body Attitudes	13.268	.080	1.6	0.8	2.0	0.8	2.3	1.0
Body Touch	10.346	.064	2.6	0.9	3.0	0.9	3.2	0.9
Body Care	9.556	.059	3.4	0.7	3.5	0.7	3.9	0.7

Note: All findings were significant at the $p < .001$ level; SD = Standard Deviation

Table 6

Dunnett T3-Corrected Post-Hoc Pairwise Comparisons of Body Attitudes and Experiences Among Suicide Attempt, Suicidal Ideation, and Non-Suicidal Groups

Dependent Variable	Group Comparison	Mean Difference	<i>p</i>	CI
Body Protection	Attempt vs. Ideation	-.49	<.001	-.74, -.25
	Attempt vs. Non-Suicidal	-.93	<.001	-1.22, -.64
	Ideation vs. Non-Suicidal	-.43	.001	-.71, -.15
Lack of Familiarity	Attempt vs. Ideation	3.52	<.001	1.71, 5.33
	Attempt vs. Non-Suicidal	7.61	<.001	5.27, 9.95
	Ideation vs. Non-Suicidal	4.09	<.001	1.81, 6.36
Body Attitudes	Attempt vs. Ideation	-.35	.002	-.60, -.11
	Attempt vs. Non-Suicidal	-.69	<.001	-1.08, -.31
	Ideation vs. Non-Suicidal	-.34	.101	-.73, .05
Body Touch	Attempt vs. Ideation	-.38	.002	-.65, -.11
	Attempt vs. Non-Suicidal	-.60	<.001	-.95, -.25
	Ideation vs. Non-Suicidal	-.22	.344	-.57, .13
Body Care	Attempt vs. Ideation	-.12	.457	-.33, .09
	Attempt vs. Non-Suicidal	-.50	<.001	-.77, -.23
	Ideation vs. Non-Suicidal	-.38	.003	-.65, -.10

Note: CI = 95% Confidence Interval

Table 7

Direct and Indirect Effects of Body Attitudes on Suicide Attempt Lethality and Frequency

Outcome	Mediator	Path	<i>B</i>	SE	<i>p</i>	CI
Attempt Lethality	--	<i>c</i>	-0.59	.17	.001	-.93, -.25
		<i>c'</i>	-0.53	.22	.016	-.96, -.10
	FAD	<i>a</i>	-1.21	.55	.028	-2.29, -.13
		<i>b</i>	.05	.02	.025	.01, .09
		<i>ab</i>	-.06	.04	--	-.16, .01
	Pain Tol	<i>a</i>	-.07	.09	.467	-.24, .11
		<i>b</i>	.20	.13	.116	-.05, .44
		<i>ab</i>	-.01	.02	--	-.09, .01
	EDE-Q	<i>a</i>	-1.03	.08	< .001	-1.19, -.87
		<i>b</i>	-.01	.13	.945	-.27, .25
		<i>ab</i>	.01	.13	--	-.24, .25
Attempt Frequency	--	<i>c</i>	-.42	.18	.018	-.78, -.07
		<i>c'</i>	-.35	.23	.125	-.80, .10
	FAD	<i>a</i>	-1.21	.55	.027	-2.29, -.14
		<i>b</i>	.03	.02	.180	-.01, .07
		<i>ab</i>	-.03	.03	--	-.12, .002
	Pain Tol	<i>a</i>	-.07	.09	.452	-.24, .11
		<i>b</i>	.27	.13	.041	.01, .52
		<i>ab</i>	-.02	.03	--	-.09, .03
	EDE-Q	<i>a</i>	-1.04	.08	.080	-.51, .03
		<i>b</i>	.02	.14	.892	-.26, .29
		<i>ab</i>	-.02	.15	--	-.30, .27

Note: *c* = total effect of body attitudes on outcome; *c'* = direct effect of body attitudes on outcome after addition of mediating variables; *a* = effect of body attitudes on mediating variable; *b* = effect of mediating variable on outcome; *ab* = indirect effect of body attitudes on outcome through mediating variable, *B* = unstandardized path coefficient; SE = standard error of the estimate; CI = bias-corrected bootstrapped 95% confidence interval; FAD = fearlessness about death; Pain Tol = pain tolerance; EDE-Q = Eating Disorder Examination-Questionnaire Global score; statistically significant (CI does not cross zero) paths are bolded for ease of interpretation; level of care was included as a covariate.

Table 8

Direct and Indirect Effects of Comfort with Touch on Suicide Attempt Lethality and Frequency

Outcome	Mediator	Path	<i>B</i>	SE	<i>p</i>	CI
Attempt Lethality	--	<i>c</i>	-0.50	.16	.002	-.82, -.18
		<i>c'</i>	-0.35	.17	.037	-.68, -.02
	FAD	<i>a</i>	-1.63	.49	.001	-2.60, -.65
		<i>b</i>	.04	.02	.035	.003, .09
		<i>ab</i>	-.07	.04	--	-.18, -.01
	Pain Tol	<i>a</i>	-.14	.08	.083	-.30, .02
		<i>b</i>	.17	.13	.177	-.08, .42
		<i>ab</i>	-.02	.02	--	-.10, .01
	EDE-Q	<i>a</i>	-.37	.09	< .001	-.55, -.19
		<i>b</i>	.15	.11	.176	-.07, .36
		<i>ab</i>	-.05	.04	--	-.16, .01
	Attempt Frequency	--	<i>c</i>	-.51	.16	.002
<i>c'</i>			-.40	.17	.020	-.74, -.06
FAD		<i>a</i>	-1.62	.49	.001	-2.59, -.65
		<i>b</i>	.02	.02	.254	-.02, .07
		<i>ab</i>	-.04	.03	--	-.13, .01
Pain Tol		<i>a</i>	-.15	.08	.070	-.31, .01
		<i>b</i>	.24	.13	.064	-.01, .50
		<i>ab</i>	-.04	.03	--	-.11, -.001
EDE-Q		<i>a</i>	-.37	.09	< .001	-.55, -.18
		<i>b</i>	.10	.11	.365	-.12, .32
		<i>ab</i>	-.04	.06	--	-.17, .05

Note: *c* = total effect of comfort with touch on outcome; *c'* = direct effect of comfort with touch on outcome after addition of mediating variables; *a* = effect of comfort with touch on mediating variable; *b* = effect of mediating variable on outcome; *ab* = indirect effect of comfort with touch on outcome through mediating variable, *B* = unstandardized path coefficient; SE = standard error of the estimate; CI = bias-corrected bootstrapped 95% confidence interval; FAD = fearlessness about death; Pain Tol = pain tolerance; EDE-Q = Eating Disorder Examination-Questionnaire Global score; statistically significant (CI does not cross zero) paths are bolded for ease of interpretation; level of care was included as a covariate.

Table 9

Direct and Indirect Effects of Body Care on Suicide Attempt Lethality and Frequency

Outcome	Mediator	Path	<i>B</i>	SE	<i>p</i>	CI
Attempt Lethality	--	<i>c</i>	-0.53	.21	.011	-0.93, -0.12
		<i>c'</i>	-0.33	.21	.115	-0.75, .08
	FAD	<i>a</i>	-2.51	.63	< .001	-3.74, -1.28
		<i>b</i>	.04	.02	.047	.001, .08
		<i>ab</i>	-0.11	.06	--	-0.27, -0.01
	Pain Tol	<i>a</i>	-0.15	.10	.141	-0.36, .05
		<i>b</i>	.19	.13	.159	-0.07, .43
		<i>ab</i>	-0.03	.03	--	-0.12, .01
	EDE-Q	<i>a</i>	-0.37	.12	.002	-0.60, -0.13
		<i>b</i>	.17	.11	.128	-0.05, .38
		<i>ab</i>	-0.06	.04	--	-0.17, .002
Attempt Frequency	--	<i>c</i>	-0.55	.20	.007	-0.95, -0.15
		<i>c'</i>	-0.42	.21	.049	-0.83, -0.001
	FAD	<i>a</i>	-2.49	.63	< .001	-3.73, -1.26
		<i>b</i>	.02	.02	.250	-0.02, .07
		<i>ab</i>	-0.06	.05	--	-0.19, .02
	Pain Tol	<i>a</i>	-0.16	.10	.118	-0.37, .04
		<i>b</i>	.23	.13	.073	-0.02, .48
		<i>ab</i>	-0.04	.03	--	-0.13, .002
	EDE-Q	<i>a</i>	-0.37	.12	.002	-0.61, -0.14
		<i>b</i>	.09	.11	.406	-0.12, .30
		<i>ab</i>	-0.03	.05	--	-0.16, .05

Note: *c* = total effect of body protection on outcome; *c'* = direct effect of body care on outcome after addition of mediating variables; *a* = effect of body care on mediating variable; *b* = effect of mediating variable on outcome; *ab* = indirect effect of body care on outcome through mediating variable, *B* = unstandardized path coefficient; SE = standard error of the estimate; CI = bias-corrected bootstrapped 95% confidence interval; FAD = fearlessness about death; Pain Tol = pain tolerance; EDE-Q = Eating Disorder Examination-Questionnaire Global score; statistically significant (CI does not cross zero) paths are bolded for ease of interpretation; level of care was included as a covariate.

Table 10

Direct and Indirect Effects of Lack of Familiarity on Suicide Attempt Lethality and Frequency

Outcome	Mediator	Path	<i>B</i>	SE	<i>p</i>	CI
Attempt Lethality	--	<i>c</i>	.09	.02	< .001	.04, .13
		<i>c'</i>	.07	.03	.010	.02, .12
	FAD	<i>a</i>	.17	.07	.020	.03, .31
		<i>b</i>	.05	.02	.021	.01, .09
		<i>ab</i>	.01	.01	--	.001, .02
	Pain Tol	<i>a</i>	.03	.01	.018	.004, .05
		<i>b</i>	.14	.13	.260	-.11, .39
		<i>ab</i>	.004	.004	--	-.001, .01
	EDE-Q	<i>a</i>	.11	.01	< .001	.09, .14
		<i>b</i>	.02	.12	.842	-.22, .27
<i>ab</i>		.003	.01	--	-.02, .03	
Attempt Frequency	--	<i>c</i>	.08	.02	.001	.03, .12
		<i>c'</i>	.07	.03	.019	.01, .12
	FAD	<i>a</i>	.17	.07	.021	.03, .31
		<i>b</i>	.03	.02	.171	-.01, .07
		<i>ab</i>	.004	.004	--	-.0003, .02
	Pain Tol	<i>a</i>	.03	.01	.014	.01, .05
		<i>b</i>	.22	.13	.095	-.04, .48
		<i>ab</i>	.01	.004	--	.001, .02
	EDE-Q	<i>a</i>	.11	.01	< .001	.09, .14
		<i>b</i>	-.003	.13	.019	.01, .12
<i>ab</i>		-.0003	.02	--	-.03, .03	

Note: *c* = total effect of lack of familiarity on outcome; *c'* = direct effect of lack of familiarity on outcome after addition of mediating variables; *a* = effect of lack of familiarity on mediating variable; *b* = effect of mediating variable on outcome; *ab* = indirect effect of lack of familiarity on outcome through mediating variable, *B* = unstandardized path coefficient; SE = standard error of the estimate; CI = bias-corrected bootstrapped 95% confidence interval; FAD = fearlessness about death; Pain Tol = pain tolerance; EDE-Q = Eating Disorder Examination-Questionnaire Global score; statistically significant (CI does not cross zero) paths are bolded for ease of interpretation; level of care was included as a covariate.

Table 11

Reversed Paths: Including FAD as Predictor and Body Protection as a Mediating Variable

Outcome	Mediator	Path	<i>B</i>	SE	<i>p</i>	CI
Attempt Lethality	--	<i>c</i>	.06	.02	.002	.02, .10
		<i>c'</i>	.03	.02	.148	-.01, .07
	Protect	<i>a</i>	-.04	.01	< .001	-.05, -.03
		<i>b</i>	-.60	.18	.001	-.96, -.24
		<i>ab</i>	.02	.01	--	.01, .04
	Pain Tol	<i>a</i>	.04	.01	< .001	.02, .06
		<i>b</i>	.12	.13	.335	-.13, .37
		<i>ab</i>	.00	.01	--	-.004, .02
	EDE-Q	<i>a</i>	.03	.01	.030	.00, .05
		<i>b</i>	.13	.11	.231	-.08, .34
<i>ab</i>		.00	.00	--	-.001, .01	
Attempt Frequency	--	<i>c</i>	.05	.02	.028	.01, .09
		<i>c'</i>	.02	.02	.241	-.03, .06
	Protect	<i>a</i>	-.04	.01	< .001	-.05, -.03
		<i>b</i>	-.46	.19	.018	-.84, -.08
		<i>ab</i>	.02	.01	--	.01, .04
	Pain Tol	<i>a</i>	.04	.01	< .001	.02, .06
		<i>b</i>	.21	.13	.109	-.05, .47
		<i>ab</i>	.01	.00	--	.002, .02
	EDE-Q	<i>a</i>	.03	.01	.036	.00, .05
		<i>b</i>	.10	.02	.461	-.03, .06
<i>ab</i>		.00	.00	--	-.003, .01	

Note: *c* = total effect of FAD on outcome; *c'* = direct effect of FAD on outcome after addition of mediating variables; *a* = effect of FAD on mediating variable; *b* = effect of mediating variable on outcome; *ab* = indirect effect of FAD on outcome through mediating variable, *B* = unstandardized path coefficient; SE = standard error of the estimate; CI = bias-corrected bootstrapped 95% confidence interval; FAD = fearlessness about death; Protect = body protection; Pain Tol = pain tolerance; EDE-Q = Eating Disorder Examination-Questionnaire Global score; statistically significant (CI does not cross zero) paths are bolded for ease of interpretation; level of care was included as a covariate.

Table 12

Reversed Paths: Including Pain Tolerance as Predictor and Body Protection as a Mediating Variable

Outcome	Mediator	Path	<i>B</i>	SE	<i>p</i>	CI
Attempt Lethality	--	<i>c</i>	.28	.12	.026	.03, .52
		<i>c'</i>	.12	.13	.335	-.13, .37
	Protect	<i>a</i>	-.16	.04	< .001	-.25, -.08
		<i>b</i>	-.60	.18	.001	-.96, -.24
		<i>ab</i>	.10	.04	--	.04, .19
	FAD	<i>a</i>	1.47	.38	< .001	.73, 2.22
		<i>b</i>	.03	.02	.148	-.01, .07
		<i>ab</i>	.05	.04	--	-.01, .13
	EDE-Q	<i>a</i>	.11	.07	.145	-.04, .25
		<i>b</i>	.13	.11	.231	-.08, .34
		<i>ab</i>	.01	.02	--	-.004, .07
	Attempt Frequency	--	<i>c</i>	.32	.13	.011
<i>c'</i>			.21	.13	.109	-.05, .47
Protect		<i>a</i>	-.16	.04	< .001	-.25, -.08
		<i>b</i>	-.46	.19	.018	-.84, -.08
		<i>ab</i>	.07	.03	--	.02, .15
FAD		<i>a</i>	1.50	.38	< .001	.75, 2.24
		<i>b</i>	.02	.02	.461	-.03, .06
		<i>ab</i>	.02	.03	--	-.03, .11
EDE-Q		<i>a</i>	.12	.07	.115	-.03, .26
		<i>b</i>	.10	.11	.356	-.12, .32
		<i>ab</i>	.01	.02	--	-.01, .08

Note: *c* = total effect of pain tolerance on outcome; *c'* = direct effect of pain tolerance on outcome after addition of mediating variables; *a* = effect of pain tolerance on mediating variable; *b* = effect of mediating variable on outcome; *ab* = indirect effect of pain tolerance on outcome through mediating variable, *B* = unstandardized path coefficient; SE = standard error of the estimate; CI = bias-corrected bootstrapped 95% confidence interval; Protect = body protection; FAD = fearlessness about death; EDE-Q = Eating Disorder Examination-Questionnaire Global score; statistically significant (CI does not cross zero) paths are bolded for ease of interpretation; level of care was included as a covariate.

REFERENCES

- American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (5th ed.). Washington, D. C.: American Psychiatric Association. <https://doi.org/10.1176/appi.books.9780890425596>
- Arcelus, J., Mitchell, A. J., Wales, J., & Nielsen, S. (2011). Mortality Rates in Patients With Anorexia Nervosa and Other Eating Disorders. *Archives of General Psychiatry*, *68*(7), 724–731.
- Boswell, J. F., Anderson, L. M., & Anderson, D. A. (2015). Integration of Interoceptive Exposure in Eating Disorder Treatment. *Clinical Psychology: Science and Practice*, *22*(2), 194–210. <https://doi.org/10.1111/cpsp.12103>
- Bulik, C. M., Thornton, L., Andrea Poyastro Pinheiro, Plotnicov, K., Klump, K. L., Brandt, H., ... Kaye, W. H. (2008). Suicide Attempts in Anorexia Nervosa. *Psychosomatic Medicine*, *70*(3), 378–383. <https://doi.org/10.1097/PSY.0b013e3181646765>
- Carano, A., De Berardis, D., Campanella, D., Serroni, N., Ferri, F., Di Iorio, G., ... Di Giannantonio, M. (2012). Alexithymia and suicide ideation in a sample of patients with binge eating disorder. *Journal of Psychiatric Practice*, *18*(1), 5–11. <https://doi.org/10.1097/01.pra.0000410982.08229.99>
- Chu, C., Buchman-Schmitt, J. M., Stanley, I. H., Hom, M. A., Tucker, R. P., Hagan, C. R., ... Chu, C. (2017). The interpersonal theory of suicide: A systematic review and meta-analysis of a decade of cross-national research. *Psychological Bulletin*. <https://doi.org/10.1037/bul0000123>
- Clus, D., Larsen, M. E., Lemey, C., & Berrouiguet, S. (2018). The Use of Virtual Reality in Patients with Eating Disorders: Systematic Review. *Journal of Medical Internet Research*, *20*(4), e157. <https://doi.org/10.2196/jmir.7898>
- Crosby, A. E., Ortega, L., & Melanson, C. (2011). *Self-directed violence surveillance: Uniform definitions and recommended data elements, Version 1.0*. Atlanta, GA: Centers for Disease Control and Prevention.
- Crow, S. J., Swanson, S. A., le Grange, D., Feig, E. H., & Merikangas, K. R. (2014). Suicidal behavior in adolescents and adults with bulimia nervosa. *Comprehensive Psychiatry*, *55*(7), 1534–1539. <https://doi.org/10.1016/j.comppsy.2014.05.021>
- Dodd, D. R., Smith, A. R., Forrest, L. N., Witte, T. K., Bodell, L., Bartlett, M., ... Goodwin, N. (2017). Interoceptive Deficits, Nonsuicidal Self-Injury, and Suicide Attempts Among Women with Eating Disorders. *Suicide and Life-Threatening Behavior*, *48*(4), 1–11. <https://doi.org/10.1111/sltb.12383>

- DuBois, R. H., Rodgers, R. F., Franko, D. L., Eddy, K. T., & Thomas, J. J. (2017). A network analysis investigation of the cognitive-behavioral theory of eating disorders. *Behaviour Research and Therapy*, *97*, 213–221. <https://doi.org/10.1016/j.brat.2017.08.004>
- Favaro, A., & Santonastaso, P. (1997). Suicidality in eating disorders: clinical and psychological correlates. *Acta Psychiatrica Scandinavica*, *95*(6), 508–514. <https://doi.org/10.1111/j.1600-0447.1997.tb10139.x>
- Franko, D. L., & Keel, P. K. (2006). Suicidality in eating disorders: Occurrence, correlates, and clinical implications. *Clinical Psychology Review*, *26*(6), 769–782. <https://doi.org/10.1016/j.cpr.2006.04.001>
- Guillaume, S., Jaussent, I., Olié, E., Genty, C., Bringer, J., Courtet, P., & Schmidt, U. (2011). Characteristics of suicide attempts in anorexia and bulimia nervosa: A case-control study. *PLoS ONE*, *6*(8). <https://doi.org/10.1371/journal.pone.0023578>
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Press.
- Hom, M. A., Joiner, T. E., & Bernert, R. A. (2016). Limitations of a single-item assessment of suicide attempt history: implications for standardized suicide risk assessment. *Psychological Assessment*, *28*(8), 1026–1030. <https://doi.org/10.1037/pas0000241>
- Joiner, T. E. (2005). *Why People Die By Suicide*. Cambridge, MA: Harvard University Press.
- Keshaviah, A., Edkins, K., Hastings, E. R., Krishna, M., Franko, D. L., Herzog, D. B., ... Eddy, K. T. (2014). Re-examining premature mortality in anorexia nervosa: A meta-analysis redux. *Comprehensive Psychiatry*, *55*(8), 1773–1784. <https://doi.org/10.1016/j.comppsy.2014.07.017>
- Klonsky, E. D., & May, A. M. (2014). Differentiating suicide attempters from suicide ideators: A critical frontier for suicidology research. *Suicide and Life-Threatening Behavior*, *44*(1), 1–5. <https://doi.org/10.1111/sltb.12068>
- Marco, J. H., Cañabate, M., García-Alandete, J., Llorca, G., Real-López, M., Beltrán, M., & Pérez, S. (2018). Body image and nonsuicidal self-injury: Validation of the Body Investment Scale in participants with eating disorders. *Clinical Psychology & Psychotherapy*, *25*(1), 173–180. <https://doi.org/10.1002/cpp.2142>
- O'Brien, R. M. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality and Quantity*, *41*(5), 673–690. <https://doi.org/10.1007/s11135-006-9018-6>
- Orbach, I., Stein, D., Shan-Sela, M., & Har-Even, D. (2001). Body attitudes and body experiences in suicidal adolescents. *Suicide & Life-Threatening Behavior*, *31*(3), 237–249. <https://doi.org/10.1521/suli.31.3.237.24250>

- Orbach, I. (1994). Dissociation, Physical Pain, and Suicide: A Hypothesis. *Suicide and Life-Threatening Behavior*, 24(1), 68–79. <https://doi.org/10.1111/j.1943-278X.1994.tb00664.x>
- Orbach, I. (1996). The role of the body experience in self-destruction. *Clinical Child Psychology and Psychiatry*, 1(4), 607–619. <https://doi.org/10.1177/1359104596014012>
- Orbach, I. (2003). Suicide and the Suicidal Body. *Suicide and Life-Threatening Behavior*, 33(1), 1–8. <https://doi.org/10.1521/suli.33.1.1.22786>
- Orbach, I., Gilboa-Schechtman, E., Sheffer, A., Meged, S., Har-Even, D., & Stein, D. (2006). Negative bodily self in suicide attempters. *Suicide & Life-Threatening Behavior*, 36(2), 136–153. <https://doi.org/10.1521/suli.2006.36.2.136>
- Orbach, I., Lotem-Peleg, M., & Kedem, P. (1995). Attitudes Toward the Body in Suicidal, Depressed, and Normal Adolescents. *Suicide and Life-Threatening Behavior*, 25(2), 211–221. <https://doi.org/10.1111/j.1943-278X.1995.tb00920.x>
- Orbach, I., & Mikulincer, M. (1998). The body investment scale: Construction and validation of a body experience scale. *Psychological Assessment*, 10(4), 415–425. <https://doi.org/10.1037/1040-3590.10.4.415>
- Payne, P., Levine, P. A., & Crane-Godreau, M. A. (2015). Somatic experiencing: Using interoception and proprioception as core elements of trauma therapy. *Frontiers in Psychology*, 6(FEB), 1–18. <https://doi.org/10.3389/fpsyg.2015.00093>
- Preti, A., Rocchi, M. B. L., Sisti, D., Camboni, M. V., & Miotto, P. (2011). A comprehensive meta-analysis of the risk of suicide in eating disorders. *Acta Psychiatrica Scandinavica*, 124(1), 6–17. <https://doi.org/10.1111/j.1600-0447.2010.01641.x>
- Probst, M., Vandereycken, W., Coppenolle, H. Van, & Vanderlinden, J. (1995). The Body Attitude Test for Patients with an Eating Disorder: Psychometric Characteristics of a New Questionnaire. *Eating Disorders*, 3(2), 133–144. <https://doi.org/10.1080/10640269508249156>
- Ribeiro, J. D., Witte, T. K., Van Orden, K. A., Selby, E. A., Gordon, K. H., Bender, T. W., & Joiner, T. E. (2014). Fearlessness about death: the psychometric properties and construct validity of the revision to the acquired capability for suicide scale. *Psychological Assessment*, 26(1), 115–126. <https://doi.org/10.1037/a0034858>
- Riva, G., & Dakanalis, A. (2018). Altered Processing and Integration of Multisensory Bodily Representations and Signals in Eating Disorders: A Possible Path Toward the Understanding of Their Underlying Causes. *Frontiers in Human Neuroscience*, 12, 49. <https://doi.org/10.3389/fnhum.2018.00049>
- Schmidt, N. B., Richey, J. A., & Fitzpatrick, K. K. (2006). Discomfort intolerance: Development

- of a construct and measure relevant to panic disorder. *Journal of Anxiety Disorders*, 20(3), 263–280. <https://doi.org/10.1016/j.janxdis.2005.02.002>
- Selby, E. A., Smith, A. R., Bulik, C. M., Olmsted, M. P., Thornton, L., McFarlane, T. L., ... Joiner, T. E. (2010). Habitual starvation and provocative behaviors: Two potential routes to extreme suicidal behavior in anorexia nervosa. *Behaviour Research and Therapy*, 48(7), 634–645. <https://doi.org/10.1016/j.brat.2010.03.016>
- Smith, A. R., Dodd, D. R., Forrest, L. N., Witte, T. K., Bodell, L., Ribeiro, J. D., ... Bartlett, M. (2016). Does the interpersonal–Psychological theory of suicide provide a useful framework for understanding suicide risk among eating disorder patients? A test of the validity of the IPTS. *International Journal of Eating Disorders*, 49(12), 1082–1086. <https://doi.org/10.1002/eat.22588>
- Smith, A. R., Fink, E. L., Anestis, M. D., Ribeiro, J. D., Gordon, K. H., Davis, H., ... Joiner, T. E. (2013). Exercise caution: Over-exercise is associated with suicidality among individuals with disordered eating. *Psychiatry Research*, 206(2–3), 246–255. <https://doi.org/10.1016/j.psychres.2012.11.004>
- Smith, A. R., Zuromski, K. L., & Dodd, D. R. (2018). Eating disorders and suicidality: what we know, what we don't know, and suggestions for future research. *Current Opinion in Psychology*, 22, 63–67. <https://doi.org/10.1016/j.copsyc.2017.08.023>
- Smith, K. E., Crosby, R. D., Wonderlich, S. A., Forbush, K. T., Mason, T. B., & Moessner, M. (2018). Network analysis: An innovative framework for understanding eating disorder psychopathology. *International Journal of Eating Disorders*, 51(3), 214–222. <https://doi.org/10.1002/eat.22836>
- Stein, D., Orbach, I., Shani-Sela, M., Har-Even, D., Yaruslasky, A., Roth, D., ... Apter, A. (2003). Suicidal Tendencies and Body Image and Experience in Anorexia nervosa and Suicidal Female Adolescent Inpatients. *Psychotherapy and Psychosomatics*, 72(1), 16–25. <https://doi.org/10.1159/000067183>
- Stein, D., Zinman, D., Halevy, L., Yaroslavsky, A., Bachar, E., Kreitler, S., & Orbach, I. (2013). Attitudes Toward Life and Death and Suicidality Among Inpatient Female Adolescents With Eating Disorders. *The Journal of Nervous and Mental Disease*, 201(12), 1066–1071. <https://doi.org/10.1097/NMD.0000000000000055>
- Swanson, S. A., Crow, S. J., Le Grange, D., Swendsen, J., & Merikangas, K. R. (2011). Prevalence and correlates of eating disorders in adolescents: Results from the national comorbidity survey replication adolescent supplement. *Archives of General Psychiatry*, 68(7), 714–723. <https://doi.org/10.1001/archgenpsychiatry.2011.22>
- Van Orden, K. A., Witte, T. K., Cukrowicz, K. C., Braithwaite, S. R., Selby, E. A., & Joiner, T. E. (2010). The interpersonal theory of suicide. *Psychological Review*, 117(2), 575–600. <https://doi.org/10.1037/a0018697>

- Witte, T. K., Zuromski, K. L., Gauthier, J. M., Smith, A. R., Bartlett, M., Siegfried, N., ... Goodwin, N. (2016). Restrictive eating: Associated with suicide attempts, but not acquired capability in residential patients with eating disorders. *Psychiatry Research*, 235, 90–96. <https://doi.org/10.1016/j.psychres.2015.11.043>
- Zuromski, K. L., & Witte, T. K. (2015). Fasting and acquired capability for suicide: A test of the interpersonal-psychological theory of suicide in an undergraduate sample. *Psychiatry Research*, 226(1), 61–67. <https://doi.org/10.1016/j.psychres.2014.11.059>

BIOGRAPHICAL SKETCH

Mary Duffy graduated from the University of Saint Joseph in 2014 with her Bachelor of Arts in Psychology. She is currently enrolled in Florida State University's Clinical Psychology Program, where she is a member of the Laboratory of the Study and Prevention of Suicide-Related Conditions. She was awarded a National Science Foundation Graduate Research Fellowship in 2018. Mary's research interests are in examining the relationship between connection to and experience of the physical body and various forms of psychopathology, with a focus on eating disorders and suicidal and self-injurious thoughts and behaviors.