An Experimental Study on the Effects of Pro-Anorexia Content on Eating Disorder Development

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AN EXPERIMENTAL STUDY ON THE EFFECTS OF PRO-ANOREXIA CONTENT ON EATING DISORDER DEVELOPMENT

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Skyler Green

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AN EXPERIMENTAL STUDY ON THE EFFECTS OF PRO-ANOREXIA CONTENT
ON EATING DISORDER DEVELOPMENT

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Pro-anorexia content, or content that promotes the development and sustainment of eating disorders, is an important topic that has been understudied in the literature. Previous research has primarily examined the content featured on pro-anorexia websites, but few researchers have conducted experimental studies examining the direct impact viewing pro-anorexia content has on individuals struggling with an eating disorder. The current study was an experimental study that exposed participants to three conditions: pro-anorexia content, pro-recovery content, and a control group. The researcher examined the impact that viewing the three levels of content for 10 minutes had on individuals who met criteria and who did not meet criteria for an eating disorder on the Eating Disorder Diagnostic Scale. Participants were examined using the Eating Attitudes Test to examine eating disorder symptomology and the Body Assessment Scale to examine body satisfaction after every condition. The results of this study showed that participants who met criteria for an eating disorder reported increased eating disorder symptomology after viewing the pro-anorexia condition.
Introduction

Prior to the recent increase in popularity of social media, women were confronted with unrealistic beauty standards in the media through magazines, television, and movies. Today, women receive a constant flow of unrealistic beauty standards that are often inescapable through social media websites, such as Facebook (Mabe, Forney, & Keel, 2014), Instagram, Tumblr, and Pinterest (Tong, Heinemann-LaFave, Jeon, Kolodziej-Smith, & Warshay, 2013). These social media websites feature idealized images that these individuals choose to portray to those viewing the website. The media has been shown to play a role in the development of low body satisfaction, and even eating disorders, by idealizing slim physiques to motivate others to obtain the same body type that is often distorted and unachievable (Polivy & Herman 2002).

The visual media, such as television, magazines, billboards, and movies contribute to the distorted and unachievable image that is promoted to millions daily (Culbert, Racine, & Klump, 2015). A 2015 study by Culbert and colleagues found that sociocultural influences such as media exposure, the pressure to be thin, and thin-ideal internalization were risks for eating disorder development, but only for those who were prone to endorse thin-ideals. If an individual was not susceptible to having low body satisfaction and motivation to lose weight, media exposure had little to no effect on him or her, and he or she was not likely to develop eating disordered behaviors from media exposure alone (Culbert et al., 2015).

The influence that the media directly has on body image is a debated issue among scholars. An article by Ferguson, Muñoz, Garza, and Galindo (2014) examined the effect of social media exposure on adolescents. Some scholars believe that the media has caused
the recent increase in levels of bulimia nervosa (Becker, Burwell, Herzog, Hamburg, & Gilman, 2002), while others believe that the link between media and eating disorders is not consistent enough to come to a substantial conclusion (Holmstrom, 2004). Ferguson and colleagues (2014) examined the influence of visual media and social media on body dissatisfaction, eating disorder symptoms, and life satisfaction of pre-adolescent and adolescent girls. To get a better understanding of the role of the media, they examined the role of television exposure and social media use. Results indicated that television had little to no effect on adolescent girls, but social media was shown to predict later peer competition that could lead to eating disorder behavior (Ferguson et al., 2014). Social media was shown to have a stronger effect on teenage girls than the visual media, and as a result, researchers determined that visual media should be less of a concern than social media in the development of eating disorders (Ferguson et al., 2014).

An article by Mabe, Forney, and Keel (2014) examined how social media influences eating disorder development. They assessed the importance of Facebook alone and found that Facebook introduces the merging of two social influences, media and peers, in the reinforcement of the thin ideal (Mabe et al., 2014). These two factors have been discovered to increase disordered eating in adolescent girls over time (Mabe et al., 2014). It was found that college students use Facebook for an average of 100 minutes a day through viewing and “liking” photos of peers. Mabe and colleagues (2014) examined whether greater Facebook use increased eating disorder behaviors, and whether Facebook viewing caused weight and shape concerns among female college students. They found that women with greater eating disorder pathology reported spending more time on Facebook and reported more comparative behavior, such as comparing appearance to
peers. They discovered that these women were “un-tagging,” or removing their name from photographs of themselves that they did not find flattering, as well as reporting greater eating disorder pathology than women without eating disorder pathology (Mabe et al., 2014). Social media has been shown to be connected to disordered eating behavior (Mabe et al., 2014).

Sidani, Shensa, Hoffman, Hanmer, & Primack (2016) assessed social media and the impact it plays on the development of eating disorders, specifically the relationship that Facebook has on disordered eating and body dissatisfaction among viewers. The purpose of their study was to examine the relationship between social media usage and eating concerns in young adults (Sidani et al., 2016). Results were consistent with the findings of Mabe and colleagues (2014), confirming a strong link between social media use and eating concerns in young adults. As time per day of viewing social media and frequency of social media website visits increased, eating concerns increased as well (Sidani et al., 2016). This study showed the impact of social media on the development of eating disordered behavior, and emphasized the impact that repetitive viewing of these websites has on young adults (Sidani et al., 2016).

**Weight Perception in Women**

It is known from the literature that the actual weight of individuals is higher than their ideal weight, but that the ideal weight has been decreasing since 1990 (Americans and Weight: Moving the Goalposts, 2013). However, females especially struggle with perceived and ideal weight discrepancies that lead to high levels of body dissatisfaction and eating disorder behavior. A study by Yost, Krainovich-Miller, Budin, and Norman
(2010) found that females are significantly more likely to attempt to lose weight than their male counterparts.

As an individual’s perception of being overweight increases, whether it be real or imagined, the risk for developing an eating disorder increases (Doninger, Enders, & Burnett, 2005). According to Lantz, Gaspar, DiTore, Piers, and Schaumberg (2018), ideal body weight has been shown to be abnormally small for those with anorexia nervosa and bulimia nervosa. The perception of the ideal body weight for those affected by eating disorders gets stronger and thinner as their disorder progresses. Those with bulimia nervosa and anorexia nervosa have shown a desired weight of 15% and 16% below the medically ideal body weight, respectively (Lantz et al., 2018).

How an individual views his or her body weight determines the importance of weight to his or her self-evaluation (Lantz et al., 2018). If individuals place a great importance on body weight, the effect of the discrepancy of ideal and actual weight will be more significant than to someone who does not place great importance on weight (Lantz et al., 2018). However, if weight is not significantly important to the individual’s self-image, he or she may still show body satisfaction, but may not develop an eating disorder (Lantz et al., 2018).

The importance of weight is the primary maintenance factor for anorexia nervosa and bulimia nervosa (Lantz et al., 2018). Body dissatisfaction has been shown to be a precursor to individuals engaging in both disordered eating behaviors, as well as purging, restriction of food intake, and dieting to reduce feelings of dissatisfaction with their bodies (Graziano & Sikorski, 2014). Placing a high importance on body weight (along with a discrepancy between perceived and ideal weight) has been shown to increase body
dissatisfaction and self-esteem immensely (Lantz et al., 2018; Rabito-Alcón & Rodríguez-Molina, 2016).

Types of Eating Disorders

The most common types of eating disorders are anorexia nervosa and bulimia nervosa (American Psychiatric Association, 2013). Recent literature has found a prevalence rate of 0.5% to 1.0% for anorexia nervosa, and a prevalence rate of 0.5% to 3.0% for bulimia nervosa (Tafà, Cimino, Ballarotto, Bracaglia, Bottone, & Cerniglia, 2017). According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, anorexia nervosa consists of (a) restriction of energy intake relative to requirement, leading to a significantly low body weight, (b) intense fear of gaining weight or becoming fat, or persistent behavior that interferes with weight gain, even though the individual is at a low weight, and (c) disturbance in the way one’s body shape is experienced, or excessive influence of body weight on self-evaluation, or persistent lack of recognition of the gravity of the current low body weight (American Psychiatric Association, 2013).

According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, bulimia nervosa consists of (a) recurrent episodes of binge eating, (b) recurrent compensatory behaviors in order to prevent weight gain (such as self-induced vomiting, misuse of laxatives, diuretics, or other medications, fasting, and/or excessive exercise), (c) binge eating and compensatory behaviors both occur at least once a week for three months, (d) self-evaluation is excessively related to body weight, and (e) the disturbance does not occur during episodes of anorexia nervosa (American Psychiatric Association, 2013).
Risk Factors of Anorexia Nervosa and Bulimia Nervosa

**Personality risk factors.** The biopsychosocial approach was used by Culbert and colleagues (2015) to examine the main etiology for eating disorders and disordered eating development in females. This approach used methodologies that examined biological influences by including variables related to idealization of thinness, negative emotionality, perfectionism, neuroticism, concentration, cognitive inflexibility, and hormones in the etiology of eating disorders and disordered eating. Culbert and colleagues (2015) found that psychological and environmental factors interact with genetic risk for disordered eating behavior, and influence the expression of eating disordered behaviors. It has also been shown that traits such as body dissatisfaction, negative emotion (depression or anxiety), low self-esteem, and a need for control have been shown to predict disordered eating (Polivy & Herman, 2002). Personality characteristics such as negative emotionality, neuroticism, and perfectionism were shown to be common traits for eating disorder development, and are shown to be genetically inherited (Culbert et al., 2015).

**Cultural risk factors.** Polivy and Herman (2002) examined the importance of cultural influences, including the cultural thin-ideal and familial influence, on the development of eating disorders. They found that the extent to which an individual internalizes the valuation of thinness predisposes him or her to develop an eating disorder. Depending on a culture’s emphasis on the importance of thinness, and an individual’s internalization of the importance, culture can cause pathological disordered eating behaviors and beliefs (Polivy & Herman 2002). Greenleaf and McGreer (2006) found that college students often internalize the ideal cultural representations of thinness.
and report being dissatisfied with their own bodies, which leads to eating disorder development in the college-aged population.

**Pro-Anorexia Websites**

Those with eating disorders are often stigmatized, and as a result, are unable to speak to peers and family members about their illness (Yeshua-Katz & Martins, 2013). As a result of this isolation, many sufferers turn to the internet to find social support, tips, and advice on what is referred to as “pro-ana,” or pro-anorexia (Yeshua-Katz & Martins, 2013). Pro-anorexia consists of content that promotes eating disorder behaviors.

According to Tierney (2006), pro-anorexia websites provide a way for individuals who endorse anti-recovery from eating disorders (primarily anorexia nervosa) to connect with others who hold the same beliefs. This is accomplished by posting and sharing images of emaciated figures, dieting tips, extreme exercise routines, and other information that is designed to encourage eating disorder behavior (Tierney, 2006).

**Relevant Past Research**

Yeshua-Katz and Martins (2013) examined the motivations, benefits, and drawbacks of using sufferers’ blogging to talk about their experiences with eating disorders. They found two types of websites featuring eating disorders, pro-anorexia (promoting anorexia nervosa) and pro-mia (promoting bulimia nervosa). The creators and viewers of these websites view eating disorders as a lifestyle choice, not a disease.

Websites such as Tumblr, Pinterest, and Instagram have started to block pro-eating disorder content due to the risk these websites have on those vulnerable to developing an eating disorder (Tong et al., 2013). However, this does not stop the pro-anorexia/pro-bulimia website administrator from creating accounts under new usernames that feature the
same triggering material as the content that was previously deleted (Yeshua-Katz & Martins, 2013).

Results from Yeshua-Katz and Martins (2013) indicated that the motives for blogging consist of seeking social support, self-expression, and coping with stigma. The benefits of blogging consist of catharsis, improving the sufferer’s mood, and support from the community of eating disorder sufferers that contribute to and/or view the blog. The drawbacks of blogging consist of the fear of disclosing eating disorder behavior and encouraging the continuation of the eating disorder by “feeding the obsession” (encouraging their eating disorder by viewing negative material that encourages weight loss). Blogging about his or her eating disorder was shown to both alleviate and contribute to his or her anxiety concerning speaking about the individual’s eating disorder (Yeshua-Katz & Martins, 2013).

**Use of Pro-Anorexia Websites**

Tong and colleagues (2013) examined the detrimental effects of pro-anorexia and pro-bulimia content in depth. The aims of this study were to describe and document the types of content on pro-anorexia blogs and to analyze the comments from others on the blog to see what type of social support viewers were receiving online. The results showed that typical pro-anorexia bloggers disclosed information regarding their sex, weight, height, geographical location, and an email address that they can be reached at by other bloggers looking for a more intimate conversation regarding eating disorder behaviors. Bloggers also commonly revealed the ideal weight that they hoped to reach in the future, referred to as their “goal weight.” Some bloggers have indicated that they have met with other bloggers offline, showing that these relationships can develop into the “real world.”
Bloggers exchange information about diets, exercise, and treatment that allow them to bond with one another over their shared eating disorders. It is common for individuals to share details of their personal lives on the blog in order to develop a deeper connection with one another (Tong et al., 2013).

**Pro-Anorexia Content**

Content of pro-anorexia websites were examined by Harshbarger, Ahlers-Schmidt, Mayans, Mayans, & Hawkins (2009). The researchers examined 10 pro-anorexia websites and found that the majority of the pro-anorexia websites contain a caloric intake section and a “Tips and Tricks” section to help individuals master, conceal, and maintain their illness. Dieting and caloric restriction were the most common sections (28.4% of websites), and included information on how to eat as little as possible. The Tips content (13.9% of websites) usually consisted of tips centered on how to eat less or how to avoid eating altogether (Harshbarger et al., 2009).

The third category listed on these websites was Deception (11.1% of websites), which consisted of content revealing how to deceive family members, friends, and health care providers by convincing them that the individual is eating when he or she is not eating (Harshbarger et al., 2009). The last category consisted of tips to burn calories through activities, certain foods, and supplements (Harshbarger et al., 2009). Many website creators encouraged individuals not to purge, use laxatives, diuretics, or diet pills; however, bloggers stated that if pro-anorexia viewers are going to use those methods of weight loss, they should follow tips provided to use them safely (Harshbarger et al., 2009). The combination of the methods, however, is highly detrimental to viewers (Harshbarger et al., 2009).
Norris, Boydell, Pinhas, and Katzman (2006) examined 12 pro-anorexia websites for content. During this examination, they found that most websites (67%) contained information about the website creators (Norris et al., 2006). Researchers found that warnings or disclaimers were found on only half of the websites (58%) (Norris et al., 2006). This was found to be concerning, given the intensity of the content featured on the website. Researchers found that most of the content on these websites (92%) consisted of “thinspiration” (Norris et al., 2006). “Thinspiration” provides viewers with pictures of distorted body images featuring emaciated females to provide encouragement to viewers. The “Tips and Tricks” section consisted of promotion of fasting and the use of laxatives (67%) (Norris et al., 2006). This section was found to include information devoted to caloric content in food. These websites were found to be very creative and included poems, stories, and various accessories (including a universal red bracelet referred to as the “ana bracelet”) (Norris et al., 2006). The “Tips and Tricks” section was promoted as “safe management” of eating disordered behavior (Norris et al., 2006).

Pro-anorexia websites are commonly created, maintained, and viewed by females (Norris et al., 2006; Harshbarger et al., 2009). Of the 12 websites examined in the Norris and colleagues (2006) study, all the website creators were female. Most pro-anorexia and pro-bulimia websites are run and viewed by female adolescents, who swap advice on initiating and maintaining their eating disorders (Harshbarger et al., 2009).

**Positives of Pro-Anorexia Websites**

Pro-anorexia websites have been shown to be a means of connection to other sufferers for those who do not respond well to group therapy (Tierney, 2006). The anonymity of a website makes it easier for sufferers to receive 24-hour companionship.
However, the companionship provided can be detrimental to the recovery of the viewer and may intensify the eating disorder. It is harder to detect emotions online, and it is likely that the content will be interpreted subjectively by viewers (Tierney, 2006).

Tierney (2006) found that pro-anorexia websites tend to state that the purpose of their website is to support those struggling with an eating disorder and to provide support and help free from judgment, where sufferers can support one another before they are ready and able to recover from their eating disorders. Tierney (2006) found that it was often stated that the goal of these websites is not to promote self-starvation, but rather to provide support for those struggling with an eating disorder. These websites have the potential to lessen the feelings of seclusion and loneliness that can accompany an eating disorder. These websites provide a connection to another person who has insight to his or her life and can relate to the struggles that he or she faces.

**Effects of Viewing Pro-Anorexia Websites**

Pro-anorexia content has been shown to have very detrimental effects on females, especially when the pressure to be thin is present females (Norris et al., 2006; Groesz et al., 2002; Harshbarger et al., 2009; Stice, 2001). Stice (2001) examined the effects of thin-ideal media exposure. Stice (2001) found that the perceived pressure to be thin acts as a predictor for an increase in body dissatisfaction. This, in turn, was found to predict increases in eating disordered behavior (Stice, 2001). The pressure to be thin plays into the increase in eating pathology. Groesz, Levine, and Murnen (2002) used a meta-analysis of 25 experimental studies that evaluated the impact of thin-ideal beauty images on females. A small, but consistent negative effect was found ($d = -0.31$); body image
was shown to be significantly more negative after viewing the thin-ideal beauty images than after viewing the control conditions (Groesz et al., 2002).

Bardone-Cone and Cass (2007) examined the effects of viewing a pro-anorexia website on affect, self-esteem, and self-efficacy to examine how pro-anorexia is contributing to eating disorders in females. This study built upon a previous pilot study by using a larger sample size, assessing participants’ reports of behavior changes as a result of viewing a website, using pre-and post-test measures, and viewing additional variables to assess as moderators of viewing the pro-anorexia website. Researchers examined the presence of an eating disorder when viewing the thin-ideal media exposure, the thin ideal internalization with the thin-ideal media exposure, BMI, dieting, and perfectionism as mediators for the study (Bardone-Cone & Cass, 2007).

Results from the Bardone-Cone and Cass (2007) study indicate that participants exposed to the pro-anorexia website had greater negative affect, lower self-esteem, and lower appearance self-efficacy after viewing the pro-anorexia website than those in the control groups. They found that pro-anorexia viewers viewed themselves as heavier after viewing the pro-anorexia website compared to the control groups. Lastly, pro-anorexia viewers reported that viewing the pro-anorexia website caused them to think about exercise and their weight while viewing the website as opposed to viewing the other control websites (Bardone-Cone & Cass, 2007).

Viewing pro-anorexia websites has been associated with higher levels of eating disturbances, poor body satisfaction, higher drive for thinness, and higher levels of perfectionism when compared to females who have not viewed a pro-anorexia website (Custers & Van den Bulck, 2009; Harper, Sperry, & Thompson, 2008; Juarez, Soto, &
Pritchard, 2012). Delforterie, Larsen, Bardone-Cone, & Scholte (2014) examined the effects of viewing a pro-anorexia website on body satisfaction, affect, and appearance self-efficacy in comparison to viewing three other websites. The three other websites consisted of home decoration, fashion, and auto-mutilation. The rationale of this study was to see how pro-anorexia websites are affecting women with body dissatisfaction because viewing pro-anorexia websites have been associated with higher levels of body image issues, drive for thinness, and perfectionistic tendencies (Delforterie et al., 2014). These websites have been linked to increased body dissatisfaction in females (Delforterie et al., 2014).

The Positive and Negative Affect Schedule had a Cronbach’s $\alpha$ of .78 for positive affect and .84 for negative affect. The Body Dissatisfaction Subscale of the Eating Disorder Inventory had a Cronbach’s $\alpha$ of .87, the Appearance Self-Efficacy had a Chronbach’s $\alpha$ of .89, and the Restrained Eating Scale of the Dutch Eating Behavior Questionnaire had a Chronbach’s $\alpha$ of .92.

To be eligible for the Delforterie and colleagues (2014) study, participants had to be of normal body weight (BMI > 18.5 and < 25). Results showed that women who viewed the pro-anorexia website did not differ on affect, appearance self-efficacy, or most body satisfaction measures from those viewing the other three website conditions. Participants who viewed the pro-anorexia website reported lower body satisfaction on body satisfaction scales. Although there were little, if any, differences in body satisfaction, affect, and appearance self-efficacy when viewing the pro-anorexia websites, there may have been more significant results if underweight participants were included. Previous research has shown an association between pro-anorexia and eating
disturbances, poor body satisfaction, a high drive for thinness, and high levels of perfectionism (Bardone-Cone & Cass, 2007; Custers & Van den Bulck, 2009; Harper et al., 2008; Juarez et al., 2012).

Complaints from viewers have resulted in the termination of pro-anorexia websites; however, many website creators re-create their websites under different usernames and URL links (Tierney, 2006). Pro-anorexia has been shown to be resistant to these attempts of elimination (Tierney, 2006). However, it is common for websites such as Tumblr and Pinterest to provide a link to the National Eating Disorders Association when an individual searches phrases such as, “pro-ana,” “skinny,” and “thinspiration.” These websites provide a way to expose those suffering from eating disorders to resources for recovery, such as the National Eating Disorder Association.

**Limitations of Pro-Anorexia Research**

Although there has been progress in the expansion of research on the effects of pro-anorexia websites on females, much of it is descriptive or exploratory in nature. The majority of the existing research examines the content on the pro-anorexia websites, but does not use experimental methods to see the effects of pro-anorexia on viewers. This is problematic because causation cannot be inferred from a correlation. Another factor may drive both the viewing of pro-anorexia content and eating disorder symptomology. The current study will examine the direct influence of pro-anorexia on eating disorder symptomology within a sample of females with eating disorder symptomology at Western Kentucky University.
Pro-Recovery

Pro-recovery is another form of content that centers around eating disorders, but in a more positive way. Pro-recovery websites have typically been created by individuals in recovery from an eating disorder to encourage recovery in other users (Branley & Covey, 2017). Branley and Covey (2017) examined the content of pro-recovery hashtags on Twitter, and found that the content typically is accompanied by posts about the user’s own recovery progress and struggles that he or she faces in recovery. Some posts contain worries about the user’s body post-weight gain. Other posts contained information aimed to inspire others to recover from an eating disorder and provide reassurance that it is possible to recover. The hashtags typically contain tips and advice, such as not counting calories, healthy exercise (as opposed to over-exercise), and regular mealtime schedules. Pro-recovery twitter users tend to post inspiring content on their account, and they tend to post more positive imagery and slogans (Branley & Covey, 2017).

Yom-Tov, Fernandez-Luque, Weber, and Crain (2012) used the Yahoo photo-sharing website, Flickr, to identify 172 pro-recovery users. Yom-Tov and colleagues (2012) found that most pro-recovery users rarely self-identified as having an eating disorder, and when they did report having an eating disorder, they reported that they were in full remission. Yom-Tov and colleagues (2012) found that comments on the pro-recovery images are between pro-recovery users; it was uncommon for pro-anorexia users to comment on pro-recovery images. Pro-recovery posters/viewers used similar tags as pro-anorexia users, but it is likely that this is done to promote recovery to pro-anorexia users (Yom-Tov et al., 2012).
Limitations of Pro-Recovery Research

Pro-recovery is a topic that is limited in empirical research. Due to this limited research, there is a small understanding of their impact. Of the current research, there are very few platforms studied for pro-anorexia content. The previous studies by Branley and Covey (2017) and Yom-Tov and colleagues (2012) examines two platforms: Twitter and Flickr. According to Twitter (The Statistics Portal, 2017) and Yahoo (Smith, 2018) user data, Twitter is still a very current and popular form of media (262 million users), but Flickr is very outdated and rarely used in comparison (90 million). There needs to be further examination into other popular and current websites such as Tumblr and Instagram for pro-recovery content.

The Use of College-Aged Females

Research has shown the prevalence of eating disorders in college-aged females. (García-Villamisar, Dattilo, & Del Pozo, 2012). The most widely known eating disorders affecting college women today are anorexia nervosa and bulimia nervosa (García-Villamisar et al., 2012). Binge eating disorder is prevalent in college-aged females, but at lower rates.

According to Schweitzer and Choate (2018), 6% of women on campuses report problems with anorexia or bulimia, and 25% to 40% report moderate eating, weight, and body shape–related problems such as body image worries, weight management behaviors, and out-of-control eating. Due to the high prevalence rates of eating disorders in college females, future research should focus on this population.
The Present Study

The purpose for the current study was to examine if pro-anorexia and pro-recovery content had an effect on eating disorder symptomology and body satisfaction for individuals with and without eating disorder symptoms. The present study was a repeated measures design. This research added to the experimental studies examining pro-anorexia and pro-recovery research. This study consisted of a post-test of eating disorder symptoms and body satisfaction measures to examine a change in body satisfaction and eating disorder symptomology after viewing a pro-anorexia, a pro-recovery, and a control home décor website pages.

Hypotheses

Based on the literature review, the following hypotheses will be evaluated:

1. Body satisfaction for participants with current eating disorder symptomology will be the lowest and eating disorder symptomology will be the highest after viewing the pro-anorexia Tumblr page, body satisfaction will be the highest and eating disorder symptomology will be the lowest after viewing the pro-recovery Tumblr page, and body satisfaction and eating disorder symptomology will have no significant changes after viewing the home decoration Tumblr page.

2. There will be no significant changes in body satisfaction or eating disorder symptomology after viewing the three Tumblr pages for participants with no current eating disorder symptomology.

3. Participants with current eating disorder symptomology will report more eating disorder symptoms and lower body satisfaction in comparison to participants with
no current eating disorder symptomology after viewing the pro-anorexia Tumblr page, pro-recovery Tumblr page, and home decoration Tumblr page.
Methods

Participants

The population of interest was female undergraduate students with and without eating disorder symptoms. A convenience sample of all female participants (N = 78) attending Western Kentucky University was recruited through the Department of Psychology Study Board. Each participant received seven credits on Study Board and a $5 Walmart gift card upon completion of all required conditions. The ages of participants ranged from 18 to 38 years of age (M = 20.01, SD = 3.19). The education attainment of participants consisted of 41 (53.90%) college freshman, 16 (21.10%) college sophomores, 4 (5.30%) college juniors, 10 (13.20%) college seniors, and 5 (6.60%) graduate school students. The self-identified races of participants included 64 (84.20%) Caucasians, 5 (6.6%) African Americans, 4 (5.30%) Bi-Racial, and 3 (3.9%) Other. Due to missing outcomes data, the final sample for analyses included 66 women.

A statistical power analysis was performed for evaluating various factors that impact eating disorder development and body satisfaction. There was a mean effect size (Cohen’s $d$) of .68. The sample size needed for this study, with an alpha of .05 and power of .80, was approximately 70 participants.

Materials

**Participant Questionnaire and Characteristics.** Participants completed a demographics and characteristics questionnaire. The questionnaire asked for participants’ age, gender, race, year in school, relationship status, sexuality, and Tumblr use history. Additionally, participants’ height in inches and weight in pounds were measured with a digital scale and tape measure, respectively (see Appendix A).
Previously Diagnosed Participant Survey. Participants with a history of an eating disorder were instructed to complete a questionnaire about their history with an eating disorder. If participants did not have a history of an eating disorder, they were instructed to skip the history of an eating disorder page. Information about the history of the eating disorder, the type of eating disorder (if any), the age the eating disorder began, inpatient hospitalization history for the eating disorder, length of hospital stay(s), therapy for the eating disorder, comorbid diagnoses, and current medications were collected (see Appendix B).

Eating Disorder Diagnostic Scale (EDDS). The EDDS is a 22-item scale that assesses for symptoms of anorexia nervosa, bulimia nervosa, and binge eating disorder (Stice, Fisher, & Martinez, 2004). This measure was used to screen for eating disorder symptomology. Participants answered questions regarding eating disorder symptomology, such as how many times in the past three months they have made themselves vomit to counteract the effects of eating, and how many menstrual cycles they have missed in the past three months.

The EDDS screens for symptoms related to anorexia, bulimia, and binge eating. However, an overall symptoms composite can be computed using summed z-scores for eating disorder symptoms items. The overall symptoms composite was used in this study. Participants identifying as non-eating disorder participants were coded as 0, and those identified as at-risk for an eating disorder were coded as 1. Initial psychometric studies for the EDDS found Cronbach’s $\alpha$ was .89 (Stice et al., 2004), meaning that it had adequate internal consistency. A Cronbach’s alpha was calculated for the study sample and was .86 (see Appendix C).
The Body Assessment Scale (BAS). This measure was used to measure overall body satisfaction after viewing each of the Tumblr pages (Lorenzen, Grieve, & Thomas, 2004). This is a 25-item scale that assesses body satisfaction on a five-point Likert scale ranging from 1 (strongly negative) to 5 (strongly positive). Scores range from 25 to 125, with low scores meaning low body satisfaction and high scores meaning high body satisfaction. Participants were instructed to rate their satisfaction with different parts of their bodies, including the face, waist, arms, and legs. The higher a participant ranks him or herself on this scale, the more satisfied he or she is with her body, and vice versa. Initial psychometric studies found Cronbach’s $\alpha$ was .94 (Lorenzen et al., 2004). A Cronbach’s alpha was calculated for the study sample for participant scores on the BAS after viewing the pro-anorexia page ($\alpha = .93$), the pro-recovery page ($\alpha = .96$), and the home-décor page ($\alpha = .95$) (see Appendix D).

The Eating Attitudes Test (EAT-26). The EAT-26 is a 26-item measure that contains a six-point Likert scale that ranges from 1 (always) to 6 (never) (Garner, 1982). This measure was used to assess and measure eating disorder symptoms after viewing each of the Tumblr pages. There were an additional four questions to measure distorted eating that were answered with either yes or no. Scores ranged from 0 to 75 on the first 25 items, with high scores meaning high susceptibility or symptoms of an eating disorder. A high score on the last item in the EAT-26 indicated low symptoms of an eating disorder. Scores ranged from 0 (always/often) to 3 (never) on the last item. A total score of 20 or more indicated eating disorder symptomology. Initial psychometric studies found Cronbach’s $\alpha$ was .85 (Siervo, Boschi, Papa, Bellini, & Falconi, 2005), meaning that it has adequate internal consistency and all of the items measured were closely related to
one another. A Cronbach’s $\alpha$ was calculated for the study sample to measure internal consistency for participant scores on the EAT after viewing the pro-anorexia page ($\alpha = .91$), the pro-recovery page ($\alpha = .90$), and the home-décor page ($\alpha = .90$) (see Appendix E).

**Tumblr pages.** Three Tumblr pages were used for this study. These pages consisted of existing pro-anorexia content, pro-recovery content, and home decoration content accessed off of public Tumblr pages. Each participant was assigned to a random order for viewing the Tumblr pages. The passwords for each of the Tumblr pages were kept confidential, and they were entered in by the researcher (see Appendix F).

The *pro-anorexia* Tumblr page contained a collection of images that were previously posted on Tumblr featuring thin women, thinness quotes, and diet tips. The *pro-recovery* Tumblr page contained a collection of images that were previously posted on Tumblr featuring body positive images of women, quotes about body positivity, and graphics depicting body positivity. The *home decoration* page contained a collection of images that were previously posted on Tumblr featuring a variety of home and room decoration styles.

**Procedures**

The study used a mixed between-groups and within-subjects experimental design. Participants were separated into two groups, non-eating disordered and eating disordered groups. Participants were exposed to three different conditions, which were scheduled a week apart. During the first session, the participants read an informed consent document (see Appendix H). They then completed the participant Questionnaire and Characteristics form. Those identifying as having an eating disorder then completed the Previously
Diagnosed Participant Survey. All participants then continued to the Eating Disorder Diagnostic Scale (EDDS). Participants then received a randomly assigned order of viewing the three webpages, with every participant in each time block viewing the same order of webpages to avoid revealing the purpose of the experiment. The three conditions were viewing a pro-anorexia (pro-ana) Tumblr page, viewing a pro-eating disorder recovery Tumblr page, and viewing a control Tumblr page consisting of pictures of home decoration ideas. The participants were not aware of the order assigned to them to view the three webpages.

The participants viewed the first randomly assigned webpage during the first session for 10 minutes. They then filled out the Body Assessment Scale (BAS) and the Eating Attitudes Test (EAT-26). Lastly, participants filled out the Tumblr Page Satisfaction Questionnaire. Participants were then debriefed with a contact information sheet about the available resources at Western Kentucky University for eating disorder support, including the eating disorder support group, the Psychology Training Clinic, and the Counseling and Testing Center, as well as the contact number for the eating disorder helpline (see Appendix I).

During the second session, participants viewed one of the two remaining Tumblr pages that they were previously randomly assigned. They viewed this Tumblr page for 10 minutes. They then filled out the BAS, the EAT, and the Tumblr page satisfaction questionnaire. During the last session, participants viewed the last previously randomly assigned Tumblr page for 10 minutes. They then completed the BAS, the EAT, and the Tumblr Page Satisfaction Questionnaire. Participants were thanked for completing the survey each time prior to leaving. After the last session was completed, participants
received a $5 gift card to Walmart for their participation. Participants were debriefed in both the second and third sessions.

**Analysis Plan**

IBM SPSS Statistics version 25 was used for all statistical analyses. Missing data was handled through list-wise deletion. Preliminary analyses consisted of computing the means and standard deviations for the BAS and EAT for the ED symptoms groups across conditions. In addition, Pearson correlations between outcomes measures were computed across conditions for each ED symptoms group.

For the analysis for testing the first hypothesis, a Mixed-Model Wilk’s Lambda repeated measures Multivariate Analysis of Variance (MANOVA) was run on the eating disorder group across all conditions. Significant omnibus $F$-tests were followed up with univariate Analyses of Variance (ANOVA) for each measure in each condition with partial eta squared as the effect size. Significant univariate $F$-tests was followed up with least significant difference (LSD) pairwise comparisons across all conditions. The effect size for significant mean differences would with the pairwise comparisons were calculated using Cohen’s $d$.

For the analysis for testing the second hypothesis, a Wilk’s Lambda repeated measures MANOVA was run on the non-eating disorder group across all conditions. Significant omnibus F-tests were followed up with univariate ANOVAs for each measure in each condition with partial eta squared as the effect size. Significant univariate F-tests were followed up with least significant difference (LSD) pairwise comparisons across all conditions. This post-hoc test was conducted because previous literature shows differences between individuals with eating disorders and individuals without eating
disorders on eating disorder measurement scales. This allows for a more liberal follow-up analysis. The effect size for significant mean differences was calculated using Cohen’s $d$.

For the analysis for testing the third hypothesis, a mixed model MANOVA was completed. A significant interaction between group and conditions was followed up with univariate ANOVAs for each measure. Significant differences for the univariate F-test were followed up with one-way ANOVAs comparing groups within each condition with partial eta squared as the effect size. Effect sizes between groups were calculated using Cohen’s $d$. 
Results

Preliminary Analyses

Cases that contained missing outcomes information were not included in the analyses ($N = 10$). Based on the score for the EDDS, 22% of the participants were classified as at-risk for an eating disorder ($N = 15$) and 78% as not at-risk for an eating disorder ($N = 51$). The height of participants ranged from 50 to 72 in. ($M = 65.00$ in., $SD = 3.44$). The weight of participants ranged from 84.2 to 303.2 lbs. ($M = 158.38$ lbs., $SD = 43.17$). The Body Mass Index (BMI) of participants ranged from 18.73 to 50.45 ($M = 26.32$, $SD = 6.75$). Differences between the groups on height, weight, BMI were statistically nonsignificant.

Table 1: Preliminary Analyses Data

<table>
<thead>
<tr>
<th>EAT</th>
<th>Pro-Anorexia</th>
<th>Pro-Recovery</th>
<th>Home-Décor</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M (SD)$</td>
<td>$M (SD)$</td>
<td>$M (SD)$</td>
<td>$M (SD)$</td>
</tr>
<tr>
<td>No ED</td>
<td>12.38 (8.27)</td>
<td>14.27 (11.36)</td>
<td>13.76 (12.18)</td>
<td>13.47 (8.00)</td>
</tr>
<tr>
<td>ED</td>
<td>25.13 (13.62)</td>
<td>13.80 (9.53)</td>
<td>15.87 (10.06)</td>
<td>18.27 (7.99)</td>
</tr>
<tr>
<td>Total</td>
<td>15.28 (11.02)</td>
<td>14.17 (10.91)</td>
<td>14.24 (11.69)</td>
<td>15.87 (9.54)</td>
</tr>
<tr>
<td>BAS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No ED</td>
<td>76.31 (14.62)</td>
<td>81.22 (18.85)</td>
<td>79.55 (18.12)</td>
<td>79.03 (12.90)</td>
</tr>
<tr>
<td>ED</td>
<td>66.43 (17.08)</td>
<td>81.73 (18.02)</td>
<td>77.47 (13.84)</td>
<td>75.21 (12.90)</td>
</tr>
<tr>
<td>Total</td>
<td>74.07 (15.64)</td>
<td>81.34 (18.53)</td>
<td>79.08 (17.16)</td>
<td>77.12 (15.40)</td>
</tr>
</tbody>
</table>

The mean scores for the EAT and BAS were calculated between and within the non-eating disorder and eating disorder groups across Tumblr page conditions and are listed in Table 1. Cases that contained missing information were not included in the
analyses (N = 5). Correlations for the BAS and EAT for the eating disorder and non-
eating disorder groups across conditions can be found in Table 2.

Table 2: Zero-order Correlations for EAT and BAS across Conditions for Eating 
Disorder (top diagonal) and Non-Eating Disorder (bottom diagonal) Groups.

<table>
<thead>
<tr>
<th></th>
<th>ED</th>
<th>AEAT</th>
<th>REAT</th>
<th>HEAT</th>
<th>ABAS</th>
<th>RBAS</th>
<th>HBAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ED</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AEAT</td>
<td>--</td>
<td>-.17</td>
<td></td>
<td>-.15</td>
<td>-.49</td>
<td>.06</td>
<td>.14</td>
</tr>
<tr>
<td>REAT</td>
<td>-.04</td>
<td>--</td>
<td>.92**</td>
<td></td>
<td>-.04</td>
<td>.02</td>
<td>-.21</td>
</tr>
<tr>
<td>HEAT</td>
<td>.03</td>
<td>.94**</td>
<td></td>
<td>-.13</td>
<td>.07</td>
<td>.20</td>
<td></td>
</tr>
<tr>
<td>ABAS</td>
<td>-.45**</td>
<td>-.02</td>
<td>-.07</td>
<td>--</td>
<td>-.04</td>
<td>-.08</td>
<td></td>
</tr>
<tr>
<td>RBAS</td>
<td>-.06</td>
<td>-.57**</td>
<td>-.57**</td>
<td>.28</td>
<td>--</td>
<td>.91**</td>
<td></td>
</tr>
<tr>
<td>HBAS</td>
<td>.02</td>
<td>-.51**</td>
<td>-.54**</td>
<td>.04</td>
<td>.84**</td>
<td>--</td>
<td></td>
</tr>
</tbody>
</table>

Note. ** indicates statistically significant correlations at p < .01

*Abbreviations: ED, eating disorder; No ED, no eating disorder; AEAT, Pro-Anorexia EAT; REAT, Pro-Recovery EAT; HEAT, Home decoration EAT; ABAS, Pro-Anorexia BAS; RBAS, Pro-Recovery BAS; HBAS, Home decoration BAS

Scores on the Pro-Recovery EAT (REAT) and the Home Decoration (HEAT) pages were positively correlated with one another. Scores on the Pro-Recovery BAS (RBAS) and Home Decoration BAS (HBAS) were positively correlated. The Home Decoration EAT (HEAT) and Pro-Recovery EAT (REAT) were positively correlated. The RBAS and the HEAT were negatively correlated. The HBAS and the HEAT were negatively correlated. The HBAS and REAT were negatively correlated. The RBAS and the REAT were negatively correlated. Lastly, the Pro-Anorexia BAS (ABAS) and the Pro-Recovery EAT (AEAT) were negatively correlated.
Hypothesis Testing

Hypothesis 1. The first hypothesis stated that body satisfaction for participants with current eating disorder symptomology would be the lowest and eating disorder symptomology would be the highest after viewing the pro-anorexia Tumblr page; body satisfaction would be the highest and eating disorder symptomology would be the lowest after viewing the pro-recovery Tumblr page; and body satisfaction and eating disorder symptomology would have no significant changes after viewing the home decoration Tumblr page.

A repeated measures MANOVA was completed to evaluate this hypothesis. There was a significant omnibus multivariate effect, $F(4, 54) = 3.17$, $p = .021$, $\Lambda = .66$. Mauchly’s Test of Sphericity indicated that the assumption of Sphericity was violated for both measures ($p$’s < .001). A Greenhouse-Geisser adjustment was used for the EAT ($\varepsilon = .54$) and the BAS ($\varepsilon = .57$). The univariate analyses indicated that were significant differences between the three conditions on the EAT score, $F(1.11, 70.79) = 7.08$, $p = .008$, $\eta^2_p = .10$. Results revealed that there were non-significant differences on scores on the BAS across the three conditions, $F(1.32, 84.50) = 1.79$, $p = .183$, $\eta^2_p = .03$. LSD pairwise comparisons indicated that there was a significant difference between scores on the EAT for the pro-anorexia and pro-recovery conditions ($p = .028$), but nonsignificant differences between pro-anorexia and home décor conditions ($p = .068$) and pro-recovery and home décor conditions ($p = .067$). For individuals in the eating disorder group, viewing the pro-anorexia content was associated with a greater mean EAT score compared to pro-recovery content ($d = .54$). In summary, individuals who meet eating
disorder diagnostic criteria reported higher eating disorder symptomology after viewing the pro-anorexia Tumblr page.

**Hypothesis 2.** The second hypothesis stated that participants who did not meet criteria for an eating disorder would show no significant changes in body satisfaction or eating disorder symptomology after viewing the three Tumblr pages. To evaluate this hypothesis, a within univariate test was completed. There was a non-significant omnibus multivariate effect, $F(4, 198) = 2.19, p = .072, \Lambda = .04$.

**Hypothesis 3.** The third hypothesis stated that participants who had eating disorder symptomology would have lower overall body satisfaction and higher overall eating disorder symptomology in comparison to participants with no current eating disorder symptomology when viewing the pro-anorexia webpages. A mixed model MANOVA was completed. Results indicated that were significant interaction effect between groups and conditions, $F(4,61) = 3.28, p = .017, \Lambda = .82$. Mauchly’s assumption for Sphericity was violated for both measures ($p$’s < .001), therefore, a Greenhouse-Geisser adjustment was used to assess for differences on the EAT ($\varepsilon = .55$) and BAS ($\varepsilon = .66$). There were significant differences between groups across conditions on the EAT, $F(1.11,70.79) = 7.08, p = .008, \eta_p^2 = .10$, but not on the BAS, $F(1.32,84.50) = 1.79, p = .183, \eta_p^2 = .03$.

One-way ANOVAs were conducted to detect differences between groups for each condition on the EAT, separately. The Levene’s test indicated that assumption of homogeneity between groups was violated in the pro-anorexia condition ($p = .015$), so a Welch’s F-test was completed to adjust for non-homogeneity of variance. It found a significant difference between groups, $F(1,17.14) = 11.86, p = .003, d = 1.32$, and there
was a large effect. The ANOVAs were nonsignificant for the pro-recovery condition, $F(1,64) = 0.02, p = .884$, and the home decoration condition, $F(1,64) = 0.37, p = .545$. This revealed that there were significantly higher scores for participants in the eating disorder group on the EAT after viewing the pro-anorexia Tumblr page.
Discussion

The purpose of this study was to examine the effect of viewing pro-anorexia content on body satisfaction and eating disorder symptomology amongst individuals meeting diagnostic criteria for an eating disorder. In order to examine the effect of pro-anorexia content on body satisfaction and eating disorder symptomology, an experimental study was conducted. Participants were separated into two groups, eating disorder and non-eating disorder, and they were randomly assigned to an order of viewing three conditions: Tumblr pages featuring pro-anorexia content, pro-recovery content, and control (non-eating disorder-related) content. They were assessed on the Body Assessment Scale (BAS) and the Eating Attitudes Test (EAT) after viewing each Tumblr page for 10 minutes.

Hypothesis One

The first hypothesis stated that body satisfaction for participants with current eating disorder symptomology would be the lowest and eating disorder symptomology would be the highest after viewing the pro-anorexia Tumblr page, body satisfaction would be the highest and eating disorder symptomology would be the lowest after viewing the pro-recovery Tumblr page, and body satisfaction and eating disorder symptomology would have no significant changes after viewing the control Tumblr page. This hypothesis was partially supported. Results indicated that there were no significant differences in scores on the BAS after viewing the three conditions for individuals in the eating disorder group. However, results indicated that there were significant differences on the EAT scores for the pro-anorexia and pro-recovery conditions for individuals in the
eating disorder group. Individuals who meet eating disorder diagnostic criteria reported higher eating disorder symptomology after viewing the pro-anorexia Tumblr page.

Previous literature conflicts with the findings that body satisfaction was not significantly affected by viewing the three webpages. In Groesz and colleagues’ 2002 study, body image was shown to be significantly more negative after viewing images of thin models than after viewing the control conditions of images of average sized models, plus-sized models, and inanimate objects (Groesz et al., 2002). These findings could be explained by the use of thin models instead of the use of pro-anorexia content. The use of pro-anorexia content on college-aged females in this study as opposed to images of thin models could have yielded different results because of the lack of thin-model bodies that have been shown to contribute to decreased body satisfaction.

Bardone-Cone and Cass (2007) found that participants had greater negative affect, lower self-esteem, and lower appearance self-efficacy after viewing the pro-anorexia website than those in the control groups (Bardone-Cone & Cass, 2007). Participants in the pro-anorexia condition were found to show an increase in eating disorder symptomology after viewing the webpage (Bardone-Cone & Cass, 2007). Similar findings were found in the current study. Participants with eating disorder symptomology had an increase in eating disorder symptomology on the EAT-26 after viewing the pro-anorexia webpage.

Delforterie and colleagues (2014) found that participants exposed to pro-anorexia content reported lower body satisfaction on body satisfaction scales than those exposed to the other conditions. These findings could be explained by the geographical area that the study took place. This study took place in Europe, which could have impacted the
differences in findings in the United States. There also could have been differences due to the differences in procedures. In the current study, participants viewed every condition, whereas in the Delforterie and colleagues 2014 study, participants viewed one randomly assigned condition. Participants were also given the freedom in the Delforterie and colleagues 2014 study to view a variety of orders, whereas, in the current study, participants were instructed to view content in a specific order.

**Hypothesis Two**

The second hypothesis stated that participants who did not meet criteria for an eating disorder would show no significant changes in body satisfaction or eating disorder symptomology after viewing the three Tumblr pages. This hypothesis was supported. Participants in the non-eating disorder group had no significant changes on the BAS or the EAT after being exposed to the three conditions. Due to the infancy of pro-anorexia experimental research, there is little research on the effects of viewing pro-anorexia on body satisfaction and eating disorder symptomology. There have been no studies that examine the effects of pro-anorexia exposure on those diagnosed with an eating disorder and those not meeting diagnostic criteria for an eating disorder. Exposure studies examining the effects of eating disorders on women who had not been separated into conditions (eating disorder and no eating disorder) found that viewing pro-anorexia content resulted in greater negative affect, decreased self-esteem, and lower appearance self-efficacy, and body dissatisfaction when compared to viewing the control groups (Bardone-Cone & Cass, 2007; Delforterie et al., 2014). These similarities support the findings of increased eating disorder symptomology after viewing pro-anorexia content in this study.
Hypothesis Three

The third hypothesis stated that participants who had eating disorder symptomology would have lower overall body satisfaction and higher overall eating disorder symptomology in comparison to participants with no current eating disorder symptomology. This hypothesis was partially supported. Results indicated that there were significant interactions between the eating disorder group and non-eating disorder group on the EAT after viewing the pro-anorexia condition. There is no previous research on pro-anorexia exposure between those diagnosed with an eating disorder and those not meeting diagnostic criteria for an eating disorder. However, researchers have found that viewing pro-anorexia caused an increase in eating disorder behaviors and body dissatisfaction amongst viewers (Bardone-Cone & Cass, 2007; Delforterie et al.,2014).

Overall, the results of this study indicate that viewing pro-anorexia content is associated with an increase in eating disorder symptomology in college-aged women who meet criteria for an eating disorder. These findings indicate a need for stricter controls on pro-anorexia content online, explicit warnings on content on the dangers of viewing this content, and more education on the danger of viewing this content. If individuals are made more aware of the dangers of viewing pro-anorexia content, it could reduce the severity the disorder has on sufferers.

Limitations

Limitations of this study consist of deletion of participant data due to missing data, unequal sample sizes between the two groups, content deletion, varying viewing speeds, and a female, college-aged sample. The first limitation of this study, like most studies pertaining to eating disorders, was the aspect of missing data, which may have
resulted in inaccurate or incomplete results. Because of missing data, 12 participants were excluded from data analysis. The second limitation of this study was the unequal sample sizes between the eating disorder and non-eating disorder group. There were 15 participants in the eating disorder group, which accounted for 23% of the analysis sample, whereas 6% of women on campuses report problems with anorexia or bulimia (Schweitzer & Choate, 2018). However, 25% to 40% report moderate eating, weight, and body shape–related problems such as body image worries, weight management behaviors, and out-of-control eating (Schweitzer & Choate, 2018).

A third limitation for this study was the deletion of existing content due to the content being reported on Tumblr. Because the study featured current pro-anorexia content, there were some posts that were deleted by Tumblr due to the explicit content featured. This resulted in some of the content being missing. This could have resulted in decreased scores on the EAT or increased scores on the BAS because not every participant was able to see the content that was deleted.

A fourth limitation of this study was the varying amount of time it took participants to look at all of the images. Some participants took the entire 10 minutes to view the content, whereas others looked through the content in less time. If participants took less than 10 minutes, they were prompted to continue looking at the content that they had already seen, which could have impacted results by not having an equal viewing time of content and having some duplicate exposure to the content.

Lastly, the lack of diversity of participants could have impacted the findings from this study. All of the participants were females from Western Kentucky University, a
majority of whom were Caucasian freshman. A more diverse sample may have led to different findings in the study.

**Implications**

Results from this study showed that exposure to pro-anorexia content led to increased eating disorder symptomology amongst individuals meeting criteria for an eating disorder. This reveals a need to decrease access to pro-anorexia content, and the need for community education on the dangers of individuals prone to eating disorder symptomology viewing pro-anorexia content.

These findings suggest a possible need to implement prevention strategies and regulations on pro-anorexia content. Implementation of awareness strategies for the danger of pro-anorexia content and stricter controls on pro-anorexia content online are thought to lessen the risk of the increase in the severity of eating disorder symptomology amongst sufferers. If access to pro-anorexia content is inhibited or limited, there may be a decrease in the longevity of eating disorders or the development of eating disorders altogether. There are current steps being taken to alleviate content, but there is more work to be done to assist with the deletion and prevention of this dangerous content.

**Directions for Future Research**

A recommendation for future research includes expanding the sample size of the study in the number of participants, as well as the number of individuals in the eating disorder group to examine if more participants result in significant effects on the BAS. It is recommended to examine participants in other geographical locations, as well as with a more diverse sample age. Lastly, it is recommended that future research examines the
longitudinal effect of viewing pro-anorexia content over time to examine long-term effects of pro-anorexia content on body satisfaction and eating disorder symptomology.

Conclusions

After 10 minutes of exposure to pro-anorexia content, individuals with eating disorders reported worsening eating disorder symptoms. This content is a serious problem with an explicit impact on the health of girls and women who suffer with eating disorders. Warnings against content and deletion of current content is vital to help alleviate the longevity and development of these life-threatening disorders.
References

Americans and weight: Moving the goalposts. (2013). *PT in Motion, 5*, 10.


APPENDIX A

Participant Questionnaire and Characteristics

Please complete the following information:

Age in years: ______________

Gender:

- Male
- Female
- Other_________________

Education Level:

- Freshman
- Sophomore
- Junior
- Senior
- Graduate Student
- Other___________

Race/Ethnicity:

- Caucasian
- African American
- Hispanic/Latino
- Asian
- Other___________

Relationship Status:

- Married
- Divorced
- Widowed
- Separated
- Single
- Dating
- Cohabiting
- Other_____________

Sexuality:

- Homosexual
- Heterosexual
- Bi-sexual
- Asexual
- Pansexual
- Other___________

Do you view Tumblr?

- Yes
  - How often?: ____________________________

- No
**Researcher will take measurements**

Height in feet/inches: ______________

Weight in lbs.: ______________
APPENDIX B

Previously Diagnosed Participant Survey

1. I have been diagnosed with an eating disorder, or I believe that I have had an eating disorder in the past, or I currently have an eating disorder:

   Yes          No

If answered Yes, continue with the rest of this page. If answered No, please skip to the next page.

2. Age that eating disorder was diagnosed: ____________

3. Type of eating disorder. Circle all that apply.
   Anorexia Nervosa (Binge-Eating/Purging Type)
   Anorexia Nervosa (Restricting Type)
   Bulimia Nervosa
   Binge-Eating Disorder
   Other Specified Feeding or Eating Disorder
   Other: ______________________________

4. Have you ever been hospitalized for an eating disorder? If Yes, when and how many times?
   Yes Number of times: ______________________
   No

5. If you were hospitalized for an eating disorder, how long were you in the hospital?
   ______________________________________

6. Have you ever been in therapy for an eating disorder? If Yes, for how long and what type(s) of treatments did you receive?
   Yes Duration: ______________________
   Type of treatment: ______________________
   No

7. Have you been diagnosed with other mental health disorders other than an eating disorder? If Yes, please list disorder(s) below:

8. What medications are you currently taking?
### APPENDIX C

**Eating Disorder Diagnostic Scale**

**EATING SCREEN**

Please carefully complete all questions.

<table>
<thead>
<tr>
<th>Over the past 3 months…</th>
<th>Not at all</th>
<th>Slightly</th>
<th>Moderately</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Have you felt fat?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. Have you had a definite fear that you might gain weight or become fat?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. Has your weight influenced how you think about (judge) yourself as a person?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. Has your shape influenced how you think about (judge) yourself as a person?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

5. During the past 6 months have there been times when you felt you have eaten what other people would regard as an unusually large amount of food (e.g., a quart of ice cream) given the circumstances? YES NO

6. During the times when you ate an unusually large amount of food, did you experience a loss of control (feel you couldn't stop eating or control what or how much you were eating)? YES NO

7. How many DAYS per week on average over the past 6 MONTHS have you eaten an unusually large amount of food and experienced a loss of control? 0 1 2 3 4 5 6 7

8. How many TIMES per week on average over the past 3 MONTHS have you eaten an unusually large amount of food and experienced a loss of control? 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

**During these episodes of overeating and loss of control did you…**

9. Eat much more rapidly than normal? YES NO

10. Eat until you felt uncomfortably full? YES NO

11. Eat large amounts of food when you didn't feel physically hungry? YES NO

12. Eat alone because you were embarrassed by how much you were eating? YES NO

13. Feel disgusted with yourself, depressed, or very guilty after overeating? YES NO

14. Feel very upset about your uncontrollable overeating or resulting weight gain? YES NO

15. How many times per week on average over the past 3 months have you made yourself vomit to prevent weight gain or counteract the effects of eating? 0 1 2 3 4 5 6 7 8 9

16. How many times per week on average over the past 3 months have you used laxatives or diuretics to prevent weight gain or counteract the effects of eating? 0 1 2 3 4 5 6 7 8 9

17. How many times per week on average over the past 3 months have you fasted (skipped at least 2 meals in a row) to prevent weight gain or counteract the effects of eating? 0 1 2 3 4 5 6 7 8 9

18. How many times per week on average over the past 3 months have you engaged in excessive exercise specifically to counteract the effects of overeating episodes? 0 1 2 3 4 5 6 7 8 9

20. How tall are you? Please specify in inches (5 ft. = 60 in.).

21. Over the past 3 months, how many menstrual periods have you missed?

22. Have you been taking birth control pills during the past 3 months?

SCORING:

EDDS: Stice et al., 2004
## APPENDIX D

### Body Assessment Scale

The following are some areas in which people tend to be concerned about their bodies. Please circle the number that corresponds to how positive or negative you feel about each of the areas.

<table>
<thead>
<tr>
<th>Area</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Weight</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. Face (appearance)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. Body Shape</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. Thighs</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. Upper Body Strength</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. Waist</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. Reflexes</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. Health</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. Shoulders</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. Physical Stamina</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. Agility</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. Biceps</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. Lower Body Strength</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Lorenzen et al., 2004
APPENDIX E

Eating Attitudes Test-26

Instructions: Please fill out the below form as accurately, honestly and completely as possible. There are no right or wrong answers. All of your responses are confidential.

Part A: Complete the following questions:

Height (Feet and Inches):

Current Weight (lbs):

Highest Weight (excluding pregnancy) (lbs):

Lowest Adult Weight (lbs):

Ideal Weight (lbs):

Part B: Please check a response for each of the following statements:

<table>
<thead>
<tr>
<th></th>
<th>Always</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I am terrified about being overweight.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>I avoid eating when I am hungry.</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>3.</td>
<td>I find myself preoccupied with food.</td>
<td></td>
<td></td>
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<tr>
<td>4.</td>
<td>I have gone on eating binges where I feel that I may not be able to stop.</td>
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<td></td>
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<tr>
<td>5.</td>
<td>I cut my food into small pieces.</td>
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<tr>
<td>6.</td>
<td>I am aware of the calorie content of the foods that I eat.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>7.</td>
<td>I particularly avoid food with a high carbohydrate content (i.e. bread, rice, potatoes, etc.)</td>
<td></td>
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<tr>
<td>8.</td>
<td>I feel that others would prefer if I ate more.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>9.</td>
<td>I vomit after I have eaten.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>10.</td>
<td>I feel extremely guilty after eating.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>11.</td>
<td>I am preoccupied with a desire to be thinner.</td>
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<tr>
<td>12.</td>
<td>I think about burning up calories when I exercise.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>13.</td>
<td>Other people think that I am too thin.</td>
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<td></td>
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<tr>
<td>14.</td>
<td>I am preoccupied with the thought of having fat on my body.</td>
<td></td>
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<tr>
<td>15.</td>
<td>I take longer than others to eat my meals.</td>
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<td>---</td>
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<tr>
<td>16. I avoid foods with sugar in them.</td>
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<tr>
<td>17. I eat diet foods.</td>
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<td></td>
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<tr>
<td>18. I feel that food controls my life.</td>
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<td></td>
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<tr>
<td>19. I display self-control around food.</td>
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<tr>
<td>20. I feel that others pressure me to eat.</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. I give too much time and thought to food.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. I feel uncomfortable after eating sweets.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>23. I engage in dieting behavior.</td>
<td></td>
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<tr>
<td>24. I like my stomach to be empty.</td>
<td></td>
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</tr>
<tr>
<td>25. I have the impulse to vomit after meals.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. I enjoy trying new rich foods.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Part C:

Behavioral Questions:

In the past 6 months have you:

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Once a month or less</th>
<th>2-3 times a month</th>
<th>Once a week</th>
<th>2-6 times per week</th>
<th>Once a day or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Gone on eating binges where you feel that you may not be able to stop?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>*Defined as eating much more than most people would under the same circumstances and feeling that eating is out of control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Made yourself sick (vomited) to control your weight or shape?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Used laxatives, diet pills or diuretics (water pills) to control your weight or shape?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Exercised more than 60 minutes a day to lose or to control weight?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Lost 20 pounds or more in the past 6 months?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EAT-26: Garner et al. 1982
APPENDIX F

Tumblr Pages

Pro-Anorexia
   Link: wkuwebsiteA.tumblr.com
   Password: proana1

Pro-Recovery
   Link: wkuwebsiteB.tumblr.com
   Password: prorecovery1

Home Decoration
   Link: wkuwebsiteC.tumblr.com
   Password: homedecor1
APPENDIX G

Tumblr Page Satisfaction Questionnaire

Answer the following questions on the scale below ranging from 1 (strongly disagree) to 5 (strongly agree).

What webpage did you view?

<table>
<thead>
<tr>
<th>Website A</th>
<th>Website B</th>
<th>Website C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I liked the webpage that I was shown.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>2. This webpage made me feel worse about my body.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>3. The webpage I was shown was negative</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>4. I would look at this webpage again in the future.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>5. I would not recommend this webpage to a friend.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>6. I like the content on the webpage.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>7. I would like to have the link to this webpage.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>8. This was a good webpage.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>9. I wish that I looked like the women on the webpage.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX H

Informed Consent Document

INFORMED CONSENT DOCUMENT

Project Title: An Experimental Study on the Effects of Pro-Anorexia Content on Eating Disorder Development
Investigator: Skyler Green, Department of Clinical Psychology
Email: Skyler.green659@topper.wku.edu

You are being asked to participate in a project conducted through Western Kentucky University. The University requires that you give your signed agreement to participate in this project. **You must be 18 years old or older to participate in this research study.**

The investigator will explain to you in detail the purpose of the project, the procedures to be used, and the potential benefits and possible risks of participation. You may ask any questions you have to help you understand the project. A basic explanation of the project is written below. Please read this explanation and discuss with the researcher any questions you may have.

If you then decide to participate in the project, please sign this form in the presence of the person who explained the project to you. You should be given a copy of this form to keep.

1. **Nature and Purpose of the Project:** The purpose of this study is to gain a better understanding of what factors influence symptoms of psychopathology. We want to know the effects of pro-anorexia content on the development of eating disorders.

2. **Explanation of Procedures:** You will be weighed and measured by the researcher during the first session of this study. You will be asked to respond to several questions that evaluate your experience with eating disorders and body satisfaction. You will be asked to view a Tumblr page that features pro-anorexia, pro-recovery, and home decoration content. The surveys assessing these topics are explicit and cover a number of different areas. Including these questionnaires and Tumblr pages was done in order to evaluate the variability of symptoms and causal factors that contribute to eating disorder development. This study will require you to attend three sessions, and each session should last approximately 40 minutes. You will receive a $10 Walmart gift card after you complete the last session.

3. **Discomfort and Risks:** Some people may have strong reactions to the questionnaires and images shown. If you do, please stop filling out the survey and let your researcher know.
4. **Benefits:** This study will contribute to the research on causation of eating disorder symptomology. Data gathered will help add to the limited knowledge of pro-anorexia content in order help decrease eating disorder development.

5. **Confidentiality:** The responses that you provide will be kept completely anonymous. Neither your name, nor any identifying information, will ever be associated with any of the data that you generate today. Nor will the researcher ever identify you in any report of this research. Your data will be combined with the data of others and submitted for presentation at a conference and/or publication in scholarly journals, but your individual responses will remain anonymous.

6. **Refusal/Withdrawal:** Refusal to participate in this study will have no effect on any future services you may be entitled to from the University. Anyone who agrees to participate in this study is free to withdraw from the study at any time with no penalty.

*You understand also that it is not possible to identify all potential risks in an experimental procedure, and you believe that reasonable safeguards have been taken to minimize both the known and potential but unknown risks.*

__________________________________________  ______________
Signature of Participant                       Date

__________________________________________  ______________
Witness                                         Date

THE DATED APPROVAL ON THIS CONSENT FORM INDICATES THAT THIS PROJECT HAS BEEN REVIEWED AND APPROVED BY THE WESTERN KENTUCKY UNIVERSITY INSTITUTIONAL REVIEW BOARD
Paul Mooney, Human Protections Administrator
TELEPHONE: (270) 745-2129
APPENDIX I

Debriefing Form

Thank you for your participation in this study. Your answers to the survey will be used to further research in eating disorder development, treatment, and prevention.

This study is concerned with the development of unwanted thoughts and actions due to participation in the study. If this study caused unwanted thoughts about body image or dissatisfaction, please see the contacts provided below.

The Counseling and Testing Center:
Potter Hall, 409
Phone: 270-745-3159

The Psychology Training Clinic
Gary Ransdell Hall, Rm 1035
Phone: 270-745-2696

The Eating Disorder Support Group:
Every Monday
5:30 pm to 7:00 pm
The Alive Center
(270) 535-7653
Open to men and women

The Eating Disorder Helpline:
The National Eating Disorders Association
Phone: 800-931-2237
Hours: Monday through Friday 8:30 am to 4:30 pm

Thank you again for your participation.