

The Link Between Dissociation, Eating Disorders, and Self-Harm

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A Senior Thesis submitted in partial fulfillment  
of the requirements for graduation  
in the Honors Program  
Liberty University  
Spring 2014

Acceptance of Senior Honors Thesis

This Senior Honors Thesis is accepted in partial fulfillment of the requirements for graduation from the Honors Program of Liberty University.

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### Abstract

Many researchers and psychological professionals believe that there is a link between eating disorders and self-harm, though this has been less widely researched than other correlations such as that between eating disorders and substance abuse. Various studies have also indicated a relationship between these two variables and dissociation independently; however, there does not seem to be a comprehensive study covering the correlations between all three variables. The researcher for this study aimed to test the correlation between eating disorders and self-harm and collect new information on the link between all three to further the available data on this topic. Data were also collected and analyzed in order to determine if certain eating disorders are more highly associated with self-harm and dissociation. A correlation was found between all three variables, and anorexia and bulimia were more closely associated with self-harm than binge eating or healthy eating. The data also indicated that those with anorexia and bulimia were more likely to have dissociative experiences than those without eating disorders. It is hoped that the correlation found between dissociative experiences and eating disorders and self-injury will serve as an impetus for future experimental research to determine if this link is causal or merely correlational.

### **Dissociation, Eating Disorders, and Self-Harm**

There are various types of harmful behavior disorders, including eating disorders and self-harm disorders. Within these two conditions are multiple variations as well. According to the newly updated Diagnostic and Statistical Manual of Mental Disorders (DSM-5), an eating disorder can fall into four main categories: anorexia nervosa, bulimia nervosa, binge eating, and eating disorder not otherwise specified (EDNOS) (American Psychiatric Association, 2013). Non-suicidal self-injury (NSSI) is not listed as a disorder in and of itself in the DSM-V and is therefore not broken down into further categories (American Psychiatric Association, 2013). However, NSSI presents itself in various ways including injuries to the skin (i.e. cutting, burning), injuries to deeper tissues (i.e. hitting oneself or intentional bashing into objects, interfering with the normal healing process), trichotillomania (pulling out one's hair), and overdosing without suicidal intent (Whitlock, 2010).

Though all eating disorders fall under the same main heading, great variation in the symptoms and underlying reasons for such behaviors may exist. Anorexia nervosa consists of excessive weight loss resulting from self-starvation and usually develops in early to middle adolescence (Kaye, Klump, Frank, & Strober, 2000). Body dysmorphia, a person's inaccurate perception of their physical self, often accompanies this condition (Santrock, 2012). Though those diagnosed with anorexia must weigh less than 85 percent of what is considered normal for their age and gender, they may still view themselves as being overweight and have an overwhelming fear of weight gain. Amenorrhea, defined in the DSM as missing at least 3 menstrual cycles in a row, is also often an adjunct to the disorder (American Psychiatric Association, 2000). Behaviorally, those with anorexia

appear anxious and obsess over weight, food content (i.e. fat or caloric quantity), and exercise. Their obsessions became so overpowering that the victims begin withdrawing from other areas of their lives, especially hobbies and social interaction with others, including friends (Kaye et al., 2000).

Bulimia nervosa is an eating disorder characterized by a binge-purge cycle that generally presents in late adolescence to early adulthood. Unlike those with anorexia, people with bulimia are generally able to maintain a healthy body weight, though there is often great fluctuation in weight by day or week (Kaye et al., 2000). Though the mechanisms differ, the preoccupation with food and weight are shared between bulimia and anorexia. Victims of bulimia, however, tend to have more difficulties with impulse control, shame, and guilt (Thompson-Brenner et al., 2008). Many are unable to respond to their emotions in a healthy manner and turn to food for comfort. Like those with binge eating disorder (BED), people with bulimia will consume large quantities of food during a “binge” (Hartman, 2010). While the amount varies per person and depends more on the person’s perception of the event rather than the actual quantity, a typical binge ranges from 1,500 to 3,000 calories (Rosen, Leitenberg, Fisher, & Khazam, 2006). Some binges are greater than this, with reports of greater than 60,000 calories, while others do not medically qualify as a binge (i.e. one cookie); however, as stated earlier, if the person with bulimia views it as such and it results in purging behavior, it qualifies as a binge (Rosen et al., 2006). The next phase of the cycle is the purge. After bingeing, there is a considerable amount of emotional discomfort in addition to the physical distress caused by the binge. Many people report feelings of disgust and guilt. In order to counteract these feelings and avoid drastic weight gain, those with bulimia force themselves to

vomit or take laxatives and diuretics (Hay & Claudino, 2010). The hope is that these measures will reduce the amount of digestion of all the food consumed. Many patients admit to vomiting five to ten or more times per day, and some use up to 50 laxative pills per day (Mehler, 2003). Other purging behaviors include excessive exercise or fasting following a binge (Kaye et al., 2000). In order to be diagnosed with bulimia nervosa, this binge-purge cycle must take place at least two times per week for three months (Wilson & Sysko, 2009).

The final maladaptive behavioral pattern that will be addressed is non-suicidal self-injury. It is estimated that over 20 percent of adolescents in the U.S. engage in self-injurious behaviors at some time (Wilkinson, 2013). The behaviors themselves are similar to those associated with suicidal ideation, but the underlying thoughts differ between the two. Like eating disorder demographics, self-harm is more prevalent in females than males, though the difference is less drastic than that seen in disordered eating. This difference in prevalence may be due to females' higher likelihood to internalize rather than externalize conflict. Cutting is the most common form of self-injurious behavior, though many other forms are also employed, often together (Wilkinson, 2013). These other forms include alternative ways to cause bleeding (i.e. scratching, pinching, ripping, or tearing skin), inflicting bruises by hitting objects, carving words into skin, burning, pulling out hair, or overdosing. Patients seen with NSSI offer a varied host of reasons behind their behavior. One of the most common explanations is that the physical pain inflicted by self-harm is able to distract the user from emotional pain. As an adolescent, the person has yet to develop a healthy way in which to deal with strong emotions and instead turns to self-injury to simply distract.

Another explanation commonly heard is that the physical pain is a way to counteract the emotional numbness felt by the user. The patients report a sense of emptiness and distance from themselves and find that physical pain can bring them back to feeling. Still other reasons exist including punishing oneself to escape guilt, trying to make others feel guilty for their actions, drawing attention to their emotional pain to receive help, or even trying to fit in with their peer group. Adolescents who self-injure often want help to stop these behaviors but find it difficult to ask (Wilkinson, 2013).

Research has indicated a strong correlation between eating disorders and self-harm, though not much has been done to investigate the link between self-harm and specific eating disorders. This study aimed to highlight any similarities or differences between the correlation of self-harm and anorexia nervosa and that of self-harm and bulimia nervosa. It is believed that these two behavioral disorders (eating disorders and NSSI) are highly linked due to similar underlying conditions such as insecurity, shame, and an inability to deal with emotions in a healthy manner. Further, both appear to be more common in adolescents prone to dissociating in stressful situations, which can often be seen after a traumatic incident.

Dissociation is defined in the DSM-IV-R as an interruption in consciousness, identity, environmental awareness, or memory which is normally well integrated in a healthy person (American Psychiatric Association, 2000). Other definitions, like that presented by Pierre Janet in 1889, define dissociation more broadly as the mental mechanism an individual uses after undergoing a serious trauma, indicating its use as a defense mechanism in response to grief (Grave, Rigamonti, Todisco, & Oliosi, 1996).

Dissociative tendencies and states are positively correlated with non-suicidal self-injury (NSSI) and are a risk factor for its development (Gratz, Conrad, & Roemer, 2002). In fact, a recent study found a statistically significant correlation ( $r_s = .36-.44$ ) between the two (Rallis, Deming, Glenn, & Nock, 2012). Patients commonly share that their behaviors have stemmed from feelings of “dissociation” or “emptiness,” and that they engage in NSSI as a way to feel again (Rallis et al., 2012). Many studies have found that a large portion of adolescents engaging in self-injurious behaviors have been abused during childhood. Other studies found evidence of a connection between abuse during childhood and dissociative tendencies (Yates, Carlson, & Egeland, 2008). It is hypothesized that early abusive experiences “may preclude one from opportunities to learn how to effectively understand, integrate, and use emotional information” (Rallis et al., 2012). With a lack of ability to handle emotions in a healthy manner, children may learn to dissociate in order to cope with the abuse. Altogether, it seems that dissociation is the link between child abuse and the development of NSSI, especially in cases where NSSI is used a tool to regulate emotions and create a sense of affective generativity (Rallis et al., 2012).

In the past two decades with the surge in eating disorder awareness, researchers have focused more attention on these issues and have found that those with past traumatic experiences are more likely to develop eating disorders (Vanderlinden & Vandereycken, 1997). As discussed above, when children are abused, they are much more likely to experience dissociative symptoms. Like those engaging in NSSI, people with eating disorders experience dissociative episodes more often than those without eating disorders (Grave et al., 1996). More specifically, dissociation seems to play an especially large role



in patients with bulimia nervosa, possibly due to the bingeing aspect of the condition (Grave et al., 1996). Many patients admit to feeling separate from their bodies (i.e. dissociating) during episodes of bingeing (La Mela, Maglietta, Castellini, Amoroso, & Lucarelli, 2010).

Overall, the objective of this study was to test whether there were statistically significant correlations between dissociative tendencies, intentional self-injury, and eating disorders. The researcher also hoped to obtain results indicating whether or not certain eating disorders were more closely related to self-harm and/or dissociative experiences. The two eating disorders that were focused on are anorexia nervosa and bulimia nervosa, with emphasis also placed on the binge-eating component of bulimia.

### **Research Questions**

1. Is there a correlation between dissociation, self-harm, and eating disorders?
  - a. Is there a link between eating disorders and self-harm?
  - b. Are certain eating disorders more closely associated with higher rates of self-harm?
  - c. Is there a link between dissociative tendencies and eating disorders?
  - d. Is a proclivity toward dissociating more closely associated with certain eating disorders?
  - e. Is there a link between dissociative experiences and self-harm?

### **Hypotheses**

H1: There is a correlation between dissociation, self-harm, and eating disorders.

H2: A correlation exists between eating disorders (measured by EAT-26) and self-harm.

H3: Anorexia nervosa is the eating disorder most closely associated with self-harm.

H4: Those with dissociative tendencies are more likely to develop an eating disorder.

H5: Bulimia nervosa is the eating disorder most highly correlated with dissociative behavior patterns.

H6: Those who are more likely to dissociate under stressful conditions are also more likely to develop self-harm disorders.

## **Method**

### **Participants**

Participants in this research study were undergraduate college students attending Liberty University, the majority of whom ranged in age from approximately 18 to 23, though some members were older. Age was only an exclusionary factor in that participants had to be at least 18 years of age so as to avoid the need for parental or guardian consent. Four people under the age of 18 attempted to take the survey, but did not proceed past the demographic questions due to their minor status. The results of these four people made up four of the eighteen sets of results that were not analyzed. People of all ages (less the aforementioned exception), genders, ethnic backgrounds, and health statuses were invited to participate. The only inclusion criteria were that participants had to be undergraduate students of Liberty University and be at least 18 years of age. This population was targeted mainly due to availability of resources. There were both male and female participants, though females outnumbered males 236 to 45. More seniors participated in the study than any other group with 91 subjects. The number of freshman, sophomore, and junior subjects ranged from 60-65 for each class. It is assumed that all participants were currently residing in or near Lynchburg, Virginia, though many most likely had an alternate permanent residence. It is also assumed that the majority of these

students were enrolled in at least one psychology class, as they would receive one psychology activity credit in any undergraduate psychology classes for their participation. Participants were notified of the opportunity by way of the Liberty University Psychology Department Psychology Activities webpage and accessed the survey online at a time and location of their choice and convenience.

### **Measures**

**Eating disorders.** The following two screening and diagnostic scales are related to the construct of eating disorders. They aim to detect tendencies toward disordered eating behavior and have the ability to differentiate between the behaviors or various eating disorders. Both of these scales are scored similarly. They require that certain numbers be associated with each item (some items were reverse-coded). The scaled scores are then added together for total scores.

*Eating Attitudes Test (EAT-26).* This scale is widely used by practitioners and treatment program professionals and admissions personnel. It is a self-report measure dealing with disordered eating habits. The original Eating Attitudes Test (EAT-40), published in 1979, was used to investigate various environmental factors affecting the development of eating disorders. After a factor analysis, the original version was shortened to its current form, which contains 26 questions. The EAT-26 was created to be administered by either professionals or laypeople with interest in the field. Because of this, it is highly available for use by all (EAT-26 self test, 2013). The EAT-26 is intended to be a screening rather than diagnostic measure, and a score above 20 is considered indicative of disordered eating behaviors or ideas. It is recommended that those scoring above 20 be referred to a physician for further testing and treatment (Garner, Olmsted,

Bohr, & Garfinkel, 1982). Studies have been performed both by the test designers as well as other researchers, and all have found similar results regarding high reliability and validity of this measure. First, according to at the  $p=0.0001$  level, there was a statistically significant correlation between the EAT-40 and each of the three factors of the EAT-26 as well as the total EAT-26 score. Further, the three factors were all significantly correlated with the total score, denoting internal validity. Last, external validity of the EAT-26 is also high as it is correlated with other disordered eating patterns measures, such as the Eating Inventory, an indication of concurrent validity ( $p=0.0001$ ) (Berland, Thompson, & Linton, 1986). The EAT-26 is a copyrighted measure; however, permission has been obtained to use it and all fees and royalties have been waived for the researcher (Garner et al., 1982).

*Eating Disorders Questionnaire (EDQ)*. This self-report measure consists of 22 items. Its results indicate the participant's tendencies toward eating disorders. Unlike the EAT-26 and many other eating disorder measures, this scale has the ability to indicate proclivity toward certain eating disorders, especially anorexia nervosa and bulimia nervosa. This questionnaire inquires about possible behaviors and feelings commonly experienced by those with an eating disorder. There are four options available for each question based on the frequency of which the person experiences the behavior or thought, ranging from almost always or often to never. There are also five true or false questions. Each answer is correlated with a number, and the score is found by adding all the numbers associated with each chosen answer. A score of 38 or less is indicative of anorexia-like symptoms. Those with bulimic tendencies tend to score between 39 and 50. A score within the 50-60 range may point to disordered eating, and is more associated

with binge eating. Those who score above 60 are highly unlikely to become involved in disordered eating habits, though these people would be more likely to partake in compulsive or binge eating than anorexic or bulimic behaviors (Monmouth Psychological Associates, 2013). The creator of the test, Lampson, has granted the researcher permission to use the questionnaire for this study (D. M. Garner, personal communication, October 20, 2013).

**Non-suicidal self-injury.** The following measure relates to NSSI and indicates whether the participant shares cognitions commonly associated with self-injury. It also asks direct questions regarding the amount of harm (if any) the participant has inflicted on him or herself.

***Self Abuse Finally Ends (S.A.F.E.) Alternatives.*** This 44-item scale is a measure of self-harm, which the DSM-V refers to as non-suicidal self-injury (NSSI). It is another self-report measure. It is used often in clinical settings, though it is not employed as a diagnostic measure as it was created in response to professional clinical experience rather than experimental research. The researcher was granted permission to use this measure (P. Leimberer, personal communication, October 30, 2013). This test is scored by counting the number of times a participant selected “true” rather than “false” on each question. The more a participant chose the "true" answer choice, the more likely it was that their early experiences, views, and behaviors matched those of someone with a self-harm disorder. A high number of “true” selections on questions 1-14 indicate that the participant likely experienced many of the same type of past experiences commonly experienced by those who develop a self-harm disorder. Answers of “true” on questions 15-23 signify similarities in the thoughts and beliefs of the participants and someone with

the disorder. Questions 24-31 are linked to self-harm behaviors. Finally, questions 32-44 ask participants about their involvement in certain harmful habits and their disclosure on whether they believe they have an issue with self-harm. The scores for this measure are broken up into these three categories (experiences, views, and behaviors) to provide more detail for the analysis.

**Dissociation.** This last measure indicates the participant's likelihood of dissociating, especially after a traumatic event.

*Dissociative Experiences Scale-II (DES-II).* This copyright-free scale, produced by Carlson and Putnam is used as a screening measure for dissociative tendencies. According to its authors, this measure was made to offer a convenient but still valid and reliable means of quantifying dissociative tendencies (Carlson & Putnam, 1993). There are 28 items on this scale, each with answer choices ranging from zero percent to 100 percent. This range allows the test to offer more in-depth results than a dichotomous scale. To score the test, the researcher drops the zero off the percent answer on each item and then simply adds the answer scores together. The average score for adults is 5.4. Average scores for those with certain disorders are listed as well, with eating disorders at 15.8 and dissociative disorders at 36 and above. (Carlson & Putnam, 1993).

### **Procedure**

A survey containing various measures regarding proclivity toward various eating disorders and non-suicidal self-injury was submitted to the Institutional Review Board at the researcher's university. After institutional approval, the researcher programmed the survey into the Qualtrics program. Once approved by Qualtrics committee members, the survey became available online. Finally, the head of the psychology department approved

the survey to qualify as a psychology activity. At that time, a link to the survey was posted on the Psychology Department Psychology Activities webpage. Some staff members in the psychology department also alerted their students about the opportunity and may have sent out an email with a link to the online survey as well.

University students were able to access and complete the online survey. It is believed that those enrolled in at least one psychology class made up a majority of the participants as they were given the incentive of class credit, but no data was collected on this to further ensure participant privacy and anonymity. Before beginning the survey, participants read and agreed to an online consent form that outlined the potential risks and benefits of the study as well as the general purpose of the study and what would be expected of participants. No deception was employed. This study qualified for a Waiver of Consent as a signature on the consent form would be the only way for the researcher to identify participants, so participants did not sign the consent form. However, they had to choose “Agree” after reading the form to indicate their consent and continue past this page.

Access to the survey was available for approximately a month. The researcher then requested access to the anonymous results. Results were available for 299 participants; however, 18 of these subjects did not complete the survey. The missing data for these 18 people made it impossible to analyze their responses and overall correlations, so all data for these 18 people were left out of the analysis. Therefore, a total of 281 participants were given an identification number. As the data were anonymous, these numbers were unable to link scores to any identifiable individual. Participant numbers were assigned based on the order in which results were received.

Testing for statistically significant correlations was then performed using the Statistical Package for the Social Sciences (SPSS). Summary scores for each scale and subscales were calculated as per scale instructions using Microsoft Excel. Then, multiple tests were performed in order to investigate whether any correlations between the variables existed.

### Results

According to the responses given by participants on the Eating Disorders Questionnaire, 28 participants displayed anorexic tendencies, 51 had bulimic inclinations, 84 exhibited a propensity for binge eating, and the remaining 118 appeared healthy. More participants scored in the unhealthy ranges than in the healthy range, which was not expected. This is addressed in the discussion. As far as an inclination to dissociate, 91 respondents received healthy scores while the other 190 scored in categories of people who are more likely to dissociate. Twenty-nine of these participants scored in a range indicative of a dissociative disorder, and 76 received scores associated with dissociative identity disorder. Again, it was not expected that many participants would score so high on this scale. More information on this can also be found in the discussion. The S.A.F.E. Alternatives measure of self-harm does not have a cut-off score that would indicate the need for a self-harm diagnosis. Rather, higher scores are more highly associated with self-inflicted harm, whereas lower scores show no correlation with the disorder.

*Table 1.* Summary table of eating disorders scores.

	<b>Anorexia</b>	<b>Bulimia</b>	<b>Binge-Eating</b>	<b>Healthy</b>
<b>Number of participants</b>	28	51	84	118



*Table 2.* Summary table of dissociation scores. In this table, DD stands for dissociative disorder, and DID means dissociate identity disorder.

	<b>Healthy</b>	<b>Likely to Dissociate</b>		
<b>Number of participants</b>	91	Likely	DD	DID
		85	29	76
<b>Totals</b>	<b>91</b>	<b>190</b>		

Exploratory statistics and histograms were calculated and created for all four measures. The data collected took the same shape (skewed in the negative direction) for all four measures. The skew was not overly large, however, and the statistical tests used are robust enough to counteract the non-normal effects observed (Larson, 2008).

Descriptive statistics for all four measures are shown below.

*Table 3.* Descriptive statistics for the four scales used in this study—Eating Attitudes Test (EAT-26), Dissociative Experiences Scale (DES-II), S.A.F.E. Alternatives (a measure of self-harm), and Eating Disorder Questionnaire (EDQ).

	<b>Mean</b>	<b>Std. Deviation</b>	<b>Possible Range</b>	<b>Observed Range</b>
<b>EAT-26</b>	10.76	11.221	0-78	0-66
<b>DES-II</b>	35.88	31.682	0-280	0-178
<b>S.A.F.E. Alternatives</b>	12.76	8.386	0-53	0-40
<b>EDQ</b>	55.06	11.169	0-80	7-69

Next, a Pearson Correlation was conducted to determine if any significant correlations exist between the three variables. For the purposes of this study, the EAT-26 was the measure used to determine a participant's likelihood of having an eating disorder, just as the DES-II and S.A.F.E. Alternatives measures were used to predict the probability of the participant having a dissociative or self-harm disorder, respectively.

The Eating Disorder Questionnaire was used solely to note which type of eating disorder, if any, a participant was likely to have at the time the survey was taken. Therefore, the Pearson Correlation took into account only the results as measured by the EAT-26, DES-II, and S.A.F.E. Alternatives.

*Table 4.* Chart depicting the Pearson Correlation values and the significance of the correlations between each participant's total scores on the EAT-26, DES-II, and S.A.F.E. Alternatives.

		<b>Correlations</b>		
		EAT-26	DES-II	S.A.F.E. Alternatives
EAT-26	Pearson Correlation	1	.277**	.435**
	Sig. (2-tailed)		.000	.000
	N	281	281	281
DES-II	Pearson Correlation	.277**	1	.462**
	Sig. (2-tailed)	.000		.000
	N	281	281	281
S.A.F.E. Alternatives	Pearson Correlation	.435**	.462**	1
	Sig. (2-tailed)	.000	.000	
	N	281	281	281

\*\*Correlation is significant at the 0.01 level (2-tailed).

All correlations calculated were significant at the  $p < 0.001$  level. With  $r$  values of 0.462 and 0.435, self-harm and dissociation as well as self-harm and eating disorders, respectively, have a strong positive relationship. This indicates that high self-harm scores are associated with high disordered eating scores and high dissociation scores. The relationship between dissociation and eating disorders is small but still positive, with an  $r$ -value of 0.277, indicating that high dissociation scores are linked with high eating disorders scores, but not as strongly linked as the aforementioned correlations.

In order to determine if certain eating disorders were more closely related to self-harm, a one-way anova was employed. First, based on his or her total score on the EDQ, each participant was labeled with a number 1-4, with 1 representing anorexia, 2 bulimia, 3 binge eating, and 4 healthy eating. These four categories made up the grouping variable of eating habits and possible eating disorder type. Self-harm scores were inputted as the test values. Results indicated a large effect, with the effect size calculated to be 0.190 (Grissom, & Kim, 2005). This means that 19.0 percent of the change in the dependent variable (S.A.F.E. Alternative results) is due to the independent variable (Eating Disorder Questionnaire results) (see Table 6).

*Table 5.* Chart showing the means and standard deviations of S.A.F.E. Alternatives scores for individuals in each of the four groups as determined by the EDQ.

#### **Descriptive Statistics**

<u>Dependent Variable: S.A.F.E. Alternatives Scores</u>		
EDQ results	Mean	Std. Deviation
Anorexia	<b>19.96</b>	<b>10.844</b>
Bulimia	<b>16.49</b>	<b>8.312</b>
Binge Eating	<b>13.19</b>	<b>6.892</b>
Healthy	<b>9.13</b>	<b>6.782</b>
Total	<b>12.76</b>	<b>8.386</b>

*Table 6.* Chart showing one-way anova results for self-harm scores grouped by eating disorder type. The row showing the significance of these results is highlighted in red.

**Tests of Between-Subjects Effects**

Dependent Variable: S.A.F.E. Alternatives Scores

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	<b>3735.789<sup>a</sup></b>	<b>3</b>	<b>1245.263</b>	<b>21.621</b>	<b>.000</b>	<b>.190</b>
Intercept	<b>45628.666</b>	<b>1</b>	<b>45628.666</b>	<b>792.236</b>	<b>.000</b>	<b>.741</b>
<b>EDQ results</b>	<b>3735.789</b>	<b>3</b>	<b>1245.263</b>	<b>21.621</b>	<b>.000</b>	<b>.190</b>
Error	<b>15953.755</b>	<b>277</b>	<b>57.595</b>			
Total	<b>65427.000</b>	<b>281</b>				
Corrected Total	<b>19689.544</b>	<b>280</b>				

a. R Squared = .190 (Adjusted R Squared = .181)

The significance value of  $p < 0.001$  expresses that the mean S.A.F.E. alternatives scores of at least one of the four grouping variables must be significantly different from the means of other groups. Therefore, for this sample of Liberty University students, the type of eating disorder or lack of eating disorder each participant was most likely to have based on their EDQ scores had a significant effect on their self-harm scores. Because of this, a post hoc analysis was run. The Tukey post hoc was chosen so as to not inflate any potential results as the Tukey is a more conservative test.

Table 7. Chart showing the Tukey post hoc analysis of the one-way anova of scores from the S.A.F.E. Alternatives and EDQ measures. Significance values are highlighted.

### Multiple Comparisons

Dependent Variable: S.A.F.E. Alternatives Scores

Tukey HSD

(I) EDQ results	(J) EDQ results	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
	Bulimia	3.47	1.785	.211	-1.14	8.09
Anorexia	Binge Eating	6.77 <sup>*</sup>	1.656	.000	2.49	11.05
	Healthy	10.84 <sup>*</sup>	1.595	.000	6.71	14.96
	Anorexia	-3.47	1.785	.211	-8.09	1.14
Bulimia	Binge Eating	3.30	1.347	.070	-.18	6.78
	Healthy	7.36 <sup>*</sup>	1.272	.000	4.08	10.65
	Anorexia	-6.77 <sup>*</sup>	1.656	.000	-11.05	-2.49
Binge Eating	Bulimia	-3.30	1.347	.070	-6.78	.18
	Healthy	4.06 <sup>*</sup>	1.083	.001	1.26	6.86
	Anorexia	-10.84 <sup>*</sup>	1.595	.000	-14.96	-6.71
Healthy	Bulimia	-7.36 <sup>*</sup>	1.272	.000	-10.65	-4.08
	Binge Eating	-4.06 <sup>*</sup>	1.083	.001	-6.86	-1.26

Based on observed means.

The error term is Mean Square(Error) = 57.595.

\*The mean difference is significant at the .05 level.

The significance values indicate that S.A.F.E. Alternatives scores are significantly different for those in the anorexia group than those in the binge-eating ( $p < 0.001$ ) or healthy ( $p < 0.001$ ) groups. Scores do not significantly differ, however, between anorexia and bulimia groups ( $p = 0.211$ ). Looking back at the means in Figure 3, it can be seen that self-harm mean scores were highest in the anorexia and bulimia groups and lowest in the healthy group. This mean difference means that individuals with anorexia had higher levels of self-harm than those who were identified as binge eaters or healthy eaters. Mean scores were higher for those with anorexia than bulimia as well, but the difference was

not significant, so it cannot be said with confidence that those with anorexia have higher levels of self-harm than those with bulimia. The only significant difference in self-harm mean scores for those with bulimia was found between this group and the healthy group ( $p < 0.001$ ). Statistically then, those with bulimia are just as likely to have high self-harm levels as those with other types of eating disorders, but more likely than those without an eating disorder. People who scored high for binge-eating behaviors appear to be less likely to harm themselves than those in the anorexia group ( $p < 0.001$ ) and more likely to self-harm than those in the healthy category ( $p = 0.001$ ), but not any more or less likely than those in the bulimia set. Following these conclusions, it can be noted that those who scored as healthy also had the lowest scores on the S.A.F.E. Alternatives measure and were statistically significantly less likely to have high self-harm behavior levels than those with any type of eating disorder ( $p \leq 0.001$ ).

Similar testing was performed to determine if dissociative tendencies were more closely associated with any specific disordered eating habits. The effect size between these groups was smaller than what was observed between self-harm and eating disorders, calculated to be 0.091. This is considered a medium effect and means that 9.1 percent of the change in dependent variable (Dissociative Experiences Scale results) can be accounted for by the independent variable (Eating Disorders Questionnaire results) (Grissom, & Kim, 2005).

*Table 8.* Chart showing the means and standard deviations of DES-II scores for individuals in each of the four groups determined by the EDQ.

<b>Descriptive Statistics</b>			
Dependent Variable: DES-II			
EDQ results	Mean	Std. Deviation	N
Anorexia	<b>54.25</b>	<b>38.068</b>	<b>28</b>
Bulimia	<b>46.64</b>	<b>35.766</b>	<b>51</b>
Binge Eating	<b>36.29</b>	<b>31.022</b>	<b>84</b>
Healthy	<b>26.58</b>	<b>24.897</b>	<b>118</b>
Total	<b>35.88</b>	<b>31.682</b>	<b>281</b>

*Table 9.* Chart of one-way anova results for dissociation scores grouped by eating disorder type. The row showing the significance of these results is highlighted in red.

<b>Tests of Between-Subjects Effects</b>						
Dependent Variable: DES-II						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	<b>25567.391<sup>a</sup></b>	<b>3</b>	<b>8522.464</b>	<b>9.240</b>	<b>.000</b>	<b>.091</b>
Intercept	<b>354250.579</b>	<b>1</b>	<b>354250.579</b>	<b>384.080</b>	<b>.000</b>	<b>.581</b>
EDQ results	<b>25567.391</b>	<b>3</b>	<b>8522.464</b>	<b>9.240</b>	<b>.000</b>	<b>.091</b>
Error	<b>255486.939</b>	<b>277</b>	<b>922.336</b>			
Total	<b>642829.500</b>	<b>281</b>				
Corrected Total	<b>281054.330</b>	<b>280</b>				

a. R Squared = .091 (Adjusted R Squared = .081)

Looking at this output, it can be gathered that the mean DES-II scores of at least one group were different from the mean scores in other groups because the univariate result is significant ( $p < 0.001$ ). Therefore, a post hoc analysis was run. Again, a Tukey HSD post hoc test was used.

*Table 10.* Chart showing the Tukey post hoc analysis of the one-way anova evaluating scores from the S.A.F.E. Alternatives and EDQ measures. Significance values are highlighted.

### Multiple Comparisons

Dependent Variable: DES-II

Tukey HSD

(I) EDQ results	(J) EDQ results	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
	Bulimia	7.61	7.143	.711	-10.85	26.08
Anorexia	Binge Eating	17.96*	6.627	.036	.83	35.09
	Healthy	27.67*	6.384	.000	11.17	44.17
	Anorexia	-7.61	7.143	.711	-26.08	10.85
Bulimia	Binge Eating	10.34	5.391	.223	-3.59	24.28
	Healthy	20.05*	5.089	.001	6.90	33.21
	Anorexia	-17.96*	6.627	.036	-35.09	-.83
Binge Eating	Bulimia	-10.34	5.391	.223	-24.28	3.59
	Healthy	9.71	4.336	.115	-1.49	20.92
	Anorexia	-27.67*	6.384	.000	-44.17	-11.17
Healthy	Bulimia	-20.05*	5.089	.001	-33.21	-6.90
	Binge Eating	-9.71	4.336	.115	-20.92	1.49

Based on observed means.

The error term is Mean Square(Error) = 922.336.

\*. The mean difference is significant at the .05 level.

Looking solely at the means, those in the anorexia category received the highest mean DES-II scores (indicative of higher proclivities toward dissociation), followed in order by bulimia, binge-eating disorder, and finally healthy eating. This ordering is based solely on means and is not meant to say that there is an actual significant difference in mean scores between each group. The DES-II scores of the anorexia and bulimia groups show no significant difference, so it appears that those with either disorder are equally likely to have high levels of dissociation. However, scores from both groups are



statistically and significantly different from scores of the healthy group ( $p \leq 0.001$ ). There is also a statistically significant difference in DES-II scores between anorexia and binge-eating groups ( $p = 0.036$ ). There does not appear to be a difference between binge-eating and healthy groups for this measure. Bulimia and binge eating also do not show a significant difference. According to these results, those who are anorexic have higher levels of dissociative behaviors than those with binge-eating disorder, but those with binge-eating disorder appear to be just as likely to have high dissociative levels as those with bulimia or those who do not have an eating disorder.

### **Discussion**

The results indicate a significant positive correlation between all three variables—eating disorders, self-harm, and dissociation. The Pearson correlation values are highest between scores from the DES-II and S.A.F.E. Alternatives, so it is theorized that dissociation and self-harm are closely associated and often occur together. Results from S.A.F.E. Alternatives and the EAT-26 also had a strong correlation value. This result means that the data supports the hypothesis that those with eating disorders are likely to face a diagnosis of comorbidity with self-harm and vice versa. The Pearson correlation coefficient between the EAT-26 and the DES-II was weaker but still significant. This coefficient leads one to conclude that eating disorders and dissociation are correlated, but that self-harm shares a closer link with dissociation and eating disorders than eating disorders share with dissociation.

The hypothesis that anorexia is the eating disorder most closely associated with self-harm was only partly upheld. Individuals with anorexia had higher levels of self-harm than those with binge-eating disorder or healthy eating, but there was not a

significant difference of levels of self harm between those with anorexia and bulimia. The results therefore support the more general claim that those with anorexia and bulimia have higher levels of intentional harm to themselves than those without eating disorders.

The last hypothesis was that those with bulimia nervosa are more likely to exhibit dissociative behaviors than people without an eating disorder or with any other type of eating disorder. This hypothesis was based on past research that indicated a correlation between binges and dissociative feelings. The data from this study, however, indicated a relationship between anorexia nervosa and dissociation that was just as strong as that between bulimia nervosa and dissociation. This is important to note as it points to more equality in the relationships of anorexia and bulimia with dissociation. In opposition to results from other studies, it appears that the dissociative component of eating disorders must not be solely due to the bingeing aspect of bulimia since those scoring in the anorexia range on the EDQ had similar responses on the DES-II to people who scored in the bulimia range on the EDQ. Therefore, there must be an additional underlying reason behind the finding that those with eating disorders are more likely to experience dissociation. Lastly, bulimia nervosa does not appear to be any more closely related to dissociative experiences than does binge eating disorder. If a big component of dissociation in eating disorders is bingeing as has been hypothesized, this result makes sense.

Something to note is the difference in the number of participants who scored as unhealthy compared to healthy. It was the result but not the expectation that more participants received scores indicative of an eating disorder than healthy eating. The researcher cannot be sure why this was the case, especially because the measures have

high reliability and validity scores. This implies that as long as participants were being honest and careful and in their answer choices (which has been assumed), the results should be correct. Some explanations are that participants did not take the survey as seriously as would be desired or that participants exaggerated their disordered eating behaviors. Another plausible explanation is that those with disordered eating patterns may be more likely to participate than the general population in a study about eating disorders. Also, more females participated in the study than males, and females are more likely to have eating disorders than males. A similar pattern was found with dissociation scores. More participants scored in the “likely to dissociate” than in the “unlikely to dissociate” range. Again, the researcher cannot provide a single explanation for this result with confidence, but multiple viable explanations exist. It is again a possibility that participants either exaggerated their dissociate tendencies or that they simply did not answer the questions as truthfully or meticulously as they could have. It could also be that many participants truly deserved high scores, and for some reason those likely to dissociate made up a majority of those who chose to be involved in the study.

The findings in this study were consistent overall with previous research and the available literature on the topic. This study added the finding that all three variables—eating disorders, self-harm, and dissociation—are related. The individual correlations that had been discovered by previous researchers were also found in this study. Something that was not consistent with past research was that binge eating and bulimia are associated with higher levels of dissociation than anorexia. Researchers had attributed this discrepancy to the dissociation experienced while binge eating, as that is a component of both bulimia and binge eating disorder, but not anorexia. The results of

this study, on the other hand, indicate no difference in the likelihood of dissociation between anorexia and bulimia.

### **Limitations**

Though the research questions were answered, there were some limitations to this study. First, the sample pool limits the generalizability of the study because all participants were students at an evangelical Christian university. Therefore, it may be difficult to say with certainty that the results obtained from this study will be true across varied populations. The researcher aimed to counteract this by having few exclusionary factors; however, it is still true that the results are probably more representative of the current study's student population than of young adults in general. Second, the research design utilized convenience sampling, in that all participants willingly chose to log on and complete the survey in their free time rather than being recruited in a more structured manner. The survey was available at the beginning of the semester and was optional, so participation could say something about each subject's personality. For instance, since psychology activities are not due until the end of the semester, those who complete them at the beginning may differ in some way from those who wait until the end. Though unlikely, this factor could have skewed the results.

Another limitation to the study was the rates that were observed. Though possible, it appears unlikely that such a large number of participants suffered from eating disorders, self-harm, and dissociation. The quantity of participants scoring high on these measures was more than what would be expected from past research and statistics. On the S.A.F.E. Alternatives measure, the last set of questions that asked for specifics regarding the number of times a person had harmed themselves, a "never" option was not

available. This was a flaw in the measure and may have resulted in overestimates of self-harm. Those who had never self-harmed most likely chose the lowest option coded with the lowest score, however, so this flaw should not have greatly skewed the results.

### **Future Research**

It is recommended for future research that a more diverse sample be utilized, recruiting from outside one educational institution. Also, including an equal number of participants from each age group and gender may be beneficial. By doing so, researchers can be more confident of the external validity of their results. Further, since a correlation was found between all three variables, it is hoped that future research will be conducted to determine if one variable precedes another and is causal, or if all three are induced by another underlying variable. This research could be carried out by more in-depth researching processes such as participant interviews in which the researcher questions participants about their self-harm and disordered eating habits as well as signs of dissociative behavior and forms a timeline of events for when these behaviors first emerged. This interview would take place after initial testing using diagnostic measures similar to those utilized in this study. In this way, the correlational research would have more depth and would offer more information as to which of the three conditions may be the impetus for the other two. Once this is found, a third experiment could be run in which many outside variables are controlled and experimenters aim to discover if the link between the variables is truly causal.

With the information gleaned from this study, there is the potential to expand society's current understanding of eating disorders, self-harm, and dissociative experiences, as well as the link between the three. Results may also benefit counselors as

they will become more aware of the comorbidity of self-harm and eating disorders, as well as the link both have to the propensity to dissociate. If counselors are aware of the high levels of association between these three psychological issues, they will be better prepared and more perceptive of signs of these other illnesses when one is presented.

These signs may too miniscule to notice on their own, but if a counselor knows to look for them, she or he is much more likely to be able to diagnose and treat the patient more holistically and accurately.

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