CYBERBULLYING ON FACEBOOK: HOW DOES IT INFLUENCE THE RISK FOR

EATING DISORDERS?

A Thesis Presented to

The Faculty of the Department

Of Health and Human Performance

University of Houston

In Partial Fulfillment

Of the Requirements for the Degree

Master of Science

By

KEISHA R.HARRISON

May, 2015

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An Abstract of a Thesis

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ABSTRACT

Social media sites, like Facebook, merge two components that influence the risk for eating disorders: media and peer evaluations. To date, a limited number of studies have examined the relationship between Facebook activity and eating disorder behavior and attitudes; and even fewer studies have examined the influence of cyberbullying on eating pathology. This study sought to elaborate upon the associations between cyberbullying, Facebook activity, and disordered eating attitudes and behavior. College-age women, 18-26 years old, were asked to complete an online self-report questionnaire in approximately 20 minutes. The questionnaire consisted of items from the Cyberbullying Scale, EAT-26, and Facebook Activity scale. After confirming the validity and reliability of the Cyberbullying and Facebook Activity scales, hierarchical regression models were used to evaluate the moderation effect of cyberbullying on Facebook use and eating attitudes and behaviors. Results indicated that social and verbal cyberbullying strengthened the relationship between general Facebook activity and eating attitudes and behavior (including bulimia & food preoccupation and dieting) at lower levels (1-SD below mean) of Facebook activity.

Key words: eating disorder, social media, Facebook, cyberbullying, body image

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Introduction

Prevalence of eating disorders: then and now

The common retort to the epidemiological claim that eating disorders (ED) are rare within the United States is that individuals afflicted with an eating disorder often conceal their illness and avoid professional help. Older epidemiological studies, that have used psychiatric case registers or medical records from hospitals, grossly underestimate the occurrence of eating disorders amongst the general population (Smink, Hoeken, & Hoek, 2012). Recent studies, utilizing a more expansive two-stage screening approach, have reported prevalence rates of eating disorders as high as 7-21% within the general population and primary care settings (Smink, Hoeken, & Hoek, 2012; Dooley-Hash et al, 2012). Improved insight into the scope of these disorders among young adults in the United States underlines the perils of the co-morbidities and the significance of the 5% lifetime prevalence rate (Treasure, Claudino, & Zucker, 2010) among all eating disorders. Improvements in screening methods and developments in comorbidity research have contributed to the enhanced detection of ED cases through secondary diagnoses (Zhao & Encinosa, 2011). Consequently, a greater number of healthcare services are used by patients with ED (Striegel-Moore et al., 2000), making disordered eating a crisis that merits attention.

Anorexia nervosa (AN), bulimia nervosa (BN), and binge eating disorder (BED) are the three eating disorders specified in the Diagnostic and Statistical Manual of Eating Disorders Fifth Edition (DSM-IV). AN, which primarily affects adolescent girls and young women, is characterized by body dysmorphia and restrictive dieting that leads to severe weight loss with a pathological fear of becoming "fat". Meanwhile, BN is characterized by frequent episodes of binge eating followed by inappropriate behavior such as self-induced vomiting to avoid weight

gain. The relatively high prevalence rate of ED not otherwise specified (EDNOS), in comparison to AN and BN, contributes to the categorization of BED in the most recent DSM. BED is defined as recurring episodes of eating significantly more food in a short period of time than most people would eat under similar circumstances, followed by feelings of lack of control. In the DSM-V, amenorrhea is no longer a required symptom of AN; and the minimum frequency of binge eating and purging has been reduced from twice a week to once a week in the BN criteria (Attia, et al., 2013). These revisions are of clinical significance because they distinguish overeating from pathological binge eating, and provide more flexibility on AN and BN diagnoses.

ED, along with the co-occurrence of substance use disorder (SUD), has the highest rate of mortality of any psychiatric disorder (Dooley-Hash et al, 2012). Meta-analysis studies have found that all EDs have an elevated mortality risk; AN being the most striking (Smink, Hokken, & Hoek, 2012). Dooley-Hash et al (2012) reported that 0.51% of annual deaths are related to AN, 0.17% to BN, and 0.331% to EDNOS. Numerous studies have linked the excessive mortality rates with suicide. According to Arcelus (2011), 25% of AN-related deaths are due to suicide. It has been reported that nearly one-third of patients with ED will attempt suicide at some point during their illness (Pompili et al, 2006; Keel, et al., 2003). The morbid implications of the onset of an eating disorder have bolstered a breadth of investigations into the risk factors of ED development. A literature review of relevant material has revealed that a majority of these exploratory studies define ED risk factors in accordance with two theoretical models: the sociocultural model and the interpersonal formulation model.

Socio-cognitive risk factors

ED are collectively characterized as a psychiatric condition with the following core features: the compulsive control of body shape, weight, and eating (Rieger et al., 2010). The social contribution to the "drive of thinness" has been well-documented as an influential component in the development of eating disorders. In Western cultural settings, lean body mass and dietary restriction are highly esteemed. Social status based upon thinness is especially pronounced in societies where a majority of individuals struggle with excess weight (Rieger et al., 2010). A consequence of this standard is a society rampant with normative discontent. It is recommended that clinicians take into account the sociocultural model when trying to understand body image disturbances among patients at with ED.

A vast majority of body image research has focused on body dissatisfaction because it is a major determinant of ED. Recent studies expand upon the prevalence of body dissatisfaction among the general population. Meta-analysis studies have shown body dissatisfaction to be related to a wide range of non-clinical morbidities, including: nicotine addiction, decreased mental health, decreased sexual functioning, and lower physical functioning (Fiske et al., 2014). The perils of body dissatisfaction are a matter of great concern; body dissatisfaction is a well-established risk factor for disordered eating behaviors and attitudes. Within the past few decades, studies have focused on the mechanism behind the eating behaviors & attitudes and body dissatisfaction correlate. Body dissatisfaction was reported to mediate the relationship between dietary restraint and bulimic eating behaviors (Ricciardelli et al, 1997). In addition, Welch et al (2009) found that drive for perfection is a partial mediator in the relationship between eating attitudes and body dissatisfaction.

"Thinspiration" on the web

Within the past few years, ED studies have begun to direct attention towards the relationship between social media and eating behavior and attitudes. Smith et al (2012) found that body dissatisfaction partially mediated the relationship between maladaptive Facebook use (defined as the tendency to pursue negative social evaluations on Facebook) and bulimic symptoms. This finding is consistent with a group of studies that have examined ED behaviors in regards to the interpersonal formulation theory (Figure 1). According to the theory, individuals faced with negative social evaluations may engage in disordered eating in an attempt to repair low self-esteem (Reiger et al, 2010). With the advent of social media as a readily-accessible and fast-paced macrocosm for social interactions, the association between social media and eating behaviors has developed as a worthy topic of study. In addition to direct social evaluations, Rieger et al (2010) postulated that indirect negative social interactions may contribute to body dissatisfaction and disordered eating behavior. Social media websites, such as Facebook, provide peers with a continuous and expedited means for exchanging social evaluations. Within seconds, individuals connected through a social network may exchange comments and photographs. New media merges two forms of social influences linked to risk for developing eating disorders: peer influence and media exposure (Mabe, Forney, & Keel, 2014). The widely accepted sociocultural theory contends that thin-beauty ideals for women are transmitted powerfully through the media (Ward & Hyde, 2008). Additionally, a vast number of studies have found that peers influence disordered eating behavior (Keel et al., 2013, Zalta & Keel 2006). Despite the pervasiveness of these risk factors by social media sites, there is a limited number of studies that examine the relationship between social media networks and eating habits. A majority of behavioral literature

on Facebook is related to bullying. Meanwhile, there is no study to date that has investigated how cyberbullying interacts with Facebook activity to predict disordered eating habits.

Cyberbullying and body dissatisfaction

Cyberbullying encompasses relational and indirect forms of bullying (Underwood, 2003). Research has shown the association between experiences of being bullied, disordered eating behavior (Engstrom & Norring 2002), and psychopathology, including body dissatisfaction, low self-esteem, and depression (Falkner et al., 2002). Additionally, Farrow and Fox (2008) found that bullying may negatively impact weight and shape-related attitudes in both men and women. Facebook appears to be a major outlet for negative peer interactions such as receiving nasty messages, insults, and threats. Kwan & Skoric (2013) reported that Facebook bullying is relatively common, with 59.4% of users reporting at least one bullying experience in the past year, and 56.9% of users engaging in one form of Facebook bullying. A number of studies further suggest that adverse experiences, such as bullying and teasing, play a role in the development of shame and binge eating. Cyberbullying carries just as many negative implications, and in some situations is perceived as worse, as traditional bullying. The frequency of cyberbullying on Facebook may contribute to the body dissatisfaction shown to be associated with Facebook use. Furthermore, cyberbullying may moderate the relationship between eating attitudes and Facebook activity.

Measuring cyberbullying and its effect on body image

After a review of the literature, three questionnaires were selected for use because of their relevance to social bullying and Facebook usage. To analyze the whole range of bullying, Fox & Farrow (2008) compiled 16 items from previously published scales to measure three factors of

bullying: verbal, physical, and social. The self-report bullying questionnaire showed good internal reliability (Cronbach's α=.85, .77, .87) and validity (chi-squared=44.76, p< 0.001). Fox and Farrow's (2008) bullying scale was designed to measure a complete range of bullying experiences: physical, verbal, and social. Current cyberbullying scales fail to distinguish between social and verbal factors; therefore we will utilize a modified version of the bullying scale to fully measure the cyberbullying experience. Meanwhile, to examine the relationship between Facebook use and factors of psychological well-being, Ellison et al (2007) created the Facebook Intensity Scale. More specifically, this scale was designed to measure engagement in Facebook-related activities, in contrast to general temporal measurements. The 8-item self-report questionnaire was shown to have good reliability (Cronbach's α= .83) but was not tested for validity. The speedy evolution of Facebook may have rendered some original items irrelevant, so the scale will be modified for our study. Another Facebook questionnaire, Facebook Survey, was developed by Mabe, Forney, & Keel (2014) to understand the manner in which and how often participants accessed and engaged in Facebook activities that relate to body dissatisfaction, such as comparing self-images to peer-images. Eight items were used to calculate a "Facebook Score", which measures the importance and frequency of Facebook features posited to heighten weight and shape concerns. Individuals who are strongly interested in the number of photo comments garnered from friends, for example, have a heightened Facebook Score. The Facebook Survey was shown to have a good reliability (Cronbach's alpha= 0.85); but validity measures were not reported. Items from both Facebook questionnaires were combined to generate a scale that measures the use of all Facebook activity, including those that are associated with heightened weight concerns. A confirmatory factor analysis was used to confirm that each individual item measures the intended Facebook construct.

Statement of Purpose

The main objective of this study is to examine the relationship between cyberbullying, eating disorder attitudes, and social media behavior. It is hypothesized that cyberbullying moderates the correlation between Facebook activity, such as posting and untagging photos, and eating disorder attitudes. In order to properly measure cyberbullying and Facebook activity, among participants, a bullying scale and a Facebook activity scale will be developed based upon the existing measures. The Bullying Scale (Fox & Farrow, 2008) will be adapted for applicability in a social media setting. In doing so, the physical bullying factors will be removed from the scale; and the verbal and social factors will be rewritten to include "social-media websites" as a condition. Furthermore, individual items from the Facebook Intensity Scale (Ellison et al., 2007) and the Facebook Scale (Mabe, Korney, & Keel, 2014) will be examined for convergent and discriminant validity. The scales will then be used to measure social media activity and cyberbullying exposure among study participants. These values will be analyzed in conjunction with eating attitude measures, using the EAT-26, to evaluate the mechanistic relationship between the study variables (Figure 2). The recent domination of global culture by social media underlines the significance of this study. As cyberbullying and "thinsipirational" images proliferate in online communities, it has become increasingly important to understand how Facebook interactions affect body image and the associated eating attitudes. Insight gained from this study may be used to develop intervention programs aimed at dissociating the negative peer evaluations, such as cyberbullying, from negative self-esteem.

Although there is an increasing amount of research available on the correlations between eating disorder behavior and attitudes and Facebook usage, little is known about the mechanistic

relationship. The interpersonal model for eating disorders strongly suggests that negative social evaluation, as can be seen in bullying, places individuals at risk for developing eating disorders. Cyberbullying, enhanced by online anonymity and a wide audience, is a prominent and potent threat to Facebook users. Therefore it is of significance to explore the relationship between bullying, Facebook activity, and eating disorder attitudes.

Research Questions

Part One: Cyberbullying and Facebook usage scales

1. Is the Cyberbullying Scale a valid and reliable measure of social and verbal cyberbullying?

2. Is the Facebook Activity Scale a valid and reliable measure of general and appearance-centric Facebook activity?

Part Two: Relationship between cyberbullying, Facebook activity, and eating attitude

3. Does cyberbullying (social and verbal) moderate the relationship between Facebook usage and food preoccupation and bulimia?

4. Does cyberbullying (social and verbal) moderate the relationship between Facebook usage and dieting?

5. Does cyberbullying (social and verbal) moderate the relationship between Facebook usage and oral control?

6. Does cyberbullying (social and verbal) moderate the relationship between Facebook usage and eating attitudes and behavior?

Research Hypotheses

Part One: Cyberbullying and Facebook usage scales

H_1: The new cyberbullying scale is a valid and reliable measure of social and verbal cyberbullying.

H_2: The Facebook usage scale is a valid and reliable measure of Facebook activity.

Part Two: Relationship between cyberbullying, Facebook activity, and eating attitude

H_3: Cyberbullying (social and verbal) will moderate the relationship between Facebook usage and food preoccupation and bulimia.

3a: Social cyberbullying will moderate the relationship between Facebook usage and food preoccupation and bulimia, that is the interaction of more Facebook usage and social cyberbullying exposure will explain the variance in food preoccupation and bulimia above and beyond what is explained by Facebook usage and social cyberbullying.

3b: Verbal cyberbullying will moderate the relationship between Facebook usage and food preoccupation and bulimia, that is the interaction of more Facebook usage and verbal cyberbullying exposure will explain the variance in food preoccupation and bulimia above and beyond what is explained by Facebook usage and verbal cyberbullying.

H_4: Cyberbullying (social and verbal) will moderate the relationship between Facebook usage and dieting.

4a: Social cyberbullying will moderate the relationship between Facebook usage and dieting and bulimia, that is the interaction of more Facebook usage and social

cyberbullying exposure will explain the variance in dieting above and beyond what is explained by Facebook usage and social cyberbullying.

4b: Verbal cyberbullying will moderate the relationship between Facebook usage and dieting, that is the interaction of more Facebook usage and verbal cyberbullying exposure will explain the variance in dieting above and beyond what is explained by Facebook usage and verbal cyberbullying.

H5: Cyberbullying (social and verbal) moderate the relationship between Facebook usage and oral control.

5a: Social cyberbullying will moderate the relationship between Facebook usage and oral control, that is the interaction of more Facebook usage and social cyberbullying exposure will explain the variance in oral control above and beyond what is explained by Facebook usage and social cyberbullying.

5b: Verbal cyberbullying will moderate the relationship between Facebook usage and oral control, that is the interaction of more Facebook usage and verbal cyberbullying exposure will explain the variance in oral control above and beyond what is explained by Facebook usage and verbal cyberbullying.

H6: Cyberbullying (social and verbal) moderate the relationship between Facebook usage and eating attitudes and behavior.

6a: Social cyberbullying will moderate the relationship between Facebook activity and eating attitudes and behavior, that is the interaction of more Facebook usage and social cyberbullying exposure will explain the variance in eating attitudes and behavior above and beyond what is explained by Facebook usage and social cyberbullying.

6b: Verbal cyberbullying will moderate the relationship between Facebook usage and

eating attitudes and behavior, that is the interaction of more Facebook usage and verbal

cyberbullying exposure will explain the variance in eating attitudes and behaviorl above

and beyond what is explained by Facebook usage and verbal cyberbullying.

Literature Review

Sociocultural theory and eating disorders

Eating disorder may be an example of one of the many physical manipulations used by

women to obtain a desirable body shape. The female body has been described as a historical

artifact, indicative of the broad historical and social values of an era, aimed at physical and

symbolic representation (Ehrenrich & English, 1979). Body modifications, regulated by societal

norms, have been exercised by countless women across an array of cultures in the hopes of

achieving a beauty ideal. Female circumcisions, for example, have been reported with high

prevalence rates (>85% of adolescents and adult females) in several African countries, including:

Somalia, Guinea, Egypt, and Sudan (UNICEF report, 2013). Although, clitoridectomies have

been performed in an attempt to control epilepsy, hysteria, and sexual desire; there have been

sociocultural explanations for the widespread practice of female circumcisions. The patriarchal

Sudanese culture, where female circumcision is practiced by 88% of the female population,

associates the uncut genitalia with slaves and prostitutes (Barstow, 1999). The long-lived

Chinese custom of foot-binding is another example of a widely practiced form of body

modification. Chinese foot-binding rose in popularity around 900 AD and remained prominent

until the late-nineteenth century. Although the foot modification was crippling and malodorous,

it was esteemed as a beauty enhancer and was commonly used to convey an image of female attractiveness (Vento, 1998). A marriageable woman was to be "virtuous" and "pure", characteristics made tangible by a bound foot. The popularity of female body modification in response to social pressures is consistent with Michel Foucault's theories on human sexuality.

Foucault (1977) postulates that the "natural body has been lost in response to the demands made by cultural pressures, social norms, and behavioral patterns. As societies transition from a medieval political-economy to a modern system, power redistributes from a central arrangement to a diffused one". In response to the power-diffusion, the authority of the body, a force obtainable to by the general population, becomes a means to obtain and control power. This theory is consistent with cross-cultural prevalence reports, which find cases of eating disorders to be less common in pre-industrialized than post-industrialized countries (Anderson-Fye & Becker, 2004). Although Foucault has not explicitly discussed the role of the transition of power on female body modifications, feminist scholars have applied his concepts to the body transformations undergone specifically by women to thrive within a patriarchal society. According to Lois McNay (1992), Foucault's work on the body "indicates to feminists a way of placing a notion of the body at the center of explanations of women's oppression that does not fall back into essentialism or biologism". In other words, patriarchal societies have placed unrealistic demands on women, such that the "natural" female body has been manipulated by ideals. The association between the Western ideal of thinness and eating disorders has been well documented (Bordo, 1990). Thinness likely gained popularity in the early twentieth century in response to multiple overlapping cultural occurrences, including: the romanticization of tuberculosis, the institutionalization of American beauty through emerging media, and the standardization of clothing sizes (Brumburg, 1998; Bordo, 1993). The pervasiveness of thin-

images in conjunction with the power-beauty correlate encouraged women to compare themselves to media images and created a rationale for food restraint.

The sociocultural model explains how exposure to thin ideals contributes to the development of eating disorders (Stice & Agras, 1998). According to the sociocultural model, the internalization of thin body ideals produces body dissatisfaction which in turn leads to negative affect, excessive energy expenditure, and restrictive food behavior; further increasing the risk for eating disorder symptomatology. Furthermore, social sensitivity, "an unwarranted or excessive awareness to the feeling and actions of ones' peers", likely mediates sociocultural pressures and the internalization of thin beauty ideals (Boyce & Parker, 1989). Consequentially, females with high levels of social sensitivity are more likely to internalize perceived criticism and adopt pathological eating behaviors. Vander wal & Thomas (2004) found social sensitivity to be a strongly correlated with disturbed eating attitudes and behavior among Caucasian, African American, and Hispanic girls in the United States. The social contributions to eating disorder symptomatology suggest that interpersonal factors play a role in the development and maintenance of these conditions.

Interpersonal theory and eating disorder

American neo-Freudian psychiatrist, Henry Stack Sullivan, is credited for the development of the Interpersonal Personal Theory. In his 1954 publication, "The Interpersonal Theory of Psychiatry", Sullivan discusses the development of personality through the internalization of social interactions. The term "interpersonal" refers to the patterns of interaction between the individual and peers, and the process by which these interactions are internalized to create a self-image (Sullivan, 1953). In other words, personality and behavior can never be isolated from complex interpersonal relationships. The role of social interaction and interpersonal functioning

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on the maintenance of good mental health are tantamount. Involvement in secure and fulfilling

relationships is perceived by a majority of individuals to be as crucial as wellbeing and happiness

(Berscheld & Peplau, 1983).

Interpersonal theory (IPT) has been applied to the epidemiology study of many psychiatric

disorders, not limited to depression, anxiety, schizophrenia, autistic spectrum disorder, and ED

(Petty, Sachs-Ericsson, & Joiner, 2004; Sullivan & Allen, 1999, Fairburn, 1997). Such

psychiatric disorders have been strongly associated with interpersonal struggles. Consistent with

interpersonal theory model of eating disorders, there is an abundance of empirical evidence

highlighting the existence of interpersonal dysfunction in the lives of individuals with ED

(Rieger et al., 2009). Individuals with ED are more lonely, report lower competence, and

perceive lower social support than individuals without eating disorders (O'Mahony & Hollwey,

1995; Herzog et al., 1993).

A majority of what is understood about the role of interpersonal difficulties in ED is derived

from Interpersonal Psychotherapy (IPT). IPT initially developed as a short-term, outpatient

treatment for individuals with major depression (Klerman et al., 1994). IPT focuses on the

resolution of problems associated with four social domains: grief, interpersonal deficits,

interpersonal role disputes, and role transitions. Moreover, IPT has been successfully adapted to

treat a wide array of psychiatric disorders, including ED (Weissman et al., 2000). There is

support for the efficacy of treating individuals with ED by targeting interpersonal problems and

resolving psychological symptoms. IPT has been found to yield comparable recovery rates to

cognitive behavioral therapy (CBT) in the long-term for BN (Agras et al., 2000) and in both

short- and long-term for BED (Wilfrey et al., 2002). Research has also shown some of the

advantages that IPT has over CBT-based self-help for individuals with BED who have low self-

esteem and high eating disorder psychopathology (Wilson et al., 2010). Interpersonal theory evolved in the context of treatment outcome evaluations. In other words, although IPT has been shown to be a successful intervention tool, there is scant information about the theoretical basis behind the efficacy of IPT on treating ED. Recently, Rieger et al (2010) published an ED-specific theoretical model of interpersonal psychotherapy (IPT-ED). IPT-ED, a negative feedback model, proposes that negative social evaluation plays a pivotal role in the development and maintenance of eating disorder symptoms. Social factors, such as cultural values regarding eating, shape, and weight, influence levels of perceived peer acceptance, resulting in a positive or negative social evaluation. Negative social evaluation leads to the development of negative self-evaluation and associated negative affect, which may result in the onset of eating disorder behavior. As social evaluation worsens, ED behavior may be perceived by the individual as a more accessible source of esteem and affect regulation. As a result, disordered eating behavior increasingly supplements the constructive attempts to engaging in the social world (Rieger et al., 2010). The IPT-ED construct sets the theoretical basis for the effect that bullying and the thin-ideal has on the development of eating disorder symptoms. According to the IPT-model, negative peer experiences, such as bullying or teasing, contribute to the development of negative self-esteem. In situations of bullying, victims often feel social rejection, sentiments that contributed to a heightened sense of self-dissatisfaction and may lead to body dissatisfaction, depending upon the context of the teasing.

Implications of thin-media

It has been widely accepted that Western women are subject to a great deal of pressure to conform to the thin ideals of feminine beauty. As previously mentioned, sociocultural theory contends that the inordinate amount of thin ideals for women are transmitted through

sociocultural influences. Mass media has been identified as the most powerful and pervasive influence. The proliferation of images through advertisements, magazine, television, and the internet inundate women with a constant bombardment of beauty standards. Silberstein, Striegel-Moore & Rodlin (1987) attributed the high prevalence of eating disorders on college campuses with a "normative discontent" with body shape and size, which arises when individuals fail to meet beauty ideals established by underweight actresses and models. Numerous studies have investigated the correlation between media use and women's body image. A majority of these studies used experimental methods to test whether women felt worse about their bodies after exposure to thin media models. Studies have repeatedly shown that women who viewed thin-ideal images experience lower self-esteem than women who viewed neutral images (Birkeland, Thompson, & Herbozo, 2005). Similar results were found among studies on televised media; women who watched television commercials that featured the thin-ideal image reported higher levels of body dissatisfaction and eating disorder symptomatology (Hargreaves & Tiggemann, 2004). A meta-analysis of 77 studies on the links between media exposure, women's dissatisfaction, internalization of the thin ideal, and eating behaviors and attitudes supports the notion that exposure to thin-ideal images is related to body image concerns for women (Grabe & Ward, 2008). Specifically, Grabe & Ward (2008) reported that thin-media exposure is related to a stronger internalization of thin-ideals, higher body dissatisfaction, and more frequent ED attitudes and behaviors.

The wealth of literature on the influence of mass media on body image concerns reveals the psychotropic effect that the media on body image. In accordance with the sociocultural and interpersonal theory, peers evaluate one another based upon a socially-accepted weight, which is partially dictated by mass media. Failure to achieve these ideals result in negative social

evaluations. As discussed previously, negative social evaluations act through negative self-evaluations to trigger ED behavior and attitudes. The rise in media accessibility poses an even greater risk on body image, as individuals are confronted with thin-ideals on a more frequent basis. Social media networks, such as Facebook, have merged peer networks and mass media, creating a perilous environment in which media ideals are enforced by peer evaluations. The accelerated rate in which individuals form personal assessments may impact the prevalence of negative social evaluations. Facebook activities, such as commenting and "liking" photos, can be used by cyberbullies as a means of abusing a victim. In accordance with the interpersonal model for eating disorder development, these negative social evaluations may contribute to the risk that Facebook usage poses on disordered eating. The current literature on Facebook usage and eating disorders fails to address these occurrences.

Facebook in Eating Disorder Research

Throughout the past decade, online social networking services have risen in popularity. Facebook, a particularly pervasive social networking site, enables users to build a personal profile and create peer networks by "adding" others as "friends". Within the Facebook network, users may exchange messages, post status updates and photos, and exchange online information with peers. Over the course of 8 years, Facebook has garnered over 845 million users who spend on average 11.47 minutes per day on the site and share 4 billion pieces of content a day (Mabe, Forney, & Keel, 2014). Moreover, Facebook usage is a particularly salient part of college-aged women's lives; 72% of female internet users and 86% of all internet users, ages 18-29, reported using Facebook in 2012 (Duggan & Brenner, 2013). Facebook activities allow users to exchange indirect social evaluations at an alarming rapid rate. The impact of Facebook usage on body

image and eating behavior is a relatively new research topic. Consequentially, there is a limited amount of literature on the topic.

Tiggemann et al (2013) conducted an investigation on the correlation between body image concerns and social media usages. 1087 girls with a mean age of 13.7 years (SD= 0.7), were recruited from 18 schools across South Australia. For the study, girls answered questions about the usage and amount of time spent on the Internet, Myspace, and Facebook. Body image concerns were measured using the Objectified Body Consciousness Scale-Youth. Triggerman and Slater (2013) found that beauty internalization, body surveillance, and drive for thinness differed significantly across Facebook-user and Facebook non-user groups. In addition, body consciousness factors significantly correlated with the number of Facebook friends among Facebook users (p<.001). These findings are consistent with the sociocultural model, and confirm that Facebook is an additional media source that influences body image. The peer component, associated with Facebook, partially mediates or modulates the risk that Facebook poses to the body satisfaction of female adolescents. This finding confirms that Facebook inundates female users with two risk factors for the development of body dissatisfaction: media ideals and social comparison. Not only are female users bombarded with numerous images of thin body shapes, they are observing these ideals being met by their peers or the backlash for not meeting them. Facebook creates the illusion of a tangible thinness that drives individuals to negatively evaluate themselves. The exploratory work done by Tiggerman et al (2013), however, did not account for how time spent on Facebook relates to body dissatisfaction. From the data obtained, it is unclear which Facebook activities affect body image.

Smith, Hames, & Joiner (2013) conducted an eating behavior study on college-aged females from a large southeast university. The aim of the study was to investigate the relationship

between eating behavior and Facebook usage. More specifically, Smith, Hames, & Joiner (2013) were interested in investigating body dissatisfaction as a potential mediator between maladaptive Facebook usage (defined as a tendency to pursue negative social evaluations and/or engage in social comparison via Facebook) and bulimic symptoms. Previous studies have linked body dissatisfaction to eating disorder behavior, as a risk factor. Tiggerman et al (2013) findings on the body dissatisfaction and Facebook-usage correlate and the IPT-model provided the theoretical basis for the Smith, Hames, & Joiner (2013) study. 242 female participants were instructed to complete three separate questionnaires in the two-part study: the Maladaptive Facebook Usage Scale (MFUS), The Eating Disorder Inventory, and the Eating Disorder Examination Questionnaire-4. The women were asked to fill out the questionnaires on two separate occasions separated by two to four weeks. In lieu of a validated scale to measure Facebook usage, the authors created a 7-item MFUS, which measured maladaptive Facebook usage in accordance with the interpersonal theory (Rieger et. al, 2010). The results report that maladaptive Facebook usage is a significant predictor of bulimic symptoms. In addition, body dissatisfaction was shown to fully mediate the relationship between maladaptive Facebook use and overeating episodes, and to partially mediate the relationship between maladaptive Facebook usage and bulimic symptoms. These longitudinal findings reinforce the supposition that maladaptive patterns of Facebook use precede increases in disordered eating. The results are also consistent with the IPT model for eating disorders, and suggest that negative affect increases with Facebook use. The nature of network interactions may contribute to the development of negative self-evaluation, which in turn, can manifest in body dissatisfaction.

Mabe, Forney, & Keel (2014) investigated the potential of an underlying third variable. The first study included 960 female college students from a southeastern state university. Participants

spent 20 minutes on Facebook and were instructed to use the site as under normal conditions; afterwards, subjects responded to the Eating Attitudes Test-26. A small but significant correlation was found between time spent on Facebook and disordered eating attitudes and behaviors for participants from the fall semester. Eighty-four women from Study 1, who endorsed Facebook use once a week, were included in an additional study. For Study 2, participants were instructed to use either Facebook (experimental group) or Wikipedia (control group) for 20 minutes under normal conditions; afterwards, the women reported on a State Trait Anxiety Inventory, a Facebook Survey, and an Eating Attitudes Test. Results had shown that anxiety and weight concerns in the experimental group did not differ significantly after 20 minutes of Facebook usage. Meanwhile, stress levels and weight concern decreased significantly among the control group after 20 minutes of Wikipedia usage. The findings indicated that Facebook activity maintains weight/shape concerns, both of which have been established as eating disorder risk factors (Stice, 2002). Mabe, Forney, & Keel (2014) were the first to examine the relationship between negative affect and Facebook-mediated weight/body concerns. According to the study, peer evaluations on Facebook increase/maintain social anxiety which contribute to the development of disordered eating behavior and attitudes. The results reveal that negative affect is maintained during Facebook usage; and further suggests that Facebook is not being used as a therapeutic tool for coping. Meanwhile, the external factors that contribute to the maintenance of eating disorder risk factors is still unclear and requires further clarification.

Mabe, Forney, & Keel (2014) measured Facebook usage in terms of specific Facebook activity that heightens shape and weight concerns. The Facebook score evaluates how activities, such as photo comments, photo likes, status likes, status comments, and the number of friends, are to Facebook users. This form of measurement relates Facebook usage to the interpersonal

formulation theory. As peers interact with one another on Facebook, gestures such as commenting and liking photographs become a palpable form of social evaluation. Mabe, Forney, & Keel (2014) confirm that the number of likes and comments garnered by a photograph allow Facebook users to compare self- and peer-appearances. When individual Facebook users fail to obtain as many likes or comments on photographs as their network peers, they internalize the deficit as a form of social rejection. As a result, they form a negative attitude about their appearance. The popularity of thin-body ideals makes it convenient for these users to conclude that their negative evaluations are related to weight and body shape.

Experiences of being bullied and eating disorders

Risk factors of eating disorders, such as body dissatisfaction, dietary restraint, and unhealthy attitudes towards eating, are common during adolescence. This also a critical period for the development of social relationships which can influence psychological health and well-being. It is possible that experiences that threaten the development of peer relationships, during adolescence, influence the development of negative eating, and weight-related cognitions and behaviors (Farrow and Fox, 2011). Being bullied and teased have been frequently identified in the etiology of eating disorders. For instance, bullying has been associated with body dissatisfaction and negative evaluations of weight in 10-year-old children (Lunde, Frisen, & Hwang, 2006), as well as low self-esteem and disordered eating behaviors (Eisenberg, Neumark-Sztainer, & Story, 2003). Olweus's (1991) definition of bullying is commonly cited in the literature for including the most important elements of bullying. In respect with this definition, bullying involves an aggressive act; a behavior that occurs frequently; an imbalance of power and a verbal, physical or indirect act. More recently, studies have begun to investigate how bullying exerts a negative impact upon eating-related behaviors.

Sweetingham and Waller (2008) examined the role of socially mediated emotions, social anxiety and shame, in the association between childhood bullying and eating disorders. The study consisted of 92 women, with a mean age of 28.5 years old, who were recruited from a specialist ED service. During their assessment for treatment, the women completed three self-report questionnaires assessing eating pathology, shame, and social anxiety. Experiences of bullying were measured in response to a semi-structured assessment interview. It was found that verbal bullying by peers was prevalent among eating disorder treated women (46.7%), and body dissatisfaction was the only risk factor of eating disorder associated with bullying experiences. Being teased about appearance by peers and being verbally bullied were associated with a significantly greater level of body dissatisfaction. Sweetingham and Waller (2008) also examined two mediations models- the potential role of shame as a mediator in the link between teasing by peers and body dissatisfaction and the potential role of social anxiety of social anxiety in the link between verbal bullying and body dissatisfaction. Data analyses revealed that shame acted as a perfect mediator between teasing about appearance and body dissatisfaction. Meanwhile, it was not supported that social anxiety mediates the relationship between verbal bullying and body dissatisfaction. These findings support the theoretical link between bullying and eating pathology. Consistent with the IPT-ED, bullying may lead to the development of negative affect, which supports risk factors of eating disorder. Furthermore, the association between bullying and body dissatisfaction may explain one way that Facebook use is related to eating disorder behavior and attitudes.

In a similar study, Fox and Farrow (2011) examined the factors that mediate the relationship among bullying and unhealthy eating behavior and attitudes among adolescents. 376 male and female students (mean age = 12.82) were asked to complete self-reported measures on bullying,

emotional symptoms, restrained eating, and body dissatisfaction. An examination of gender

differences revealed that females were more likely to report being a victim of verbal and social

bullying, as well as more emotional symptoms, restrained eating, and body dissatisfaction than

their male counterparts. Only verbal bullying was found to be a significant predictor of body

dissatisfaction. This finding indicates that the mode of bullying dictates the impact of the

experience on the development of risk factors for eating disorders. In addition, it was reported

that emotional symptoms partially mediate the relationship between verbal bullying and body

dissatisfaction. The findings further confirm the relationship between bullying and eating

pathology, and suggest that bullying affects eating attitudes in females of various ages. The

accessibility of peers through Facebook may expose more females to social and verbal bullying

than would be possible through traditional bullying. Therefore, it is important to understand how

social and verbal forms of Facebook-mediated bullying affect eating pathology.

Cyberbullying on Facebook

While the amount of research on social media websites has increased exponentially

(Anderson et al., 2012), the implications of social network usage on body image has been given

little consideration. Very few studies have examined the relationship between Facebook and

eating disorder behavior. Meanwhile, a large portion of Facebook research has identified a

number of risk factors for negative affect- including cyberbullying (Moreno & Kolb, 2012).

Bullying has been a subject of behavioral research for decades. The relationship between bully

victimization and a range of negative effects, including emotional trauma and suicide, has made

bullying a topic of great intrigue (Dupper & Meyer-Adams, 2002). Bullying can be defined as a

prolonged mistreatment by a person with malicious intentions on another (Hinduja & Patchin,

2007). Face-to-face bullying may be carried out physically, verbally, or relationally (Woods &

Wolke, 2004). While researchers have predominantly focused on "traditional" face-to-face bullying, cyberbullying has generated a shift in focus. Communication technologies have been evolving; and as a result, social interactions occur in a technology-mediated environment as often as they occur "face-to-face". Accompanying the rise in social networking is the emergence of cyberbullying.

Many different definitions of cyberbullying have been found in the literature (Tokunaga, 2010). One of these definitions characterizes cyberbullying as "…an aggressive behavior that is repeatedly and intentionally carried out against a defenseless victim using electronic forms of contact (e.g. Internet, mobile devices, etc.)" (Smith et al., 2008). Through the medium of electronic devices, cyberbullying has an increased potential to reach larger audiences, an increased potential for the anonymity of the bully, lower levels of supervision, and decreased direct feedback between the bully and the victim (Patchin & Hinduja, 2006; Slonje & Smith, 2008). These specific aspects of cyberbullying suggest that it poses a greater psychosocial risk to victims than traditional forms of bullying. Although cyberbullying is generally perceived as worse than traditional scenarios, Sticca and Perren (2012) found that the role of media is secondary to the role of publicity and anonymity when it comes to evaluation bullying severity. Therefore the archetypal attributes of cyberbullying may amplify the severity of bullying and potentially accelerate the appearance of negative affect.

The features of Facebook that are used to facilitate the extension of one's social network and the maintenance of network "friends" may also be used with ill intentions to harass and abuse others. Specifically, the wide audience, longevity of messages, and anonymity of the bully are features of cyberbullying that may be obtained through Facebook usage. A large amount of exposure takes place over social bullying. Through Facebook, users are able to build a social

network and connect with peers beyond their social circles. Friends Finder, for example, can be used as a search engine to find friends. As a result of a wider audience, cyberbullying interactions exceed the bully-victim frame and extends to a larger social frame. While traditional bullying involves the interaction between the victim and the bully, cyberbullying exposes the bullying to unknown masses (Kwan & Skoric, 2013). Meanwhile, longevity of messages refers to the Internet's capacity to store an unlimited amount of information for an extended period of time. Cyberbullying interactions may be accessible online long after the abuse has taken place. The terms of Facebook use states that users, depending upon privacy settings, grant Facebook transferable rights to use any IP address (Facebook, 2010). Thus, Facebook interactions cannot be deleted until a user deletes his or her account. Even then, content that has been shared with peers is still owned by Facebook.

A review of the studies into cyberbullying suggests that it is a common problem among adolescents. Wolak, Mitchell, & Finkelhor (2006) observed that 9% of youngsters had been exposed to cyberbullying; and 57% of these victims were victimized by one of their peers. The persistence and pervasiveness of bullying content through social media websites, such as Facebook, has inspired bullying researchers to investigate the consequences of social bullying. Kwan & Skoric (2013) found that Facebook usage and the engagement in risky Facebook behavior are related to cyberbullying. Although traditional bullying has been found to be especially prevalent among obese children, compared to average weight children, the current literature on cyberbullying through Facebook fails to examine the impact of cyberbullying on eating attitudes (Falker et al., 2001).

Bullying Scales

    A majority of bullying studies have measured experience of bullying through self-reporting questionnaires. After a review of available literature, Fox and Farrow (2009) felt that no existing scale captured the whole range of bullying experiences: social, verbal, and physical. Many scales included physical and verbal bullying; whereas others group verbal and physical together as "direct" and indirect". Based upon Underwood's (2003) categorization of bullying, 16 items were written to reflect the complete range of the bullying experience, with 15 falling into the three categories described above. Fox and Farrow (2009) examined the strength of the 15 items in a one-factor and three-factor model (Table 1). A confirmatory factor analysis (using AMOS 4.0) revealed that both models are valid (chi-squared=44.76, p< 0.001); and the three-factor model was a better fit of the data than the one-factor model (Figure 3). In addition, reliability analyses showed very good internal reliability coefficients of each subscale as follows: Verbal (α=.85), Physical (α=.77), Social (α=.87).

    As seen in the literature, the major means of measuring cyberbullying is through self-report questionnaires, scales, and surveys. The Cyber Bullying Inventory (CBI), developed by Erdur-Baker and Kavsut (2007), is a one-factor scale that rates the occurrence of cyberbullying events. Ayas and Horzum (2010) introduced a 3-factor cyberbullying scale that determines the levels of practice of and exposure to cyberbullying among students. The factors are distributed as such: the bully and victim sexual matters, the buy and victim in regard to frustration and hurt, the bully and victim in spreading rumors in cyberspace. Cetin et al (2011) proposed an alternative three-factor scale that distributed items based upon cyber verbal bullying, anonymity, and cyber forgery. These scales fail to distinguish between verbal and social forms of cyberbullying.

Therefore, it will be of significance to revise the Fox and Farrow (2009) scale to be measure the full cyberbullying experience.

Facebook Activity Scales

The Facebook Intensity scale was developed by Ellison et al (2007) to obtain a better measure of Facebook usage than frequency or duration indices. The scale consists of eight-separate items designed to holistically measure the extent to which participants are actively engaged in Facebook activities: the number of Facebook friends, time spent on Facebook on a typical day, and attitude towards engagement in Facebook activity (Table 2). Attitudinal items are measured based upon a Likert-scale; responses range from 1 = strongly disagree to 5 = strongly agree. Items 3 through 8, measure the emotional internalization of Facebook activity. More specifically Items 3 and 5 focus on the integration of Facebook activity into what is perceived as a personal norm. Items 2 and 4 measure the acceptance of Facebook as a prominent social environment and social esteem within peer networks. Meanwhile, Item 8 measures the emotional dependence associated with Facebook usage.

The rapid development of technology, increasing prevalence of Facebook usage, and increasing modes of Facebook access, suggest that the Facebook Intensity Scale is dated. Item 4, in particular, is no longer representative to a majority of Internet users. Over the past 5 years, there has been a growth in Facebook-based activities. Media-based application services, such as Instagram and Spotify, have been incorporated into the Facebook conglomeration, allowing users to access the site for a wider range of media-based activities such as photo-editing and music sharing. With such an expansion in applications, users may become more dependent on the site for media-services. In addition, there has been an increase in the number of businesses that use Facebook as a resource page. Facebook usage has become increasingly associated with Internet-

wide functionality. As a result, Facebook users are more inclined to view the site as a ubiquitous tool rather than a social community. Emotional connections to the website, such as "pride", are no longer reliable measures of Facebook usage.

A more recent scale of Facebook usage had been developed by Mabe, Forney, & Keel (2014). A Facebook survey was designed to better understand the importance of Facebook features, usage of activities on Facebook, the amount of time spent on Facebook, and access to Facebook. To determine how participants used Facebook, individual items were analyzed. Eight items were used to calculate a Facebook score, which reflects the importance and frequency of using Facebook features to heighten weight/body shape concerns (Table 3).

Individually, each item of the Facebook Score (Mabe, Forney, & Keel, 2014) measures a distinct aspect of weight/shape concern heightened through Facebook usage. Item 1 measures the prevalence of social comparison and body image evaluation through Facebook images. Social comparison is considered a central contributor to body image; it refers to the cognitive judgment that people make about their own attributes compared to others (Jones, 2011). Item 2 measures the importance of social comparison of body image through "likes" or comments on Facebook-based images. Items 3 through 6 collectively measure the prevalence of social evaluation through Facebook-based activities. These items are consistent with literature on the role of interpersonal formulation on the development of disordered eating. Rieger et al (2010) postulated that indirect sources of evaluative information, such as social-media feedback, can lead to poor body image and disordered eating. Meanwhile, Item 7 measures the integration of Facebook usage into non-computer based activity. Lastly, Item 8 is a measure of negative affect in response to stress or social evaluations; this items is based upon the posit that individuals are likely to remove Facebook "tags" in response to stress or anxiety about a displayed image.

Both Facebook scales have high Cronbach's score (α>.80) indicating good internal consistency; however, they have yet to be confirmed for validity. To get an updated and complete scope of Facebook usage as it relates to body shape and weight concerns, a one-factor confirmatory analysis will be run on both Facebook scales. Reliability and validity will be accounted for using the appropriate statistical tools.

Implications for Future Study

A review of the literature has shown confirmatory evidence of the impact of Facebook usage on risk factors for eating disorders. Tiggermann et al (2013) reported that the general use of social media websites, such as Facebook and Myspace, account for significant differences in body consciousness across Facebook and non-Facebook users. Smith, Hames, and Joiner (2013) expanded upon these findings, and reported that maladaptive Facebook usage significantly predicts bulimic symptoms. Collectively, these studies suggest that indirect forms of social evaluation can lead to negative self-evaluations and the associated negative affect (Rieger et al., 2010). In this regard, the interpersonal formulation theory suggests that negative evaluations lead to the formation of eating disorder symptoms. Mabe, Forney, & Keel (2014) linked the usage of Facebook activities to negative affect, further suggesting that the photograph-liking and commenting provide the basis for the internalization of social evaluations of appearances.

Although the available research provides some insight into how social media usage impacts body consciousness, it is still unclear as to how these negative social evaluations form. Meanwhile, studies on the eating disorder-bullying correlate have shown that there is a significant relationship between verbal bullying and eating pathology. Social media sites enable users to target peers within a social network. Specifically, cyberbullying has been exposed as a prevalent occurrence on Facebook. Facebook possesses the features that contribute to the ease of

cyberbullying: wide audience, longevity of messages, and anonymity. The current study intends to explain the relationship between Facebook use and eating disorder pathology as a moderation effect through cyberbullying. The broadened access to peers, provided by Facebook, may enable cyberbullying interactions that contribute to the negative affect that leads to the development of disordered eating behavior and attitudes. If the moderation model is shown to exist, intervention programs for eating disorders may be designed with the Facebook-cyberbullying paradigm in mind. This study also aims to develop new scales for the measure of cyberbullying and Facebook use. When these scales are shown to be valid and reliable, the full range of cyberbullying (social and verbal) may be examined. In addition, Facebook usage may be measured as a sum of general and body-centric activities.

Methodology

Participants

College students use Facebook an average of 100 mins/day, interacting with peers primarily by posting and viewing photos (Wang, Q, Wei, C, Yu, L; 2011). Although it has been shown that males are at risk for developing eating disorders in response to social pressures, the current study places emphasis on the maintenance of disordered eating behavior in response to media-promoted thin-ideals amongst women. In addition, this study aims to elaborate upon previous literature that has examined the relationship between traditional bullying and eating disorders. A majority of these studies have focused on female participants because of multiple accounts of high rates of body dissatisfaction among young women (Striegel-Moore et al., 2002; Sweetingham & Waller, 2008). A study that did investigate the effects of traditional bullying

across gender groups found that girls experienced a significantly higher level of social and verbal bullying than boys; in addition overweight girls experienced significantly lower levels of physical self-esteem and higher levels of body dissatisfaction (Fox & Farrow, 2009). Cyberbullying in this study focuses on social and verbal bullying experiences through Facebook usage; therefore, it was within our interest to focus on the gender group that has a more pronounced relationship with traditional bullying and eating disorder risk factors. As a result, only females were asked to participate in the study. Males who did participate were excluded from analysis.

Participants for the pilot study were recruited from Dr. Whitney Breslin's KIN1304 course, "Public Health Issues in Physical Activity and Obesity". Whereas, participants for the main study were recruited from Dr. Breslin's KIN1304 and KIN1352, "Introduction to Kinesiology" courses. These courses were selected because of the large class size (>1300 students enrolled) and the diversity amongst students (in regards to age and major subjects). As an incentive to participate, students from both courses were given extra course credit. To disclose the potential effects of trained desensitization to media-mediated body image pressure, women who had undergone some form of therapy for an eating disorder or a body dysmorphic disorder were excluded from the study. In addition, women who used Facebook too frequently or infrequently were omitted from the data analysis. Included participants reported using Facebook for at least 2 hours weekly. The temporal limit was enforced to ensure that subjects were Facebook-literate and were able to use all forms of Facebook activities. Participants who report using 6 hours or more daily were also excluded; this amount of internet usage falls under the criteria for Internet Addiction (Tao et al., 2010). All procedure methods, including recruitment, were submitted to the Committee for the Protection of Human Subjects for approval.

Measures

The measures described below were used to analyze the relationship between cyberbullying, eating attitudes, and Facebook use. The primary hypothesis described the type of relationship that may exist between the study variables: cyberbullying was hypothesized to moderate the association between Facebook use and eating attitudes. Within the proposed model, "eating attitudes" was defined as the dependent variable, and "Facebook activity" was defined as the predictor variable, and "verbal cyberbullying" or "social cyberbullying" were set as moderators. The demographic variables (education level, ethnicity, and age) that had significant effect on the study variables were controlled for when analyzing the moderation effect.

Body Mass Index (BMI) was calculated using participants self-reported weight and height, and applying the measures to the standard formula (kg/m2). Weight status was categorized in accordance with the body mass index table as follows: Underweight: BMI <18.5; Normal: BMI 18.5–24.9; Overweight: BMI 25–29.9; Obese (Class I): BMI 30–34.9; Obesity (Class II): BMI 35–39.9; and Extreme Obesity (Class III): BMI ≥ 40.1(Janssen et al, 2004). In the analysis, BMI >30 was classified as "obese".

Eating Attitudes Test (EAT-26): The EAT is one of the most commonly used tests to screen youths for disordered eating attitudes and behaviors. Garner and Garfinkle (1979) developed the EAT to evaluate thoughts and behaviors related to anorexia nervosa. Although it was originally designed to identify individuals with AN-like symptoms, it has been established as a measure of general eating disorder pathology, and has been widely used to detect individuals for threshold eating disorders. There are two versions of this measure. The original 40-item version of the EAT contains seven subscales, including (a) Food Preoccupation, (b) Body Image for Thinness,

(c) Vomiting and Laxative Abuse, (d) Dieting, (e) Slow Eating, (f) Clandestine Eating, and (g)Perceived Social Pressure to Gain Weight. The EAT-40 consisted of 40 items scored on a 6-point Likert scale ranging from "always" to "never" (Williamson et al., 1996). Garner and colleagues (1982) revised the EAT into a 26-item version, EAT-26, based upon a factor analysis of the original. The EAT-26 measures three factors (a) Dieting (13 items), (b) Bulimia and Food Preoccupation (six items), and (c) Oral Control (7 items). Although the reduction of six-factor to three-factor scales can compromise test validity and integrity, the EAT-26 has been extensively validated across clinical and non-clinical subgroups from various cultural backgrounds (α =0.9, x^2 =0.9) (Mintz & O'Halloran, 2000; Banasiak et al., 2001). Furthermore, the EAT-26 assesses disordered eating attitudes and behaviors on a six-point Likert scale from "Always" to "Never". Each item was valued in the six-point scale; such that, a higher score was used to determine the severity of disordered eating attitudes among participants. The sensitivity of the EAT-26 score is useful in assessing eating disorder behavior and attitudes among clinical and non-clinical subpopulations, in addition to distinguishing between non-clinical and clinical cases. For the purposes of the study, the EAT-26 score and the three subscale scores were used to detect a graded severity of general disturbed eating attitude, attention to calories ingested and burned during physical activity, propensity towards bulimia and concern about food, and control of food intake.

Cyberbullying Scale: From a review of existing bullying scales and previous studies, Fox and Farrow (2008) developed a bullying scale that consists of 15-items that reflect the complete range of the current bullying scale. The three-factor scale measures the bullying experience through (a) verbal bullying, (b) physical bullying, and (c_i) social bullying. Participants were

asked about the type of bullying and the frequency of bullying experiences. Items described a specific bullying situation, i.e. "Been left out of the group on purpose", and participants respond with the following options, "1=never", "2=sometimes", "3=once or twice a month", "4=about once a week", and "5=several times a week". The original scale showed good internal reliability coefficients for each of the three subscales as follows: Verbal=.85, Physical=.77, and Social=.87 (Fox & Farrow, 2008). The three-factor model was found to be better fit of the study data than a one-factor scale and bullying was measured as a combination verbal, social, and physical bullying.

To fit the objectives of this study, the bullying scale was modified to assess experiences of cyberbullying in terms of verbal and social bullying. Physical bullying does not apply to a cyber-medium; so only items from the verbal and social factors were included in the measure. The remaining 12 items were reworded to measure bullying, as it occurs in a social media context (Table 4). Cyberbullying items that placed an emphasis on being teased, receiving negative commentary, and being verbally silenced ("blocked") were categorized as "verbal cyberbullying"- items. Each of these items pertained to a form of social media dialogue that had been utilized to antagonize. Whereas, items that measured social media interactions and general actions were characterized as "social cyberbullying"-items. These items included threats of violence, harassment, and social isolation. The cyberbullying items were adapted from an existing scale so content validity was assumed. Exploratory (EFA) and confirmatory factor analyses (CFA) were performed to establish the goodness of fit of the 2-factor model and to establish construct validity. Lastly, reliability was measured using Cronbach's alpha (Bland & Altman, 1997).

Facebook Activity Scale: The Facebook activity scale was created to obtain a complete measure of attitudes on Facebook activity in relation to time spent online, emotional investment in Facebook activities, and perceived significance of Facebook-mediated interactions. The scale was a composite of items from the Facebook Intensity Scale (Ellison et al, 2007) and the Facebook Score Scale (Mabe, Forney, & Keel, 2014). The Facebook intensity scale was developed to obtain as a better measure of attitudes on Facebook use. The scale measures Facebook usage, in terms of friends and time duration, in addition to attitudes surrounding Facebook. The six attitudinal questions are a series of Likert-scale items designed to measure the extent to which participants are emotionally connected to Facebook and the extent to which Facebook is integrated into participants' daily activities (Ellison et al., 2007). The Facebook score had been developed to measure the perceived significance of Facebook activities associated with body image. More specifically items within in this scale measure the extent in which participants emotionally connect with activities such as Facebook image sharing and status updates. Items from both scales were combined to measure a complete range of general and appearance-centric Facebook activities (Table 5). The items of the questionnaire were adapted from an existing questionnaire, so content validity assumed. Previous reports of convergent validity are missing; so confirmatory and exploratory factor analyses were employed to establish goodness of fit for the two-factor model. Internal reliability will be measured using Cronbach's alpha (Bland & Altman, 1997).

*Social Connectedness Scale***:** The social connectedness scale (Lee & Robbins, 1995) was developed according to the psychoanalytic self-psychology theory on a college-age population. The scale measures the degree of interpersonal kinship that is experienced between an individual

and his or her social environment (e.g. peers, friends), as well as the degree of difficulty in maintaining this sense of closeness. The self-report questionnaire consists of 8 items that are rated along a 6-point Likert scale (1 = "strongly agree" to 6 = "strongly disagree". The subscale has a high internal reliability (α=.91) and has been shown to possess construct validity (Yoon et al., 2012). Three items from the scale were included in the cyberbullying scale to establish divergent validity; "I am able to connect with other people", "I see people as friendly", and "I feel close to people". Permission to use the scale was granted by Dr. Richard Lee (Appendix A).

Procedure

Young female adults, between the ages 18-26 years old, were invited to participate in the study. Subjects were recruited from Dr. Whitney Breslin's KIN1352 and KIN1304 courses by means of an online class announcement and a research flyer. Before beginning the questionnaire, participants were asked to read over the terms of the experiment and initial the cover letter upon agreement (Appendix C). The cover letter included a brief description of the study aims, questionnaire instructions, potential risks, participation benefits, and contact information for further information. The questionnaire, made available through Survey Monkey at *https://www.surveymonkey.com/s/eating_fb*, was composed of items from the EAT-26, Facebook Intensity Scale, Facebook Scale, and Cyberbullying Scale (Appendix B). In addition, participants were asked to answer demographic questions, including: age, gender, highest level of education, BMI, and ethnicity/race. The questionnaire was easily accessible online and was designed to take 15-20 minutes to complete. Participants were asked to take the questionnaire once and to answer every question. Study variables were later controlled for using demographic information to confirm that the observed correlates were not significantly influenced by extraneous variables.

Such that education, ethnicity/race, and age were entered into the regression models as covariates. Participants who did not meet the inclusion criteria or failed to complete the questionnaire were omitted from the study.

There were two-rounds of participant recruitment. The first three-hundred and twenty-five participants from round one were included in the pilot study. Participants who met the inclusion criteria were used in the pilot study. Data collected from the Cyberbullying and Facebook activity items were subsequently used in exploratory and confirmatory analyses to validate the two-factor models for both scales. After confirming construct validity for both measures, the remaining participants from round 1 were pooled with round 2 participants to strengthen the power of the main study and compensate for the large amount of missing data. Group differences were measured using ANOVA and it was determined that there was no significant difference across the study variables between the first-round and second-round participants.

Data Analysis

The statistical analyses was performed using Statistical Package for the Social Sciences (SPSS, 2012) Software version 20, G*Power version 3.0.10 (2011), and Mplus version 7 (2012). An initial screening of the data was performed prior to carrying out the proposed analyses to ensure that the underlying assumptions of multivariate analyses had been met.

Power Analysis: The proposed moderation model was tested by examining a series of regression analyses. To determine the appropriate number of subjects for the analyses, a power analysis was conducted. The power analysis was performed using G*power (Faul et al, 2007), assuming the entry of covariates in block 1 and the predictors in block 2. The number of participants required

was calculated as 191 for the appropriate p-value of $\alpha < 0.05$, a desired power level of 0.85, and a small-to-moderate effect size ($f^2 = 0.10$).

Statistical Models: The skewness, kurtosis, residuals scatterplots, and histograms of each variable in the data set were examined to test the assumptions of normality, linearity, and homoscedasticity. Linear transformations (log 10) were applied to variables that deviate from normal distribution (Tabachnick & Fidell, 2001). Tolerance statistics and intercorrelations between the measures assessed for multicollinearity. Lastly, a reliability analysis was conducted on the subscales to test internal consistency. Only measures with good-to-excellent reliability, $\alpha > 0.75$, were included in the data analyses. A correlations test was conducted between the demographic measures and the study variables (Facebook usage, EAT-26 subscore, and cyberbullying subscores) in order to determine if any demographic variables needed to be statistically controlled.

Hierarchical multiple regression analyses were used to test the moderation of cyberbullying on Facebook use and eating disorder attitudes and behaviors. Since the purpose of the primary hypotheses was to assess the relationships between study variables and to test moderation models, the predictor was entered stepwise into a regression equation followed by the moderator and the interaction effect (Tabachnick & Fidell, 2001). A moderator is a variable that changes the strength and/or direction of the relationship between predictor and criterion variables (Baron & Kenny, 1986). The significance of the interaction effect and the conditional effects were further examined using the PROCESS function (Hayes, 2012).

Hypothesis 1 states that experiences of cyberbullying (social or verbal) will moderate the relationship between Facebook activity and food preoccupation and bulimia in college-age females. To address these hypotheses, two hierarchical regressions were conducted. In the two

analyses, demographic controls were entered first, Facebook use was entered as a predictor variable in the second step, cyberbullying experience in the third step, and the interaction (Facebook use x cyberbullying) in the fourth step. Food preoccupation and bulimia served as the criterion variable.

   Hypothesis 2 states that cyberbullying experience (social or verbal) will moderate the relationship between Facebook activity and dieting. To address these hypotheses two hierarchical regressions were conducted. In the two analyses, Facebook use was entered as a predictor variables in the first step, cyberbullying experience in the second step, and the interaction (Facebook use x cyberbullying) in the third step. Dieting served as the criterion variable.

   Hypothesis 3 states that cyberbullying experience (social or verbal) will moderate the relationship between Facebook use and oral control. To address these hypotheses two hierarchical regressions were conducted. In the two analyses, Facebook use was entered as a predictor variables in the first step, cyberbullying experience in the second step, and the interaction (Facebook use x cyberbullying) in the third step. Oral control served as the criterion variable.

   Lastly, *Hypothesis 4* states that cyberbullying experience will moderate the relationship between Facebook use and total eating behavior and attitude score. To address these hypotheses two hierarchical regressions were conducted. In the two analyses, Facebook use was entered as a predictor variables in the first step, cyberbullying experience in the second step, and the interaction (Facebook use x cyberbullying) in the third step. Total eating behavior and attitude score served as the criterion variable (Figure 4).

Factor Analysis

Factor analysis was used to validate the two-factor model for the Cyberbullying and Facebook Activity Scales. An EFA, employing principle components analysis with an oblique rotation, was conducted on the 15-items cyberbullying scale and the 13-items Facebook activity scale with the data from the pilot study. Three items from the Social Connectedness Scale were incorporated in the cyberbullying scale to confirm divergent validity. The remaining 12-items were reworded from the Fox and Farrow (2009) bullying scale items. The analysis was performed to answer the research questions: what is the factor structure and internal consistency of verbal and social factors derived from the cyberbullying scale; what is the factor structure and internal consistency of general and appearance-centric factors derived from the Facebook activity scale? The factors were determined by examining the scree plot following the principle components analysis. The scree plot method involved an examination of a plot of eigenvalues for breaks and discontinuities.

Once it was confirmed which items load onto the designated factors, a confirmatory factor analysis was performed using MPlus 7.0 software. Verbal cyberbullying items were loaded onto the CBVERB factor and social cyberbullying items were loaded onto the CBSOCIAL factor. For the Facebook activity measure, general activity items were loaded onto the FBGEN factor and appearance-centric activity items were loaded on to the FBWEIGHT item. Chi-square probability of fit and root mean square error of approximation values (RMSEA) were used to compare the goodness of fit for the one-factor and the two-factor models (Chen, F., 2008).

Results

Descriptive Data Analysis

The sample for the pilot study originally consisted of 325 participants recruited from an undergraduate kinesiology course at the University of Houston's main campus. Of these participants, 242 met the inclusion criteria and were included in the exploratory and confirmatory factor analyses. The sample for the main study consisted of 566 young adults, recruited from one of two introductory kinesiology courses at the University of Houston's main campus. After a preliminary analysis of the demographics, the following participants did not meet the inclusion criteria: 17 male subjects, 21 subjects older than the 26 years-old cutoff, 10 subjects with a history of ED therapy, and 122 subjects who used Facebook for less than 2 hours per week. Of the original sample, 396 participants (70%) were included in the cohort for further data analysis. Given that a power analysis indicated the sample size of 191 was needed to detect a medium effect, the sample size, for both the pilot and the main study, was deemed sufficient to complete the statistical analyses.

Participants in the main study were between the ages 18 and 26 years old with a mean age of 21.6 (SD=1.8). Body mass index (BMI), calculated from self-reported heights and weight information, averaged 23.3 kg/m^2 (SD=4.9). The participants were assigned to BMI groups and were distributed as such, 8.6% underweight, 67.0% normal weight, 14.2% overweight, and 10.3% obese. The sample was ethnically diverse, 35.7% Caucasian, 12.5% Hispanic/Latino, 35.4% Asian, 9.6% African American, and 6.9% of participants classified themselves as "other" in regards to ethnicity and race. A majority (81.3%) of participants listed "High School (GED/diploma)" as the highest level of education, which was to be expected from a sample of

college-aged students. A complete list of the distribution of demographic variables has been shown in Table 7.

Cyberbullying Scale Factor Analyses

EFA and CFA were performed to confirm construct validity (divergent and convergent) for the cyberbullying scale, along with the goodness of fit of the two-factor model. Responses from the pilot study were used in the factor analyses. The exploratory factor analysis was performed to identify the number of factors amongst the cyberbullying items. In this instance, a principle component analysis extraction and promax oblique rotation were used to identify independent and unique factors among the 13 cyberbullying items.

Data from the cyberbullying scale items were placed into SPSS to conduct a preliminary EFA. The principle component analysis with univariate demographic information from the pilot sample, promax oblique rotation, and scree plot indicated 3 factors with Eigenvalues of 1.00 or greater. Additionally, an inspection of the scree plot showed a slight break after the third component. An oblique rotation was performed to identify the three components of the cyberbullying experience. It was shown that 5-items (CB5, CB6, CB7, CB8, and CB12) had strong loadings onto component 1. These items were consistent with those listed under the CBVERB subscale; component 1 was referred to as the CBVERB (cyberbullying verbal) factor. Whereas, 6-items (CB1, CB2, CB4, CB9, CB10, and CB13) were shown to have strong loadings onto component 2. These items were consistent with those listed under the CBSOCIAL subscale, so component 2 was referred to as CBSOCIAL. One item from the cyberbullying scale, CB14, did not load strongly onto either component, so it was removed from future analysis. Items from

the cyberbullying scale, CB3, CB11, and CB15, loaded strongly onto component 3. This observation was indicative of the divergent validity of the cyberbullying scale.

The one-factor model and the two-factor model (derived from EFA) was entered into Mplus for CFA to determine the model of best-fit. For a confirmation of divergent validity, social connectedness items (CB3, CB11, and CB15) were loaded onto a general factor along with the cyberbullying items. It was found that these items did not significantly load onto the general latent variable (p = 0.95, 0.99, and 0.67). For a one-factor model, 11-items (CB1, CB2, CB4, CB5, CB6, CB7, CB8, CB9, CB10, CB12, and CB13) were loaded onto a general factor, CBSCALE. All factor loadings were significant onto CBSCALE. However, an analysis of the chi-square value (186.328, p = 0.00) and RMSEA (0.167, p < 0.05) indicated that a single factor scale was not adequate for simultaneously measuring verbal and social experiences of cyberbullying. Next, to assess the two-factor model, the CBVERB items were loaded onto factor CB_1 and the CBSOCIAL items were loaded onto CB_2. All items loaded onto CB_1 or CB_2 significantly. The Chi-Square test of the model fit was better for the 2-factor model (69.401, p = 0.01), however the p-value was below the acceptable value of p>0.05. Whereas, the RMSEA value (0.05, p = 0.46) and CFI (0.96) indicated goodness of fit. These indices are considered to be more indicative of model fitness than Chi-Square, which is more susceptible to specification error, so it was decided to claim construct validity for the 2-factor model. The factor-loadings for the cyberbullying scale items are depicted in Figure 5.

Facebook Activity Scale Factor Analyses

EFA and CFA were employed to test the convergent validity of the Facebook activity scale, along with the goodness of fit of the two-factor model. Responses from the pilot study were used

in the factor analyses. The EFA was performed to indicate the number of factors formed amongst the individual items of the cyberbullying scale. In this instance, a principle component analysis extraction and a promax oblique rotation was used to identify common and unique factors among the 13 Facebook activity items.

Data from the Facebook activity scale items was placed into SPSS to conduct a preliminary EFA. The principle component analysis with univariate demographic information from the pilot sample, oblique rotation, and scree plot indicated 2 factors with Eigenvalues of 1.00 or greater. Additionally, an inspection of the scree plot revealed a slight break after a second component. An oblique rotation was performed to interpret the two components of Facebook activity. It was shown that 5-items (FB1, FB2, FB3, FB4, and FB5) had strong loadings onto component 1. These items were consistent with those listed under the general Facebook activity subscale; component 1 was referred to as the FB_G factor. Whereas, 8-items (FB6, FB7, FB8, FB9, FB10, FB11, FB12, and FB13) were shown to have strong loadings onto component 2. These items were consistent with those listed under the appearance-centric Facebook activity subscale, so component 2 was referred to as FB_W. An analysis of item correlation revealed that multicollinearity was an issue for item FB1, FB2, FB7, FB8, FB9, and FB10 ($R > 0.95$). To remove the problem of multicollinearity, items FB2, FB8, and FB9, were removed from the scale. FB1 and FB2 (i.e. "Facebook is part of my everyday activity" and "Facebook is part of my daily routine") so removal of FB2 was not expected to negatively impact the breadth of the scale. Removal of FB8 and FB9 was less assuring, so we proceeded with precaution and recognized the potential problem in the Appearance-Centric Facebook activity subscale.

The one-factor and the two-factor models (derived from EFA) were entered into Mplus for CFA to determine the model of best-fit. For the one-factor model, 10-items (FB1, FB3, FB4,

FB5, F6, FB7, FB9, FB10, FB12, and FB13) were loaded onto a general factor, FBScore. A

majority of factor loadings were significant onto CBSCALE; FB1 failed to load significantly

onto the general factor (p = 0.06). Furthermore, an analysis of the chi-square value (378.7, p =

0.00), CFI (0.656), and RMSEA (0.171, p < 0.5) indicated that a single factor scale was not

adequate for simultaneously measuring general and appearance-centric Facebook activity. Next,

to assess the two-factor model, the general Facebook activity items were loaded onto factor

FB_1 and the appearance-centric Facebook items were loaded onto FB_2. All items loaded onto

FB_1 or FB_2 significantly. The RMSEA (0.05, p = 0.48) and CFI (0.97) values suggested

goodness of fit. The Chi-Square test of the model fit was better for the 2-factor model (55.8, p =

0.01), however the p-value was still below the acceptable value of p>0.05. The correlation factor

between the two factors was 0.4, indicating a weak/moderate relationship between the two

constructs. A complete list of the factor-loadings for the Facebook activity scale items are

depicted in Figure 6.

Preliminary Analysis

    Prior to conducting the moderation analyses, an examination of the data was conducted

including an inspection of missing values, normality, linearity, and multicollinearity. Of the 396

participants, 57 (14.4%) did not complete the cyberbullying scale. After running an ANOVA to

compare group difference in study and demographic variables amongst the group with missing

responses and the group without, it was determined that there were no significant differences

between the two groups. As such, it was decided to conduct a listwise elimination on the missing

values. The remaining 339 participants were used in the descriptive and main analyses.

Skewness and kurtosis for each of the variables was evaluated to determine the normality of the distribution (Tabachnick & Fidell, 2001). Three variables showed significant kurtosis and skewness: CBSocial, CBTotal, and CBVerb. To improve the skewness, the variables were transformed via a logarithmic transformations calculation. To access the effect of the transformation on the variables in achieving a normal distribution, skewness and kurtosis were re-evaluated. Moving forward, the transformations of CBSocial, CBTotal, and CBVerb were used to analyze the moderation relationship between the study variables. Following the transformations, the assumptions of linearity and normality were met (Table 8). FBWeight was unable to be transformed, so the variable was excluded from the remaining analyses of the moderation effect.

Cronbach's alpha was calculated and reported for each subscale to assess the reliability of each measure (Table 8). A majority of the scales met or exceeded an alpha value of $\alpha > 0.8$, which is indicative of good reliability (George & Mallory, 2003). FBGeneral had an alpha value of 0.74 which is considered acceptable. Whereas, EATOral had an alpha value of 0.67, which casted some doubt on the internal consistency of the Oral Control subscale.

The next step was to conduct a series of one-way analyses of variance (ANOVA) to test for potential differences between demographic variables (age, education, ethnicity/race, and BMI status) and the dependent variables. The results of the ANOVA test between the participant's highest level of education and the dependent variables revealed a significant difference between groups on CBSocial ($F(3,333) = 5.61$, $p < 0.05$) and CBVerb ($F(333,3 = 4.72)$, $p < 0.05$). Statistically significant differences between groups means for CBSocial ($F(4,328) = 2.39$, $p = 0.5$) and CBVerb ($F(4,328) = 3.73$, $p < 0.05$) was found amongst ethnicity/race groups.

Consequentially, education and ethnicity/race were used as covariates in the moderation analyses.

Spearman's rho correlations were computed to explore the relationships among the study variables and to further test the assumptions of multicollinearity (Table 9). A nonparametric test for correlation was used to account for the non-normal trends in the study variables. It was found that there was a positive and significant correlation (0.17, $p < 0.01$) between average daily time spent on Facebook and Bulimia and Food restriction scores amongst college-age females. Additionally, the three EAT-26 subscales were found to be significantly correlated with general FB activity. None of the rho-values exceed 0.8, indicating that the assumption of multicollinearity had been met and the subscales could be used as variables (Bryman & Coleman, 2003).

Main Analyses

Four hierarchical multiple regressions were performed to assess whether experiences of cyberbullying (verbal- and social-cyberbullying) moderated the relationship between general Facebook activity and eating attitudes and behavior (bulimia & food preoccupation, dieting, and oral control). In the analyses, covariates were entered in the first block, general Facebook activity was entered in the second block, cyberbullying experience into the third, and the interaction effect into the fourth step. Appearance-centric Facebook activity was removed due to problems with normality and the internal consistency.

Moderating Analyses on Bulimia/Food Preoccupation Attitudes and Behavior

For hypothesis 1a, general Facebook activity did not predict bulimia and food preoccupation attitudes and behavior, Step 1: $F(4,327) = 2.10$, p= .081 . However, verbal cyberbullying predicted bulimia and food preoccupation attitudes and behavior, Step 2; $F(5, 326) = 5.37$, p < 0.001. The interaction of general Facebook activity and verbal cyberbullying did add variance in bulimia and food preoccupation attitudes and behavior, Step 3, $F(6, 325) = 5.43$, p < 0.001, ΔR^2 = 0.01. Hypothesis 1a was determined to be significant, and a summary of the hierarchical multiple regression can be seen in Table 10. To clarify the nature of the interaction effect, conditional effects between general Facebook activity and bulimia and food preoccupation attitudes and behavior were examined using the upper third and lower third of the sample in the cyberbullying verbal distribution. It was observed that CBVerb had a conditional effect size of 0.30 (p = 0.00) at low levels (1-SD below mean) of general Facebook activity; and CBVerb had a conditional effect size of 0.02 (p = 0.89) at high levels (1-SD above) general Facebook activity. A plot of the interaction effect depicted the influence of verbal cyberbullying intensity on bulimia and food preoccupation at different levels of Facebook activity (Figure 7). College-age females with low and mean accounts of Facebook activity had the highest level of bulimia and food preoccupation in response to high experiences of verbal cyberbullying. The interaction effect decreased with increased exposure to cyberbullying, such that the moderating effect was no longer significant at values 1 SD away from the mean. Similar results were seen for social cyberbullying. General Facebook activity did not predict bulimia and food preoccupation attitudes and behavior, Step 1: $F(4, 327) = 2.10$, p= 0.081. However, social cyberbullying predicted bulimia and food preoccupation attitudes and behavior, Step 2; $F(5, 326) = 4.50$, p < 0.001. The interaction of general Facebook activity and verbal cyberbullying added variance in

bulimia and food preoccupation attitudes and behavior, Step 3, $F_{(6, 325)} = 4.75$, p = p < 0.001, $\Delta R^2 = 0.01$. CBSocial had a conditional effect size of 0.31 (p = 0.00) at low levels of general Facebook activity (1-SD below); and CBSocial had a conditional effect size of 0.02 (p = 0.89) at high levels of general FB activity. Hypothesis 1b was considered to be significant, and an interaction plot can be seen in Figure 7.

Moderating Analyses on Dieting Attitudes and Behavior

For hypothesis 2a, general Facebook activity did predict dieting attitudes and behavior, Step 1: $F_{(4, 327)} = 2.44$, p= 0.047. Additionally, verbal cyberbullying predicted dieting attitudes and behavior, Step 2; $F_{(5, 326)} = 4.27$, p= 0.001. The interaction of general Facebook activity and verbal cyberbullying did add variance in dieting attitudes and behavior, Step 3, $F_{(6, 325)} = 4.75$, p < 0.001, $\Delta R^2 = 0.01$. Hypothesis 2a was determined to be significant, and a summary of the hierarchical multiple regression can be seen in Table 11. To clarify the nature of the interaction effect, conditional effects between general Facebook activity and dieting attitudes and behavior were examined using the upper third and lower third of the sample in the cyberbullying verbal distribution. It was observed that CBVerb had a conditional effect size of 0.71 (p = 0.00) at low-levels of general Facebook activity; and CBVerb had a conditional effect size of -0.06 (p = 0.80) at high levels of general Facebook activity. A plot of the interaction effect depicted the influence of levels of cyberbullying verbal on dieting at different levels of Facebook activity (Figure 8). College-age females with low and mean Facebook activity had the highest level of dieting in response to high experiences of verbal cyberbullying. Similar results were seen for social cyberbullying. General Facebook activity did predict dieting attitudes and behavior, Step 1: $F_{(4, 327)} = 2.44$, p= 0.047. Additionally, social cyberbullying predicted dieting attitudes and

behavior, Step 2; $F_{(5, 326)} = 3.90$, p= 0.002. The interaction of general Facebook activity and social cyberbullying added variance in dieting attitudes and behavior, Step 3, $F_{(6, 325)} = 4.22$, p < 0.001 , $\Delta R^2 = 0.01$. Furthermore, CBSocial had a conditional effect size of 0.66 (p = 0.00) at low levels of general Facebook activity; and CBSocial had a conditional effect size of 0.00 (p = 0.99) at high levels of general Facebook activity. Hypothesis 2b was considered to be significant, and an interaction plot can be seen in Figure 8.

Moderating analyses on oral control

For hypothesis 3a, general Facebook activity did not predict oral control attitudes and behavior, Step 1: $F_{(4, 327)} = 1.57$, p= 0.181. However, verbal cyberbullying predicted oral control attitudes and behavior, Step 2; $F_{(5, 326)} = 3.96$, p= 0.008. The interaction of general Facebook activity and verbal cyberbullying did not add variance in oral control attitudes and behavior, Step 3, $F_{(6, 325)} = 3.65$, p = 0.002, $\Delta R^2 = 0.00$. Hypothesis 3a was determined to not be significant, and a summary of the hierarchical multiple regression can be seen in Table 12. Similar results were seen for social cyberbullying. General Facebook activity did not predict oral control attitudes and behavior, Step 1: $F_{(4, 327)} = 1.57$, p= 0.181. However, social cyberbullying predicted oral control attitudes and behavior, Step 2; $F_{(5, 326)} = 3.96$, p= 0.002. The interaction of general Facebook activity and social cyberbullying did not add variance in oral control attitudes and behavior, Step 3, $F_{(6, 325)} = 3.55$, p = 0.002, $\Delta R^2 = 0.00$. Hypothesis 3b was considered to be non-significant.

Moderating analyses on overall disordered eating attitudes and behavior (EAT-26 Score)

For hypothesis 4a, general Facebook activity did not predict EAT-26 scores, Step 1: $F_{(4, 327)} = 1.88$, p= 0.114. However, verbal cyberbullying was a significant predictor of EAT-26,

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Step 2; $F(5, 326) = 5.06$, $p < 0.001$. The interaction of general Facebook activity and verbal cyberbullying did add variance in EAT-26 scores, Step 3, $F(6, 325) = 5.51$, $p < 0.001$, $\Delta R^2 = 0.02$. Hypothesis 4a was determined to be significant, and a summary of the hierarchical multiple regression can be seen in Table 13. To clarify the nature of the interaction effect, conditional effects between general Facebook activity and EAT-26 scores were examined using the upper third and lower third of the sample in the cyberbullying verbal distribution. It was observed that CBVerb had a conditional effect size of 1.29 ($p = 0.00$) at low levels of general Facebook activity; and CBVerb had a conditional effect size of 0.05 ($p = 0.90$) at high levels of general Facebook activity. A plot of the interaction effect depicted the influence of varied levels of cyberbullying verbal on EAT-26 scores at different levels of Facebook activity (Figure 9). College-age females with low and mean Facebook activity had the highest level of EAT-26 scores in response to high levels of verbal cyberbullying. Similar results were seen for social cyberbullying. General Facebook activity did not predict EAT-26 scores, Step 1: $F(4, 327) = 1.88$, $p= 0.114$. However, social cyberbullying was a significant predictor of EAT-26, Step 2; $F(5, 326) = 4.98$, $p < 0.001$. The interaction of general Facebook activity and social cyberbullying did add additional variance in EAT-26 scores, Step 3, $F(6, 325) = 5.37$, $p < 0.001$, $\Delta R^2 = 0.02$. Furthermore, CBSocial had a conditional effect size of 1.24 ($p = 0.00$) at low levels of general Facebook activity; and CBSocial had a conditional effect size of 0.05 ($p = 0.76$) at high levels of general Facebook activity. Hypothesis 4b was considered to be significant, and an interaction plot can be seen in Figure 9.

Discussion

The purpose of the present study was to expand upon the emerging topic of social media in eating disorder research, and to assess the influence of cyberbullying on the relationship between eating attitudes and behavior and Facebook activity. This study tested a series of moderation models, demonstrating the moderating effects of social and verbal cyberbullying on the predictive strength of Facebook activity on eating attitudes and behavior (Figure 2). This section will discuss the results of the study in relation to the research questions and to the existing literature. In addition, this section will present some limitations of the findings and clinical relevance.

Overall, the results of the pilot and the main study demonstrated support for several of the research hypotheses. The 2-factor cyberbullying scale was shown to be a reliable and valid measure of social and verbal cyberbullying. The 2-factor Facebook activity was shown to have a superior goodness of fit, in comparison to a 1-factor model, in assessing appearance-centric and general Facebook activity. However, the integrity of the internal structure of the appearance-centric subscale was brought into question; and it was ultimately disregarded in main data analyses. Meanwhile, there were significant differences in measures of cyberbullying and eating attitudes and behavior amongst individuals of different ethnicities/races and different levels of education. As such, these demographic variables were controlled for as covariates in the moderation models. Social and verbal cyberbullying were found to significantly interact with general Facebook activity in predicting bulimia and food preoccupation, dieting, and general disturbed eating attitudes and behavior. Whereas, experiences of cyberbullying were not shown

to have any significant effect on the relationship between oral control and general Facebook activity. The model fit for the hypothesized moderation model was found to be acceptable.

Cyberbullying Scale Validity and Reliability

The cyberbullying scale, used in the present study, was largely based off of the Fox and Farrow (2009) bullying scale, which was designed to measure the full bullying experience. To measure the full cyberbullying experience, items were designed to account for the occurrence of social and verbal cyberbullying on social media websites. Six-items were written to reflect the direct, confrontational, and verbally derogatory scenarios that are associated with verbal cyberbullying; and 6-items were written to describe scenarios of indirect and relational victimization that are affiliated with social cyberbullying (Wang et al, 2009).

Results from the EFA indicated that there were three constructs being measured by the cyberbullying scale. Six items, reworded from the Bulling Scale (Fox & Farrow, 2009), were shown to measure the verbal cyberbullying construct. Whereas, five items were shown to measure the social cyberbullying construct. The three items from the Social Connectedness Scale were not correlated with either verbal or social cyberbullying subscale, validating the divergent validity of the overall scale. The EFA showed that verbal and social cyberbullying were measured by the cyberbullying scale, and the subscales were successful in measuring experiences of online social rejection. The CFA showed "goodness of fit" for the two-factor model over the one-factor model, further confirming construct validity. The factor analyses ultimately indicated that the cyberbullying construct should be measured in terms of social and verbal cyberbullying. A good measure of reliability further confirmed that the cyberbullying

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scale is a valid and reliable measure of the total cyberbullying experience and may be referenced in future studies.

Facebook Activity Scale Validity and Reliability

The Facebook Activity Scale was designed to account for both general and appearance-centric activity on Facebook. Measures of Facebook activity, in regards to social behavior research, are still relativity new and are varied amongst the existing literature. In an attempt to measure a wide range of Facebook attitudes and behavior, it was decided to combine items from the Facebook Intensity Scale (Ellison et al, 2007) and Facebook Score Scale (Mabe, Forney, & Keel, 2014).

All of the items from the Facebook Intensity Scale measured one construct of Facebook activity, labeled "general Facebook activity"; while all of the items from the Facebook Score Scale measured another construct of Facebook activity, labeled "appearance-centric" Facebook activity. There were problems with internal consistency in both scales; especially in regards to individual items measuring unique components of the two Facebook activity constructs. To improve construct validity, items with similar wording were removed from both subscales. The CFA indicated that the 2-factor model was a better fit than the 1-factor model, suggesting that appearance-centric and general activity constructs of Facebook activity should be accounted for separately. Ultimately, the present study was unable to demonstrate validity for the appearance-centric subscale, casting some doubt on the findings by Mabe, Keel, and Forney (2014). It was concluded that general activity was the only reliable and valid measure of Facebook activity. Previous studies that had used the Facebook Score Scale as a measure of Facebook activity

should re-evaluate their findings, and consider the potential of inflated accounts of appearance-centric Facebook activity.

Verbal Cyberbullying as a moderator

The two-factor model of cyberbullying was validated and shown to have good internal consistency, so cyberbullying was measured in terms of verbal and social cyberbullying rather than total cyberbullying. Verbal cyberbullying moderated the relationships between general Facebook activity and bulimia and food preoccupation attitudes and behavior, general Facebook activity and dieting attitudes and behavior, and general Facebook activities and disordered eating attitudes and behavior. Whereas, verbal cyberbullying did not moderate the relationship between general Facebook activity and oral control attitudes and behavior. For all three models of moderation, verbal cyberbullying had a strong moderating effect on low Facebook activity and a weak effect on high Facebook activity. This observation further confirms a moderation effect taking place because moderators, by definition, strengthen the relationship between the criterion and predictor at varying levels of the moderator (Kenny, 2013).

In this study, it was observed that high levels of verbal cyberbullying strengthened the relationship between general Facebook activity and the three criterions (bulimia, dieting, and general EAB) at low and average levels of general Facebook activity. At below-average Facebook activity, verbal cyberbullying significantly moderated the relationship between Facebook activity and pathological eating attitudes and behavior; so that there was a significant difference in eating attitudes and behavior amongst individuals who experienced verbal cyberbullying. At low levels of general Facebook activity, verbal cyberbullying was found to have the strongest moderation effect on predicting bulimia and food preoccupation. In other

words, the greatest difference in the account of disordered eating patterns amongst individuals with low, average, and high exposure to verbal cyberbullying was found for bulimia and food pre-occupation. This observation is consistent with Hughes and Gullone's (2011) findings that the frequency of direct dysfunctional interactions, such as verbal bullying, are significantly correlated with bulimic symptoms. The moderation effect was not as strong for overall disordered eating behavior and attitudes (EAT-26) and dieting attitudes and eating behavior; however, the effect was still significant at low levels of general Facebook activity.

The moderation effect of verbal cyberbullying for all three models was strongest at low-levels of Facebook activity, and waned as activity increased. One interpretation of these findings is that verbal cyberbullying maintains disturbed eating behavior at lower levels of Facebook interaction. When low Facebook activity limits exposure to negative peer interactions, verbal cyberbullying accounts for supplemental peer conflict, and enhances the relationship between general Facebook activity and disordered eating. In such case, college-age females who spend less time on Facebook, but are victims of frequent verbal attacks online through alternative social media sites, will maintain bulimia and food-preoccupation behavior. Whereas, young adult women who spend above-average time on Facebook encounter constant peer pressure, through photo-sharing and photo-commenting (Smith, Hames, and Joiner, 2013). These young females are likely to be exposed to eating pathology risk factors, such as body dissatisfaction, and low-levels of cyberbullying will not lessen the effect. One study on the consequences of homophobic-themed language on peer interactions found that verbal bullying maintained social isolation and absenteeism (Flowers & Buston, 2001). Verbal cyberbullying may function in a similar way, accounting for the direction of moderation found in the study.

Conversely, an unexamined component of social media may explain the direction of cyberbullying moderation on EAB and Facebook use. Perhaps, Facebook activity is related to a number of positive peer interactions for certain young adult females. At the surface, social media websites aim to connect peers and bolster an environment of kinship amongst individuals who would traditionally "grow-apart" (Nadakami & Hoffman, 2012). In such a case, Facebook users are able to protect themselves from the negative self-evaluation imposed by experiences of bullying. Some participants who were more active on Facebook may use social media websites to garner peer support, generating a positive feedback loop of social belongingness and Facebook use. A Facebook scale that reliably measured a Facebook use construct, rather than the attitudinal one used in study, would further evaluate these two potential explanations.

Social Cyberbullying as a moderator

Similar to verbal cyberbullying, social cyberbullying was shown to moderate the relationships between general Facebook activity and bulimic and food preoccupation eating attitudes and behavior, general Facebook activity and dieting eating attitudes and behavior, and general Facebook activity and general disturbed eating attitudes and behavior amongst college-aged females. The moderation effect by social cyberbullying was found to be directional for all three models; higher levels of social cyberbullying was found to strengthen the relationship between general Facebook activity and disordered eating criteria (bulimic and food preoccupation, dieting, and EAT-26) at low and mean levels of Facebook activity. At above mean levels of general Facebook activity, social cyberbullying did not influence the relationship between the predictor and the criteria variables.

Social cyberbullying was a strong moderator between Facebook activity and eating pathology at low levels of Facebook activity. Under this condition, differences between accounts of disordered eating behavior & attitudes were significant amongst low, average, and high levels of social cyberbullying. In other words, individuals who weren't very active on Facebook were more susceptible to developing disordered eating habits when exposed to high levels of social cyberbullying. Meanwhile, those less-active Facebook users who were exposed to average-to-low levels of cyberbullying had significantly lower accounts of disordered eating behaviors and attitudes.

Similar to verbal cyberbullying, the moderating effect of social cyberbullying was found to be the strongest for accounts of bulimia and food preoccupation. Furthermore, these findings suggest that cyberbullying, regardless of directness, has the ability to predict bulimic attitudes and symptoms amongst college-aged females. Any form of cyberbullying, from teasing to threatening with violence, may disrupt self-esteem in body-shape and weight and contribute to the development of pathological eating attitudes and behavior.

Social cyberbullying did not moderate the relationship between general Facebook activity and oral control attitudes and behavior. These findings may be in part related to the nature of eating disorder development, in respect with the interpersonal formulation model. According to the model, disturbed eating attitudes and behavior develop as a coping mechanism to placate negative affect. Individuals may be focused on controlling calories consumed and burnt, or controlling binge episodes by purging. In that regard, college-age females who are cyberbullied or/and engage in heighten Facebook activity may be experiencing an illusion of control. On the other hand, the oral control subscale had low-to-adequate internal reliability ($\alpha = 0.67$). The subscale may have been inadequate in consistently measuring the oral control construct.

Another interpretation of these findings is that young females who have less-than-average activity on Facebook, avoid social media sites because of experiences with traditional bullying. Individuals who are bullied online also tend to be bullied in-person (Kowalski & Limber, 2013) and social media websites may function as just an additional outlet that the traditional bully uses to antagonize the victim. Previous studies have shown the association between bulimic symptoms and bullying by peers and have correlated low self-concept with experiences of teasing (Fosse & Holen, 2006). In such case, individuals with heightened exposure to traditional bullying may be avoiding additional encounters of bullying by restricting their Facebook use. These victims may then be developing negative affect and eating pathology in response to the combination of in-person bullying and high levels of cyberbullying. In order to determine the isolated moderation effect of cyberbullying on eating pathology, a future study should examine the moderation effect of cyberbullying amongst individuals who have been experiencing cyberbullying without experiencing traditional bullying. Such a study would determine whether cyberbullying acts independently as a moderator or in conjunction with bullying on predicting the development of eating pathology.

Contributions to the Existing Literature

The aim of the study was to expand upon the existing knowledge of cyberbullying, Facebook use, and eating pathology. Social media is a relatively new topic in eating disorder research. Recent literature has brought attention to the association between time spent on Facebook and eating disorder risk factors (Mabe, Forney, & Keel, 2014). As the topic has evolved over the past couple of years, researchers have begun to question how specific Facebook activities contribute to eating disorder etymology and how negative affect mediate Facebook use and eating disorder

risk factors. This study contributes to this field of study, and examines how cyberbullying contributes to the Facebook-eating disorder paradigm. Findings have shown that verbal and social cyberbullying strengthen the effect of general Facebook activity on bulimia and food preoccupation, dieting, and overall eating attitudes and behavior at low levels of Facebook use. As described above, these findings may suggest that cyberbullying, in general, maintains the association between disturbed eating attitudes and Facebook activity. Existing literature on cyberbullying has shown verbal bullying to be a predictor of body dissatisfaction (Fox and Farrow, 2013) amongst college-age students. Whereas the present study suggests that cyberbullying may have just as deleterious of an effect on body image and healthy eating behavior as bullying.

All the while, cyberbullying may be emerging as the dominant form of bullying. As dictated by the literature, social media sites offer bullies the advantages of enhanced exposure and a wider audience to perpetuate harassment (Gonzales, 2014). In some instances, face-to-face bullying may be too emotionally intense for the bully. Social media sites allow peers to harass one another in an empathy-free zone; without the drawbacks of witnessing the victims' responses. In this case, it is important to examine the implications of social-media cyberbullying on adolescent mental health. This study made an attempt to examine the influence of cyberbullying on eating attitudes and behavior without removing traditional bullying as a confounding variable, which has been linked to eating disorder pathology. However, if cyberbullying increasingly accounts for most experiences of bullying, traditional bullying may have a just supplemental effect on moderating eating disorder symptoms. In future, it would be interesting to compare the moderating effects of cyberbullying and traditional bullying on the Facebook activity and eating attitudes relationship.

The study's findings showed a strong correlation between time-spent on Facebook, general Facebook activity, and disordered eating attitudes and behavior. Because of the cross sectional nature of the study, it is impossible to claim a causal effect between time spent on Facebook activity and disordered eating trends. Facebook may be exposing young adults to negative peer interactions and media ideals, or negative social experiences; and thin-media may lead to an increase in Facebook engagement. Young college-age females compare themselves to media images of the thin-ideal fashion model; and it has been found that thin-media exposure predicts body dissatisfaction (Tiggeman et al., 2013). Females, in response, may be turning to Facebook as an outlet for coping with feelings of extreme dissatisfaction. On Facebook, these females may be able to compare themselves to a wider range of body types, and more body shapes that are similar to their own. Facebook may then be utilized as a coping mechanism, and the correlation between disordered eating habits and Facebook use may account for an emerging form of self-medication. This suggestion is consistent with the social comparison theory that has been found in eating disorder literature to say that people do compare weight and body shape and often experience negative effects on self-esteem (Lockwood & Kunda, 2002). The question is "which mode of social comparison has the most salient effect?" By answering this question, we will gain more insight into the direction of the Facebook-Thin Media-Eating Patterns paradigm.

Lastly, this study was successful at creating a reliable and valid measure of cyberbullying. The cyberbullying scale was designed to measure the full cyberbullying experience in terms of social and verbal cyberbullying. Exploratory and confirmatory factor analyses used to confirm divergent and convergent validity of the scale items, and validated the 2-factor fit. Future studies on cyberbullying may use this scale to assess the effects of direct and/or indirect cyberbullying on a number of variables.

Clinical Implication

It is important for clinicians to be cognizant of the impact of social networking and cyberbullying on self-esteem and body image in the treatment of young adult females struggling with eating disorders. Research has shown that the amount of time spent viewing media messages influences perceptions of self-worth and satisfaction with body image (Cardosi, 2006). Facebook is a social website that combines risk factors of eating disorders, peer pressure and media messages. The pervasiveness of Facebook use by adolescent and young adult females may produce emotional consequences towards body image as it acts as a point of reference for comparison. Studies have illustrated that maladaptive Facebook behavior is a predictor of bulimic symptoms (Smith, Hames, & Joiner, 2013); whereas, the present study identified a significant correlation between times spent on Facebook and bulimia behavior and attitudes. These findings illuminate the threat that social media websites pose on the maintenance of healthy eating habits. Meanwhile cyberbullying is another online occurrence that endangers the psyche of adolescent and young females. A study investigating the relationship between cybervictimization and body esteem on ages 10-15 found that cyberbullying was often directed towards appearance and negatively impacted body-image (Frisen, Berne, & Lunde, 2013). Awareness of the implications of social-media use and cyberbullying on eating disorder symptomology will empower therapists and counselors. Clinicians, for example, who design out-patient treatment programs for individuals recovering from eating disorders, may incorporate behavioral components of social-media aversion into the therapy. Or, therapists may even add coping strategies into the treatment to help young females deflect harmful messages from social media and/or cyberbullying sources.

Moreover, studies of this nature will prepare clinicians in addressing the changing landscape of eating disorder development. The next step would be to design clinical studies on eating disorder interventions that incorporate cyberbullying-response elements. If cyberbullying is maintaining negative affect related to social elements, such as social isolation, at lower levels of Facebook activity, it would be important to examine the clinical significance of addressing cyberbullying and general social-media use in eating disorder therapy. In this case, therapists will be able to mitigate the deleterious effects of cyberbullying in-lieu of excessive social media activity. In addition, clinical research should also examine the effects of a therapy that adds a cyberbullying component to existing forms of cognitive behavioral treatment. The aim of cognitive behavioral therapy is to enable the patient to recognize situations that trigger eating disorder behavior (Fairburn, Cooper, & Shafran, 2003). Trials that incorporate a cyberbullying element may make important therapeutic gains that match the current climate of eating disorder development.

Study Limitations

This study was successful at bridging two predictors of eating disorder pathology, bullying and social-media use. However, there are some limitations to the study that warrant review. While correlations were found, the study was unable to determine causal relationships between the study variables. Therefore, it cannot be assumed that more frequent experience of cyberbullying or increases in Facebook activity cause eating disorder attitudes and behavior. This study has only shown the strength of the relationship between these variables in a specific population.

Furthermore, the moderation effect was determined by examining the significance between the predictor, moderator, interaction effect, and the criterion. The strength of moderation was then examined by analyzing the R^2 change, or by how much more variance the moderation explained. The R^2-values in all three regression models were low, indicating the moderation of cyberbullying explained 1-2% of variance in EAB, bulimia, and dieting amongst participants. This limitation should be addressed in a future study, by investigating the confounding effects of Facebook time and the number of Facebook friends on the moderation paradigm.

Another limitation was in the scope of study participants. Subjects were recruited from one of two kinesiology courses at the University of Houston. Students who participated may have had a bias view of dieting and food restriction due to the nature of their field of interest. Students from these two courses were not necessarily Nutrition or Kinesiology majors; but their interests in a kinesiology course may have generated a response bias. Of the original 566 participants, only 339 met the inclusion criteria and completed the questionnaire. This high attrition rate may indicate some additional response bias. Those who did not correctly read the instructions or failed to complete the questionnaire may have held less interest in the study. Whereas, those who completed the questionnaire may have had impactful experiences with cyberbullying or eating disorder. All in all, the sample population may not be reflective of the general population.

Thirdly, the items from the General Facebook Activity were not tested for content validity. The measure was taken from an existing scale that claimed to reliability measure Facebook use and attitudes about Facebook activity; however no information about validity was found in the previous literature. EFA and CFA were used to test for convergent validity, and it was determined that the scale items loaded onto the general activity factor, but it is questionable what construct was being measured. High scores ("5" on a 6-point "Likert" scale) on attitudinal

questions about Facebook activity were interpreted as increased Facebook activity. Additionally, the items referred to general Facebook activity so it is impossible to determine how Facebook use predicts eating attitudes and behavior. In future studies, a reliable and valid measure of Facebook activity should be developed. The current measures of Facebook activity attitudes were found to have issues with internal consistency and redundancy. However, the one scale that was found to have construct validity, did not adequately measure the construct of interest. In order to determine the moderating effect on true Facebook activity, a better scale is needed. For the time being, the results are promising and suggest that Facebook activity is a predictor of eating disorder attitudes and behaviors in response to cyberbullying.

Lastly, the Eating Attitudes Test-26 was selected as a measure of disordered eating. To evaluate the severity of disordered eating for the three subscales, each point was given a weight of "1". For the original scoring system "0", "1", and "2" are equally weighed as "0". As a result, values for the EAT-26 measures cannot be directly interpreted for clinical significance. In future studies, the influence of Facebook activity and cyberbullying experiences on eating disorder symptoms. The present study found that the moderation effect of cyberbullying was the strongest on bulimia and food preoccupation attitudes and behavior. To account for the poor translation power of the present study, future studies should aim to replicate these findings on bulimia symptoms.

Conclusion

 The implications of social-media use on pathological eating attitudes and behavior is a relatively new topic in eating disorder research. Even though bullying and Facebook use have been associated with the formulation of eating disorder risk factors, there is no study to date that examines the relationship between cyberbullying, Facebook activity, and eating attitudes and behaviors. The aim of the present study was to assess the moderation of cyberbullying on Facebook activity and eating attitudes and behavior. Findings from the study supported the moderation effect of cyberbullying, verbal and social, on general Facebook activity as a predictor bulimia and food preoccupation, dieting, and overall eating attitudes and behavior. Furthermore, the findings show that cyberbullying moderates the Facebook-eating behavior and attitudes paradigm at low levels of Facebook activity. Verbal and social cyberbullying may be acting as a moderator by maintaining negative peer interactions at lower levels of Facebook activity, predicting eating behaviors and attitudes. Although this study identifies cyberbullying as a contributor to the Facebook activity and eating disorder paradigm, it is still unknown how cyberbullying moderates the relationship and what type of Facebook activity is being effected.

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Appendix A

Appendix A.1 Tables

Table 1. Factor loadings for 15 items on the Fox & Farrow (2009) self-report experience of bullying questionnaire.

Item Description	Factor Loading
Verbal	
1. Called a nasty name	.70
2. Had something nasty said about you (or a member of your family) either to your face, or within your family)	.74
3. Teased in a nasty way	.80
4. Yelled/shouted at	.75
5. Threatened with violence	.79
Physical	
6. Kicked, slapped or punched	.61
7. Pushed or tripped up	.68
8. Had something thrown at you or been hit with an object	.78
Social	
9. Had nasty stories/rumors spread about you	.72
10. Been left out of the group on purpose	.73
11. Everyone stopped talking to you, or ignored you	.75
12. Gigged/laughed about	.78
13. Received nasty phone-calls, text messages, notes, or emails	.58
14. Given dirty looks	.70
15. Someone has said something like, "I won't like you unless you…	.71

Table 2. Items for Facebook Intensity Scale (Ellison et al, 2007)

Facebook Usage (Cronbach's Alpha = .85)
1. About how many total Facebook friends do you have at MSU or elsewhere?
       0 = 10 or less, 1 = 11-50, 3 = 101-151, 4 = 151-200, 5 = 201-250, 6 = 251-300,
       7 = 301-400, 8 = more than 400
2. In the past week, on average, approximately how many minutes per day have
       you spent on Facebook? 0 = less than 10, 1 = 10-30, 2 = 31-60 minutes,
       3 = 1-2 hours, 4 = 2-3 hours, 5 = more than 3 hours
3. Facebook is part of my everyday activity
4. I am proud to tell people that I'm on Facebook
5. Facebook has become part of my daily routine
6. I feel out of touch when I haven't logged onto Facebook for a while
7. I feel I am part of the Facebook community
8. I would be sorry if Facebook shut down

_____

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Table 3. Items from the Facebook Score Scale

Individual Items   .
Facebook Usage (Cronbach's Alpha = .85)
1. How often do you compare your photos to photos of your female friends?
2. How important is it to you to have more likes or comments on your photos than your
    other female friends?
3. How important is it to you that people "like" your photos?
4. How important is it to you that people comment on your photos?
5. How important is it to you that people "like" your status updates?
6. How important is it to you that people comment on your status updates?
7. How often do you take photos in public for the main purpose of posting them on
    Facebook?
8. How often do you untag your photos?

_____

.

Table 4. Cyberbullying Scale Items

_____

Verbal
1. Called nasty names on a social media site (CB1)
2. Had something nasty said about you (or a member of your family) either on your profile
    page or a peer's social media page (CB2)
3. Teased in a nasty way on a social media site (CB4)
4. Had been blocked on a social media site (CB9)
5. Had been publicly made fun of on a social media site (CB10)

6. Received a negative response to a comment on a social media site (CB13)

Social

1. Threatened with violence on a social media site (CB5)
2. Had nasty stories/rumors spread about you on a social media site (CB6)
3. Been left out of a social media group or event on propose (CB7)
4. Had been harassed in some way on a social media site (CB8)
5. Received nasty posts or messages (CB12)
6. Someone has commented something like, 'I won't like you unless you… (do what I say)' (CB14)

_____

Table 5. Facebook Scale Items

_____

 General

1. Facebook is part of my everyday activity (FB1)
2. Facebook has become part of my daily routine (FB2)
3. I feel out of touch when I haven't logged onto Facebook for a while (FB3)
4. I feel that I am part of the Facebook community (FB4)
5. I would be sorry if Facebook shut-down (FB5)

Appearance-Centric

1. How often do you compare your photos to photos of female friends? (FB6)
2. How important is it to you to have more likes or comments on your photos than your other female friends? (FB7)
3. How important is it to you that people "like" your photos? (FB8)
4. How important is to you that people comment on your photos? (FB9)
5. How important is it to you that people "like" your status updates? (FB10)
6. How important is it you that people comment on your status updates? (FB11)
7. How often do you take photos in public for the main purpose of posting them on Facebook? (FB12)
8. How often do you untag photos? (FB13)

_____

Table 6. Social Connectedness Scale Items added to the Cyberbullying Scale

_____

7. I am able to connect with other people (CB3)
8. I see people as friendly (CB11)
9. I feel close to people (CB15)

_____

Table 7. Demographic Characteristics of Information

Demographic variable	Mean	St. Dev	Range
Age	21.6	1.8	18 – 26
BMI (kg/m^2)	23.3	4.9	15.0 - 42.9

Demographic Variable	Category	Frequency	Percentage%
BMI group	Underweight (<18.5 kg/m^2)	29	8.6
	Normal weight (18.5-24.9 kg/m^2)	227	67
	Overweight (25-29.9 kg/m^2)	48	14.2
	Obese (>30 kg/m^2)	35	10.3
Ethnicity	Caucasian	119	35.7
	Hispanic/Latino	41	12.3
	Asian	118	35.4
	African American	32	9.6
	Other	23	6.9
Highest level of education	High School (diploma/GED)	274	81.3
	Associate's/ Professional Certificate	25	7.4
	Bachelor's (B.A/B.S)	37	11
	Graduate	1	0.3
Weekly time spent on Facebook	11-30 minutes	126	37.8
	31-60 minutes	75	22.5
	1-2 hours	66	19.8
	2-3 hours	36	10.8
	>3 hours	30	9
Number of Facebook friends	100 or less	21	6.2
	101-200	47	10.7
	201-300	46	13.9
	301-400	44	13.6
	401-500	33	13.1
	601-700	18	9.8
	>700	92	27.1

Table 8. Cronbach's α, Means, Standard Deviations, Skewness, and Kurtosis for the Variables

Variable	α	N	M	SD	Range	Skewness Original Scores	Kurtosis Original Scores	Skewness Transformed Scores	Kurtosis Transformed Scores
FBGeneral	0.74	339	12.5	3.6	4.0-20.0	-0.41	-0.16	-	-
EATOral	0.67	339	16.5	5.6	7.0-35.0	0.6	0.24	-	-
EATDiet	0.90	339	35.5	12.7	13.0-75.0	0.5	-0.31	-	-
EAT26	0.91	339	63.9	19.8	26.0-134.0	0.62	0.44	-	-
CBSocial	0.82	339	6.4	2.5	5.0-18.0	2.47	6.24	1.71	2.42
CBTotal	0.91	339	14.3	5.2	11.0-39.0	2.24	5.00	1.58	1.85
CBVerb	0.83	339	7.9	2.9	6.0-22.0	1.98	3.80	1.36	0.99
Bulimia	0.79	339	11.91	5.2	6.0-32.0	1.13	0.98	-	-

Note: FBGeneral = General Facebook activity attitude; EATOral = Eating Attitudes Test: Oral Control; EATDiet = Eating Attitudes Test: Dieting; Bulimia = Eating Attitudes Test: Bulimia; EAT26= Eating Attitudes Test; CBSocial = Social Cyberbullying; CBVerb = Verbal Cyberbullying; CBTotal = Cyberbullying score (total).

Table 9. Spearman's Correlation Matrix of Study Variables

Variable	1	2	3	4	5	6	7	8	9
1. FB Time	1								
2. BMI	0.03	1							
3. Bulimia	0.17**	0.1	1						
4. EATOral	0.07	-0.16**	0.4**	1					
5. EATDiet	0.05	0.29	0.63**	0.43**	1				
6. FBGen	0.5	-0.08	0.12*	0.17**	0.12*	1			
7. CBVerb	0.15	0.05	0.23**	0.2**	0.17**	0.08	1		
8. CBSocial	0.05	0.04	0.17**	0.16**	0.16**	-0.04	0.66	1	
9. CBScore	0.11*	0.04	0.22**	0.20**	0.17**	0.04	0.92**	0.86**	1

Note: FBGeneral = General Facebook activity; EATOral = Eating Attitudes Test: Oral Control; EATDiet = Eating Attitudes Test: Dieting; Bulimia = Eating Attitudes Test: Bulimia; EAT26= Eating Attitudes Test; CBSocial = Social Cyberbullying; CBVerb = Verbal Cyberbullying; CBTotal = Cyberbullying score (total).
* $p < 0.05$, ** $p < 0.01$

Table 10. Summary of Hierarchical Regression Analysis using Bulimia and Food Preoccupation

Variable 1	B	SEBeta	Beta	t	R^2	ΔR^2
Bulimia						
Step 1: FBGen	1.27	0.48	0.61	2.63**	0.03	
Step 2: CBVerb	24	6.83	0.88	3.51**	0.08	0.05
Step 3: FBGen x CBVerb	-1.23	0.53	-0.86	-2.31**	0.09	0.01
Bulimia						
Step 1: FBGen	1.25	0.45	0.87	2.76**	0.03	
Step 2: CBSocial	24.13	7.06	0.6	3.42**	0.07	0.04
Step 3: FBGen x CBSocial	-1.34	0.56	-0.82	-2.38**	0.08	0.01

Note: FBGen = General Facebook activity; Bulimia = EAT-26 Subscale: Bulimia and Food Pre-Occupation; CBSocial = Social Cyberbullying; CBVerb = Verbal Cyberbullying; * $p < 0.05$, ** $p < 0.01$

Table 11. Summary of Hierarchical Regression Analysis using Dieting

Variable 2	B	SEBeta	Beta	t	R^2	ΔR^2
EATDiet						
Step 1: FBGen	3.31	1.18	0.95	2.82**	0.02	
Step 2: CBVerb	58.67	16.7	0.611	3.51**	0.05	0.03
Step 3: FBGen x CBVerb	-3.39	1.31	-0.97	-2.60**	0.06	0.01
EATDiet						
Step 1: FBGen	2.89	1.1	0.83	2.62**	0.03	
Step 2: CBSocial	55.1	17.24	0.56	3.20**	0.06	0.03
Step 3: FBGen x CBSocial	-3.24	1.38	-0.82	-2.35**	0.07	0.01

Note: FBGen = General Facebook activity; EATDiet = EAT-26 subscale: Dieting; CBSocial = Social Cyberbullying; CBVerb = Verbal Cyberbullying; * $p < 0.05$, ** $p < 0.01$

Table 12. Summary of Hierarchical Regression Analysis using Oral Control

Variable 3	B	SEBeta	Beta	t	R^2	ΔR^2
EATOral						
Step 1: CBVerb	0.93	0.53	0.6	1.76	0.02	
Step 2: CBVerb	18.43	7.48	0.43	2.47*	0.06	0.02
Step 3: FBGen x CBVerb	-0.83	0.59	-0.53	-1.41	0.06	
EATOral						
Step 1: FBGen	0.771	0.49	0.5	1.56	0.02	
Step 2: CBSocial	15.82	7.74	0.37	2.05*	0.06	0.02
Step 3: FBGen x CBSocial	-0.711	0.617	-0.4	-1.15	0.06	

Note: FBGen = General Facebook activity; EATOral = EAT-26 subscale: Oral Control; CBSocial = Social Cyberbullying; CBVerb = Verbal Cyberbullying; * $p < 0.05$, ** $p < 0.01$

Table 13. Summary of Hierarchical Regression Analysis using EAT-26

Variable 4	B	SEBeta	Beta	t	R^2	ΔR^2
EAT26						
Step 1: CBVerb	101.1	25.87	0.67	3.91	0.02	
Step 2: CBVerb	5.5	1.82	1	3.02	0.06	0.04
Step 3: FBGen x CBVerb	-5.45	2.02	-1	-2.7	0.08	0.02
EAT26						
Step 1: FBGen	95.04	26.79	0.62	3.55	0.02	
Step 2: CBSocial	4.91	1.71	0.9	2.87	0.06	0.04
Step 3: FBGen x CBSocial	-5.29	2.14	-0.85	-2.48	0.08	0.02

Note: FBGen = General Facebook activity; EAT26 = Eating Attitudes Test-26; CBSocial = Social Cyberbullying; CBVerb = Verbal Cyberbullying; * $p < 0.05$, ** $p < 0.01$

Appendix A.2 Figures

Figure 1. Interpersonal Formulation Model for Eating Disorders

Negative Social Evaluation
(i.e. Grief, Role Transition, Interpersonal dispute, & Interpersonal Deficit...)

Negative Self-Evaluation and Negative Affect
(i.e. Self-disturbance)

Eating Disorder Behaviors
(i.e. Self-starvation, Binge eating, and other extreme dietary behavior)

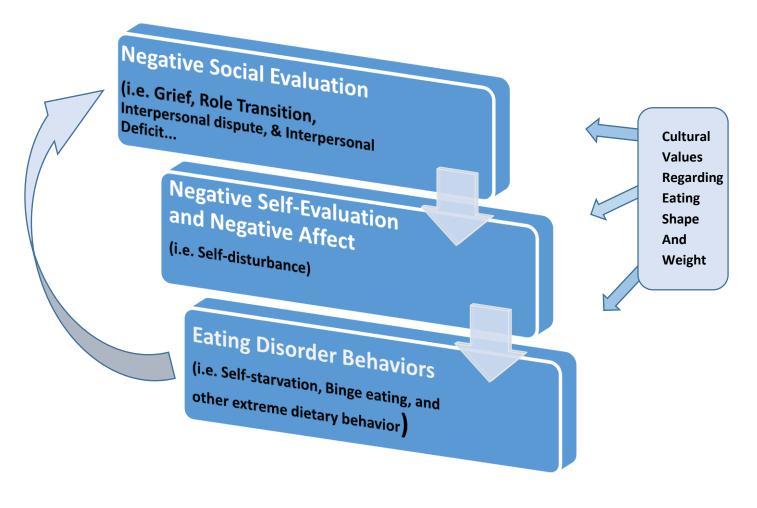Cultural Values Regarding Eating Shape And Weight

Figure 2. Theoretical model of the moderating effect of cyberbullying on Facebook activity and ED attitudes and behavior.
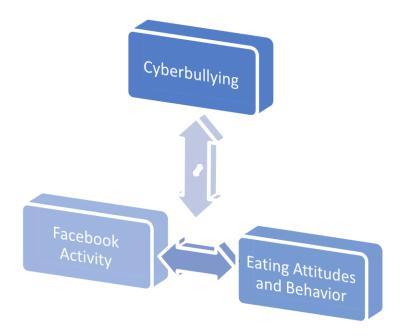
Figure 3. Path diagram showing the results of the Confirmatory Factor Analysis: three-factor model with standardized coefficients (Fox & Farrow, 2009)
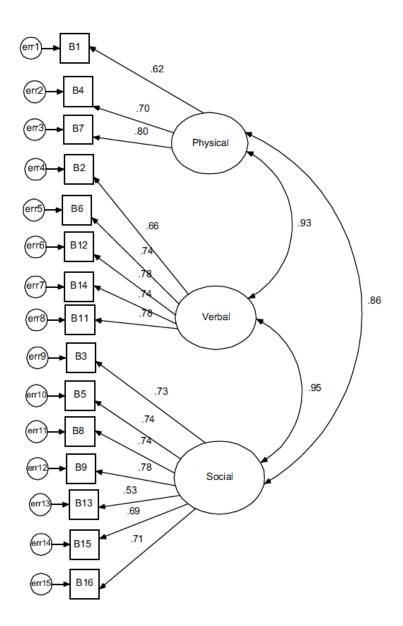
Figure 4. Moderator model: Impact of Facebook use and cyberbullying on eating attitudes and behavior
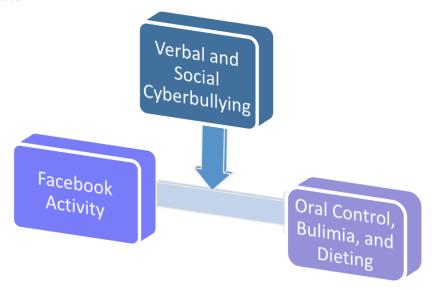
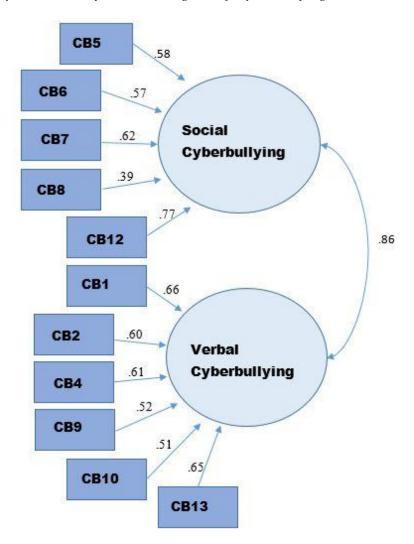*Figure 5. Confirmatory Factor Analysis Path Diagram of Cyberbullying Scale Items*

Figure 6. Confirmatory Factor Analysis Path Diagram of Facebook Activity Scale Items
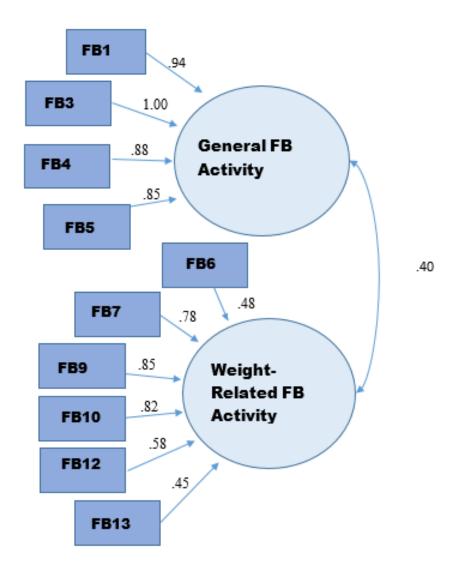
Figure 7. Verbal and Social Cyberbullying as a Moderator between General Facebook Activity and Bulimia and Food Preoccupation
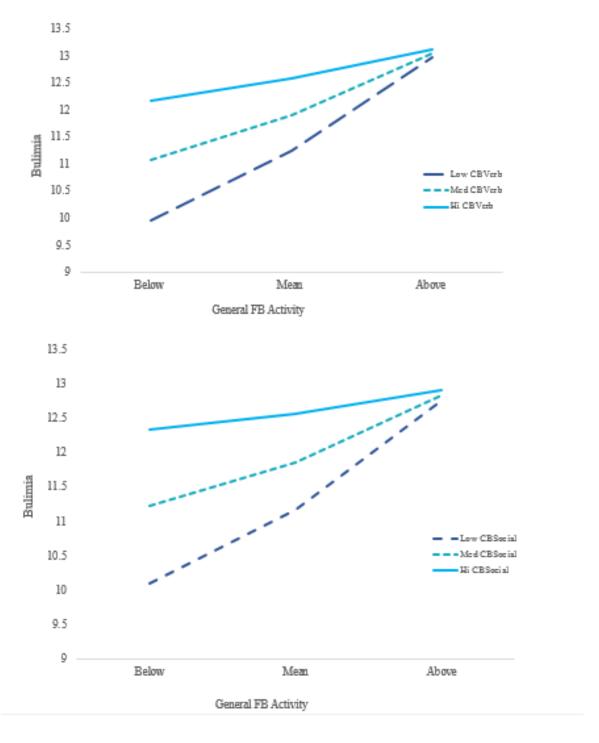
Figure 8. Verbal and Social Cyberbullying as a Moderator between General Facebook Activity and Bulimia and Food Preoccupation
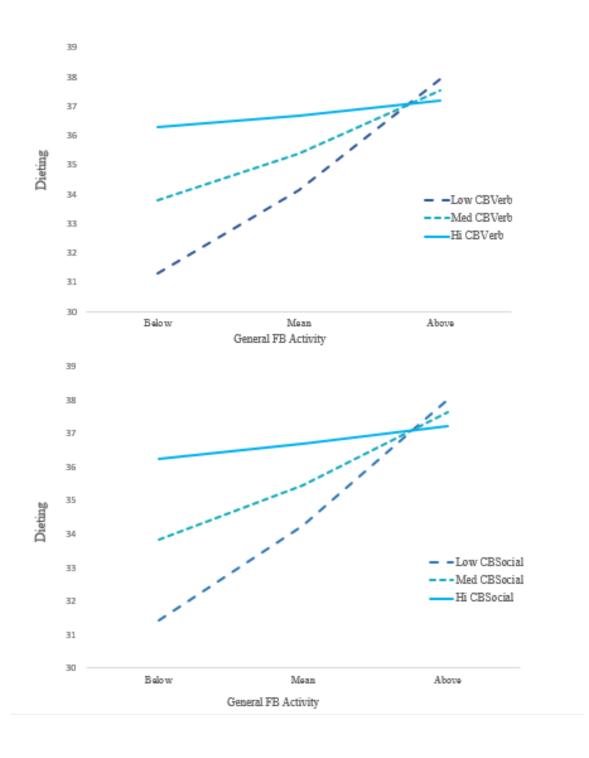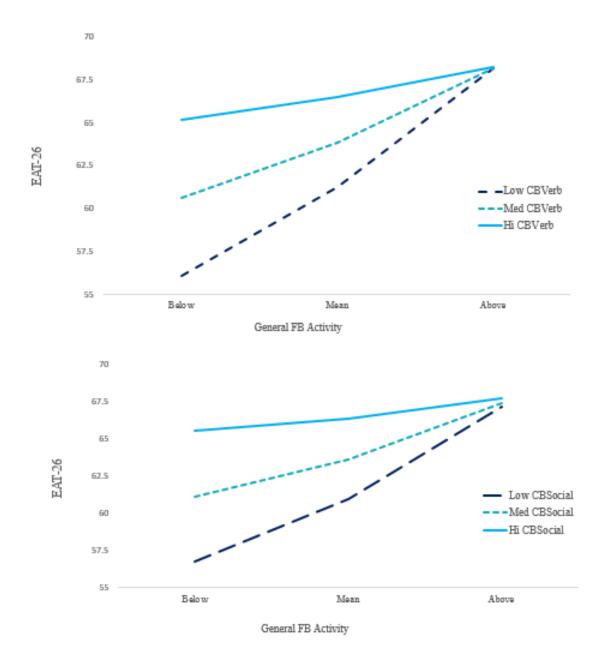
Figure 9. Verbal and Social Cyberbullying as a Moderator between General Facebook Activity and EAT-26

Appendix B

Appendix B.1 Facebook Activity Questionnaire

Evaluate the following statements.

	Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree
Facebook is part of my everyday activity	○	○	○	○	○
Facebook has become part of my daily routine	○	○	○	○	○
I feel out of touch when I haven't logged onto Facebook for a while	○	○	○	○	○
I feel I am part of the Facebook community	○	○	○	○	○
I would be sorry if Facebook shut down	○	○	○	○	○

Evaluate the following statements.

	Not at all	Somewhat	Moderately	Very	Extremely
How often do you compare your photos to photos of your female friends?	○	○	○	○	○
How important is it to you to have more likes or comments on your photos than your other female friends?	○	○	○	○	○
How important is it to you that people "like" your photos?	○	○	○	○	○
How important is it to you that people comment on your photos?	○	○	○	○	○
How important is it to you that people "like" your status updates?	○	○	○	○	○
How important is it to you that people comment on your status updates?	○	○	○	○	○
How often do you take photos in public for the main purpose of posting them on Facebook?	○	○	○	○	○
How often do you untag photos?	○	○	○	○	○

Appendix B.2 Cyberbullying Questionnaire

Evaluate the following statements.

	Never	Once or twice a month	Sometimes	About once a week	Several times a week
Called nasty names on a social media site	○	○	○	○	○
Had something nasty said about you (or a member of your family) either on your profile page or a peer's social media page	○	○	○	○	○
I feel close to people	○	○	○	○	○
Teased in a nasty way on a social media site	○	○	○	○	○
Threatened with violence on a social media site	○	○	○	○	○
Had been harassed in some way on a social media site	○	○	○	○	○
Had nasty stories/rumours spread about you on a social media site	○	○	○	○	○
Been left out of a social media group or event on propose	○	○	○	○	○
Had been blocked on a social media site	○	○	○	○	○
Had been publicly made fun of on a social media site	○	○	○	○	○
I see people as friendly and approachable	○	○	○	○	○
Received nasty posts or messages	○	○	○	○	○
Received a negative response to a comment on a social media site	○	○	○	○	○
Someone has commented something like, 'I won't like you unless you... (do what I say)'	○	○	○	○	○
I am able to connect with other people	○	○	○	○	○

Appendix B.3 EAT-26 Scale

. **Check a response for the following questions:**

	Always	Usually	Often	Sometimes	Rarely	Never
I am terrified of being overweight	○	○	○	○	○	○
I avoid eating when I am hungry	○	○	○	○	○	○
I find mysef preoccupied with food	○	○	○	○	○	○
I have gone on eating binges where I feel that I may not be abe to stop	○	○	○	○	○	○
I cut my food into small pieces	○	○	○	○	○	○
I am aware of the calorie content of foods that I eat	○	○	○	○	○	○
I particularly avoid food with a high carbohydrate content	○	○	○	○	○	○
I feel that others would prefer if I ate more	○	○	○	○	○	○
I vomit after I have eaten	○	○	○	○	○	○
I feel extremely guilty after eating	○	○	○	○	○	○
I am occupied with the desire to e thinner	○	○	○	○	○	○

I think about burning up calories when I exercise	○	○	○	○	○	○
Other people think that I am too thin	○	○	○	○	○	○
I am preoccupied with the thought of having fat on my body	○	○	○	○	○	○
I take longer than others to eat my meals	○	○	○	○	○	○
I avoid foods with sugars in them	○	○	○	○	○	○
I eat diet foods	○	○	○	○	○	○
I feel that food controls my life	○	○	○	○	○	○
I display self-control around food	○	○	○	○	○	○
I feel that others pressure me to eat	○	○	○	○	○	○
I give too much time and thought to food	○	○	○	○	○	○
I engage in dieting behavior	○	○	○	○	○	○
I like my stomach empty	○	○	○	○	○	○
I have the impuse to vomit after meals	○	○	○	○	○	○
I enjoy trying new rich foods	○	○	○	○	○	○

Appendix C

Appendix C.1 Cover Letter

PROJECT TITLE: Cyberbullying on Facebook: how does it influence the risk of eating disorders? You are being invited to participate in a research project conducted by Keisha Harrison, BA from the Department of Health and Human Performance at the University of Houston.

NON-PARTICIPATION STATEMENT: Your participation is voluntary and you may refuse to participate or withdraw at any time without penalty or loss of benefits to which you are otherwise entitled. You may refuse to answer any part of the survey and your submission will be withdrawn from the study.

PURPOSE OF THE STUDY: The purpose of the study is to determine the type of relationship that exists between cyberbullying on social media, Facebook use, and eating attitudes & behavior.

PROCEDURES: You will be one of approximately 120 subjects to participate in a research project that examines the effects of Facebook-mediated cyberbullying on eating behaviors and attitudes. Participation includes completing an online questionnaire through the survey-based website, SurveyMonkey. After following the provided link, you will be asked to answer 15-questions in regards to eating attitudes and behavior, experiences of bullying on social media, and Facebook activity. Some questions consist of a series of statement and will ask you to rank the statement in accordance with your own experience. As a participant in a research study, you will be asked to answer these questions to the best of your ability. The survey will take 20 to 25 minutes to complete and will only be taken once.

CONFIDENTIALITY: Every effort will be made to maintain the confidentiality of your participation in this project. Each subject's entry will be paired with a code number by the principal investigator. Individual survey responses will be associated with an assigned code number, and identifying information, such as names, addresses, and phone numbers, will not be collected as part of the survey. Email addresses will be collected as part of the compensation process. They will be dissociated from survey responses and entered into a raffle for a gift card.

Confidentiality will be maintained within legal limits. Limits of confidentiality include disclosure of child abuse, elder abuse, incapacitated adult abuse, and suicidal intentions. Disclosure of these events may result in reporting to appropriate officials or emergency care. Finally, receiving compensation in this study requires you to sign an incentive log that includes signatures from all participants in this study who had won the raffle. Compensation cannot be provided without your signature on this document.

RISKS/DISCOMFORTS: There are few risks to participating but they may include risk of emotional discomfort as you recall experiences with eating pathology or cyberbullying. A resource list of health providers will be provided to all participants.

BENEFITS: Participants cannot expect any benefits from participation in this study but it is possible that you may help our understanding of the association between eating pathology and social media.

ALTERNATIVES: Participation in this project is voluntary and the only alternative to this project is non-participation.

INCENTIVES/REMUNERATION: To compensate you for your time you will be eligible to receive course credit in KIN1304 or KIN1352

PUBLICATION STATEMENT: The results of this study may be published in professional and/or scientific journals. It may also be used for educational purposes or for professional presentations. However, no individual subject will be identified.

CIRCUMSTANCES FOR DISMISSAL FROM PROJECT

Your participation in this project may be terminated by the principal investigator:

- if you do not complete the questionnaire
- if you do not follow the instructions you are given;

- if the principal investigator determines that staying in the project is harmful to your health or is not in your best interest;

- if the study sponsor decides to stop or cancel the project

SUBJECT RIGHTS

1. I understand that informed consent is required of all persons participating in this project.

2. All procedures have been explained to me and all my questions have been answered to my satisfaction.

3. Any risks and/or discomforts have been explained to me.

4. Any benefits have been explained to me.

5. I understand that, if I have any questions, I may contact *Tracey Ledoux* at 713-743-1870.

6. I have been told that I may refuse to participate or to stop my participation in this project at any time before or during the project. I may also refuse to answer any question.

7. ANY QUESTIONS REGARDING MY RIGHTS AS A RESEARCH SUBJECT MAY BE ADDRESSED TO THE UNIVERSITY OF HOUSTON COMMITTEE FOR THE PROTECTION OF HUMAN SUBJECTS (713-743-9204). ALL RESEARCH PROJECTS THAT ARE CARRIED OUT BY INVESTIGATORS AT THE UNIVERSITY OF HOUSTON ARE GOVERNED BY REQUIREMENTS OF THE UNIVERSITY AND THE FEDERAL GOVERNMENT.

8. All information that is obtained in connection with this project and that can be identified with me will remain confidential as far as possible within legal limits. Information gained from this study that can be identified with me may be released to no one other than the principal investigator. The results may be published in scientific journals, professional publications, or educational presentations without identifying me by name.

I HAVE READ (OR HAVE HAD READ TO ME) THE CONTENTS OF THIS CONSENT FORM AND HAVE BEEN ENCOURAGED TO ASK QUESTIONS. I HAVE RECEIVED ANSWERS TO MY QUESTIONS. I GIVE MY CONSENT TO PARTICIPATE IN THIS STUDY. I HAVE RECEIVED (OR WILL RECEIVE) A COPY OF THIS FORM FOR MY RECORDS AND FUTURE REFERENCE.

Appendix C.2 Permission Letter for Social Connectedness Scale

Hello Keisha,

Thank you for the interest in my measures. I have attached a copy of the scales, including different versions, scoring procedures, select references, and terms for usage. I also included a 2008 paper in which we dropped five items from the SCS-R due to overlap with extraversion. You may use any version. Please read the terms for usage and let me know if they are acceptable prior to use of the scales. If you have any questions regarding the terms, please let me know.

Best, Rich

Appendix C.3 Subject Recruitment Flyer

Research Participants Needed

Facebook-mediated bullying and eating habits research

Description of the Project: We are investigating how experiences with cyberbullying on Facebook relate to eating attitudes and behaviors amongst college-age females. To participate, you will be asked to complete an online survey. The questionnaire should take 15-20 minutes of your time.

https://www.surveymonkey.com/s/eating_fb

To participate: **Females** in-between the ages **18-26**, who use Facebook, may participate in the study.

Participants who complete the survey are eligible to receive extra credit in Dr. Breslin's KIN1352 course.