

TOWSON UNIVERSITY
COLLEGE OF GRADUATE STUDIES AND RESEARCH

SELF-INJURIOUS BEHAVIOR AND EATING DISORDERS:
PSYCHOLOGICAL CORRELATES AND SHORT-TERM TREATMENT

by

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THESIS APPROVAL PAGE

This is to certify that the thesis prepared by Lindsay M. Martin, entitled Self-Injurious Behavior and Eating Disorders: Psychological Correlates and Short-Term Treatment Outcomes, has been approved by this committee as satisfactory completion of the requirement for the degree of Master of Arts in Clinical Psychology in the department of Psychology.



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ABSTRACT

SELF-INJURIOUS BEHAVIOR AND EATING DISORDERS: PSYCHOLOGICAL CORRELATES AND SHORT-TERM TREATMENT OUTCOMES

Lindsay M. Martin

Lifetime self-injurious behavior (SIB) has been linked to heightened eating disorder symptomatology and general psychopathology (Muehlenkamp, et al., 2011). This study examines the lifetime prevalence, psychological variables, and short-term outcomes in a large sample of eating disordered inpatients with a history of self-injury. Patients who were currently engaging in purely impulsive SIB or purely compulsive SIB were also compared using identical dependent variables. SIB+ patients were 64% of the sample, and were found to be younger, have lower ages of eating disorder onset, and higher BMIs at admission. They were also more likely to engage in purging, have greater eating disorder symptomatology, and general psychopathology. No significant differences were found between patients with current impulsive SIB and compulsive SIB, nor were there any differences in short-term treatment outcome variables. Future studies must focus more on the current SIB, type of SIB, and effect of SIB+ on long-term treatment outcomes.

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1.

LITERATURE REVIEW

Anorexia nervosa (AN) and bulimia nervosa (BN) are behavioral disorders driven by a relentless fear of fatness or “motivated eating restraint” (Guarda, 2008; Schmidt & Treasure, 2006). Characterized by significant cognitive, behavioral, and emotional distress, medical complications are often severe, ranging from osteoporosis, hypokalemia, and cardiovascular distress, to a reduction in brain volume, organ failure, and growth retardation (Mitchell & Crow, 2006; Rome & Ammerman, 2003). Lifetime prevalence rates are between 0.4% and 0.6% for AN and 0.6% and 1.6% for BN (Machado, Machado, Goncalves, & Hoek, 2007; Stice, 2009). Over 50% of individuals diagnosed with AN meet criteria for the purging subtype (AN-P) versus AN of the restricting type (AN-R; Fichter, Quadflieg, & Hedlund, 1999), while 80-90% of those diagnosed with BN are categorized as purgers (BN-P; Tobin, Johnson, Dennis, 1992). Eating disorder not otherwise specified (EDNOS), a diagnosis representing individuals who meet most, but not all, DSM-IV criteria for an eating disorder (e.g., AN patient whose body weight is above 85%, or a BN patient who is below the bingeing and/or purging frequency threshold), is even more widespread, with a prevalence of 2.4% (Machado, et al., 2007).

Strikingly little evidence supports the long-term efficacy of existing interventions for eating disorders. The Maudsley method of conjoint family therapy (Lock & le Grange, 2005) yields positive outcomes for AN, but only for adolescents with an early onset and a short duration of illness (Russell, Szmulker, Dare, & Eisler, 1987); there is no evidence-based treatment for adults. To date, the recovery rate for adults and adolescents

with AN is as low as 50% (Nilsson & Hagglof, 2005; Steinhausen, 2002). Manual-based cognitive-behavioral therapy (CBT) has been recognized as the treatment of choice for adults with BN, however only 30-50% of patients experience complete remission of symptoms. Finally, while acceptance and mindfulness-based behavior therapies, such as Dialectical Behavioral Therapy (Linehan, 1993) and Acceptance and Commitment Therapy (ACT; Hayes, Wilson, & Stosahl, 1999), seem to be promising in the treatment of eating disorders, the body of literature is small (Baer, Fischer, & Huss, 2005; Juarascio, Forman, & Herbert, 2010).

Psychiatric comorbidity is as high as 95% for BN and 56% for AN (Hudson & Pope, 2007). Among the many behaviors that co-occur with eating disorders are alcohol and substance abuse (Carbaugh & Sias, 2010), compulsive buying (Mitchell, Redlin, Wonderlich, Crosby, Faber, Miltenberger, & Smyth, 2002), stealing (Vandereycken & Van Houdenhove, 1996), attempted suicide (Bulik, Sullivan, & Joyce, 1999), and self-injurious behavior (Muehlenkamp, Claes, Smits, Peat, & Vandereyken, 2011). Of these behaviors, one of the most pervasive among individuals with disordered eating is self-injury (Solano, Fernandez-Aranda, Aitken, Lopez, & Vallejo, 2005), also referred to as self-harm (Gratz, 2003) or self-mutilation (Nock & Prinstein, 2004).

Self-injurious behavior (SIB) is defined as a socially unacceptable act that causes minor to moderate physical injury, has no suicidal intent, and is performed in the context of psychological distress (Claes & Vandereycken, 2007; Favazza & Rosenthal, 1993; Tantam & Whittaker, 1992). Two subtypes of SIB are often distinguished: impulsive and compulsive. Impulsive SIB refers to episodic, gratifying acts, whereas compulsive SIB is more habitual, repetitive, and ego-dystonic (Favazza & Simeon, 1995). Specific forms of

impulsive SIB are cutting, burning, bruising, and scratching, while compulsive SIB includes skin-picking, hair-pulling, and nail-biting.

Approximately 45% of inpatients with eating disorders engage in at least one form of self-injury (Claes, Klonsky, Muehlenkamp, Kuppens, & Vandereycken, 2010), and individuals who engage in purging (e.g., AN-P and BN-P) versus restrictive behaviors (e.g., AN-R) are more likely to self-injure (Claes & Vandereycken, 2007; Favaro & Santonastaso, 1996; Peebles, Wilson, & Lock, 2011; Svirko & Hawton, 2007). A recent review of SIB in eating disorders reports an occurrence of 28% to 68% in AN-P, 26% to 55% in BN-P, and 14% to 42% in AN-R (Svirko & Hawton, 2007). Moreover, the co-occurrence of SIB and eating disorders is associated with heightened eating disorder symptomatology, including body dissatisfaction and interoceptive awareness (Muehlenkamp, et al., 2011; Solano et al., 2005).

In terms of general psychopathology, patients with eating disorders and a history of SIB consistently report higher neuroticism, anxiety, depression, anger, and hostility (Cassin & von Ranson, 2005; Claes, Vandereycken, & Vertommen, 2007); they also commonly present with cluster B personality disorders and increased suicide attempts (Ruuska, Kaltiala-Heino, & Rantanen, 2005; Stein, Lilienfeld, Wildman, & Marcus, 2004). Traumatic events and obsessive-compulsive symptoms are heightened in self-injurers with eating disorders (Davis & Karvinen, 2002; Stein, et al., 2004), as are levels of dissociation, self-criticism, and childhood emotional, physical, and sexual abuse (Claes & Vandereycken, 2007; Muehlenkamp et al., 2011).

Component analyses of SIB in patients with eating disorders support the distinction between impulsive and compulsive SIB, with cutting, burning, suicide

attempts, substance/alcohol, and laxative abuse loading onto an impulsive SIB factor and hair-pulling, nail biting, and vomiting loading onto a compulsive SIB factor (Favaro & Santonastaso, 1998; 2000). Impulsive SIB has been further linked to greater novelty-seeking in eating disorders, whereas compulsive SIB is associated with increased harm avoidance (Favaro & Santonastaso, 2000). Engaging in the combination of *both* compulsive and impulsive SIB is related to higher treatment dropout rates in AN (Favaro & Santonastaso, 2000).

Current study

Past research has focused mostly on patients who have engaged in SIB over their lifetime or in the last year, rather than also exploring current SIB and type of SIB. The current study, therefore, had primary and exploratory aims. The primary objectives were as follows:

- (i) to examine lifetime history of SIB in a large sample of inpatients with eating disorders, specifically exploring associations between a past history of SIB and demographic factors (sex, age, etc.), eating disorder pathology (i.e., diagnosis, admission BMI, behavioral frequencies, eating disorder cognitions), and general psychopathology (personality characteristics and depressive symptomatology)
- (ii) to investigate the association between lifetime history of SIB and short-term treatment outcomes at discharge from the hospital (i.e., inpatient and partial hospital length of stay, and inpatient and partial hospital rates of weight gain).

The exploratory objectives were

- (i) to explore the association between current SIB (pure compulsive versus pure impulsive SIB) on demographic factors (sex, age, etc.), eating disorder pathology

(i.e., diagnosis, admission BMI, behavioral frequencies, eating disorder cognitions), and general psychopathology (personality characteristics and depressive symptomatology)

(ii) to explore the association between current SIB (pure compulsive verses pure impulsive SIB) and short-term treatment outcomes at discharge from the hospital (i.e., inpatient and partial hospital length of stay, and inpatient and partial hospital rates of weight gain).

Based on past research it was hypothesized that SIB would be associated with more severe eating disorder symptomatology and general psychopathology, and that there would be no difference between purely impulsive and compulsive self-injurers on these variables. The examination of treatment outcomes in those with and without a history of SIB, and in those who engage in purely impulsive versus compulsive SIB, was novel and, thus, exploratory.

2.

METHOD AND MATERIALS**Participants**

Two hundred and sixty-eight patients were admitted to the Johns Hopkins Eating Disorder Inpatient Program between the years 2004 and 2011. Thirty-four participants were excluded from the current study because they had incomplete and/or discrepant responses regarding SIB. Excluded patients did not differ from the 234 participants included in the current sample on age, $t(266) = .641, p = 0.52$ or diagnosis (restricting versus purging), 84% vs. 70% purging, respectively [$\chi^2(1, N = 260) = 2.11, p = 0.15$]. Approximately 23% ($n=53$) of patients were diagnosed with anorexia nervosa restricting type (AN-R), 27% ($n=63$) were diagnosed with anorexia nervosa binge-eating/purging type (AN-P), 24% ($n=55$) were diagnosed with bulimia nervosa (BN; purging type =53; nonpurging type =2), and 1% ($n=3$) had binge eating disorder. The remaining 25% ($n=60$) met criteria for a subthreshold eating disorder (subthreshold AN-R=15, subthreshold AN-P=39, subthreshold BN=6). The vast majority of patients were female (93%), single/never married (73%), and Caucasian (87%), and the mean age of patients was 28.57 years ($SD=11.69$; 14-75 years); the average age of eating disorder onset was 18.61 ($SD = 7.87$). The average BMI of the entire sample was 19.06 ($SD = 5.04$), and among those examined for analyses of weight gain rates (those with a BMI less than 19.5; $n=163$, 61%), the average BMI was 16.31 ($SD = 2.12$). Participants who chose to participate did not differ from those who refused, thus limiting the risk of under or over-report from consenters versus non-consenters,.

Design and Procedure

Upon admission, patients consented to an IRB-approved longitudinal study of the integrated inpatient and partial hospital treatment program at Johns Hopkins Hospital and within 3-4 days completed a battery of self-report measures. Trained clinicians determined specific eating disorder diagnoses using the eating disorder modules of the Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders (SCID; First, Spitzer, Gibbon, & Williams, 1997). Those patients who only met partial criteria for AN or BN were classified as subthreshold AN (EDNOS-AN-R or EDNOS AN-P) or subthreshold BN (EDNOS-BN). The Johns Hopkins Eating Disorder Program focuses on manipulating current maladaptive eating repertoires with an integrated, step-down approach from inpatient to partial hospital. Intervention strategies adhere to a strict behavioral protocol in the context of a supportive environment of psychiatrists, residents, social workers, occupational therapists, nutritionists, and nurses (for a fuller description of program, see Guarda & Heinberg, 2003).

Materials and Tasks

Demographic Information. Basic demographic information was collected for each participant, including age, race, relationship status, and education, and age of onset.

Clinical Indices. Information in participants' clinical charts was used to calculate illness duration, length of inpatient and partial hospital stay, body mass index (BMI, kg/m^2) at inpatient admission and discharge, and number of past eating disorder admissions. Inpatient and partial hospital rates of weight gain were calculated for participants on weight gain protocol ($\text{BMI} < 19.5$).

Self-injurious Behavior. Both current and past self-injurious behaviors were assessed via self-report. Items evaluating a history of SIB asked participants to indicate

the behaviors that they have *ever* engaged in from the following list: cutting, burning, bruising, scratching, nail-biting, hair-pulling, and skin-picking. Participants were also asked how many times “during the past 8 weeks” they engaged in any (or all) of these behaviors to assess current presence and frequency. Frequency responses ranged from never (1) to several times a day (7).

Behavioral Data. Current eating behaviors, including restricting portion sizes, consuming low-fat/low-calorie foods, skipping meals, binge eating, vomiting, and laxative, diet pill, and diuretic use, were evaluated via self-report items questioning the frequency of the named behaviors in the 8 weeks prior to admission. Responses ranged from never (1) to several times a day (7). Behavioral variables also included age of first using alcohol and number of days on which alcohol was consumed in the last 30 days.

Eating Disorder Inventory-2¹(EDI-2; Garner, 1986). The Eating Disorder Inventory-2 is a commonly used self-report measure that assesses intensity of eating disorder pathology. The Drive for Thinness (DT), Body Dissatisfaction (BD), and Bulimia (B) subscales were used to measure eating disorder cognitions. The psychometric properties have been well-established (Garner, 1991). In the current study, Cronbach’s alphas for these scales were 0.90, 0.93, and 0.88, respectively.

Eating Disorder Recovery Self-Efficacy Questionnaire (EDRSQ; Pinto, Heinberg, Coughlin, Fava, & Guarda, 2008).The EDRSQ is a 23-item questionnaire designed to examine the confidence a participant has in his or her ability to recover from an eating disorder. The EDRSQ is comprised of two subscales, one assessing a participants’ belief that she can engage in normative eating patterns (Normative Eating)

¹ The current version of the Eating Disorder Inventory (3) was not used for this study, as the EDI-2 was the current version when data collection began.

and another assessing confidence in achieving a healthy body image (Body Image; Pinto, et al., 2008). Both subscales have been shown to predict inpatient treatment outcomes (e.g., length of stay, body dissatisfaction), and have demonstrated acceptable internal consistency. The Normative Eating subscale and the Body Image subscale in this sample had excellent internal consistency at 0.97 and 0.94, respectively.

Socio-cultural Attitudes Towards Appearance-Eating Disorders (SATAQ-ED; Heinberg, Coughlin, Pinto, Haug, Brode, & Guarda, 2008). The SATAQ-ED assesses societal and cultural influences (via television, magazines, sports figures, etc.) on body image. The scale is 9-items ranked on a 5-point scale, ranging from “definitely disagree” to “definitely agree.” It is comprised of 2 subscales, including success (i.e. perception of one’s personal achievement of a socially acceptable and attractive appearance), and internalization (i.e. the extent to which individuals have accepted socio-cultural standards of thinness and beauty). In the current sample, the Success and Internalization subscales had Cronbach’s alphas of 0.85 and 0.91, respectively.

NEO Five Factor Inventory (NEO-FFI; Costa & McCrae, 1992). The NEO-FFI is 60 item personality inventory that is commonly used to extrapolate five personality domains: Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness. The scale has acceptable construct validity and the utility of the validity scales has been well established (Costa & McCrae, 1992; Scandell, 2000). In this sample, Cronbach’s α coefficients for each of the subscales were as follows: 0.80, 0.82, 0.77, 0.77, and 0.89, respectively.

Beck Depression Inventory (BDI; Beck, Steer, & Brown, 1996). The BDI is a 21-item measure employed to assess depressive symptomatology in adolescents and

adults. BDI total scores range from 0 to 63, with high severity identified in scores above 29 (Beck, 1978). The BDI has good internal consistency in clinical and non-clinical samples, with Cronbach's α of .86 and .81, respectively (Beck, Steer, & Brown, 1996). The Cronbach's α coefficient for this sample was .92.

3.

STATISTICAL ANALYSES

Prior to analysis, data were evaluated for the presence of missing data, outlying data points, and non-normality. Missing data were imputed using a 10% mean imputation method, meaning if a participant responded to less than 10% of any particular scale (e.g., they completed 19, instead of 21, items on the BDI), the missing data points were replaced with the mean value of all items completed (DiLalla & Dollinger, 2006). Approximately 2% of the psychosocial measures included in the current study had a < 10% response rate and were included in the mean imputation calculations.

For primary statistical analyses, participants were first dichotomized into one of two groups – those who had a past history of SIB (SIB+) and those who did not (SIB-). Chi-square tests of independence assessed whether there were differences between SIB+ and SIB- (independent variable) groups on sex and diagnostic category² (dependent variables). Due to no theoretical rationale supporting a unique combination of dependent variables, student's t-tests compared the independent variable (those who were SIB+ versus SIB-) on the continuous univariate dependent variables (i.e., age, age of onset of eating disorder, admission BMI, age of onset of alcohol use, and depressive symptomatology).

A series of separate multivariate analyses of variance (MANOVA) were conducted to compare those who were SIB+ to those who were SIB- on the following dependent variables: related behavioral frequencies (restrictive and purging behaviors),

² For the analysis of SIB by diagnosis, *DSM-IV*-defined diagnostic categories were categorized as restrictors or purgers. Restrictors included those with AN-R and subthreshold AN-R; purgers included those with AN-P, BN-purging type, subthreshold AN-P and subthreshold BN.

the EDI-2, NEO-FFI, SATAQ-ED and EDSRQ subscales. Follow-up univariate analyses were performed on all individual subscales.

Between-subjects univariate analyses of covariance (ANCOVA's) were performed for the first short-term treatment outcome variable, length of stay (inpatient and partial), wherein self-injury group served as the independent variable and BMI (admission or partial hospital, respectively) served as a covariate. T-tests were used for the second treatment outcome variable, rates of weight gain (inpatient and partial).

For exploratory analyses, patients who engaged in SIB were divided into two pure SIB groups: those who currently engaged in impulsive SIB only and those who currently engaged in compulsive SIB only. To compare the two groups, identical procedures were followed as stated above, however, rather than SIB+/- serving as the independent variable, impulsive SIB/compulsive SIB served as the independent variable.

Homogeneity of variance was examined using Levene's tests and Box's M; for the latter heterogeneity was assumed if $p < 0.001$ (Tabanachick & Fidell, 2007). To correct for multiple comparisons, we used the modified Bonferroni Holm procedure (see Table 1). To conduct this procedure, variables were first divided by hypothesis into one of the following four groups:

- 1) SIB+/SIB- psychosocial and clinical variables
- 2) SIB+/SIB- treatment outcome variables
- 3) Impulsive SIB/Compulsive SIB psychosocial and clinical variables
- 4) Impulsive SIB/Compulsive SIB treatment outcome variables.

Each group was further divided into the number of tests conducted for each hypothesis; there were seven tests for each psychosocial and clinical hypothesis and four tests for

each treatment outcome hypothesis. After positioning p values from lowest to highest for each hypothesis, the adjusted alpha was determined using the following formula:

$$(\text{the number of tests}) - (\text{position in the sequence}) + 1$$

Significance values that did not exceed the adjusted alpha were considered significant.

For primary analyses (those with SIB+/SIB- as the independent variable), the minimum number of participants required for adequate power was determined by an a-priori power analysis with the computer program Gpower (Gpower: Faul, Erfelder, Lang, Buchner, 2007). The analysis indicated that a sample size of 212 would be sufficient to detect a large significant effect with the most complicated dependent variable (NEO-PI-R), with a power of 0.80 and an alpha of 0.05.

To determine the minimum number of participants that would be required for adequate power in the exploratory analyses (those with pure impulsive SIB/pure compulsive SIB as the independent variable) another a priori power analysis was conducted. To detect small effect with the NEO-PI-R, again with a power of 0.80 and an alpha of 0.05, a sample size of 134 would be needed.

4.

RESULTS**Prevalence of SIB**

Approximately 64% ($n=149$) of the entire sample reported a history of SIB. Of those who had ever engaged in SIB, 44% ($n=65$) indicated that they had engaged in three or more SIB behaviors in their lifetime, and 17% ($n=25$) had engaged in five or more behaviors. The three most common behaviors reported were nail-biting ($n=91$, 39%), skin-picking ($n=90$, 39%), and cutting ($n=78$, 33%), followed by scratching ($n=60$, 26%), hair-pulling ($n=33$, 14%), bruising ($n=30$, 13%), and burning ($n=24$, 10%).³ Patients with purging diagnoses were significantly more likely to engage in SIB than those with restricting diagnoses, [77% vs. 23%, respectively; $\chi^2(1, N = 229) = 7.92, p = .005$].

SIB and Demographic, Clinical and Psychosocial Variables

Patients with a history of self-injury (SIB+) were significantly younger at admission ($M = 26.89$; $SD = 10.41$) than those who had never self-injured ($M = 31.52$, $SD = 13.20$), $t(232) = 2.96, p = 0.003, r = -0.19$, and they had a lower age of eating disorder onset (SIB+: $M = 17.44$, $SD = 5.93$; SIB-: $M = 20.68$, $SD = 10.16$), $t(219) = 2.99, p = .003, r = -.19$. Additionally, BMI at admission was higher in SIB+ patients ($M = 19.87$, $SD = 5.17$) than SIB- patients ($M = 17.66$, $SD = 4.52$), $t(220) = -3.200, p = 0.002, r = .22$. There was no difference between groups on sex [$\chi^2(1, N = 234) = 2.19, p = .14$] or levels of depression in SIB+ ($M = 25.24$, $SD = 12.89$) versus SIB- ($M = 22.94$, $SD = 12.89$), respectively.

³ Given the high number of nail biters in the SIB+ sub-sample, all analyses were conducted again excluding those individuals who exclusively engaged in nail-biting. The results were comparable and are, therefore, not reported here.

Behavioral frequencies yielded a multivariate effect, [$F(6,215) = 2.87, p = .01$, Wilkes $\lambda = 0.93, \eta_p^2 = .07$, observed power = .89], with lifetime self-injury being significantly related to a higher frequency of vomiting in SIB+ patients, [$F(1,222) = 93.89, p < .001, \eta_p^2 = .046$, observed power = .96] and no differences on frequency of binge eating, laxative use, exercise, restricting portions, or eating low calorie/low fat foods. There was also a main multivariate effect for eating disorder cognitions, [$F(3,224) = 5.72, p = .001$, Wilkes $\lambda = 0.93, \eta_p^2 = .07$, observed power = .95]; follow-up univariate analyses indicated that the SIB+ group had greater drive for thinness [$F(1,228) = 10.09, p = .002, \eta_p^2 = .04$, observed power = .89] and body dissatisfaction [$F(1,228) = 16.95, p < .001, \eta_p^2 = .07$, observed power = .98]; there was no difference between those who were SIB+ or SIB- on the bulimia subscale ($p = 0.28$). The SATAQ-ED had a significant omnibus multivariate effect, [$F(2,210) = 1619.67, p < .001$, Wilkes $\lambda = 0.06, \eta_p^2 = .94$, observed power = 1.00], with thin ideal internalization heightened in SIB+ patients, [$F(1,130) = 6.60, p = .011, \eta_p^2 = .05$, observed power = .72], and no difference on the success subscale, ($p = 0.37$). The NEO-FFI multivariate analysis produced significant findings, [$F(5,212) = 6.73, p < .001$, Wilkes $\lambda = 0.86, \eta_p^2 = .14$, observed power = 1.00], with univariate analyses indicating that SIB+ patients had higher levels of Neuroticism, [$F(1,218) = 26.62, p < 0.001, \eta_p^2 = .106$, observed power = 1.00], and Openness, [$F(1,218) = 4.91, p = 0.03, \eta_p^2 = .02$, observed power = .60], and lower levels of Agreeableness, [$F(1,218) = 4.36, p = .04, \eta_p^2 = .020$, observed power = .55], and Conscientiousness, [$F(1,218) = 5.18, p = .02, \eta_p^2 = .02$, observed power = .62]. The Extroversion subscale yielded no significant difference, ($p = 0.14$). Finally, there was a significant multivariate effect for recovery self-efficacy, [$F(2,216) = 6.49, p = .002$,

Wilkes $\lambda = 0.94$, $\eta_p^2 = .06$, observed power = .90]; SIB+ patients reported lower recovery self-efficacy related to body image (i.e., less confidence in their ability to have an accepting versus negative body image), [$F(1,219) = 10.91$, $p = 0.001$, $\eta_p^2 = .05$, observed power = .91], and no significant difference in the normative eating subscale, ($p = 0.44$).

SIB and Short-term Treatment Outcomes

There were no significant differences between SIB+ and SIB- patients on treatment outcome measures, including inpatient length of stay ($M = 18.57$, $SD = 16.64$ vs. $M = 24.32$, $SD = 19.82$), [$F(1,222) = .67$, $p = .414$, $\eta_p^2 = .003$, observed power = .67] and day hospital length of stay ($M = 28.29$, $SD = 16.94$ vs. $M = 29.85$, $SD = 17.57$), [$F(1,173) = .12$, $p = .746$, $\eta_p^2 = .001$, observed power = .06] . Among those who were underweight at admission, inpatient rates of weight gain did not differ between SIB+ patients ($M = 4.21$, $SD = 1.91$) versus SIB- patients ($M = 4.39$, $SD = 1.91$), $t(131) = .64$, $p = 0.60$, $r = -0.05$ nor did partial hospital rates of weight gain in the SIB+ ($M = 2.54$, $SD = 4.78$) versus SIB- group ($M = 3.33$, $SD = 1.78$), $t(87) = .90$, $p = 0.37$, $r = -0.12$.

Impulsive and Compulsive SIB

One hundred and thirty-one (88%) of the patients with a history of SIB engaged in SIB during the 8 weeks prior to admission. Ninety-five of these patients (64%) engaged in either purely compulsive ($n=83$, 87%) or purely impulsive self-injury ($n=12$, 13%). The remaining 36 patients engaged in both impulsive and compulsive self-injury. The most frequently engaged in compulsive behavior was skin-picking, which occurred on average more than once a day, and the most frequently engaged in impulsive behavior was cutting which occurred on average once a month. There were no significant differences between patients currently engaged in purely impulsive SIB and purely

compulsive SIB on demographic, clinical, psychosocial, or treatment outcome variables (see Table 2); however, there was a trend for those who engaged in purely impulsive behaviors to have purging diagnoses and to have a longer length of stay (an average of 40 ± 14.74) days length of stay) in partial hospital in comparison to those engaging in purely compulsive SIB (an average of 29.00 ± 17.30 days length of stay), [100% vs. 73%, respectively; $(\chi^2(1, N = 94) = 7.92, p = .04]$.

5.

DISCUSSION

This study examined associations between lifetime history of self-injurious behavior and personal and eating disorder characteristics, general personality and affective psychopathology, and short-term treatment outcomes in a large sample of inpatients with eating disorders. It also investigated differences between individuals who engage in current impulsive and compulsive SIB using the same dependent variables.

Two thirds of the patients (64%) reported a history of SIB, a rate that is greater than those previously reported in inpatients with eating disorders (45%; Claes et al., 2010) and in those with bipolar I disorder, borderline personality disorder, major depression, and healthy controls (38%, 26%, 16%, 2%, respectively; Joyce, Light, Rowe, Cloninger, Kennedy, 2010). A plausible explanation for our higher prevalence of SIB in comparison to other inpatient eating disorder samples is likely one of measurement. That is, Claes and colleagues assessed SIB over the last year, whereas the current study assessed lifetime rates and then queried further about current rates. Moreover, similar to previous studies on the topic of self-injury (Favaro & Santonastaso, 1998; 2000), this study included less deliberate self-injury behaviors (e.g., nail biting, skin picking), whereas Claes and colleagues examined only burning, cutting, scratching, and bruising. The lifetime SIB behaviors most commonly reported in the current sample were nail-biting and skin-picking although this may have contributed to an inflation of our findings, the same analyses excluding nail-biters resulted in comparable findings. Give that both cutting and bruising were engaged in by approximately 30% of patients, and nearly 20% of patients engaged in five or more self-injurious behaviors in their lifetime, our results

suggest that not only is self-injury in eating disorders common, but that it also has fairly stable correlates.

Our findings replicate previous research linking SIB to more severe eating disorder symptomatology (Muehlenkamp et al., 2011). SIB+ patients were more likely to have a purging diagnosis and reported a higher frequency of vomiting, drive for thinness, thin ideal internalization, and body dissatisfaction. Additionally, the SIB+ group was younger, had a lower age of onset of their eating disorder, and had a higher BMI at admission. The finding that patients with SIB+ had a higher BMI is consistent with the fact that there were more purging diagnoses in the SIB+ group, as purgers usually weigh more than restrictors. It is inconsistent, however, with the finding that patients are younger, as purging behaviors are often associated with an older age because patients tend to gravitate from purely restrictive behaviors to binge-purging behaviors over time (Eddy, Keel, Dorder, Delinsky, Franko, & Herzog, 2002). Perhaps the presence of self-injury elicits members of patients' support network (e.g., parents, medical professionals) to encourage and/or force patients to enter treatment sooner rather than later, or perhaps it is related to a higher level of functional impairment, prompting patients to seek treatment sooner. Given the findings that link SIB+ to purging, the lack of difference between patients with SIB+ and SIB- scores on the bulimia subscale of the EDI-2 is noteworthy. It is possible that this subscale either lacks validity or it is more focused on the binge-eating versus purging aspects of bulimia. Further exploration of the validity of the bulimia sub-scale should be explored using the EDI-3 version.

A probable explanation for the association between SIB and eating disorder severity and diagnosis is that there are similar personality dimensions underlying these

maladaptive thoughts and behaviors. Indeed, the current data support substantive personality differences between groups, with SIB+ patients presenting as significantly more prone to experience negative affective states (neurotic), more sensitive to both positive and negative emotions (more open), more antagonistic and difficult to get along with interpersonally (less agreeable), and typically less willful or able to control oneself (less conscientious) than SIB- patients (Costa & McCrae, 1992).

The temperamental differences between those who self-injure and those who do not also mirror previous findings that SIB+ eating disorder patients are more anxious, novelty-seeking and willing to please, and less cheerful, efficient, or ambitious (Claes et Vandereyken, & Vertommen, 2004; Ahren-Moonga, Holmgren, von Knorring, & Klinteberg, 2008). Interestingly, researchers have linked the unwillingness to experience (or inability to regulate) difficult thoughts or affective states to both SIB (see Klonsky, 2009 for a review) and eating pathology (Forman, Herbert, Moitra, Yeomans, & Geller, 2007; Merwin, Timko, Moscovich, Ingle, Bulik, & Zucker, 2011; Serpell, Treasure, Teasdale, & Sullivan, 1999; Tiggemann & Raven, 1998, Wildes, Ringham, & Marcus, 2010). In a sample of 89 adolescent psychiatric inpatients, almost 53% reported engaging in SIB to “stop bad feelings,” and approximately 31% claimed that they injured themselves to attenuate feelings of numbness or emptiness (Nock & Prinstein, 2004). Moreover, seventy percent of eating disorder inpatients experienced a short-term reduction of anxiety, tension, anger and emotional pain after harming themselves (Paul, Schroeter, Dahme, & Nutzinger, 2002). Given that the most espoused function of SIB is the removal or avoidance of distressing emotional experiences (Chapman, Gratz, & Brown, 2006; Gratz, 2003; Linehan, 1993) – also known as experiential avoidance (EA;

Hayes et al., 2004) – perhaps individuals prone to negative affect are also more likely to engage in behaviors, including SIB and purging, aimed at attenuating their distress.

Arguably, personality differences involving uncomfortable affective states may distinguish between eating disorder severity and diagnosis in patients who engage in self-injury and those who do not.

The finding that a history of SIB was associated with less confidence in one's ability to have a healthy body image (i.e., body image self-efficacy) is novel, and suggests that SIB+ may be associated with later recovery, as previous research has demonstrated the significant predictive utility of this variable in future behavior activation and change among eating disorders (Pinto, Guarda, Heinberg, DiClemente, 2006). We argue that this lack of confidence in recovery could be accounted for by the severity of eating disorder symptomatology within this sample, such that the more the eating disorder is interfering with an individual's life, the less she believes that she can become healthy. Moreover, it is reasonable to hypothesize that individuals engaged in a vast repertoire of maladaptive behaviors – say for instance, cutting, restricting, and vomiting – are more distressed, and thus less confident in their capacity to recover. Finally, given that the majority of SIB+ patients are purgers, it is possible that the ego-dystonic nature of the purging behavior is lowering self-efficacy scores. Perhaps the fact that we found a significant difference in recovery self-efficacy, but not inpatient or partial hospital outcomes, speaks to the importance of the construct in assessing later, rather than short-term, outcomes.

The non-significant findings for both hospital length of stay and rates of weight gain could be related to the restricted context of inpatient and partial hospital treatment.

Due to the fact that the heightened distress and illness severity typically associated with SIB in eating disorder patients is somewhat (possibly temporarily) attenuated in the treatment milieu, variables that may otherwise be affected (e.g., length of stay, weight gain rates) instead closely mirror those of SIB- patients. One way to account for weight gain rates, in particular, is that regardless of history of SIB in underweight patients, each patient is on similar weight gain protocol that has little room for patient compromise. In short, the treatment goals and trajectory of SIB+ and SIB- groups may be more similar due to the consistent and restricted context of inpatient and day hospital interventions. Such evidence begs the question as to whether or not recovery course post inpatient/day hospital stay is actually affected by a history of SIB. Indeed, six month follow-up analyses are needed between groups on both weight gain outcomes and cognitive and behavioral measures.

Another area that is limited in the eating disorder literature is *current* self-injurious behavior in inpatients. Our study examined current purely impulsive versus compulsive behaviors upon admission. While our findings reflect the proposed definition of compulsive and impulsive behavior (Favazza & Simeon, 1995) – with impulsive behavior being more episodic and occurring less frequently, and compulsive behavior occurring more frequently – there was no significant difference between groups on psychosocial and clinical or short-term treatment outcome variables. Due to the small sample size, this analysis was underpowered. Therefore, we must continue to speculate on the significance of type of SIB behavior; however, given that there is a distinct difference between individuals who engage in SIB and those who do not, one might posit

that the form or presentation of the behavior impacts clinical and psychological variables less than its functional nature.

APPENDICES

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Table 1

Modified Bonferroni Holm Procedure

SIB+ / SIB- Psychosocial and Clinical Variables			
Order	Adjusted alpha	<i>p</i> value	Dependent Variable
1	.007	.002	Inpatient Admission BMI
2	.008	.003	Age
3	.01	.003	Age of Onset (Eating Disorder)
4	.0125	.005	Restrictors vs. Purgers
5	.017	.01	Age of Onset (Alcohol Use)
6	.025	.14	Sex
7	.05	.23	Beck Depression Inventory (BDI)
Pure Impulsive SIB and Pure Compulsive SIB			
Order	Adjusted alpha	<i>p</i> value	Dependent Variable
1	.0125	.37	Weight Gain Rates (Day Hospital)
2	.0167	.41	Length of Stay (Inpatient)
3	.025	.60	Weight Gain Rates (Inpatient)
4	.05	.92	Length of Stay (Day Hospital)
SIB+ / SIB- Psychosocial and Clinical Variables			
Order	Adjusted alpha	<i>p</i> value	Dependent Variable
1	.007	.04	Restrictors vs. Purgers
2	.008	.15	Inpatient Admission BMI
3	.01	.26	Age
4	.0125	.34	Sex
5	.017	.55	Age of Onset (Alcohol Use)
6	.025	.56	Age of Onset (Eating Disorder)
7	.05	.62	Beck Depression Inventory (BDI)

Pure Impulsive SIB and Pure Compulsive SIB			
Order	Adjusted alpha	<i>p</i> value	Dependent Variable
1	.0125	.02	Length of Stay (Day Hospital)
2	.0167	.54	Weight Gain Rates (Inpatient)
3	.025	.78	Length of Stay (Inpatient)
4	.05	.84	Weight Gain Rates (Day Hospital)

Table 2

Comparisons of Current Pure Impulsive (SIB+) and Compulsive Non Self-Injurers (SIB-)

Outcome of Interest	Pure Impulsive SIB+	Pure Compulsive SIB+	t , F , or χ^2	df	p
Sex			0.93	95	0.33
Restrictors versus Purgers			4.21	94	0.04
Age	30.67(11.48)	26.95(10.37)	1.15	93	0.26
Age of Eating Disorder Onset	18.00 (4.31)	16.91(5.86)	0.59	88	0.56
Age of Alcohol Use Onset	14.78 (1.64)	15.46 (3.03)	-0.61	63	0.55
Inpatient Admission BMI	21.03 (4.72)	19.02 (4.22)	1.45	87	0.15
Beck Depression Inventory	26.56 (14.68)	24.17 (13.14)	0.50	75	0.62
Frequency of Vomiting	4.92 (2.07)	4.30 (2.63)	2.74	87	0.10
EDRSQ Normal Eating	1.63 (0.83)	2.29 (1.16)	3.32	91	0.07
EDRSQ Body Image	1.44 (0.49)	2.01 (1.02)	3.20	91	0.08
NEO-FFI Neuroticism	35.17 (5.36)	32.70 (8.03)	1.06	89	0.31
NEO-FFI Extraversion	27.83 (7.40)	24.00 (8.55)	2.16	89	0.15
NEO-FFI Openness	32.42 (5.26)	28.87 (7.07)	2.76	89	0.10
NEO-FFI Agreeableness	30.75(8.00)	30.82 (6.04)	0.001	89	0.97
NEO-FFI Conscientiousness	32.17 (6.81)	30.80 (8.69)	0.27	89	0.61
EDI-2 Drive for	13.80(6.47)	10.86(7.16)	0.65	95	0.42

Thinness					
EDI-2 Body	17.88(8.03)	13.20(8.58)	2.50	95	0.12
Dissatisfaction					
EDI-2 Bulimia	5.50 (4.81)	5.33 (5.71)	0.01	95	0.92
SATAQ-ED	24.09 (8.01)	25.23 (6.79)	0.52	85	0.47
Internalization					
SATAQ-ED Success	7.09 (1.70)	7.49 (1.89)	0.26	85	0.61
Length of Stay	15.91 (9.77)	17.96 (15.57)	0.08	89	0.78
(Inpatient)					
Length of Stay (Partial	40.00 (14.74)	29.00 (17.30)	5.72	72	0.02
Hospital)					
Rate of Weight Gain	3.75 (0.67)	3.93 (1.75)	-0.21	50	0.84
(Inpatient)					
Rate of Weight Gain	4.06 (0.67)	2.31 (5.64)	0.61	41	0.54
(Partial Hospital)					

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Lindsay M. Martin, M.A.

Curriculum Vitae

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 Owings Mills, MD 21117
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EDUCATION

Towson University , Towson, MD Master of Arts, Clinical Psychology GPA: 4.0	June 2009 – Spring 2010
University of Nevada , Reno, NV Bachelor of Arts – With High Distinction Major: Psychology; Minor: History Psychology GPA: 4.0	Fall 2004 – Spring 2008
Trinity University , San Antonio, TX GPA: 4.0	Fall 2003 – Spring 2004
Murray State College , Tishomingo, OK GPA: 4.0	Fall 2002 – Spring 2003 (during senior year HS)

PUBLICATIONS

Under review:

Martin, L. M., Plumb, J. C., & Timko, C. A. (in press). *Examining the relationship between interpersonal values, acceptance, and mindfulness and eating pathology.*

Timko, C. A., **Martin, L. M.**, & Darcy, C. (under review). *The impact of media on body image: The role of experiential avoidance and dieting.*

In preparation:

Martin, L. M., Coughlin, J. W., Guarda, A. G., Redgrave, G. W. (in preparation) Self-injurious behavior and eating disorders: Psychological correlates and short-term treatment outcomes.

Martin, L. M., Timko, C. A. (in preparation). *Validation of the Body Image Acceptance and Action Questionnaire (BIAAQ) with the Body Image Avoidance Questionnaire (BIAQ).*

Singer, T., **Martin, L. M.**, Chasson, G. C. (in preparation). *Is anorexia nervosa a subtype of BDD? Probably so...and read on.*

PROFESSIONAL PRESENTATIONS

Workshops:

- Timko, C. A., Merwin, R. M., Sandoz, E. K., Juarascio, A. S., **Martin, L. M.**, & Moskovich, A. (2011, April). *Acceptance and commitment therapy for eating disorders*. Workshop presented at the annual Academy for Eating Disorders Conference, Miami, FL.
- Merwin, R. M., Timko, C. A., Zucker, N., **Martin, L. M.**, & Moskovich, A. (2010, June). *ACT-based family intervention for adolescents with anorexia nervosa*. Workshop presented at the 8th annual ACT World Conference, Reno, NV.
- Wilson, K. G., Sandoz, E. K., Slater, R., & **Martin, L. M.** (May, 2008). *ACT case conceptualization (intermediate/advanced)*. Workshop presented at the ACT Summer Institute IV, Chicago, IL.
- Wilson, K. G., Sandoz, E. K., Slater, R., & Nasser, S. N. **Martin, L. M.** (August, 2008). *3 Day Combined Intro and Skill Building with Kelly Wilson*. Workshop presented in Memphis, TN.
- Papers:*
- Merwin, R. M., Timko, C. A., Zucker, N., **Martin, L. M.**, Honeycutt, L., Moscovich, A. (2010, November). *Innovative acceptance-based approaches to the assessment, conceptualization, and treatment of complex medical and mental health problems*. In M. Karekla & L. F. Brown (chairs), "Innovative acceptance-based approaches to the assessment, conceptualization, and treatment of complex medical and mental health problems. Paper to be presented at the 44th annual meeting of the Association for Behavioral and Cognitive Therapy, San Francisco, CA.
- Leitz-Ruzicka, A., Timko, C. A., **Martin, L. M.**, & Starling, C. (2010, November). *An investigation of the construct validity of three measures of restraint*. In C. A. Timko (chair), "Dietary restraint: Questions arising from 40 years of research." Paper presented at the annual meeting of the Association for Behavioral and Cognitive Therapy, San Francisco, CA.
- Sandoz, E. K., Kellum, K. K., Wilson, K. G., **Martin, L. M.** (2009, July). The effects of ACT for body image disturbance on eating behavior and valued living. In N. Lucas (Chair), *Investigations into Acceptance and Commitment Therapy and Real Life*. Paper presented at The Third World Conference on ACT, RFT, and Contextual Behavioral Science, Enschede, The Netherlands.
- Plumb, J. C., Hayes, S. C., Hildebrandt, M. J., & **Martin, L. M.** (2007, May). Values and valued action as key processes in clinical intervention. In J. C. Plumb (Chair), *Engaging in life: Values and valued action as catalysts for change*. Paper presented at the Annual Convention of the Association for Behavior Analysis, San Diego, CA.

Posters:

- Martin, L. M.**, Neal, A., Tiwari, R., Shuman, A., Eyring, C., Whiteman, K. C., Timko, C. A., Devan, B. (2010, May). *Validation of the Virtual Water Maze as a behavioral measure of cognitive flexibility*. Poster presented at the annual meeting of the Association for Behavior Analysis, San Antonio, TX.
- Plumb, J. C., **Martin, L. M.**, Hayes, S. C., Yadavaia, J., Hildebrandt, M. J. (2007, November). *Engaging in life: The relationship between valued living and depression*. Poster presented at the annual meeting of the Association of Behavioral and Cognitive Therapies, Philadelphia, PA.

RESEARCH EXPERIENCE

**Research
Coordinator**

NIMH Grant, Johns Hopkins Medical Institution, Baltimore, MD Nov. 2010 – Present
 "Olanzapine versus Placebo in Outpatients with Anorexia Nervosa"
 Principal Investigator for Hopkins: Angela Guarda, M. D.

- Duties: Conduct clinical assessments (SCID, EDE, YBOCS), Assist in recruitment via web, primary care providers, and flyers, phone screening and screening interview, assist patient to medical unit for testing and sampling, collect and mail patients' blood samples to NIMH, conduct research interviews throughout 24-weeks, data management, and data entry

Research Assistant Johns Hopkins Medical Institution, Baltimore, MD May 2010 – Present
 Eating Disorder Psychiatry Unit
 Supervisors: Angela Guarda, M. D.
 Janelle Coughlin, Ph. D.
 Graham Redgrave, Ph. D.

- *Longitudinal Examination of the Efficacy of Inpatient and Outpatient Eating Disorders Treatment*
 Duties: Conduct eating disorder SCID interviews on inpatient participants, Develop SCID eating disorder diagnoses by chart review, manage SPSS database, perform statistical analyses of data, organize and maintain clinical materials for the project, and contact patients (via email, snail mail, and phone) to collect their 6 month follow-up assessment
- *NIMH Grant: Bulimia Research Study Using PET Scans*
 Duties: Assist in recruitment (via web advertising and fliers), manage SPSS database, and conduct statistical analyses
- *Assessment of Cognitive Functioning in Anorexia Nervosa and Bulimia Nervosa*
 Duties: Assist in recruitment (via web advertising and fliers), manage SPSS database, and conduct statistical analyses with data

Data Manager NIMH Grant, Towson University, Towson, MD May 2009 – Present
 “Acceptance-based Separated Family Treatment for Adolescent Anorexia”
 Principal Investigator for Towson site: C. Alix Timko, Ph. D.

- Duties: Assist in writing and editing treatment manual, set up and manage databases, conduct adherence coding of ACT sessions, contact families to conduct qualitative interviews, write imputation and scoring syntax, and analyze data

Research Assistant Dept. of Psychology, Towson University, Towson, MD May 2010 – Present
 Site for OCD and Autism Research (SOAR)
 Supervisor: Greg S. Chasson, Ph. D.

Research Assistant Dept. of Psychology, Towson University, Towson, MD May 2009 – Present
 Disordered Eating and Body Image Laboratory
 Supervisor: C. Alix Timko, Ph. D.

- *Validation of the Virtual Water Maze as a Behavioral Measure of Cognitive Flexibility*
 Duties: Write and submit IRB, run participants, create and maintain database in SPSS, analyze data, and organize and maintain clinical materials for the project
- *Qualitative and Quantitative Investigation*
 Duties: Clean database, impute and score data

Research Assistant Dept. of Psychology, University of Nevada, Reno Spring 2005 – Spring 2008
 Supervisor: Steven C. Hayes, Ph. D.

- *Acceptance and Commitment Therapy and Cognitive Therapy for Depression*
Duties: Coordinate recruitment, create and maintain database in SPSS, analyze data, and organize and maintain clinical materials for the project
- *Assessment of Training in Acceptance and Commitment Therapy*
Duties: Participate in data collection from various ACT training workshops and maintain database for analysis
- *NIMH Grant: ACT with Obsessive Compulsive Disorder*
Duties: Conduct adherence coding for Progressive-Relaxation Training (PRT) condition – Supervised by Holly Hazlett-Stevens, Ph. D., and help maintain database in SPSS

Research Assistant Dept. of Psychology, University of Nevada, Reno Fall 2006 – Spring 2008
Supervisor: Victoria M. Follette, Ph. D.

- *ACT Workshop for Women with Disordered Eating*
Duties: Assist in recruitment, data collection, and scheduling of assessments, administer informed consent, help organize workshop
- *Women's Life Experiences and Body Image Concerns*
Duties: Assist in recruitment of Time 1 participants and data collection, administer informed consent, maintain SPSS database, schedule appointments for Time 2 participants

Research Assistant Dept. of History, University of Nevada, Reno Fall 2006 – Spring 2008
Supervisor: Richard O. Davies, Ph. D.

- Compile research for:
Davies, R. O. (2010) Front Matter, in Rivals! The Ten Greatest American Sports Rivalries of the 20th Century, Wiley-Blackwell, Oxford, UK.
doi: 10.1002/9781444320800.fmatter.
- Compile research for:
Davies, R. O., & Abram, R. (2001). Betting on the line: sports wagering in American life. Columbus, Ohio; United States: Ohio State University Press.

CLINICAL EXPERIENCE

Resident Johns Hopkins Eating Disorder Program Nov. 2010 – Present
Staff Assistant Supervisor: Angela Guarda, M.D.
Graham Redgrave, M.D.
Janelle Coughlin, Ph.D.

- Duties: Manage day-hospital patients on night shift (5pm-8am), provide support in meal preparation and eating, conduct behavioral observations, counsel patients, write clinical reports on each patient, prepare for emergencies (i.e. incidents of self-harm or overdose) manage locked cabinets before and after mealtime, accompany patients back to eating disorder unit, report concerns to doctors and nursing staff

WORK EXPERIENCE

Center for Advanced Learning (Behavioral Learning Center) Jan. 2008 – May 2008
Administrative Assistant
Supervisors: Kimberley Berens, Ph. D.
Nick Berens, Ph. D.

AWARDS and HONORS

Dean's Fellowship Award

- Drexel University

Fall 2011 – Fall 2013

Outstanding Graduate Student Award - Clinical Psychology Master's Program

Spring 2011

- Towson University

Phi Kappa Phi Honor Society

- University of Nevada, Reno Chapter

Alpha Gamma Delta Honor Society

- Trinity University Chapter

President's Honor Roll

- University of Nevada, Reno
- Trinity University

Fall 2004 – Fall 2008

Fall 2004 – Spring 2004

Dean's List

- University of Nevada, Reno
- Trinity University

Fall 2004 – Fall 2007

Fall 2003 – Spring 2004

Valedictorian

- Ardmore High School

Spring 2003

VOLUNTEER and LEADERSHIP ACTIVITIES

Center for Hope of the Sierras—Inpatient Eating Disorder Facility

Fall 2006 – Fall 2008

Reno, NV

- Counsel current and past residents

Fellowship of Christian Athletes

2001 – 2003

Ardmore, OK

- President of Organization—planned meetings, mentored students

First Presbyterian Church, USA

2001 – 2003

Ardmore, OK

- Ordained as a Youth Deacon
- Serve on Deacon Committee
- Coordinate Sound System

PROFESSIONAL MEMBERSHIPS

Association for Behavioral and Cognitive Therapy

Association for Contextual Behavioral Science

Association for Behavioral Analysis International

American Psychological Association

Academy of Eating Disorders