

SOCIAL NETWORKING SITES AND BODY IMAGE  
IN ADOLESCENT GIRLS

By

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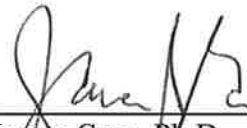
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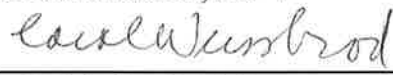
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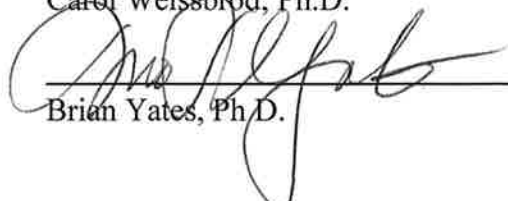
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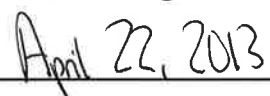
  
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ABSTRACT

The present study examines the relationship between engagement with the social networking site (SNS) Facebook and body image in adolescent girls. A recent study by Tiggemann and Miller (2010) found a strong correlation between body image disturbances and Internet use in general, and a particularly strong association with social networking site (SNS) use. This present study sought to replicate and extend upon these findings by identifying the specific Facebook features that correlate with body image disturbances in adolescent girls. 103 middle and high-school females were administered a survey that measured specific Facebook feature activity, weight dissatisfaction, drive for thinness, internalization of the thin ideal, appearance comparison, and self-objectification. It was predicted that girls with high overall Facebook use and relatively heavy engagement with appearance-related Facebook features, including posting and viewing self and peer photos, would report greater body image disturbance. Results did not demonstrate an association between overall Facebook use and body image disturbance, but did support the prediction that higher levels of appearance-related activity correlates with greater body image disturbance. Analysis on more detailed correlations for ‘self’ vs. ‘other’ photo interactions suggested that the subject of the photos being viewed was less important in explaining variance in body image scores than whether the activity was active or passive. Implications for eating disorder prevention programs and best practices in researching social networking sites are discussed.

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## INTRODUCTION

### Adolescent Body Image and Eating Disturbances

Adolescence marks a period of increased preoccupation with image and the opinions of others (Harter, 1999). Self-esteem declines substantially during middle adolescence, with evidence pointing toward shifts in body image as a particularly important correlate (Clay, Vignoles, & Dittmar, 2005). Approximately 50 percent of girls and undergraduate women report dissatisfaction with their bodies (Bearman, Presnell, & Martinez, 2006; Monteath & McCabe, 1999). Longitudinal studies have shown a decrease in body satisfaction as boys and girls move through adolescence, a pattern that exists even when controlling for shifts in BMI that accompany the onset of puberty (Paxton, Eisenberg, & Neumark-Sztainer, 2006.) This trend affects female adolescents in particular, with numerous studies reporting widespread body dissatisfaction and disturbed eating patterns among adolescent females (Ata, Ludden, & Lally, 2007; Tiggemann, 2005). According to a nationwide survey of 16,410 US high school students, female students were more likely than their male classmates to report that they are trying to lose weight (59.3% and 30.5%), deliberately restricting the amount and/or type of food they consume (51.6% and 28.4%), and fasting for over 24 hours to lose weight or prevent weight gain (14.5% and 6.9%) (Center for Disease Control and Prevention [CDC], 2009).

Body dissatisfaction has been shown to be a risk factor for the development of clinical eating disorders (Griffiths & McCabe, 2003; McCabe & Ricciardelli, 2003; Phares, Steinberg, & Thompson, 2004; Stice, 2002; Wiseman, Peltzman, Halmi, & Sunday, 2004). Studies have found a high prevalence of eating disorders among adolescent girls in particular (Thompson & Smolak, 2001). Research consistently finds that anorexia nervosa (AN) and bulimia nervosa (BN) are most likely to emerge during adolescence and that the age of onset has decreased in younger

generations (Favaro, Caregaro, Tenconi, Bosello, & Santonastaso, 2009), emphasizing the importance of prevention, early diagnosis, and treatment. The consequences of eating disorders are far-reaching. A national survey of adolescent eating disorder prevalence and comorbidity reported strong correlations between eating disorders, particularly bulimia nervosa (BN), and mood disorders, anxiety disorders, substance abuse, behavioral disorders, severely impaired social role functionality, and suicidality (Swanson, Crow, Le Grange, Swendsen, & Merikangas, 2011). Although eating disorder mortality research has historically focused on anorexia nervosa (AN), recent longitudinal research has found a rise in the mortality rate for BN (3.9%), and a particularly noteworthy elevation in the mortality rate for eating disorder not otherwise specified (EDNOS) (5.2%) (Crow, Peterson, Swanson, Raymond, Specker, Eckert, & Mitchell, 2009).

### Unraveling the Web of Eating Disorder Etiology

In recent decades, thousands of studies have sought to identify the etiology and correlates of eating disorders, adding substantial insight into the roots of these disorders while simultaneously painting a complex and incomplete picture of the main causes. Research has proposed a wide range of factors suggested to predict body dissatisfaction and disordered eating. While a comprehensive review is beyond the scope of the current study, the following examples illustrate the complexity of eating disorder etiology. Family and twins studies have found mounting support for the role of genetic factors on the development of AN and BN (Bulik, 2004). Cognitive factors such as obsessive thought patterns have been linked to eating disorder symptoms (Gleaves, Lowe, Snow, Green, & Murphy-Eberenz, 2000). Negative affect is predictive of eating disorders (Ball & Lee, 2000; Leon, Keel, Klump, & Fulkerson, 1997). Studies have identified several personality traits thought to predispose individuals for disordered



eating such as perfectionism (Hewitt, Flett, & Ediger, 1995), low novelty-seeking, high harm avoidance, high persistence, and low self-directedness in AN and high novelty-seeking, high harm avoidance and low self-directedness in BN (Fassino, Abbate-Daga, Amianto, Leombruni, Boggio, & Rovera, 2002). Eating disorders are linked to individuals with a history of adverse life events, most notably past experience of sexual abuse (Connors & Morse, 1993; Everill & Waller, 1995; Pope & Hudson, 1992; Wonderlich, Brewerton, Jolic, Dansky, & Abbott, 1997).

The risk factors mentioned above represent a small sample of the many proposed causes contributing to the onset of eating disorders, but much of the empirical evidence cannot make robust causal claims due to cross-sectional rather than longitudinal study design (Jacobi, Hayward, de Zwaan, Kramer, & Agras, 2004). Jacobi and colleagues' (2004) meta-analysis of risk factor studies cautioned that many of these findings lack explicit claims of temporal precedence and may in fact be conflating risk factors with symptoms, maintenance factors, or consequences of eating disorders. In an analysis of the empirical evidence base using a risk factor approach (Kraemer, Kazdin, Offord, Kessler, Jensen, & Kupfer, 1997), Jacobi and colleagues determined the majority of proposed eating disorder risk factors to be correlates, although longitudinal studies provided causal evidence for gender, ethnicity, genetic factors, childhood eating, feeding, and gastrointestinal issues, sexual abuse, low self-esteem, and psychiatric morbidity as predictive factors. The authors note that elevated weight and shape concerns, body dissatisfaction, and dieting behavior are the strongest and most consistent predictors to the onset of eating disorders (Jacobi et al., 2004).

Despite conflicting viewpoints on many of the proposed causes of eating disorders, low body image, as characterized by elevated weight and shape concerns and body dissatisfaction, is consistently found to predict eating disorders and is considered by most to be a non-controversial

risk factor (Jacobi et al., 2004). If body image disturbance is one of the strongest and most well-replicated factors contributing to the onset of eating disorders, understanding the elements that explain adolescent body image variance is a crucial step in identifying the causal pathway to eating disorder pathology.

### Sociocultural Influences on Body Image

A leading model framing the dynamics of body dissatisfaction and associated eating disturbances posits that the contemporary female standard of beauty is transmitted through sociocultural pressures from parents, peers, and the media (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). This tripartite influence model (Keery, van den Berg, & Thompson, 2004b; van den Berg, Thompson, Obremski-Brandon, & Covert, 2002) argues that the culturally-inscribed beauty ideal places a premium on thinness to an extent that is not practically attainable for many women and girls (Katzmarzyk & Davis, 2001; Wiseman, Gray, Mosimann, & Ahrens, 1992). Women and girls nonetheless internalize the thin standard of beauty and base their own appearance appraisals on comparisons with it (Keery et al., 2004b), leading to inevitable body dissatisfaction if and when they fail to meet this unrealistic standard. Elevated body dissatisfaction is a strong predictor of eating disorder pathology (Jacobi et al. 2004).

Keery and colleagues successfully replicated this causal pathway in a study of 325 middle school girls. Results showed that internalization of the thin ideal and appearance comparison processes fully mediated the relationship between parental influence and adolescent body dissatisfaction and partially mediated the relationship between both peer influence and body dissatisfaction and media influence and body dissatisfaction (Keery et al., 2004b). Follow-

up studies have replicated the causal pathway between peer and media, but not parent, influence on body dissatisfaction (Shroff & Thompson, 2006).

A longitudinal study of 11-year old girls found that adolescents' levels of perceived parental influence on weight concerns, self-reported appearance-related peer interaction, and media message awareness predicted the presence of 'appearance schemas,' which were linked to body dissatisfaction (Sinton & Birch, 2006). Appearance schemas are described as a domain of individual self-schemas related to the cognitive generalizations about the role, importance, and meaning of appearance in an individual's life (Cash & Labarge, 1996). Increased appearance schemacity has been linked to changes in body dissatisfaction over time (Hargreaves & Tiggemann, 2002). Though not explicitly proposed by the authors, the conceptualization of appearance schemas as a construct influenced by parents, peers, and media, fits well within the tripartite influence model (Keery et al., 2004b).

### Parental Influences

Parents may potentially influence their daughters' body dissatisfaction by establishing an appearance-focused family culture as manifested by expressed attitudes towards appearance and comments about body size (Golan & Crow, 2004). Appearance-focused family culture has been linked to an increase in disordered eating in daughters, with evidence of body dissatisfaction as a partially mediating factor (Kluck, 2010). Parental encouragement to control weight and shape has emerged as one of the most prevalent forms of parental pressure shown to predict body dissatisfaction (Helfert & Warschburger, 2011; Kluck, 2010). Additional studies have found support for appearance comparison processes fully mediating the relationship between parental influences, body dissatisfaction, and restrictive and bulimic eating patterns (van den Berg et al.,

2002). Parental influence on adolescent body image was most strongly exerted by physical appearance feedback, teasing, perceived pressure, and inferred attitudes (van den Berg et al., 2002).

Evidence for the parental modeling of disordered eating patterns has been inconclusive. Some studies have reported higher rates of eating pathology and dietary restraint in mothers of eating disordered adolescents compared with control groups (Pike & Rodin, 1991), while other studies found no such relation and concluded that parents of eating-disordered adolescents did not differ from controls on measures of dietary restraint and eating pathology (Attie & Brooks-Gunn, 1989; Leon, Fulkerson, Perry, & Dube, 1994; Steiger, Stotland, Ghadirian, & Whitehead, 1995).

### Peer Influences

Adolescence marks a time of increasing peer-orientation and reliance on friends for support and approval. While positive peer social support and acceptance has been correlated with positive body image and resilience (Stice et al., 2002), the heightened salience of peer approval renders adolescents particularly vulnerable when approval and acceptance are withheld. Many girls perceive acceptance by peers to be contingent on appearance and believe that they would be more accepted if they were thinner, a belief schema that has strong ties to body dissatisfaction (Jones & Crawford, 2006). Studies show that lower peer acceptance, perceived social support, and friendship intimacy are predictors of poor body image in samples of adolescent females (Gerner & Wilson, 2005). In fact, prospective studies suggest that peer support is a stronger predictor of eating disordered behaviors than parental support, particularly in predicting the onset of binge eating in adolescent females (Stice et al., 2002).

Appearance-based rejection by peers has shown to be a strong predictor of body image disturbances in adolescents (Oliver & Thelen, 1996), though some studies identify the association in girls only (Jones, 2004). Teasing by parents and peers has received a substantial amount of research attention, producing strong evidence that both weight teasing and general appearance teasing can have long-lasting negative consequences including low self-esteem, body dissatisfaction, and disordered eating (Eisenberg, Neumark-Sztainer, Haines, & Wall, 2006; Menzel, Schaefer, Burke, Mayhew, Brannick, & Thompson, 2010). Although many studies did not differentiate between parents and peers as sources of teasing, those that did have found peer teasing to be more prevalent (Helfert & Warschburger, 2011; Neumark-Sztainer, Falkner, Story, Perry, Hannan, & Mulert, 2002). Appearance-related feedback and encouragement to lose weight is more commonly aimed at girls by both male and female peers (McCabe & Ricciardelli, 2001). Even when girls are not the target of weight and shape-related teasing, adolescent girls that witness vicarious teasing of others experience patterns of increased internalization of social norms and body dissatisfaction (Jones & Crawford, 2006).

In addition to experiencing weight and body-related teasing and general feedback from peers, peer groups may exert influence when they establish a social environment that places high value on appearance and the thin ideal of beauty (Jones & Crawford, 2006; Kluck, 2010). These social environments are integral in adolescents' construction of social norms and appearance ideals. Studies have shown that peer groups tend to foster shared body image and dieting attitudes, creating an appearance culture that is preoccupied with weight and shape concerns (Paxton, Schutz, Wertheim, & Muir, 1999). Friendship attitudes are significant predictors of individual body image concerns and eating behaviors, including the use of extreme weight loss behaviors.

Girls report more body dissatisfaction as a result of having friends who are dissatisfied with their own bodies than as a result of direct encouragement to lose weight (Lieberman, Gauvin, Bukowski, & White, 2001), suggesting the role of peer modeling as an important process in which body dissatisfaction disseminates within peer groups. Evidence shows that adolescent girls often think they should lose weight because their friends believe so themselves (Hutchinson & Rapee, 2007; Mackey & Greca, 2007; Padilla-Walker & Bean, 2009). Peer dieting behavior has been shown to predict elevated body dissatisfaction in girls (Jones, 2004).

Adolescents who report more frequent appearance-related conversations with peers also report greater internalized appearance ideals and body dissatisfaction (Jones, Vigfusdottir, & Lee, 2004). Nichter and Vukovic coined the term “fat talk” in reference to the widespread phenomenon of within peer-group self-deprecating body talk, which functions to promote group affiliation and camaraderie while at the same time reinforcing the importance of thinness (Nichter & Vukovic, 1994). Studies suggest that fat talk is perceived as normative among college students (Britton, Martz, Bazzini, Curtin, & LeaShomb, 2006). Though adolescents and adults often believe that these self-critical conversations actually make them feel better about themselves by soliciting contradictory statements from peers, research has shown that self-reported fat talk is in fact associated with greater body dissatisfaction and the internalization of the thin ideal (Salk & Engeln-Maddox, 2011).

Appearance comparisons to peers have been linked to increased adolescent body dissatisfaction, with strongest correlations between the weight and body shape components of appearance (Jones, 2001). This study found that peers are a more frequent target of appearance comparisons than models and celebrities, a pattern that follows traditional social comparison theory that individuals prefer to make comparisons to similar others (Miller, Turnbull, &

McFarland, 1988). Self-reported social comparison accounted for a greater amount of variance in body dissatisfaction in girls compared to boys (Jones, 2001).

## Media Influences

The relationship between media exposure and body image disturbances constitutes the third and final leg of the tripartite influence model of eating disorders (Keery et al, 2004b) and has received an abundance of research attention. Meta-analysis of the media effects literature highlights the many contradicting findings and suggests that the evidence base may at best suggest that mass media engagement is a variable risk factor of body image disturbance, but not a causal risk factor (Levine & Murnen, 2009). Multiple meta-analyses found small-to-modest effect sizes across reviewed studies (Holmstrom, 2011; Levine & Murnen, 2009), although Levine and colleagues caution that since several variables are theorized to mediate and moderate the association between media and body image disturbance, small to modest effect sizes would be expected.

Studies that have identified strong correlations between media consumption and body image disturbances suggest that media may be the most pervasive and powerful factor of the three sociocultural influences that make up the tripartite influence model (Stice, 1994; Tiggemann, 2002), and exerts disproportionate pressure on adolescent girls compared to boys (Ata et al., 2007) and adult women (Levine & Murnen, 2009). Adolescent females are known to use the media as a guide in identity construction and negotiating their role in the world (Botta, 1999; Durham, 1999). Adolescents are still developing the cognitive processing skills, including critical evaluation, that adults use to differentiate between reality and the fictional worlds portrayed in media (Granello, 1997), leaving them particularly susceptible to media messages.

The bulk of research has focused on effects of exposure to magazines and television, specifically, linking increased media engagement with body dissatisfaction (Jones et al., 2004; Tiggemann, 2002) and eating disorder behaviors (Harrison, 2000; Stice et al., 1994; Thomsen, Weber, & Brown, 2002).

Content analyses of women's magazines and television programs confirm that these media disproportionately feature young, tall, and very thin women (Fouts & Burggraf, 1999, 2000; Malkin, Wornian, & Chrisler, 1999). The average size of these idealized female bodies continues to decline significantly, according to a review of 80 years of *Playboy Magazine* models, "Miss America" winners, and fashion models (Bryd-Bredbenner, Murray, & Schlusell, 2005). The same study compares this trend with changes in the BMI of the average young American female, which are shifting in the opposite direction. BMI is at an all-time high with 66% of the adult US population classified as overweight and more than 32% meeting the criteria for obesity. The tripartite influence model of eating disorders posits that the discrepancy between the media-portrayed ideal of female beauty and the average female shape leads to body dissatisfaction (Keery et al., 2004b).

Experimental laboratory studies have been a popular method used to investigate the effect of acute thin ideal media exposure on body image dissatisfaction and have the advantage of establishing causal pathways between the media manipulation and body image. Experimental findings have shown that exposure to thin models in print advertisement stimuli led to increased state-level body anxiety compared to exposure to average-sized models or no models (control), and that this correlation was moderated by levels of internalization of the thin ideal (Dittmar & Howard, 2004). Exposure to television advertisements has shown a similar pattern, with exposure to advertisements featuring thin ideal models, as opposed to average-sized models or



non-appearance related material, leading to increases in body dissatisfaction, negative affect, and appearance comparisons (Hargreaves & Tiggemann, 2004). Although experimental studies are useful in that they have the advantage of establishing causality, they suffer from a lack of external validity in that they can only capture acute response to media exposure rather than measuring the long term effects of natural media consumption (Grabe, Ward, & Hyde, 2008). Correlational studies, although unable to establish causality, are useful in identifying the effects of natural and long-term media exposure on body dissatisfaction variables.

Findings from correlational studies have consistently shown an association between media consumption and body weight dissatisfaction. Adolescent females that consume more entertainment television report increased weight dissatisfaction (Anderson, Huston, Schmitt, Linebarger, & Wright, 2001). College women's exposure to "thin ideal promoting" entertainment television, but not sports programming or general entertainment television, has been shown to be a significant predictor of disordered eating in a sample of 218 college women, emphasizing the key role of media type and content (Bissell & Zhou, 2004). Morry and Staska (2001) found similar patterns for magazine exposure; females reporting higher levels of 'beauty' magazine consumption reported more internalization of societal ideals, self-objectification, and eating disordered behaviors.

Self-objectification theory suggests that media exposure impacts female body image by routinely objectifying bodies, socializing girls and women to take an outsider's perspective on the physical self (Aubrey, 2006), leading to constant appearance monitoring which causes body shame, anxiety, reduced flow experiences, and diminished bodily awareness (Moradi & Huang, 2008). Content analysis studies have identified themes of "body-ism" in the media's representation of women where a disproportionate focus is placed on women's bodies or body

parts, at times eliminating females' heads completely (Unger & Crawford, 1996). Studies have shown that exposure to sexually objectifying television increases trait self-objectification in adult men and women (Aubrey, 2006). Self-objectification has been shown to correlate with disordered eating in adolescent girls, a relationship partially mediated by body shame and appearance anxiety (Slater & Tiggemann, 2002).

Various types of media have been shown to have differential impact on adolescent female body image. A meta-analysis of the strength of correlation between different types of media use and body dissatisfaction in girls and women found a stronger link between fashion magazine exposure and body dissatisfaction than TV exposure (Murnen, Levine, Groesz, & Smith, 2007). Within-media type differences have been found as well. In a study of 1,035 Flemish male and female adolescents, females with increased exposure to TV programs featuring "idealized-bodies" reported elevated weight dissatisfaction, whereas no relationship between overall TV exposure and weight dissatisfaction was found among females (Van den Bulck, 2000). Similarly, in a study of 1,452 Australian adolescent boys and girls, results showed no correlation between overall TV exposure and body image measures but did identify a link between soap opera exposure and drive for thinness in both genders (Tiggemann, 2005). A study of 837 ninth grade girls in California found that music video exposure was significantly correlated with an increase in perceived importance of appearance and weight concerns, while no correlation was found between these variables and overall electronic media use, defined to include TV, videotapes, video and computer games, and music videos (Borzekowski, Robinson, & Killen, 2000). While these findings offer an inconclusive picture of what exact genres contribute to body image concerns, they all suggest that it is not overall media exposure but rather specific media content that is associated with body image disturbances.

Other studies have suggested that it is neither overall media exposure nor exposure to specific media types that relates to weight dissatisfaction, but the extent that an individual identifies with the thin media model (Bell & Dittmar, 2011). Female subjects that identified more strongly with media models were more negatively impacted by experimental exposure to thin ideal media images, a process that supports that tripartite influence model's emphasis on the mediating role of social comparison tendencies (Keery et al., 2004b). Additional studies have proposed that it is the cognitive processes used during exposure to thin ideal media that relates to body image disturbances rather than media exposure itself, and that certain processing styles can actually produce an improvement in body image variables in response to thin ideal media exposure (Tiggemann, Polivy & Hargreaves, 2009). In an experimental study, women were exposed to thin ideal magazine advertisements and provided with 'social comparison', 'fantasy', or control instructional prompts intended to activate different cognitive processes. Subjects engaging in social comparison processing reported decreased mood and body satisfaction, while 'fantasy' instructions encouraging women to imagine being the thin model led to an increase in mood and body satisfaction (Tiggemann et al., 2009). These opposing media effects suggest the importance of social comparison processes as a mediator between thin ideal media exposure and body dissatisfaction as proposed in the tripartite influence model, and offer a potential explanation as to why some girls and women experience body dissatisfaction in response to media exposure while others are unaffected.

### The Internet and Body Image Disturbances

While the evidence base on the media's impact on body image is extensive, the research predominantly focuses on TV and magazine exposure with very few studies exploring the effect

of Internet use until very recently. The need for an increased focus on the effects of Internet exposure is particularly warranted given the changing landscape of adolescent media use. While magazine reading is decreasing among adolescents, online media use continues to rise, with 84% of American youth now reporting to have home Internet access (Rideout, Foehr, & Roberts, 2010) and as many as 94.9% of 13-18 year-olds claiming some form of Internet access in or outside of the home (Subrahmanyam & Lin, 2007).

In an investigation of the impact of specific types of media on body image, Bell and Dittmar (2011) set out to explore the effects of thin ideal exposure via new media, including the Internet, but ultimately omitted the data on specific Internet site use in their analysis based on the fact that most subjects reported using the Internet primarily for social networking, which the authors deemed a communication tool rather than a platform for thin ideal exposure. The same study found girls allocated more hours weekly to Internet use than all other media types, suggesting that although the use of social networking sites (SNS) may not conform well to the traditional media exposure model, it is a pervasive part of modern adolescents' lives and should be explored.

Tiggemann and Miller (2010) found that Internet appearance exposure, which was calculated by coding specific websites for their appearance-focused content and collecting data on subjects' specific website usage, was associated with greater internalization of thin ideals, appearance comparison, weight dissatisfaction, and drive for thinness, a pattern that paralleled correlations found in studies of traditional media exposure. Consistent with the tripartite influence model (Keery et al., 2004b), the effects of Internet appearance exposure on weight satisfaction was fully mediated by internalization and appearance comparison, and the effect of Internet appearance exposure on drive for thinness was partially mediated by internalization and

appearance comparison (Tiggemann & Miller, 2010). When broken down by specific website exposure, time spent on the SNS MySpace and Facebook were strongly correlated with drive for thinness ( $\beta=.22$  and  $\beta=.24$ ), and Facebook use was also correlated with increased internalization of the thin ideal ( $\beta=.18$ ) and decreased weight satisfaction ( $\beta=-.20$ ) (Tiggemann & Miller, 2010). The authors note that their data is unable to shed light on the specific features of SNS usage that impact body image variables, and that the interactive nature of Internet use in general poses a complex challenge for future media effects research. Regardless of the hurdles that the idiosyncrasies of SNS create for researchers, the strong correlation between the use of these sites and adolescent body image disturbances warrants additional exploration.

Viewed within the framework of the tripartite model of influence (Keery et al., 2004b), SNS represent an intersection of the influence of both peers and media, two of the three main components thought to encourage internalization of the thin ideal, appearance-based social comparisons, drive for thinness, and weight dissatisfaction. Taken together, SNS may be an even more potent catalyst for the onset of these body image disturbances, which may explain findings that heavy usage correlates particularly strongly with body image disturbances more so than traditional media or general Internet exposure (Tiggemann & Miller, 2010). It is likely that many of the real-life peer interactions that effect girls' body image, including weight and appearance teasing (Eisenberg et al., 2006; Menzel et al., 2010), exposure to vicarious teasing (Jones & Crawford, 2006), "fat talk" (Nichter & Vukovic, 1994), and the establishment of an "appearance culture" preoccupied with weight and shape concerns (Paxton et al., 1999), are now taking place in a public, digital forum. As social networking sites represent a heterogeneous collection of features (Smock, Ellison, Lampe, & Wohn, 2011) and individuals may use them in very

different ways, it is necessary to take a closer look at specific SNS feature use in order to isolate the elements that affect adolescent girls' body image.

### Trends in Adolescent Social Networking Site (SNS) Use and Research Applications

A recent nation-wide survey of American teens age 12-17 found that 95% of adolescents are online and 80% of this group uses SNS such as Facebook or MySpace (Lenhart, Madden, Smith, Purcell, Zickuhr, & Rainie, 2011). Both the pervasiveness and intensity of SNS use among adolescents is a relatively new phenomenon. SNS account ownership has increased from 55% in 2006, and the number of teens that report visiting SNS sites several times a day has nearly doubled to 46% from 24% in 2004 (Lenhart et al., 2011). Another study found that visiting SNS is now the most popular activity that teens age 8-18 engage in when on their computer (Rideout et al., 2010). For the purpose of this study, measures will be collected on Facebook use only as it is by far the most widespread SNS among American teenagers today (Lenhart et al., 2011).

Teenagers use SNS for a range of activities including instant messaging (88%), posting comments on a friend's post (87%), posting status updates (86%), posting photos or videos (80%), sending private messages to a friend (76%), tagging people in posts, photos, or videos (69%) and playing games (50%) (Lenhart et al., 2011). Data suggests that adolescent girls and boys interact with SNS similarly with several key differences. Overall, boys spend more time on the computer each day, but girls allocate more of their daily computer usage on SNS (Rideout et al., 2010). Girls are more likely than boys to post photos and videos (88% vs. 71%) and tag people in posts, photos, or videos (79% vs. 60%) (Lenhart et al., 2011).

In surveys of adolescents' attitudes and impressions of SNS behavior, both girls and boys report that peers mostly treat each other with kindness on SNS, although 33% of girls age 12-13 responded that SNS peer treatment is "mostly unkind", which is by far the most negative assessment of SNS behavior by age and gender sub-group (Lenhart et al., 2011). In focus groups conducted to assess teenagers' impressions of online interactions, open-ended responses were predominantly negative, with popular responses of "mean," "fake," "crude," "over-dramatic," and "disrespectful" (Lenhart et al., 2011). A national survey of girls age 14-17 found that 74% of girls report that "most girls my age use social networking sites to make themselves look cooler than they really are," suggesting that SNS usage involves processes of identity construction and impression management (Salmond & Parcell, 2011). The identity that girls' portray on SNS differs from the real-life version. In person, girls said that they come across as smart (82%), fun (82%), funny (80%), kind (76%), a good influence (59%), outgoing (55%), cool (55%), social (51%), and confident (51%), but say that based on their online profile alone, they come across as fun (54%), funny (52%), and social (48%), implying that girls portray a less well-rounded image of themselves online, downplaying their smartness, kindness, and positive influence (Salmond & Parcell, 2011). Not surprisingly, self-esteem impacts the type of image girls portray online. Girls with low self-esteem are more likely to admit that their social networking image differs from their real-person image and more likely than high self-esteem girls to describe their image as "sexy" and "crazy" (Salmond & Parcell, 2011). These trends suggest that girls, particularly those with low self-esteem, may be creating an "ideal-self" image through their SNS profiles and may be accomplishing this, in part, through frequent use of photo and video features.

Research on the effects of SNS is in its infancy and studies on SNS use and body image are virtually nonexistent. A recent, unpublished study at the University of Haifa found a link

between adolescent girls' Facebook usage and bulimia, anorexia, negative physical self-image, negative approach to eating and more of an urge to be on a weight-loss diet (Feldman, 2011). Eating and weight disturbances were also associated with exposure to online fashion and music sites and viewing gossip and leisure-related TV programs such as "Gossip Girl," but Facebook usage emerged as the strongest correlate (Feldman, 2011). Future research should seek to replicate this relationship and identify the specific Facebook features and uses that are associated with eating disorders, body dissatisfaction, and desire to diet.

Several studies have explored the relationship between specific Facebook feature usage and more general self-esteem and identity variables. Crocker and colleagues proposed that self-esteem is based on internal and external bases, and individuals differ in the specific domains in which they base their self-esteem (Crocker, Luhtanen, Cooper, & Bouvrette, 2003). In a study investigating male and female college students' Facebook behavior and contingencies of self-worth, results showed a strong correlation between the intensity of online photo-sharing and elevated appearance-based contingencies of self-worth among females (Stefanone, Lackaff, & Rosen, 2011). In an experimental study on the effects of Facebook exposure and self-esteem, college students that viewed and updated their personal profile page reported higher self-esteem than subjects who also viewed the profiles of others and subjects in conditions with no Facebook interaction at all (Gonzales & Hancock, 2011). The authors suggest that Facebook profile maintenance allows users to selectively self-present themselves in a public space by emphasizing positive aspects of the self while downplaying deficits. Exposure to this online self-presentation affects attitudes about the self and may act to improve self-esteem (Gonzales & Hancock, 2011). A study on male and female college students in Canada found strong correlations between narcissism and the frequency of overall Facebook engagement as well as a link between



narcissism and levels of self-promotional content in Main Photos, View Photos, Status Updates, and Notes sections (Mehdizadeh, 2010). The same study also found negative correlations between self-esteem and overall Facebook engagement as well as a negative link between self-esteem and Main Photo self-promotion levels (Mehdizadeh, 2010).

SNS engagement can be studied in terms of active usage, including profile creation and photo posting, as explored in the studies above, and more passive monitoring of others' activities, including profile viewing, photo viewing, or reading others' comments on one's own content. Studies have shown that among adolescents age 10-19 in the Netherlands, increased self-esteem was correlated with receiving positive feedback on their own profiles and degraded self-esteem was correlated with negative feedback (Valkenberg, Peter, & Schouten, 2006).

Although these studies do not address body image variables directly, they demonstrate the utility of a more fine-grained approach to studying SNS usage by measuring user interaction with specific Facebook features (photos, status updates, interaction with personal profile pages versus others' profile pages, etc.) rather than overall time spent on Facebook. Extending upon Tiggemann and Miller's study of adolescent girl's Internet appearance exposure and weight concerns by measuring user engagement with specific SNS features would offer important insight into what elements of SNS engagement correlate with body image and eating disturbances.

#### Applying Uses and Gratifications Theory to Facebook

Facebook engagement is more complex than mere exposure, and understanding its use must include an exploration not only of the specific features frequently used, but also the motives and needs driving adolescent girls' Facebook uses. Uses and Gratifications theory (U & G) is a

framework used to understand how individuals use media to fulfill specific needs and reach individual goals (Katz, Blumler, & Gurevich, 1974) and has been applied to Facebook and other SNS (Bumgarner, 2007; Foregger, 2008; Lampe, Wash, Velasquez, & Ozkaya, 2010; Papacharissi & Mendelson, 2011; Raacke & Bonds-Raacke, 2008). These studies have offered various explanations for motives behind Facebook use among the general population, including passing time, relaxing entertainment, expressive information sharing, escapism, cool and new trend participation, companionship, professional advancement, social interaction, and meeting new people (Papacharissi & Mendelson, 2011).

The U & G framework has also been applied specifically to adolescent girls' SNS use, identifying clusters of gratifications sought by subjects, including communication, friending, identity creation and management, entertainment, escapism and alleviation of boredom, information search, and interacting with boys (Dunne, Lawlor, & Rowley, 2010). Gratifications ultimately obtained were determined separately and included portraying one's ideal image, peer acceptance, relationship maintenance, safety from embarrassment and rejection, and engaging in playground politics (Dunne et al., 2010).

Smock and colleagues criticized the standard methods of SNS research for treating SNS use as homogenous; arguing that these sites are really a collection of diverse tools and features (Smock et al., 2011). Instead, they suggested applying a U & G framework to understand user motives and the use of specific Facebook features, such as status updates and wall posts, rather than just overall time spent on Facebook, and applied this strategy in a study on undergraduate students' Facebook usage and correlated motives (Smock et al., 2011). Their analysis shows that user motivations correlate with specific feature use above and beyond correlations with general time spent logged in, offering more insight into the psychological processes behind SNS use

(Smock et al., 2011). As previous studies have shown that high levels of specific feature usage such as photo-posting (Stefanone et al., 2011) and profile management (Gonzales & Hancock, 2011) relate to self-esteem variables, it seems appropriate to investigate Facebook usage's effects on body image variables at the more granular feature-level.

### The Present Study

The aim of the present study was to expand upon Tiggemann's findings of a strong correlation between adolescent females' Facebook usage, internalization of the thin ideal, appearance comparison, weight dissatisfaction and drive for thinness (Tiggemann & Miller, 2010). Additionally, the impact of Facebook usage on self-objectification was explored with the expectation that interaction with Facebook will parallel the effects of exposure to traditional media in leading to an increase in self-objectification (Morry & Staska, 2001). The study aimed to replicate the general relationship between overall Facebook usage and these body image variables while identifying the specific Facebook features and uses that are more strongly associated with the body image variables, as specific feature usage has been shown to offer more predictive utility than overall site usage (Smock et al, 2011). In the same way that exposure to more appearance-focused magazines and TV programs has been shown to have an increased impact on body image variables (Tiggemann, 2005; Van den Bulck, J., 2000), heavy interaction with Facebook photos may be more strongly correlated with body image disturbances than heavy interaction with non-appearance-related features. This study aimed to replicate and extend upon previous findings in order to identify the specific elements of Facebook usage that impact adolescent girls' body image.

## Hypothesis I

Overall Facebook usage will correlate with increases in scores for internationalization of the thin ideal, appearance comparison, drive for thinness, and self-objectification, and decreases in scores for weight satisfaction.

## Hypothesis II

An increase in subjects' Facebook appearance exposure score, as operationalized by user activity related to all photos (profile photos, self-photo albums, other-photo albums), will correlate with an increase in scores for internationalization of the thin ideal, appearance comparison, drive for thinness, and self-objectification, and decreases in scores for weight satisfaction.

It is was thought that time spent managing and interacting with one's own photos may affect body image positively by way of selective self-presentation processes in the same manner that self-esteem was elevated in college students after Facebook profile engagement (Gonzales & Hancock, 2011). Interaction with one's own photos may differ completely from prolonged interaction with peers' photos, which parallels the more traditional media exposure model. For this reason, it is important to differentiate between "self-photo" appearance scores and "other-photo" appearance scores in order to identify differential effects of exposure. SNS differ from traditional media in that usage may involve active identity construction and management as well as more passive exposure to peer content. Two additional hypotheses were added to account for these potentially divergent effects.

### Hypothesis III

An increase in subjects' Facebook "other-photo" appearance exposure score, as operationalized by user activity related to others' photos (profile photos, photo albums) will correlate with an increase in scores for internationalization of the thin ideal, appearance comparison, drive for thinness, and self-objectification, and decreases in scores for weight satisfaction.

### Hypothesis IV

An increase in subjects' Facebook "self-photo" appearance score, as operationalized by user activity related to self-photos (profile photo, photo albums) will correlate with an increase in scores for internationalization of the thin ideal, appearance comparison, drive for thinness, and self-objectification, and decreases in scores for weight satisfaction..

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## METHODS

### Participants

Participants were 103 adolescent female students between the ages of 12-18, with a mean age of 15.4. Two study participants were age 12 despite recruitment materials requiring participants to be age 13-18. The investigator determined that the age difference was less relevant than the school year grade, and opted to retain the subjects within the sample. Girls were recruited from an upstate New York State public middle/high school. The majority of students attending this school come from families with middle class socioeconomic status and were predominantly white (87.3%) (Greece Central School District, 2011).

### Measures

#### Demographic Information Measure:

Participants were first asked to fill out a questionnaire on their basic demographic information including their age, grade level, ethnic group identification, height, and weight.

#### Internalization of Thin Ideal:

The internalization of the thin ideal was measured using the Sociocultural Internalization of Appearance Questionnaire for Adolescents (SIAQ – A) (Keery, Shroff, Thompson, Wertheim, & Smolak, 2004a). This brief 5-item measure assesses the extent to which adolescents adopt the media-presented appearance ideals for themselves. Responses are made on a 5-point Likert scale, ranging from 1 (definitely disagree) to 5 (definitely agree), and then summed. Possible scores

range from 5 to 25, with higher scores indicating greater internalization of appearance ideals. The questionnaire has been validated in six early adolescent female samples from the United States, Australia, and India. The scale has shown high internal consistency in previous studies, with Cronbach's  $\alpha$  ranging from .83 to .92 (Keery et al. 2004a). In the present sample, the scale had high internal reliability (Cronbach's  $\alpha = .919$ ).

#### Appearance Comparison:

Appearance comparison was measured using the Physical Appearance Comparison Scale (PACS) (Thompson, Heinberg, & Tantleff-Dunn, 1991). The PACS is a five-item measure that assesses tendency to compare one's own appearance to the appearance of others. Response options ranged from never (1) to always (5). Thompson and colleagues (1991) reported adequate internal consistency ( $\alpha = .78$ ). Previous studies have shown less than acceptable reliabilities ( $\alpha = .61$ ) with adolescent samples (Keery et al., 2004b, Tiggemann & Miller, 2010) due to a single negatively-worded and reverse-coded item (item 4). Once this item was removed, the scale's internal reliability was shown to increase to an acceptable level ( $\alpha = .78$ ). The present study also found inadequate reliability for the 5-item PACS (Cronbach's  $\alpha = .683$ ) due to the single negatively-worded item. Removing item 4 improved the reliability to an acceptable level (Cronbach's  $\alpha = .803$ ). All subsequent analysis was made using the 4-item measure.

#### Weight Satisfaction:

Weight satisfaction was assessed by the Weight Satisfaction subscale of the Body-Esteem Scale for Adolescents and Adults (BES) (Mendelson, Mendelson, & White, 2001). Students were

administered the entire BES, a 23-item scale composed of positive and negative statements about the body and appearance adapted for ages 12-25. The original authors' factor analysis identified 3 body esteem factors: appearance esteem (10 items) assesses subjects' general feelings about their own looks, external attribution (5 items) assesses how others perceive the subjects' looks, and weight satisfaction (8 items) assesses attitudes and feelings towards bodies, particularly weight. Participants indicate how they feel about the statements on a 5-point scale, from 0 (never) to 4 (always). The Weight Satisfaction subscale was of primary interest in testing our hypothesis. Example items of this subscale include "I think I have a good body" and "I am preoccupied with trying to lose weight (R)". Negative items are reversed so that higher scores indicate greater weight satisfaction, with summed scores ranging from 0 to 32. Mendelson and colleagues (2001) reported good internal consistency in ( $\alpha=.95$  among females,  $\alpha=.87$  among males) and test-retest reliability over three months ( $r(95) = .92, p < .001$ ) across a number of samples. In the present sample, the overall 23-item scale had good internal reliability ( $\alpha=.944$ ) and the subscales had good to acceptable internal reliability (BE-Appearance:  $\alpha=.93$ ; BE-Weight:  $\alpha=.935$ ; BE-Attribution:  $\alpha=.702$ ).

#### Drive for Thinness (EDI)

Drive for thinness was assessed by the Drive for Thinness subscale of the Eating Disorder Inventory (EDI; Garner et al. 1983). The subscale is an indicator of the characteristics associated with anorexia nervosa and assesses intense pursuit of thinness as well as fear of being fat. It consists of 7 items (e.g., "I am preoccupied with the desire to be thinner") with which respondents rate their agreement on a 6-point scale, from 1 (never) to 6 (always). Scores are summed so that higher scores indicate a greater drive for thinness, with possible scores ranging



from 7 to 42. Garner (1991) reported adequate internal consistency ( $\alpha=.83$ ) for the original scoring in a sample of eating disordered individuals and in four samples ( $\alpha$ 's=.81–.91) of nonpatient female controls. In the present sample, the scale had high internal reliability (Cronbach's  $\alpha = .941$ ).

### Self-Objectification

Self-objectification was assessed by the Self-Objectification Questionnaire (Noll & Fredrickson, 1998). This questionnaire measures individual differences in self-objectification by requiring subjects to rank ten body attributes in order of how important each is to their physical self-concept. Five of the ten body attributes are physical appearance-based (physical attractiveness, weight, sex appeal, measurements, and firm/sculpted muscles), and the other five body attributes are physical competence-based (physical coordination, health, strength, energy level, and physical fitness level). Scores are calculated based on the difference between the sum of the appearance rankings and the sum of the competence rankings and range from -25 to 25. Positive scores indicate a greater emphasis on appearance, which is interpreted as greater self-objectification (Noll & Fredrickson, 1998). This scale has been shown to have sufficient validity, as demonstrated by correlations with instruments measuring preoccupation with appearance ( $r$ s = .46 - .52).

### Facebook Activity

The first part of the Facebook Activity Questionnaire (FBQ) asked subjects to approximate average Internet and Facebook frequencies. A preliminary yes/no question asked “Do you have

access to the Internet?” Subsequent items asked subjects to report general Internet usage with the question “On average how frequently do you use the Internet (outside of instructor-led classroom activities)?” Response options were:

- |                                    |                              |
|------------------------------------|------------------------------|
| a. Never/almost never              | d. 1-2 hours per day         |
| b. Less than 1/2 hour per day      | e. 2-3 hours per day         |
| c. From 1/2 hour to 1 hour per day | f. More than 3 hours per day |

Next, subjects were asked if they have an active Facebook account. Subjects that responded “Yes” were prompted to continue to the next question, which asks “On average, how much time do you spend daily on Facebook?” Response options were:

- |                               |                                      |
|-------------------------------|--------------------------------------|
| a. Never/almost never         | d. Between 1/2 hour – 1 hour per day |
| b. Less than 1 hour per week  | e. 1-2 hours per day                 |
| c. Less than 1/2 hour per day | f. More than 2 hours per day         |

Subjects were asked to specify their privacy settings (‘public’, ‘private’, ‘custom’, and ‘I don’t know’). Next, subjects were asked to approximate the number of current Facebook friends and the number of photos of themselves on Facebook. Past studies have found that young people are able to recall the number of photos shared with a fair amount of accuracy with no systematic differences based on age or gender (Steffafone et al., 2011). Subjects were asked to describe their current Facebook Profile photo from a list of options.

The second part of the FBQ assessed the frequency of user activity specific to particular Facebook features. The investigator compiled an exhaustive list of individual Facebook user activities based on a list of popular features published on the Facebook help center site (“Basics”, n.d.) for a total of 24 items. Activities were split into 9 ‘low-base-frequency’ activities (ie: Create an event) and 15 ‘high-base-frequency’ (ie: Post a status update). Subjects were asked to rate the

frequency with which they generally engage in each listed Facebook activity, rating on a 5-point Likert scale ranging from (5) ‘More often than once a month’ to (1) ‘Almost never or never’ for low-base-frequency items, and from (5) ‘Nearly every time I log on’ to (1) ‘Almost Never’ for high-base-frequency items. All items included a (0) ‘I don’t know’ option. Based on the method employed by Tiggemann and Miller (2010), the investigator assigned an appearance score to each activity item, assigning a (0) for not appearance-related and a (1) for appearance-related. Any feature involving a photo was considered “appearance-related”. The investigator also categorized each photo-related activity into “self-photo” or “other-photo” groups to differentiate between activities that involve users interacting with their own photo versus others’ photos. A Facebook appearance related exposure score (ARS) was calculated by adding the subject’s activity frequency score (0-5) for appearance-related items. The total ARS score was divided over the total FBQ score to create a relative appearance exposure score so that high ARS scores were not simply representative of high overall Facebook activity use or a response bias. Thus, a higher score indicates a higher appearance exposure relative to Facebook activity overall. Separate scores were calculated for “self-photo” appearance scores (SARS) (ie: “view friends’ photos that they’ve added of me”) versus “other-photo” appearance scores (OARS) (ie: “view friends’ photos of themselves”) in order to identify specific correlates between each type of appearance exposure and to ensure that an individual’s uneven interaction with the two types did not negate each other and mask real effects. All photos that reference the presence of the ‘self’ were counted toward the SARS score even though, hypothetically, these photos may include other individuals. The wording of the questions are framed to mention whether the photo is of ‘self’ or ‘other’ without further details on the additional content of the photo. A full analysis of the FBQ’s reliability is provided in the results.

## Procedure

Following approval by the American University International Review Board, a letter was sent to the school principal at an upstate New York middle/high school. Once agreement from the principal and teaching staff was obtained, teachers were asked to announce the study to their respective homerooms and were provided a script. A letter of introduction and accompanying consent form was sent home to parents via their daughters. Finally, an announcement and consent form were posted to the school's online newsletter.

Questionnaire administration took place in a class room setting over a 1-week period. Participation was completely optional and was scheduled during students' "free" periods as to not disrupt normal classroom instruction. All minors were required to return a signed parent consent form before the study was administered and students age 18 and above were given a consent form. All participants were reminded of the confidentiality and anonymity of their answers. The questionnaire, titled "Social Media and me", took approximately 20-30 minutes to complete. As a token of appreciation for their participation, girls were given the opportunity to be entered into a raffle for a \$150 gift voucher to Target.

Subjects were administered the Demographic Questionnaire, followed by the Internet and Facebook Activity Questionnaire. Next, subjects were administered each of the five body image measures, with the order of administration staggered to minimize sequencing effects. Upon completion, subjects were thanked for their participation and given the option to be entered into the raffle.

## RESULTS

Several issues regarding subject characteristics, data screening, and justification for analytic strategy will be discussed. Missing data was handled using pairwise deletion in order to maintain as much of the sample as possible. Missing responses were minimal for the SIAQ-A, PACS, and the EDI, allowing all subjects' scores to be retained. One subject failed to respond to the PACS entirely, and therefore analysis on this scale is limited to 102 subjects. Another subject marked the midway point between scores for several PACS items which was interpreted by the investigator as implying a 'half-point' response; in the interest of retaining this subject's score within the analysis, the investigator recorded the more conservative of the two response options (ie: when the midway space between (1) *Never* and (2) *Seldom* was marked, the more neutral (2) *Seldom* score was recorded.) It was intended that using the less 'extreme' of the two responses that the subject marked between would run the least risk of creating a Type I error by effectively normalizing the user's response.

Data returned for the Self-Objectification Questionnaire was particularly problematic and requires specific discussion. The instructions for this measure were longer and more complex than other included scales, resulting in several problematic response types. Despite instructions to rank a list of 10 body attributes on a scale from 0-9, several subjects used a 1-10 scale, which the investigator converted down 1 to a 0-9 scale on the basis that the measure is intended to assess the relative importance of body attributes, and the reported number is purely symbolic. Several subjects ranked items on a 0-10 scale, skipping a number entirely. The investigator determined that these scores still reflected the relative importance of each item and therefore handled these cases by shifting all responses to fit the 0-9 scale. Other subjects assigned the same ranking score several times to multiple items, which the investigator deemed a misinterpretation of the instructions to assign a unique ranking. However, these responses still offered information

on the relative importance of each body attribute. A typical response pattern for these cases is that a subject assigned a (0) ‘least impact’ to several items, (5) ‘medium impact’ to several items, and (9) ‘most impact’ to several items. Despite a marked departure from the scale’s intended response pattern, the responses still gave valid information in regard to the construct that the scale intends to measure, and removing these subjects’ scores did not impact the means and standard deviations. On this basis, the investigator opted to retain the end scores for these cases. All response sets where over 50 percent of the items were completed were retained for analysis, resulting in 3 scores being dropped completely for an N=100.

Analysis of skewness and kurtosis coefficients indicated that sample was non-normal on several of the key outcome variables. Descriptive analysis displayed in Table 8 shows kurtosis coefficients for ‘Internalization of Thin Ideal,’ ‘Self-Objectification,’ and ‘Drive for Thinness’ that are outside of the limits of normality (-1.145, --1.078, and -1.217, respectively). Log to the base 10 ( $\lg 10$ ) and natural log ( $\ln$ ) data transformations were performed but did not improve the kurtosis coefficients. Analysis of these variables with several moderate outliers removed did not improve the kurtosis coefficients, therefore the outliers were retained for subsequent analysis of these variables. Two extreme outliers were identified in the FBQ data; these subjects’ full FBQ responses were thrown out and subsequent analysis was performed on the remaining 89 subjects.

Analysis was performed using Spearman’s rank order correlation coefficient (i.e., Spearman’s rho) rather than Pearson’s Product-Moment Correlation for two important reasons. Unlike Pearson’s  $r$ , Spearman’s rho is nonparametric and therefore more appropriate analysis of the current, non-normal sample. Additionally, although it is common in the social sciences to analyze Likert scale measures using Pearson’s  $r$  correlations, this is technically invalid as Likert scales are ordinal-level variables, not interval-level. The investigator opted for the more

conservative approach of using Spearman's rho in order to minimize the risk of committing a type I error. All partial correlations were also computed using Spearman's rho.

In order to adjust for the multiple comparisons required to analyze the four main hypotheses, a correction for multiple comparisons procedure similar to Bonferoni's was used. Each hypothesis was treated separately. For each hypothesis, the null hypothesis was zero significant correlations and the alternative hypothesis predicted significant correlation with all eight main variables. Each hypothesis is shown below:

#### Hypothesis I:

$H_0$  = No significant correlations between overall Facebook use and main variables.

$H_1$  = 8 Significant correlations; a significant, positive correlation between overall Facebook use and Internalization of thin ideal, Physical Appearance Comparisons, Self-Objectification, and Drive for Thinness, a significant, negative correlation between overall Facebook use and Body Esteem – Appearance, Body Esteem – Weight, Body Esteem – Attribution, and overall Body Esteem.

#### Hypothesis II:

$H_0$  = No significant correlations between Facebook appearance exposure and main variables.

$H_1$  = 8 Significant correlations; a significant, positive correlation between Facebook appearance exposure and Internalization of thin ideal, Physical Appearance Comparisons, Self-Objectification, and Drive for Thinness, a significant, negative correlation between Facebook appearance exposure and Body Esteem – Appearance, Body Esteem – Weight, Body Esteem – Attribution, and overall Body Esteem.

#### Hypothesis III:

$H_0$  = No significant correlations between Facebook “other-photo” appearance exposure and main variables.

$H_1$  = 8 Significant correlations; a significant, positive correlation between Facebook “other-photo” appearance exposure and Internalization of thin ideal, Physical Appearance Comparisons, Self-Objectification, and Drive for Thinness, a significant, negative correlation between Facebook “other-photo” appearance exposure and Body Esteem – Appearance, Body Esteem – Weight, Body Esteem – Attribution, and overall Body Esteem.

Hypothesis IV:

$H_0$  = No significant correlations between Facebook “self-photo” appearance exposure and main variables.

$H_1$  = 8 Significant correlations; a significant, positive correlation between Facebook “self-photo” appearance exposure and Internalization of thin ideal, Physical Appearance Comparisons, Self-Objectification, and Drive for Thinness, a significant, negative correlation between Facebook “self-photo” appearance exposure and Body Esteem – Appearance, Body Esteem – Weight, Body Esteem – Attribution, and overall Body Esteem.

For each hypothesis, 8 correlations were run for main variables. Results showed significant correlations for:

Hypothesis I: 0/8

Hypothesis II: 6/8

Hypothesis III: 4/8

Hypothesis IV: 3/8

Assuming that all 4 null hypotheses are true, then each of these results is an observation from a binomial distribution with  $N = 8$ , and  $p(\text{success}) = .05$ . The binomial distribution table reports the probability of various numbers of successes at  $N = 8$ ,  $p = .05$ :

	<b>.05</b>
<b>0</b>	.6634
<b>1</b>	.2793
<b>2</b>	.0515
<b>3</b>	.0054
<b>4</b>	.0004
<b>5+</b>	.0000

For each hypothesis, the probability of finding significance for three or more correlations is .0054. Therefore, results provide evidence for three of the four hypotheses (Hypotheses II, III, and IV), but not Hypothesis I, at a .0054 criterion level.



## Preliminary Analysis

The demographic characteristics of the sample are displayed in Table 1. Subjects' ages ranged from 12-18, with a mean age of 15.4. The majority of subjects self-identified as white (84.5%), which is representative of the overall school population. Several respondents marked more than one response option, which the researcher interpreted as meaning 'mixed race' and these subjects were counted in the 'Mixed Race/Other' category.

General Internet and Facebook use data is displayed in Table 2, with frequencies shown for the entire sample and by grade (Table 2). 100% of subjects had regular Internet access, and

Table 1: Demographics

*Frequencies (N=103)*

<i>Race</i>	<i>n</i>	<i>%</i>	<i>Grade</i>	<i>n</i>	<i>%</i>	<i>Age</i>	<i>N</i>	<i>%</i>
White	87	84.5	7	9	8.7	12	2	1.9
Black	4	3.9	8	26	25.5	13	18	17.5
Latino	1	1.0	9	16	15.5	14	24	23.3
Asian	1	1.0	10	9	8.7	15	12	11.7
Mixed Race/Other	10	9.7	11	13	12.6	16	7	6.8
			12	30	29.1	17	20	19.4
						18	20	19.4

the modal response to a question on average daily Internet use was 'between 1-2 hours per day' (35.9%), followed by 'between 2-3 hours per day' (20.4%), 'between 1/2 hour-1 hour per day' (19.4%), '3+ hours per day' (19.4%), 'less than 30 minutes per day (3.9%) and 'never to almost never' (1.0%).

88.3% of subjects reported having an active Facebook account, which is somewhat higher than the recently reported nation-wide norm of 80% SNS-site use (Lenhart et al., 2011). The modal response for average time spent on Facebook per day was 'between 1/2 – 1 hour per day' (36.9%), followed by 'between 1-2 hours' (18.4%), 'no account' (11.7%), 'less than 1/2 hour per day' (10.7%), 'more than 2 hours per day' (8.7%), 'less than 1 hour per week' (8.7%), and 'never/almost never' (4.9%). Of the subjects with active Facebook accounts, most have their

privacy settings on 'private' (63.7%), 20.9% have 'custom' privacy settings, 8.8% responded 'I don't know', and just 6.6% have a public account. Most subjects identified their Facebook profile photo as being 'a photo of just me, waist and above visible' (44.0 %), followed by 'a photo of me and friends, waist and above visible' (25.3%), 'a photo of just me, full body visible' (12.0%), 'a photo of me and friends, full body visible' (11.0%), 'other/I don't know' (6.6%) and 'a photo/image with no people in it' (1.1%).

Means and standard deviations for BMI, approximate number of Facebook friends and photos are shown in Table 3. The distributions for both Facebook friends and photos were highly skewed due to the presence of outliers, but outliers were left in the sample on the basis that correlational analysis was performed using Spearman's Rho, which is less susceptible to the influence of outliers.

The Facebook Questionnaire (FBQ) (N number of items = 24) demonstrated good internal reliability (Cronbach's  $\alpha = .874$ ). Total FBQ scores were significantly correlated with subject's ratings of overall Facebook use ( $r(89) = .421, p < .001$ ), demonstrating convergent validity, and total FBQ scores were not significantly correlated with subjects' ratings of overall Internet use, demonstrating discriminant validity. Table 4 displays item-total statistics for the FBQ. Results show that deleting several items would slightly improve overall Cronbach's Alpha including 'Create Quiz' ( $\alpha = .876$ ), 'Create album with art/photography' ( $\alpha = .875$ ), 'Play Games' ( $\alpha = .880$ ), and 'Write FB Note' ( $\alpha = .880$ ). However, the researcher opted to keep the full scale intact for two reasons.

First, the incremental improvement in reliability was deemed small enough to justify maintaining all items. Second, the FBQ was purposely designed to be reasonably exhaustive in listing specific Facebook activities, and the relative infrequency of some activities compared to

others is an important part of the overall understanding of whether subjects' Facebook activity is concentrated in just a few activities or more evenly dispersed across many activities. Table 5 displays the means and standard deviations for FBQ items, ranked by mean. Table 6 shows the top five FBQ activity means, by grade.

Reliability for the 8-item Facebook Questionnaire Appearance-Related subscale (ARS) was good ( $\alpha = .817$ ). The scale's alpha would not improve by deleting any individual item, indicating good internal consistency (Table 7).

Descriptive statistics for body image and FBQ scores are displayed in table 8. Mean scores for internalization of the thin ideal, as measured by the Sociocultural Internalization of Appearance Questionnaire-Adolescents (Keery et al. 2004a) were similar to those collected by Tiggemann and Miller (2010) ( $M=15.22$ ;  $M=15.146$  in current sample).

Mean scores for drive for thinness, as measured by the Drive for Thinness subscale of the Eating Disorder Inventory (EDI; Garner et al., 1983), were notably higher than seen in Tiggemann and Miller's sample ( $M=19.95$ ,  $M=22.77$  in current sample). Mean scores for the three subscales of the Body-Esteem Scale for Adolescents and Adults (Mendelson et al., 2001) were similar to norms for 13-18 year-old females published by the scale's authors (Appearance subscale:  $M=2.117$  in validation sample,  $M=2.161$  in current sample, divided by number of items; Weight subscale:  $M=2.017$  in validation sample,  $M=2.168$  in current sample, divided for number of items; Attribution subscale:  $M=2.033$  in validation sample,  $M=2.139$  in current sample, divided for number of items) (Mendelson et al., 2001). Mean scores for the adjusted Appearance Comparison scale were similar to those found in Tiggemann and Miller's sample ( $M=11.92$ ,  $M=11.777$  in current sample) (2010).

An analysis of the internal consistency of the Self-Objectification Questionnaire (Noll & Fredrickson, 1998) is not logically valid, as it is an ipsative measure. Construct validity has been demonstrated by moderate positive correlations with the Appearance Anxiety Questionnaire and the Body Image Assessment (Noll & Fredrickson, 1998). Mean scores for self-objectification were higher than means found in studies in adolescent populations. Slater and Tiggemann (2002) administered the survey to a sample of 12-16 adolescent female dancers and non-dancers, and reported means of -11.27 and -6.49, respectively. The mean self-objectification score in the current sample was .850. The investigator determined that the relatively higher means found in the current sample did not demand that this measure be removed from analysis, since the measure has almost exclusively been administered to adult samples and the few studies reporting adolescent means are not large enough to establish norms for this age group.

#### Associations among Variables

Spearman's rho correlations were computed to determine the relationships between age, BMI, body image variables, and Internet and Facebook variables (see Table 9). As expected, all body image measures had strong positive correlations with one another with the exception of the Attribution subscale of the BES, which had nonsignificant correlations with internalization of the thin ideal, self-objectification, appearance comparison, and drive for thinness. This finding is not surprising, since this subscale asks subjects how they believe others evaluate their appearance, whereas the remainder of the body image variables relate to subjects' own evaluations of their appearance, bodies, and eating behaviors. More detailed discussion of this finding is beyond the scope of this study.

Age was largely uncorrelated with body image and Facebook activity, with the exception of weak, positive correlations with the internalization of thin ideal ( $r(103) = .171, p < .05$ ), body esteem - attribution ( $r(102) = .205, p < .05$ ), and 'other-appearance' related Facebook activity ( $r(89) = .194, p < .05$ ). BMI was also uncorrelated with most outcome variables, with the exception of negative correlations with total body esteem ( $r(102) = -.242, p < .01$ ), body esteem – attribution ( $r(102) = -.281, p < .01$ ), a negative correlation with body esteem – weight ( $r(102) = -.334, p < .001$ ), and a positive correlation with drive for thinness ( $r(103) = .215, p < .05$ ). Overall Internet use was not associated with any of the outcome variables with the exception of overall Facebook usage ( $r(103) = .320, p < .001$ ).

### Hypothesis I

It was hypothesized that overall Facebook use would correlate positively with internalization of the thin ideal, appearance comparisons, drive for thinness, self-objectification, and negatively with body esteem – weight. Since the BES was administered in full, correlations for total body esteem, body esteem – appearance, and body esteem – attribution have been reported as well. Support for our first hypothesis was not found. No significant correlations were found between overall Facebook usage and any of the body image variables (Table 9).

### Hypothesis II

It was hypothesized that an increase in Facebook appearance exposure scores (ARS), as operationalized by user activity related to all photos divided by the subject's total FBQ score will correlate positively with internalization of the thin ideal, appearance comparisons, drive for

thinness, self-objectification, and negatively with body esteem – weight. As previously noted, correlations for total body esteem, body esteem – appearance, and body esteem – attribution have been reported as well (Table 9).

Results supported Hypothesis II. FB appearance exposure was positively correlated with internalization of the thin ideal ( $rs(89) = .357, p < .001$ ), body esteem – attribution ( $rs(89) = .245, p < .05$ ), self-objectification ( $rs(89) = .279, p < .005$ ), physical appearance comparison ( $rs(89) = .194, p < .05$ ), and drive for thinness ( $rs(89) = .205, p < .05$ ), and negatively correlated with body esteem – weight satisfaction ( $rs(89) = -.184, p < .05$ ). No significant correlations were found for body esteem – appearance or overall body esteem.

#### Hypothesis III & IV

In order to explore whether FB appearance exposure oriented towards others' photos or one's own photos is particularly detrimental to body image, analyses were computed by breaking down the overall ARS score into 'others' and 'self' appearance exposure to determine whether the components differ in the strength or direction of association with internalization of the thin ideal, appearance comparison, drive for thinness, and weight satisfaction.

Weak to moderate positive correlations were also found between self-related appearance exposure and the internalization of the thin ideal ( $rs(89) = .284, p < .005$ ), body esteem – attribution ( $rs(89) = .200, p < .05$ ), self-objectification ( $rs(89) = .180, p < .05$ ), and drive for thinness ( $rs(89) = .186, p < .05$ ). Self-related appearance exposure scores did not demonstrate stronger correlations than general appearance exposure scores on any of the body image variables.

Weak to moderate positive correlations were found between other-related appearance exposure and the internalization of the thin ideal ( $r_s(89) = .177, p < .05$ ), self-objectification ( $r_s(89) = .259, p < .01$ ), and appearance comparison ( $r_s(89) = .219, p < .05$ ). All significant correlations were weaker in magnitude compared to overall appearance exposure score correlations with the exception of OARS and appearance comparison.

BMI was correlated to several main variables, including body esteem-weight ( $r_s(102) = -.334, p < .001$ ), body-esteem attribution ( $r_s(102) = .281, p < .005$ ), overall body-esteem ( $r_s(102) = .242, p < .01$ ), and drive for thinness ( $r_s(103) = .215, p < .05$ ). Spearman's correlations were computed controlling for BMI. Results are displayed in Table 10. Controlling for BMI did not have a significant impact on most correlations, with the exception of increasing the negative association between self-appearance exposure and weight satisfaction to the point of significance ( $r_s(86) = -.202, p < .05$ ), and diminishing the correlation between self-related appearance exposure and body esteem- attribution to non-significance. It should be noted that the actual difference in  $r$ 's with or without the control for BMI were fairly small. Table 11 displays SARS' correlations with BE-Weight and BE-Attribution before and after controlling for BMI.

The decision to isolate photo-related Facebook activities to create the appearance-related score (ARS) was based on theory rather than empirical evidence; therefore, it is important to ensure that this cluster of photo-related activities was uniquely linked to body image more so than other possible combinations of activities that reflect Facebook users' activity patterns. Although there are many potential common activity profiles, it seemed possible that appearance-related scores may be reflecting high 'presence managers,' or users who have heightened activity levels dedicated to managing their public image on Facebook. It may be that a high rate of photo-based activity is part of a larger pattern of self-presentation activity that also includes posting,

commenting, and updating profile information. To ensure that the apparent link between photo activity and body image is not better explained by presence management concerns, two ‘presence management scores’ were created. One score consisted of all non-photo-related FBQ activity items that are visible to the general public (i.e. ‘Post a status update’) as opposed to private activity that the public cannot view (i.e. ‘Facebook chat’). The ‘Presence Management Score – Non-Photo (PMS-NP)’ consists of 11 items (Appendix G). Another presence management score was calculated that includes the same publicly-visible activity but also includes photo-related activity that is publicly visible. The ‘Presence Management Score – Total (PMS-T)’ consists of 16 items (Appendix G). Correlations were run for all main body image variables and both versions of the presence management score and are presented beside the original associations found for the ARS (Table 12). PMS-NP was significantly negatively correlated with internalization of the thin ideal ( $rs(88) = -.202, p < .05$ ), body esteem – attribution ( $rs(86) = -.230, p < .05$ ), and self-objectification ( $rs(85) = -.288 p < .005$ ). PMS-T was significantly negatively correlated with self-objectification ( $rs(83) = -.266 p < .01$ ).

### Exploratory Analyses

For exploratory purposes, two-sided spearman’s correlations were run for raw scores on individual FBQ items and the body image variables to identify if any specific activity was significantly associated with body image disturbances (Table 12). No corrections were made to account for multiple correlations. All data is presented for solely exploratory purposes and requires replication and more rigorous future testing. Several non-appearance-related activities



Table 2: Internet and Facebook Use

<i>Descriptive Statistics for Categorical Variables</i>			<i>By Grade</i>											
	<i>N</i>	<i>%</i>	7	<i>%</i>	8	<i>%</i>	9	<i>%</i>	10	<i>%</i>	11	<i>%</i>	12	<i>%</i>
<u>Internet Access</u>														
Yes	103	100												
<u>Internet Usage</u>														
Never/almost never	1	1.0%	0	0	1	4%	0	0	0	0	0	0	0	0
>30 min/day	4	3.9%	1	11%	0	0%	1	6%	0	0	1	8%	1	3%
30-60 min/day	20	19.4%	3	33%	6	23%	2	13%	1	11%	4	31%	4	13%
1-2 hr/day	37	35.9%	3	33%	9	35%	7	44%	5	56%	5	38%	8	27%
2-3 hr/day	21	20.4%	0	0%	6	23%	2	13%	2	22%	2	15%	9	30%
3+ hr/day	20	19.4%	2	22%	4	15%	4	25%	1	11%	1	8%	8	27%
<u>Facebook Account</u>														
Yes	91	88.3%	7	78%	22	85%	12	75%	8	89%	13	100%	29	97%
No	12	11.7%	2	22%	4	15%	4	25%	1	11%	0	0	1	3%
<u>Facebook Usage</u>														
No Account	12	11.7%	2	22%	4	15%	4	25%	1	11%	0	0	1	3%
Never/almost never	5	4.9%	0	0%	2	8%	1	0	0	0	0	0	2	7%
>1 hr/wk	9	8.7%	2	22%	1	4%	1	0	0	0	1	8%	4	13%
>30 min/day	11	10.7%	1	11%	2	8%	2	13%	0	0	3	23%	3	10%
30-60 min/day	38	36.9%	2	22%	8	31%	3	19%	5	56%	8	62%	12	40%
1-2 hr/day	19	18.4%	1	11%	8	31%	3	19%	1	11%	1	8%	5	17%
2+ hr/day	9	8.7%	1	11%	1	4%	2	13%	2	22%	0	0	3	10%
<u>Privacy Settings (FB Account Holders Only)</u>														
Public	6	6.6%	1	14%	1	5%	2	17%	0	0	0	0	2	7%
Private	58	63.7%	3	43%	18	82%	8	67%	5	63%	7	54%	17	59%
Custom	19	20.9%	3	43%	2	9%	2	17%	1	13%	5	38%	6	21%
I don't know	8	8.8%	0	0%	1	5%	0	0%	2	25%	1	8%	4	14%
<u>Facebook Profile Photo (FB Account Holders Only)</u>														
A photo of just me, waist and above	40	44.0%	5	71%	11	50%	4	33%	4	50%	3	23%	13	45%
A photo of just me, full body	11	12.1%	0	0	1	5%	4	33%	2	25%	3	23%	1	3%
A photo of me and friend(s), waist and above	23	25.3%	0	0	7	32%	2	17%	0	0	4	31%	10	34%
A photo of me and friend(s), full body	10	11.0%	2	29%	0	0	1	8%	1	13%	1	8%	5	17%
A photo/image with no people in it	1	1.1%	0	0	1	5%	0	0	0	0	0	0	0	0
Other/I don't know	6	6.6%	0	0	2	9%	1	8%	1	13%	2	15%	0	0%

Table 3: Descriptive Statistics for BMI, # of Facebook friends, # of photos

	<i>Mean</i>	<i>SD</i>	<i>N</i>
BMI	22.23	4.24	103
# of Facebook friends	588.52	443.32	91
# of Facebook photos	438.93	770.88	91
Total years on Facebook	2.66	1.27	89

Table 4: Mean FBQ Item Scores and Reliability Coefficients (*N*=83)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Corr.	Squared Multipl e Corr.	Cronbach's Alpha if Item Deleted
View friends' status updates	56.837	144.104	0.572	0.712	0.865
View friends' photos that they've added of me	57.175	145.893	0.535	0.566	0.867
View friends' photos that they've added of themselves	57.428	143.507	0.613	0.663	0.864
Post a status update	57.560	140.704	0.660	0.643	0.862
Post a photo	57.590	145.739	0.619	0.713	0.865
Send or receive messages	57.633	148.970	0.448	0.481	0.869
Comment on friends' photos	57.657	143.719	0.628	0.672	0.864
Comment on friends' status updates	57.723	144.477	0.585	0.683	0.865
Facebook chat	57.801	145.372	0.446	0.500	0.869
Update profile photo	57.807	145.908	0.477	0.708	0.868
Create album w/photos of self, friends, family	58.090	145.940	0.479	0.569	0.868
View friends' links	58.199	145.274	0.435	0.715	0.870
Post link to news story, video, website, etc.	58.777	141.191	0.679	0.674	0.862
Comment on friends' links to news, videos, websites	58.789	139.879	0.668	0.802	0.862
Tag myself in friends' photos	58.837	144.604	0.459	0.622	0.869
Untag myself in friends' photos	58.910	150.830	0.297	0.404	0.874
Join groups	58.922	145.954	0.428	0.565	0.870
Create album with art/photography	59.271	151.874	0.254	0.418	0.875
Update profile interests	59.307	148.511	0.445	0.594	0.869
Write FB note	59.464	156.182	0.095	0.427	0.880
Play games	59.476	157.377	0.065	0.582	0.880
Create event	59.765	155.100	0.289	0.470	0.873
Create group	59.910	156.489	0.299	0.517	0.873
Create quiz	59.934	159.114	0.077	0.333	0.876

Table 5: Ranked Means for FBQ Items

	<i>Mean</i>	<i>Mode</i>	<i>SD</i>
View friends' status updates	4.19	5	1.063
View friends' photos that they've added of me	3.843	4	0.999
View friends' photos that they've added of themselves	3.59	4	1.035
Post a status update	3.449	3	1.168
Post a photo	3.421	4	0.907
Send or receive messages	3.392	3	0.945
Comment on friends' photos	3.348	3	1.012
Comment on friends' status updates	3.292	3	1.055
Facebook chat	3.236	3	1.216
Update profile photo	3.199	4	1.121
Create album w/photos of self, friends, family	2.937	3	1.119
View friends' links	2.798	3	1.245
Post link to news story, video, website, etc.	2.242	1	1.077
Comment on friends' links to news, videos, websites	2.225	2	1.194
Join groups	2.14	1	1.222
Tag myself in friends' photos	2.118	1	1.225
Untag myself in friends' photos	2.08	1	1.085
Update profile interests	1.742	1	0.995
Create album with art/photography	1.73	1	1.116
Play games	1.534	1	1.005
Write FB note	1.517	1	1.078
Create event	1.227	1	0.62
Create group	1.08	1	0.435
Create quiz	1.057	1	0.382

Table 6: Top 5 Facebook Activity Frequency Scores, by Grade

<b>Grade 7 (n=7)</b>	<b>Mean</b>	<b>Mode</b>	<b>SD</b>
Facebook chat	4	3	1
Post a photo	4	3	1
Post a status update	4	3	1
View friends' status updates	4	5	1.265
Update profile photo	3.857	5	1.215
<b>Grade 8 (n=22)</b>	<b>Mean</b>	<b>Mode</b>	<b>SD</b>
View friends' status updates	4.048	5	1.161
View friends' photos they've added of me	3.81	4	0.928
Facebook chat	3.524	4	1.123
Post a status update	3.524	4	1.327
Post a photo	3.381	4	0.805
<b>Grade 9 (n=12)</b>	<b>Mean</b>	<b>Mode</b>	<b>SD</b>
View friends' status updates	4.208	4	0.722
View friends' photos they've added of me	4	4	0.953
Update profile photo	3.667	4	1.052
Facebook chat	3.667	4	0.888
Post a photo	3.583	4	0.793
<b>Grade 10 (n=8)</b>	<b>Mean</b>	<b>Mode</b>	<b>SD</b>
View friends' photos they've added of me	4.375	5	0.744
View friends' status updates	4.375	5	0.744
View friends' photos they've added of themselves	4.125	4	0.835
Comment on friends' photos	4.125	5	0.991
Post a photo	3.875	3	0.835
<b>Grade 11 (n=13)</b>	<b>Mean</b>	<b>Mode</b>	<b>SD</b>
View friends' status updates	4.077	5	1.32
View friends' photos that they've added of me	3.692	4	1.251
View friends' photos that they've added of themselves	3.462	4	0.776
Post a status update	3.308	3	1.251
Facebook chat	3.231	3	1.363
<b>Grade 12 (n=29)</b>	<b>Mean</b>	<b>Mode</b>	<b>SD</b>
View friends' status updates	4.333	5	1.074
View friends' photos that they've added of themselves	3.857	4	1.044
View friends' photos that they've added of me	3.714	4	1.013
Comment on friends' status updates	3.554	4	0.975
Comment on friends' photos	3.464	4	0.793

Table 7: Facebook Questionnaire: Appearance-Related Subscale: Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Corr.	Squared Multiple Corr.	Cronbach's Alpha if Item Deleted
Create album w/photos of self, friends, family	21.55814	25.385	0.51	0.461	0.799
Update profile photo	21.28488	24.486	0.593	0.577	0.787
Post a photo	21.06977	25.048	0.709	0.591	0.775
View friends' photos that they've added of me	20.64535	25.564	0.571	0.444	0.791
View friends' photos that they've added of themselves	20.90116	25.34	0.566	0.409	0.791
Comment on friends' photos	21.13372	26.308	0.479	0.306	0.803
Tag myself in friends' photos	22.32558	24.31	0.539	0.397	0.796
Untag myself in friends' photos	22.37791	27.182	0.353	0.238	0.821

Table 8: Descriptive Statistics for Body Image and Facebook Use

	N	Mean	SD	Skewness	SD	Kurtosis	SD
Internalization of thin ideal	103	15.146	5.618	-0.073	0.238	-1.145	0.472
Body Esteem-Appearance	102	21.608	8.564	0.061	0.239	-0.678	0.474
Body Esteem-Weight	102	17.343	7.882	0.074	0.239	-0.641	0.474
Body Esteem-Attribution	102	10.696	3.391	-0.047	0.239	-0.224	0.474
Body Esteem-TOTAL	102	49.647	16.796	0.096	0.239	-0.427	0.474
Self-Objectification	100	0.850	13.414	-0.072	0.241	-1.078	0.478
Appearance Comparisons	103	11.777	3.619	0.144	0.238	-.682	0.472
Drive for Thinness	103	22.767	10.303	0.281	0.238	-1.217	0.472
ARS: Appearance-Related Score/FBQ	89	0.400	0.050	0.449	0.255	-0.134	0.506
SARS: Self-Appearance-Related Subscale/FBQ	89	0.286	0.048	0.22	0.255	-0.273	0.506
OARS: Other-Appearance-Related Subscale/FBQ	89	0.114	0.019	-0.655	0.255	0.684	0.506
Valid N (listwise)	85						

returned significant correlations with variables ('create group' and body esteem – attribution,  $r_{s(88)} = -.228$ ,  $p < .05$ ; 'create album with art/photography' and self-objectification,  $r_{s(86)} = -.355$ ,  $p < .005$ ; 'play games' and body esteem – attribution,  $r_{s(88)} = -.223$ ,  $p < .05$ ; 'post link to a news story, video, website, etc.' and both internalization of thin ideal,  $r_{s(89)} = .266$ ,  $p < .05$ , and

appearance comparisons ,  $rs(89) = .212, p < .05$ ; view friends' status updates and both internalization of thin ideal,  $rs(87) = .281, p < .008$ , and appearance-comparison,  $rs(87) = .373, p < .001$ , 'comment on friends' status updates' and appearance comparisons,  $rs(89) = .214, p < .05$ , and 'comment on friends' links to news, videos, and websites' and internalization of thin ideal,  $rs(89) = .227, p < .05$ , body esteem-appearance,  $rs(89) = .223, p < .05$ , and appearance comparisons,  $rs(89) = .214, p < .05$ .

Analysis of correlations between body image variables and the individual items that comprise the Appearance Related Subscale (ARS) found that many individual ARS items correlate with multiple body image disturbance variables, with the exception of 'Create Album w/photos of self, friends, and family' (Table 12). 'Update profile photo' was significantly positively correlated with thin ideal internalization ( $rs(88) = .309, p < .005$ ), and body esteem – attribution ( $rs(88) = .324, p < .005$ ); 'Post a photo' was positively correlated with thin ideal internalization ( $rs(89) = .278, p < .01$ ); 'View friends' photos that they've added of me' was positively correlated with internalization of thin ideal ( $rs(89) = .346, p < .005$ ), body esteem – attribution ( $rs(89) = .287, p < .01$ ), appearance comparisons ( $rs(89) = .301, p < .005$ ), drive for thinness ( $rs(89) = .266, p < .05$ ) and negatively correlated with body esteem – appearance ( $rs(89) = .238, p < .005$ ); 'View friends' photos that they've added of themselves' was positively correlated with thin ideal internalization ( $rs(89) = .412, p < .001$ ), self-objectification ( $rs(86) = .247, p < .05$ ), appearance comparisons ( $rs(89) = .486, p < .001$ ), drive for thinness ( $rs(89) = .219, p < .05$ ), and negatively correlated with body esteem – appearance ( $rs(89) = -.346, p < .005$ ), body esteem – weight ( $rs(89) = .243, p < .05$ ) and overall body-esteem ( $rs(89) = -.285, p < .01$ ); 'Comment on Friends' Photos' was positively correlated with thin ideal internalization ( $rs(89) = .231, p < .05$ ), appearance comparisons ( $rs(89) = .237, p < .05$ ), and drive for thinness

$(rs(89) = .251, p < .05)$ , and negatively correlated with body esteem – appearance  $(rs(89) = -.235, p < .05)$ , ‘Tag myself in friends’ photos’ was positively correlated with thin ideal internalization  $(rs(89) = .448, p < .001)$ , self-objectification  $(rs(89) = .286, p < .01)$ , appearance comparisons  $(rs(89) = .271, p < .05)$ , and drive for thinness  $(rs(89) = .314, p < .005)$ , and negatively correlated with body esteem – appearance  $(rs(89) = -.348, p < .005)$ , body esteem – weight  $(rs(89) = -.297, p < .01)$ , and overall body esteem  $(rs(89) = -.349, p < .005)$ . Finally, ‘Untag myself in friends’ photos’ was positively correlated with thin ideal internalization  $(rs(88) = .335, p < .005)$ , self-objectification  $(rs(88) = .264, p < .05)$ , appearance comparisons  $(rs(88) = .296, p < .01)$ , and drive for thinness  $(rs(88) = .502, p < .001)$ , and negatively correlated with body esteem – appearance  $(rs(88) = -.414, p < .001)$ , body esteem – weight  $(rs(88) = -.414, p < .001)$ , and overall body esteem  $(rs(88) = -.384, p < .001)$ .

Table 9: Spearman's Correlations for Body Image, Internet, and Facebook Use Variables

		Age	BMI	Total Internet Use	Total FB Use	# of FB Friend	# FB photos	SIAQ- A	BE- App.	BE- Weight	BE- Attrib.	BE- Total	SOS	PACS 4-Item	EDI- DFT
BMI	Corr. Coeff.	0.138	1	-0.105	0.062	-0.040	-0.055	-0.018	-0.086	<b>-.334**</b>	<b>-.281**</b>	<b>-.242**</b>	0.048	0.055	<b>.215*</b>
	Sig. (1-tailed)	0.082		0.145	0.268	0.344	0.289	0.430	0.195	0.000	0.002	0.007	0.316	0.289	0.015
	N	103	103	103	103	103	103	103	102	102	102	102	100	103	103
Total Internet Use	Corr. Coeff.	0.13	-	1	<b>.320**</b>	0.064	0.096	0.12	-0.078	0.022	-0.085	-0.048	0.057	0.044	-0.078
	Sig. (1-tailed)	0.1	0.145	.	0	0.26	0.167	0.113	0.219	0.414	0.198	0.317	0.286	0.33	0.216
	N	103	103	103	103	103	103	103	102	102	102	102	100	103	103
Total FB Use	Corr. Coeff.	0.11	0.062	<b>.320**</b>	1	<b>.454**</b>	<b>.442**</b>	0.113	-0.024	-0.059	0.099	-0.011	0.098	0.121	0.065
	Sig. (1-tailed)	0.13	0.268	0	.	0	0	0.129	0.406	0.279	0.162	0.455	0.165	0.111	0.258
	N	103	103	103	103	103	103	103	102	102	102	102	100	103	103
ARS/ Total FBQ	Corr. Coeff.	0.04	-	0.02	0.039	<b>.331**</b>	<b>.348**</b>	<b>.357*</b>	-0.129	<b>-.184*</b>	<b>.245*</b>	-0.132	<b>.279*</b>	<b>.194*</b>	<b>.205*</b>
	Sig. (1-tailed)	0.36	0.148	0.427	0.357	0.001	0	0	0.113	0.042	0.01	0.108	0.005	0.034	0.027
	N	89	89	89	89	89	89	89	89	89	89	89	86	89	89
SARS/ Total FBQ	Corr. Coeff.	-0.1	-	0.042	0.155	<b>.322**</b>	<b>.382**</b>	<b>.284*</b>	-0.072	-0.143	<b>.200*</b>	-0.082	<b>.180*</b>	0.065	<b>.186*</b>
	Sig. (1-tailed)	0.17	0.1	0.348	0.074	0.001	0	0.004	0.252	0.091	0.03	0.224	0.049	0.272	0.041
	N	89	89	89	89	89	89	89	89	89	89	89	86	89	89
OARS/ Total FBQ	Corr. Coeff.	<b>.194*</b>	0.123	-0.057	<b>-.213*</b>	-0.024	-0.065	<b>.177*</b>	-0.166	-0.168	0.066	-0.171	<b>.259*</b>	<b>.219*</b>	0.136
	Sig. (1-tailed)	0.03	0.125	0.297	0.022	0.412	0.273	0.048	0.06	0.058	0.269	0.055	0.008	0.02	0.102
	N	89	89	89	89	89	89	89	89	89	89	89	86	89	89

*SIAQ-A: Internalization of Thin Ideal; BE-APP: Body Esteem - Appearance; BE-Weight: Body Esteem - Weight, BE-Attrib: Body Esteem - Attribution, BE-Total: Overall Body Esteem Scale, SOS: Self Objectification, PACS: Physical Appearance Comparison, EDI-DFT: Drive for Thinness*

\* Correlation is significant at the 0.05 level (1-tailed).

\*\* Correlation is significant at the 0.01 level (1-tailed).



Table 10: Spearman Rho Correlations for Body Image and FB Appearance Exposure, Controlling for BMI

		Total FB Use	SIAQ- A	BE- App.	BE- Weight	BE- Attrib.	BE- Total	SOS	PACS	EDI- DFT
Total FB Use	Correlation Coefficient	1	.114	-.019	-.04	.121	.004	.096	.118	.053
	Sig. (1-tailed)	.	.127	.426	.344	.114	.485	.173	.118	0.3
	N	0	100	99	99	99	99	97	100	100
ARS/ Total FBQ	Correlation Coefficient	.047	<b>.357**</b>	-.14	<b>-.236*</b>	<b>.224*</b>	-.165	<b>.286**</b>	<b>.202*</b>	<b>.236*</b>
	Sig. (1-tailed)	.333	0	.096	.013	.018	.062	.004	.029	.013
	N	86	86	86	86	86	86	83	86	86
SARS/ Total FBQ	Correlation Coefficient	.165	<b>.284**</b>	-.085	<b>-.202*</b>	.17	-.119	<b>.188*</b>	.074	<b>.223*</b>
	Sig. (1-tailed)	.062	.004	.217	.029	.057	.134	.042	.248	.019
	N	86	86	86	86	86	86	83	86	86
OARS/ Total FBQ	Correlation Coefficient	<b>-.223*</b>	<b>.181*</b>	-.158	-.136	.106	-.146	<b>.256**</b>	<b>.214*</b>	.113
	Sig. (1-tailed)	.018	.046	.071	.104	.163	.087	.009	.023	.147
	N	86	86	86	86	86	86	83	86	86

*SIAQ-A: Internalization of Thin Ideal; BE-APP: Body Esteem - Appearance; BE-Weight: Body Esteem - Weight, BE-Attrib: Body Esteem - Attribution, BE-Total: Overall Body Esteem Scale, SOS: Self Objectification, PACS: Physical Appearance Comparison, EDI-DFT: Drive for Thinness*

\* Correlation is significant at the 0.05 level (1-tailed).

\*\* Correlation is significant at the 0.01 level (1-tailed).

Table 11: Spearman's Correlations Affected by Controlling for BMI

		BE- Weight	BE-Weight BMI Controlled	BE-Attrib.	BE-Attrib. BMI Controlled
SARS/Total FBQ	Corr. Coefficient	-0.143	<b>-0.202*</b>	<b>.200*</b>	0.17
	Sig. (1-tailed)	0.091	0.029	0.03	0.057
	N	89	86	89	86

\*Correlation is significant at the .05 level (1-tailed).

Table 12: Correlations for FB Appearance Exposure, Presence Management (no photos), Presence Management (with photos) and body image variables

		SIAQA	BE-App	BE-Weight	BE-Attrib	BE-Total	SOS	PACS	EDI-TFT
Appearance Exposure	Corr. Coeff.	<b>.357**</b>	-.129	<b>-.184*</b>	<b>.245*</b>	-.132	<b>.279**</b>	<b>.194*</b>	<b>.205*</b>
	Sig. (1-tailed)	.000	.113	.042	.010	.108	.005	.034	.027
	N	89	89	89	89	89	86	89	89
Presence Management (No Photos)	Corr. Coeff.	<b>-.202*</b>	.064	.081	<b>-.230*</b>	.053	<b>-.288**</b>	-.133	-.101
	Sig. (1-tailed)	.029	.278	.226	.016	.313	.004	.108	.175
	N	88	88	88	88	88	85	88	88
Presence Management (With Photos)	Corr. Coeff.	-.028	.140	.048	-.125	.075	<b>-.266**</b>	-.176	-.067
	Sig. (1-tailed)	.401	.100	.330	.126	.247	.008	.053	.269
	N	86	86	86	86	86	83	86	86

Table 13: Spearman's Correlations for FBQ Items and Body Image Variables

		SIAQ-A	BE-App.	BE-Weight	BE-Attrib.	BE-TOTAL	SOS	PACS	EDI-TFT
Create group	Corr. Coef.	0.059	-0.15	-0.015	<b>-.228*</b>	-0.102	-0.024	0.056	0.108
	Sig. (2-tailed)	0.585	0.162	0.891	0.033	0.344	0.826	0.606	0.317
	N	88	88	88	88	88	85	88	88
Write FB Note	Corr. Coef.	-0.092	-0.088	-0.112	-0.203	-0.117	-0.2	-0.157	0.028
	Sig. (2-tailed)	0.391	0.41	0.295	0.057	0.274	0.064	0.141	0.797
	N	89	89	89	89	89	86	89	89
Facebook chat	Corr. Coef.	0.029	-0.086	0.027	0.155	-0.017	-0.065	0.029	-0.087
	Sig. (2-tailed)	0.789	0.423	0.798	0.147	0.876	0.553	0.791	0.415
	N	89	89	89	89	89	86	89	89
Create quiz	Corr. Coef.	-0.003	-0.194	-0.097	-0.16	-0.174	-0.038	-0.039	0.03
	Sig. (2-tailed)	0.981	0.07	0.37	0.137	0.106	0.727	0.717	0.782
	N	88	88	88	88	88	85	88	88
Create event	Corr. Coef.	0.094	0.016	0.101	0.048	0.065	-0.174	0.059	-0.019
	Sig. (2-tailed)	0.384	0.883	0.348	0.654	0.546	0.11	0.585	0.862
	N	88	88	88	88	88	85	88	88
Create album w/photos of self, friends, family Y	Corr. Coef.	0.176	-0.066	-0.053	0.139	-0.048	-0.181	0.15	-0.018
	Sig. (2-tailed)	0.102	0.543	0.623	0.198	0.659	0.097	0.163	0.87
	N	88	88	88	88	88	85	88	88
Create album with art/photography	Corr. Coef.	-0.035	0.044	0.13	0.033	0.103	<b>-.355**</b>	-0.072	-0.113
	Sig. (2-tailed)	0.745	0.682	0.225	0.761	0.336	0.001	0.501	0.293
	N	89	89	89	89	89	86	89	89
Join groups	Corr. Coef.	0.048	-0.071	-0.012	-0.038	-0.048	-0.127	0.093	-0.059
	Sig. (2-tailed)	0.656	0.508	0.909	0.721	0.657	0.246	0.385	0.583
	N	89	89	89	89	89	86	89	89
Update profile photo Y	Corr. Coef.	<b>.309**</b>	0.033	-0.009	<b>.324**</b>	0.048	0.05	0.12	0.021
	Sig. (2-tailed)	0.003	0.759	0.934	0.002	0.657	0.651	0.264	0.846
	N	88	88	88	88	88	85	88	88
Update profile interests	Corr. Coef.	-0.043	-0.162	0.035	-0.185	-0.086	-0.046	0.194	0.052
	Sig. (2-tailed)	0.686	0.129	0.747	0.083	0.422	0.675	0.069	0.631
	N	89	89	89	89	89	86	89	89

		SIAQ-A	BE-App.	BE-Weight	BE-Attrib.	BE-TOTAL	SOS	PACS (4-item)	EDI-TFT
Send or receive messages	Sig. (2-tailed)	0.373	0.717	0.702	0.036	0.712	0.133	0.613	0.969
	N	88	88	88	88	88	85	88	88
	Corr. Coef.	0.151	-0.167	-0.086	0.053	-0.118	-0.058	0.202	-0.071
Post a photo Y	Sig. (2-tailed)	0.161	0.12	0.426	0.621	0.273	0.601	0.059	0.51
	N	88	88	88	88	88	85	88	88
	Corr. Coef.	<b>.278**</b>	-0.114	-0.056	0.187	-0.077	0.03	0.162	0.1
Post a status Update	Sig. (2-tailed)	0.008	0.287	0.6	0.079	0.473	0.782	0.129	0.351
	N	89	89	89	89	89	86	89	89
	Corr. Coef.	0.187	-0.106	-0.043	0.133	-0.083	-0.081	<b>.231*</b>	0.105
Post link to news story, video, website, etc.	Sig. (2-tailed)	0.079	0.321	0.69	0.213	0.44	0.459	0.03	0.327
	N	89	89	89	89	89	86	89	89
	Corr. Coef.	<b>.266*</b>	-0.158	-0.131	0.133	-0.124	0.117	<b>.212*</b>	0.124
View friends' photos of me Y	Sig. (2-tailed)	0.012	0.139	0.219	0.214	0.248	0.285	0.046	0.247
	N	89	89	89	89	89	86	89	89
	Corr. Coef.	<b>.346**</b>	<b>-.238*</b>	-0.119	<b>.287**</b>	-0.125	0.168	<b>.301**</b>	<b>.266*</b>
View friends' photos of themselves Y	Sig. (2-tailed)	0.001	0.025	0.267	0.006	0.243	0.122	0.004	0.012
	N	89	89	89	89	89	86	89	89
	Corr. Coef.	<b>.412**</b>	<b>-.346**</b>	<b>-.243*</b>	0.108	<b>-.285**</b>	<b>.247*</b>	<b>.486**</b>	<b>.219*</b>
View friends' status updates	Sig. (2-tailed)	0	0.001	0.022	0.312	0.007	0.022	0	0.039
	N	89	89	89	89	89	86	89	89
	Corr. Coef.	<b>.281**</b>	-0.193	-0.053	0.182	-0.097	0.125	<b>.373**</b>	0.099
View Friends' Links	Sig. (2-tailed)	0.008	0.073	0.625	0.092	0.371	0.258	0	0.36
	N	87	87	87	87	87	84	87	87
	Corr. Coef.	0.081	-0.185	-0.066	-0.111	-0.129	0.071	0.14	0.074
Comment on friends' photos Y	Sig. (2-tailed)	0.45	0.083	0.536	0.3	0.227	0.515	0.191	0.493
	N	89	89	89	89	89	86	89	89
	Corr. Coef.	<b>.231*</b>	<b>-.235*</b>	-0.158	0.057	-0.196	0.165	<b>.237*</b>	<b>.251*</b>
Comment on friends' status updates	Sig. (2-tailed)	0.03	0.027	0.139	0.598	0.065	0.13	0.026	0.018
	N	89	89	89	89	89	86	89	89
	Corr. Coef.	0.208	-0.157	-0.147	0.034	-0.142	0.163	0.189	<b>.214*</b>
Comment on friends' links to news, videos, sites	Sig. (2-tailed)	0.05	0.143	0.169	0.753	0.185	0.133	0.076	0.044
	N	89	89	89	89	89	86	89	89
	Corr. Coef.	<b>.227*</b>	<b>-.223*</b>	-0.097	-0.105	-0.17	0.143	<b>.214*</b>	0.137
Tag myself in friends' photos Y	Sig. (2-tailed)	0.033	0.036	0.364	0.326	0.112	0.19	0.044	0.199
	N	89	89	89	89	89	86	89	89
	Corr. Coef.	<b>.448**</b>	<b>-.348**</b>	<b>-.297**</b>	-0.067	<b>-.349**</b>	<b>.286**</b>	<b>.271*</b>	<b>.314**</b>
Untag myself in friends' photos Y	Sig. (2-tailed)	0	0.001	0.005	0.533	0.001	0.008	0.01	0.003
	N	89	89	89	89	89	86	89	89
	Corr. Coef.	<b>.335**</b>	<b>-.373**</b>	<b>-.414**</b>	0.058	<b>-.384**</b>	<b>.264*</b>	<b>.296**</b>	<b>.502**</b>
	Sig. (2-tailed)	0.001	0	0	0.59	0	0.015	0.005	0
	N	88	88	88	88	88	85	88	88

*SIAQ-A: Internalization of Thin Ideal; BE-APP: Body Esteem - Appearance; BE-Weight: Body Esteem - Weight, BE-Attrib: Body Esteem - Attribution, BE-Total: Overall Body Esteem Scale, SOS: Self Objectification, PACS: Physical Appearance Comparison, EDI-DFT: Drive for Thinness*

\* Correlation is significant at the 0.05 level (2-tailed).

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

Y = Appearance Related Subscale

## DISCUSSION

The purpose of the present study is to update the media effects literature to include consideration of how the Internet, and more specifically, Facebook, may influence adolescent girls' body image. Past research has found that exposure to the Internet, more so than magazines or television, is significantly correlated with drive for thinness, the internalization of the thin ideal, physical appearance comparisons, and weight dissatisfaction (Tiggemann & Miller, 2010). Upon taking a more detailed look at the specific websites that correlated with body image disturbances, these researchers found particularly strong correlations for the SNS Facebook and MySpace, but were unable to identify the specific features of SNS use that accounted for the correlations (Tiggemann & Miller, 2010). This study aims to expand upon these findings, adopting a strategy proposed by recent SNS researchers that views Facebook as a collection of diverse tools and features rather than a homogenous platform (Smock et al., 2011). It was thought that measuring adolescent girls' use of specific Facebook features may account for more variation in body image variables than overall Facebook use scores alone, offering a more detailed understanding of the specific parts of Facebook use that may be detrimental to adolescent body image.

Neither age nor BMI were associated with total Internet use, total Facebook use, or any of the appearance-related subscales, with the exception of a modest positive correlation between age and other-related appearance exposure. This suggests that times spent on Facebook does not vary predictably across the 12-18 age span, which parallels the finding that, for all grade levels, the modal time spent on Facebook daily was '30-60 minutes/day' (though responses for both grade 8 and 9 were bimodal, evenly split between '30-60 minutes/day' and '1-2 hours/day').

## Hypothesis I

Hypothesis I predicted that overall Facebook use would correlate with increases in scores for internationalization of the thin ideal, appearance comparison, drive for thinness, and self-objectification, and decreases in scores for weight satisfaction. Contrary to this hypothesis, total Facebook use was not correlated with any of the body image variables. Additionally, there were no correlations between total Internet use and the body image variables. It should be noted that responses to the item measuring total Internet use suggested that there may have been ceiling effects, and more response options on the higher end may have offered more detailed information on general Internet use surpassing 3 hours per day. Future research on adolescent Internet use should expand response options or ask subjects to approximate their daily use in an open-ended format.

The findings of no significant correlation between total Facebook use and the body image variables are inconsistent with previous findings by Tiggemann and Miller (2010), which may be explained by substantial differences in Facebook prevalence and usage patterns between samples and by rapid expansion of Facebook applications in recent years. If a higher percentage of adolescent girls are using Facebook regularly and the range of possible activities to engage with while on Facebook has grown substantially, it would follow logically that there may be more variation in adolescent Facebook use. Higher within-sample variation in overall Facebook use would certainly affect associations between total time spent on the site and body image disturbances, further underscoring the importance of measuring engagement with specific Facebook applications rather than general time spent on site. The important differences between the two study samples are discussed below.

Facebook use was much more prevalent among the US students, sampled in 2012, than in the Australian students, sampled in 2008 (88.3% and 41.8%, respectively) (Tiggemann & Miller, 2010; M. Tiggemann, personal communication, August 29, 2012). The difference in prevalence is likely a function of an increase in Facebook's popularity among adolescents between 2008 and 2012 and a relatively higher rate of adoption among US students compared to Australian students. Research has shown that SNS use among 12-17 year-olds in the US increased from 55% in 2006, when the Facebook first opened registration to all users age 13 and up (Abram, 2006) to 80% in 2011 (Lenhart et al., 2011). Another potential factor may be a difference in Facebook usage rates between Australian and American adolescents. Focus groups conducted with Australian adolescents age 13-17 in June of 2008 suggested that while adolescents spent large portions of online time on Bebo, MySpace, and YouTube, the majority did not use Facebook and considered it to be more frequently used by older teens and adults (ACMA, 2009). The quantitative portion of the same study suggested that Facebook was not the dominant SNS and was outranked by MSN and MySpace across age-groups (ACMA, 2009). Interestingly, when comparing Australian and American teens on general SNS in 2008, more Australian teens reported using a SNS at some point; 80% of 12-13 year-olds, 94% of 14-15 year-olds, and 97% of 16-17 year-olds (ACMA, 2009) compared to 65% of 12-17 year-olds in the US (Lenhart et al, 2011). This data suggests that it is not that Australian teens are using SNS's less than American teens, but that in 2008, Facebook was not the preferred SNS among Australian adolescents.

Given this information, it should be considered that the teens who reported higher Facebook use in Tiggemann and Miller's 2008 sample could be considered 'early adopters' of Facebook among Australian teens, given that this was not the predominant SNS in the way that it is among the US teens in the 2012 sample. There may have been some differences in the

characteristics of individuals who preferred Facebook or in the ways that they used the site compared to other, more popular SNS options. What these may be is purely speculative, but clearly the difference in Facebook's market penetration among the 2008 Australian sample and the 2012 US sample makes the divergent findings in Hypothesis I less surprising.

An additional factor that complicates the comparison of the Australian sample's use of Facebook and that of the current US sample is that Facebook itself has changed dramatically in the four years separating the two studies. The activities and features that are available in 2012 greatly outnumber those available in 2008, meaning that the total time spent on Facebook in 2012 could consist of a wide range of usage patterns among the sample, compared to a more limited range of options in the 2008 sample. For example, though some features have been long-time staples on Facebook, including 'liking', status updates, photo sharing, and 'friending', many features have been added since the time of Tiggemann and Miller's study, including 'chat' in 2008, 'subscribe', 'ticker', 'timeline', and 'questions' in 2011, to name a few (Facebook Features, 2011). Adding another layer of variation in Facebook usage, it is possible to access the site via smart phones, which have increased in popularity among US adolescents, with 49% of teens age 12-17 accessing the Internet via smart phone in the past 30 days, according to a 2011 survey (Lenhart, 2012). How exposure to Facebook on a mobile phone as opposed to a computer may differ is beyond the scope of the current study, but it merits mentioning to further demonstrate the wide range of potential Facebook usage patterns among adolescents.

With so many features available within Facebook, measuring total time spent on Facebook becomes increasingly less informative. The growth of potential Facebook usage patterns helps to explain why correlations between overall Facebook exposure and body image

disturbances are not replicated in the current study, and offers further justification for the necessity of measuring specific Facebook feature use at a more precise level.

## Hypothesis II

As predicted in Hypothesis II, subjects' Facebook appearance-related exposure scores (ARS), as operationalized by user activity related to all photos (profile photos, self-photo albums, other-photo albums), were significantly positively correlate with internationalization of the thin ideal, appearance comparison, drive for thinness, and self-objectification, and significantly negatively correlated with weight satisfaction. In contrast to the total FB use measure, ARS measures the use of photo-related features relative to total feature use. It is neutral to overall time spent on Facebook and instead represents the proportion of a user's overall activity that is allocated to photo-related activities. Implications are discussed below.

Higher ARS scores demonstrated significant, positive correlations with internalization of the thin ideal. Correlational studies do not allow for claims of causality, so it is possible that adolescents with high levels of thin ideal internalization are driven to interact more heavily with photo-related Facebook features, or that these interactions serve to increase thin ideal internalization. Unlike experimental studies where stimuli can be manipulated, we cannot determine whether subjects are being exposed to thin ideal images while using FB photo applications, since most FB photo content contains images of peers with naturally varying shapes and weights rather than image of tall, thin models that dominate traditional media (Fouts & Burggraf, 1999, 2000; Malkin, Wornian, & Chrisler, 1999). It is possible that Facebook photo-sharing, viewing, and commenting applications act as a digitalized version and extension of real-life 'appearance conversations' that have been shown to correlate with internalized appearance



ideals (Jones, Vigfusdottir, & Lee, 2004). It is possible that there is a bi-directional relationship between FB appearance exposure and thin ideal internalization in that high thin ideal internalizers may be driven to interact more heavily with photos, creating a new platform for appearance conversations and thus expanding the ‘appearance culture’, which may serve to reinforce their thin ideal internalization.

Appearance-related FB exposure had no significant correlations with overall body esteem or body esteem - appearance. There were significant negative correlations with body esteem - weight satisfaction ( $rs(89) = -.184, p < .05$ ), and this association is actually strengthened somewhat when controlling for BMI ( $rs(89) = -.236, p < .05$ ). This parallels past findings of correlations between weight dissatisfaction and consumption of entertainment television (Anderson et al., 2001) and exposure to television advertisements featuring thin ideal models in a laboratory setting (Hargreaves & Tiggemann, 2004). Facebook photo interactions are unique in that the models individuals are viewing are often themselves and peers. Studies have suggested that the extent that an individual identifies with the thin media model exacerbates the negative impact on weight satisfaction (Bell & Dittmar, 2011). The current study did not explicitly measure the extent to which subjects identified with the photos they view on Facebook, but it seems reasonable to assume that one would identify more strongly with a self or peer-photo than with a model photo, which may help explain why exposure to Facebook photos is linked to weight dissatisfaction. Facebook photo exposure is uniquely positioned at the cross-section of media influence and peer influence within the tripartite influence model of body image disturbance (Keery et al., 2004b), meaning it may be a particularly potent threat to girls’ weight satisfaction.

Interestingly, while ARS was negatively correlated with weight satisfaction, it was positively correlated with body esteem – attribution, a subscale that measures evaluations attributed to others about one's body and appearance ("People my own age like my looks"), even when controlling for BMI (Mendelson, Mendelson, & White, 2001). Again, we are unable to determine causality. Girls who perceive that others have favorable opinions of their appearances may spend more time posting, tagging, or interacting with Facebook photos, or alternatively, girls who post more photos or spend more time reading comments on their photos may receive positive peer feedback, leading them to perceive others as having favorable opinions on their appearance. When looking more specifically at Facebook activity related to self-photos (SARS) versus peer photos (OARS), only self-photo activity correlates with body esteem – attribution, though the correlation disappears when controlling for BMI. This implies that the relation between body esteem – attribution and increased interaction with self-photos may be largely a function of BMI.

It is tempting to draw conclusions about the mixed findings on body esteem and appearance-related Facebook activity to propose that interaction with Facebook photos can effect girls' weight satisfaction and estimates of others' opinions on their appearance while having no effect on general appearance satisfaction or overall body esteem, but given the low to moderate effect sizes ( $r_s = -.184$  and  $r_s = .245$ , respectively), results should be replicated before a detailed interpretation is warranted.

In support of Hypothesis II, appearance-related Facebook exposure was positively correlated with higher self-objectification, a pattern which has been found with traditional media, including exposure to beauty magazines (Morry & Straska, 2001) and sexually-objectifying TV (Aubrey, 2006). Self-objectification theory suggests that media often places a disproportionate

focus on women's bodies and appearance and repeated media exposure acts to train girls and women to routinely objectify females and to ultimately to take an outsider's perspective on the physical self (Aubrey, 2006). A self-objectification measure was included in the present study because it was thought that Facebook may be particularly well-suited to perpetuate self-objectification. Whereas self-objectification theory views media effects as a two-step process where individuals first consciously or subconsciously learn to objectify females in the media and then transfer this pattern inwards by taking an outsider's perspective on the physical self (Aubrey, 2006), the nature of Facebook photo-sharing expedites the process. Taking an outsider's perspective on the physical self is by definition the very purpose of posting and tagging photos on Facebook, and often the outsider's perspective is explicitly provided in the form of 'likes' or comments. Results confirm our hypothesis that increased interaction with Facebook photos relates to an increase in self-objectification, which is troubling given past findings linking self-objectification with body shame, anxiety, and disordered eating among adolescent girls (Moradi & Huang, 2008; Slater & Tiggemann, 2002).

Results also supported our hypothesis that appearance-related Facebook activity would correlate positively with physical appearance comparisons, even when controlling for BMI. This finding is congruent with previous findings linking appearance comparisons with exposure to TV advertisements featuring thin models (Hargreaves & Tiggemann, 2004) and to overall Internet exposure (Tiggemann & Miller, 2010). Facebook photo exposure may be particularly well-positioned to encourage appearance comparisons given that photos are of peers rather than unknown models or celebrities. Previous research has found that peers are a more frequent target of appearance comparisons compared to models and celebrities (Miller, Turnbull, & McFarland, 1988), and these comparisons often lead to body dissatisfaction (Jones, 2011).

While in the pre-Internet years, physical comparisons to friends were made primarily in the context of face-to-face interactions, Facebook offers a new platform that may be even more conducive to physical comparisons than real-world settings. Subjects reported a mean of 439 photos, offering a battery of peer images that can be pored over in detail repeatedly. Not surprisingly, when splitting subjects' appearance-related Facebook activity into self and other-photo activity, appearance comparisons correlate with increased exposure to peer' photos, but not self-photos. Actively posting photos, creating albums, and updating a status photo may fall in the realm of selective self-presentation and identity management, which has been shown to actually improve self-esteem in college students (Gonzales & Hancock, 2011), whereas viewing others' photos more closely parallels the face-to-face peer interactions and traditional media exposure where appearance comparisons have been shown to occur.

Appearance-related Facebook activity was shown to correlate with increased drive for thinness ( $r_{s(89)} = .205, p < .05$ ), and the correlation increased somewhat when controlling for BMI ( $r_{s(89)} = .236, p < .05$ ). This parallels previous findings linking drive for thinness with soap opera exposure (Tiggemann, 2005), Internet use, and Facebook use (Tiggemann & Miller, 2010), and is particularly troubling due to the role of drive for thinness in the etiology of eating disorders (Garner et al., 1983). As with all reported correlations, causality cannot be determined, and we are unable to determine whether interaction with Facebook photos increases girls' drive for thinness or if girls with high pre-existing drive for thinness are increasingly driven to use photo-related applications.

### Hypothesis III

In the interest of determining whether interaction with photos of others specifically (as opposed to self-photos) correlated with body image disturbance in the same direction as overall appearance-related activity, 2-tailed correlations were run on scores on the other-related appearance subscale (OARS). All reported correlations have controlled for BMI (Table 10). No significant correlations were found for overall body esteem, BE-appearance, BE-weight satisfaction, BE-attribution, or drive for thinness. A positive correlation emerged for internalization of the thin ideal ( $rs(89) = .181, p < .05$ ), but the effect size was less than that found for the composite ARS score ( $rs(89) = .357$ ) and the self-appearance related score (SARS) ( $rs(89) = .284$ ). This suggests that both types of photo interactions are important in explaining variance in drive for thinness, but variation in SARS explains a larger portion of the relationship.

Conversely, the positive correlation between self-objectification and OARS had a greater effect size than SARS and self-objectification ( $rs(89) = .256, p < .01$ ;  $rs(89) = .188, p < .05$ , respectively), though both effect sizes were less than that found with the total ARS score ( $rs(89) = .286, p < .01$ ). This is somewhat surprising since intuition would suggest that interaction with photos of the self would be more related to self-objectification than interaction with peer photos. This does, however, fit within the logic of self-objectification theory in that by frequently viewing others' photos, girls may become more conscious of the reality that others may be doing the same with their photos and will begin to assess their photos and appearance through an outsider's eyes (Aubrey, 2006).

The one place where OARS scores returned correlations with larger effect sizes than both SARS and total ARS was with physical appearance comparisons. It seems somewhat intuitive that interacting with peer photos would be more linked to physical comparisons, since

comparison by definition requires some external reference point. It should be noted that the effect size for correlations between physical appearance comparisons and OARS was not dramatically higher than the ARS ( $rs(89) = .214, p < .05$  and  $rs(89) = .202, p < .05$ , respectively).

#### Hypothesis IV

Correlations were also run to test the relative influence of interaction with photos of the self (SARS), controlling for BMI, and body image disturbance. As seen with ARS, significant positive associations were found between SARS and internalization of the thin ideal, self-objectification, and drive for thinness, and a negative association was found for weight satisfaction. None of the SARS interactions produced larger effect sizes than the ARS correlations. SARS did correlate significantly with weight dissatisfaction whereas OARS did not, implying that it is interaction with one's own photos that relates to weight dissatisfaction more than viewing peer photos. This could suggest that by repeatedly viewing photos of themselves, girls become hypercritical of their weight, or effects may work in the opposite direction, where girls high in weight-dissatisfaction are more likely to interact with their own photos, perhaps in the interest of selective self-presentation and identity management. These explanations are purely speculative as causality cannot be inferred.

Effect sizes for the correlation between self-photo interactions and thin ideal internalization were greater than those found for other-photo interactions ( $rs(89) = .284, p < .01$  and  $rs(89) = .181, p < .05$ , respectively) although both were less than the overall ARS correlation ( $rs(89) = .357, p < .001$ ), suggesting that both pieces are helpful in understand variation in thin ideal internalization. Self-photo interactions correlated with drive for thinness whereas other-

photo interactions did not, which may mean that repeated exposure to one's own photos increases girls' desire to be thin, or it is possible that girls with preexisting high drive for thinness are compelled to view and manage their Facebook photos. Experimental studies would be required to determine the direction of causality.

In order to ensure that the association observed between the appearance related score (ARS) and body image variables was truly reflecting the role of photo interaction rather than a different construct of 'presence-management', a presence-management score was calculated to reflect all Facebook activity that can be publicly viewed. Interestingly, scores reflecting elevated presence management activity on all publicly-viewable applications besides photo-based features were negatively associated with the internalization of the thin ideal, body esteem-attribution, and self-objectification. These correlations are the opposite of the patterns found for appearance related scores. When including publicly viewable photo activities into the presence-management score, only the association with decreased self-objectification remained. These findings strengthen the main findings by suggesting that high-photo interaction is more reflective of appearance exposure than general online presence management, and that users who spend more time posting content and commenting on other users' content may in fact have lower self-objectification and thin-ideal internalization. This parallels findings from past experimental research showing that subjects who viewed and managed their own Facebook page reported high self-esteem than subjects who viewed the profiles of others (Gonzales & Hancock, 2011). Unlike findings from experiments, causality cannot be established for the present findings. Interestingly, non-photo-based presence management was linked to negative body esteem – attribution, which may mean that individuals who believe that others' don't appraise their bodies well may spend more time on non-photo based self-promotion.

## Exploratory Analysis

Once each of the hypotheses was tested, additional analysis was run on individual FBQ items to identify whether any specific activities on Facebook had strong associations with body image disturbances. No corrections were made for multiple comparisons. The data is presented for purely exploratory purposes and must be replicated in future studies to reduce the risk of Type I error. All associations should be interpreted with caution due to the high number of correlations run. It should be noted that analysis was run on raw FBQ scores rather than converting each to a ratio over total FBQ score. Discussion will be limited to associations found between body image disturbances and the appearance-related items, though several interesting correlations were found among the non-appearance related items. For example, the item ‘create album with art/photography’ had a significant negative correlation with self-objectification, which is tempting to interpret as showing that Facebook used as an platform for sharing artwork may actually relate to lower levels of self-objectification in adolescents. However, critics have demonstrated the risk of committing type I errors across multiple comparisons and warn that *a posteriori* hypothesis generation can provide seemingly reasonable explanations for correlations that are a product of type I error (Duffy, 2010). In the interest of avoiding the pitfalls of data-dredging (Duffy, 2010), discussion will be limited to the ARS items that are related to our predefined hypotheses.

Subjects with higher internalization of the thin ideal were more likely to update their profile photos, post photos, view photos that friends have posted of the subject (‘photos that they’ve added of me’), view photos that friends have added of the themselves, tag themselves in photos, and untag themselves in photos. Interestingly, the relationship can be found among self-



related photo items as well as other-related photo items and active items (i.e. 'Post a photo) as well as passive items (i.e.: 'View friends photos they've added of themselves'). This may be a function of high thin ideal internalizers being especially drawn to photo applications as a means to manage their online identity or run surveillance on peer group appearance norms, or it may be that this relatively new social utility extends and amplifies the 'appearance culture' that exists in real-world high school social settings (Paxton et al., 1999), serving to increase girls' internalization of the thin ideal. An experimental research design would be required to determine the direction of causality.

Several appearance-related FBQ items were linked to decrease body esteem - appearance, suggesting that either girls with low appraisals of their general appearance are more likely to engage in these activities, or that the engagement itself serves to lower girls' views on their appearance. Subjects with lower appearance appraisals were more likely to view friends' photos that they've added of the subject 'view friends' photos added of me', view friends' photos that they've added of themselves, comment on friends' photos, tag themselves in friends' photos, and untag themselves' in friends' photos. It is interesting to note that of the 8 ARS items, the 5 that relate to lower body esteem - appearance all involve interactions with a peer's photos, which may imply that girls with lower appearance esteem are monitoring their online identity in order to highlight favorable photos and un-tag less favorable photos. Additionally, it is possible that spending large amounts of time viewing photos of the self and peers increases the salience of appearance and an increased opportunity to be hypercritical of perceived flaws.

Similarly, several items were related to decreased weight satisfaction. Girls that spent more of their online time viewing friends' photos that they've added of themselves, tagging self in photos, and untagging self in photos reported lower weight satisfaction. Similar to appearance

esteem, the causality of this relationship could potentially go in either direction, or there may be a bi-directional relationship. These same items correlated to lower overall body esteem.

Girls that more frequently update their profile photo and view friends' photos added of the subject had relatively higher body esteem - attribution scores. Frequency of profile photo updates implies a certain level of identity management, and it is possible that posting a favorable profile photo increases their sense that others approve of their appearance. Another explanation is that girls receive explicit feedback in the form of 'likes' or compliments posted as comments on their profile photos or photos posted by friends, which could increase girls' sense of outside appearance approval. Additional questions would need to be asked to examine how these variables relate.

The same three activities that were linked to lower appearance esteem, weight esteem, and overall body esteem were also associated with higher self-objectification. Frequently viewing friends' photos that they've added of themselves may serve to accustom girls to the voyeuristic nature of Facebook, that is, as they scan and critique peer photos, they may extrapolate this out to assume that others do the same of their photos. The act of spending time tagging and untagging photos that peers have posted seems rooted in self-objectification; users are imagining that others will see these photos and are deciding whether or not they want to allow this. What the basis of this decision is can't be determined, but it seems likely that appearance concerns are an important component.

All of the non-content producing ARS items correlated with higher appearance-comparison scores ('view friends' photos that they've added of me', 'view friends' photos that they've added of themselves', 'comment on friends' photos', 'tag myself in friends' photos', 'untag myself in friends photos'), which seems somewhat intuitive in that the act of viewing

others' photos would provide the material for making such appearance comparisons. Not surprisingly, the strongest correlation was with the item 'view friends' photos that they've added of themselves'. While girls may have been comparing each other based on appearance in real-world settings for years, viewing others' photos may be a digitalized version, offering a new platform for endless appearance comparisons. What's more, unlike real-world settings where individuals may compare peers' appearance to the internal image they have of their own appearances, on Facebook girls can literally compare images of themselves adjacent to peers. As with all correlations reported, it cannot be determined whether girls who are already prone to make appearance comparisons are driven to these specific Facebook activities, or if the use of them encourages more appearance comparisons.

As was found with appearance comparisons, drive for thinness was positively linked to the same 5 non-content producing ARS items, with a particularly strong effect size for 'un-tagging myself in photos'. This pattern suggests that, more than actively posting images, increased consumption of both self and peer images relates to body image disturbance more than actively posting images.

The five items that correlate with drive for thinness and the three that correlate with weight dissatisfaction are also linked to higher internalization of thin ideal and appearance comparison, supporting the theoretical model proposed by the tripartite influence model (Keery et al., 2004b). Mediation analyses of these relationships was not possible due to the use of Spearman's *rho* rather than the Pearson coefficient, but it is possible that appearance comparison and internalization of the thin ideal mediate the relationship between appearance-related Facebook activity and drive for thinness and weight dissatisfaction, as was found for Internet use in Tiggemann & Miller's study (2010).

## Conclusion

Taken as a whole, these findings add to the media effects literature by exploring how one of today's most popular websites impacts adolescent girls' body image and by highlighting the importance of approaching Internet use and its effects from a uses and gratifications perspective. The findings that Facebook photo interactions are related to body image variables that have been shown to proceed more serious eating disturbances is disconcerting. Parents, educators, and clinicians may consider limiting adolescents' overall time spent interacting with photos on Facebook, but should keep in mind that Facebook use in general is not linked to problematic body image.

The popularity of photo applications on Facebook and elsewhere on the Internet may constitute an extension of the 'appearance culture' that permeates adolescent peer groups and has been linked to weight and shape concerns (Paxton, Schutz, Wertheim, & Muir, 1999). Studies on schools and communities that have implemented prevention programs aimed at improving adolescent body image through various combinations of psychoeducational media literacy, advocacy, CBT interventions, and more have provided mixed, but in several cases, promising results (for review, see Grogan, 2010). Future iterations of these programs should include consideration of how Facebook use may play a role in the overarching appearance culture and how teens can regulate their own use in the interest of reducing time spent focusing on their own appearance and that of their peers.

This study also contributes to the ongoing process of identifying strategies to study media effects as the media available grows exponentially, becomes increasingly interactive, and evolves at a rapid speed. The interactive and personalized nature of Internet use makes it a challenge to study, but its prevalence demands that it be included in studies of media effects,

particularly among adolescents. This study's findings highlight the importance of looking at specific user activity when testing associations among Facebook use and body image, or any construct. The same reasoning should extrapolate out to studies of general Internet use. Facebook, like many sites on the Internet, is a heterogeneous platform (Smock et al., 2011), and assessing correlations with total time on Facebook is likely to miss important phenomena. Additionally, by looking at specific features or activities we can better take into account the rapid evolution of Facebook and other websites. Comparing the effects of Facebook use in 2005 with Facebook use in 2012 does not provide useful information because these are essentially different websites, just as comparing the effects of Internet use in 1997 versus 2012 would be meaningless. By measuring at a more specific level researchers will also be able to more effectively build off of existing knowledge and will have common definitions beyond the umbrella terms of 'Facebook Use' or 'Internet Use' which, as this study shows, could mean many different things.

### Limitations and Future Directions

The above findings should be understood in the context of several limitations. First, the correlational design of the present study precludes any inferences on causation, and future studies may address this in several ways. Experimental designs may provide insight on the state-level effects of Facebook activities performed in a lab setting, but this design would not capture the effects of daily FB use over a span of years on more long-term variables. Longitudinal studies tracking changes in body image pre-and-post FB account activation may be a better design to measure the accumulative effects of years of daily interaction with the site, though there may be many confounding factors in this design. Facebook use is increasingly initiated in

early adolescence, coinciding with the onset of a developmental stage where body image concerns are known to increase dramatically (Ata et al., 2007; Clay et al., 2005; Harter, 1999; Tiggemann, 2005). Any longitudinal study on body image pre-and-post Facebook account activation must be careful not to confound the effects of Facebook use with the dramatic changes in emotional, social and physical variables that span through adolescence.

Another limitation in the current study is the use of self-report data, which may suffer from memory recall issues and a possible social desirability bias. The use of FBQ response options formatted as relative frequencies for specific Facebook activities (“nearly every time I log on”) as opposed to minutes per day was intended to alleviate the burden on estimating accurate usage times, but future research should explore ways to collect this type of data through alternative routes, such as experimental designs, content analysis, or using more advanced computer tracking methods to measure activity. Subjects may be averse to more invasive data collection strategies, but these would give more precise data that is free from subject bias. Certain data could easily be collected through content analysis of subjects’ posted material, but additional methods would be required to explore non-posted user-activity, such as viewing photos/posts or messaging. It is also possible that BMI data may not be perfectly accurate, as it was calculated based on self-reported height and weight, which may also be subject to social desirability bias.

Several sampling issues should be addressed, primarily that the current study uses a convenient sample that may not represent the total US population of adolescent girls. The sample was primarily white and of a higher socioeconomic status than national norms. Future research should explore whether SNS appearance exposure affects body image differently across racial and ethnic groups and socioeconomic classes. Another issue is that participation was entirely

voluntary. Ample literature has discussed the ‘volunteer problem’ in terms of characteristics of volunteers that differ from the overall population (for review, see Rosnow, 1993). This may be remedied by requiring that all students participate regardless of whether their data is collected for the study, which would require a level of cooperation among teachers and staff that was beyond the scope of the current study.

Finally, the current study’s definition of ‘Appearance-Related Facebook Exposure’ was limited to activity involving posting, viewing, and commenting on photos, but there are potentially other ‘appearance-related’ FB features that could be included (i.e. visiting a fashion company Fan Page displaying thin ideal models). Future research analyzing Facebook or other social networking sites at the activity-level should be sure to operationalize the construct of interest after a thorough analysis of the most recent activity updates, as these sites are constantly evolving.

Exploring Facebook appearance exposure in relation to body image is new territory, and therefore the current study was limited to investigating effects on adolescent females. Future research should seek to replicate these findings and compare against males and various adult age groups. It is likely that usage varies greatly among age groups and may have disparate effects depending on usage patterns and motivations. The effects of Facebook are likely widespread and associations beyond body image are fertile ground for future research.

## APPENDIX A:

## DEMOGRAPHIC QUESTIONNAIRE

Age \_\_\_\_\_

Grade in School \_\_\_\_\_

Race (Circle one)      (a) Caucasian (white)      (b) African American      (c) Asian American

(d) Latino (e) Native American (f) Other

Height \_\_\_\_\_ feet \_\_\_\_\_ inches

Weight \_\_\_\_\_ lbs.



## APPENDIX B:

### SOCIOCULTURAL INTERNALIZATION OF APPEARANCE QUESTIONNAIRE FOR ADOLESCENTS

For each statement, check the response that best fits how you feel from (1) definitely disagree, (2) mostly disagree, (3) neither agree nor disagree, (4) mostly agree, and (5) definitely agree.

1. I would like my body to look like the bodies of people in the movies.

- ☐ 1 definitely disagree
- ☐ 2 mostly disagree
- ☐ 3 neither agree nor disagree
- ☐ 4 mostly agree
- ☐ 5 definitely agree

2. Looking at magazines makes me want to change the way I look.

- ☐ 1 definitely disagree
- ☐ 2 mostly disagree
- ☐ 3 neither agree nor disagree
- ☐ 4 mostly agree
- ☐ 5 definitely agree

3. Reading magazines makes me want to lose or gain weight.

- ☐ 1 definitely disagree
- ☐ 2 mostly disagree
- ☐ 3 neither agree nor disagree
- ☐ 4 mostly agree
- ☐ 5 definitely agree

4. Reading magazines makes me want to change my appearance.

- ☐ 1 definitely disagree
- ☐ 2 mostly disagree
- ☐ 3 neither agree nor disagree
- ☐ 4 mostly agree
- ☐ 5 definitely agree

5. I would like my appearance to be like the appearance of people in the magazines.

- ☐ 1 definitely disagree
- ☐ 2 mostly disagree
- ☐ 3 neither agree nor disagree
- ☐ 4 mostly agree
- ☐ 5 definitely agree

## APPENDIX C:

### BODY ESTEEM SCALE FOR ADOLESCENTS AND ADULTS

Indicate how often you agree with the following statements ranging from "never" (0) to "always" (4). Circle the appropriate number beside each statement.

	Never	Seldom	Some- times	Often	Always
1. I like what I look like in pictures.	0	1	2	3	4
2. Other people consider me good looking.	0	1	2	3	4
3. I'm proud of my body.	0	1	2	3	4
4. I am preoccupied with trying to change my body weight.	0	1	2	3	4
5. I think my appearance would help me get a job.	0	1	2	3	4
6. I like what I see when I look in the mirror.	0	1	2	3	4
7. There are lots of things I'd change about my looks if I could.	0	1	2	3	4
8. I am satisfied with my weight.	0	1	2	3	4
9. I wish I looked better.	0	1	2	3	4
10. I really like what I weigh.	0	1	2	3	4
11. I wish I looked like someone else.	0	1	2	3	4
12. People my own age like my looks.	0	1	2	3	4
13. My looks upset me.	0	1	2	3	4
14. I'm as nice looking as most people.	0	1	2	3	4
15. I'm pretty happy about the way I look.	0	1	2	3	4
16. I feel I weigh the right amount for my height.	0	1	2	3	4
17. I feel ashamed of how I look.	0	1	2	3	4
18. Weighing myself depresses me.	0	1	2	3	4
19. My weight makes me unhappy	0	1	2	3	4
20. My looks help me to get dates.	0	1	2	3	4
21. I worry about the way I look.	0	1	2	3	4
22. I think I have a good body.	0	1	2	3	4
23. I'm looking as nice as I'd like to.	0	1	2	3	4

## APPENDIX D:

### PHYSICAL APPEARANCE COMPARISON SCALE

Using the following scale please select a number that comes closest to how you feel:

Never	Seldom	Sometimes	Often	Always
1	2	3	4	5

---

1. At parties or other social events, I compare my physical

appearance to the physical appearance others. 1 2 3 4 5

---

2. The best way for a person to know if they are overweight or

underweight is to compare their figure to the figure of others. 1 2 3 4 5

---

3. At parties or other social events, I compare how I am

dressed to how other people are dressed. 1 2 3 4 5

---

4. Comparing your "looks" to the "looks" of others is a bad

way to determine if you are attractive or unattractive. 1 2 3 4 5

---

5. In social situations, I sometimes compare my figure to

the figures of other people. 1 2 3 4 5

---

## APPENDIX E:

### SELF-OBJECTIFICATION QUESTIONNAIRE

We are interested in how people think about their bodies. The questions below identify 10 different body attributes. We would like you to *rank order* these body attributes from that which has the *greatest impact* on your physical self-concept (rank this a "9"), to that which has the *least impact* on your physical self-concept (rank this a "0").

Note: It does not matter *how* you describe yourself in terms of each attribute. For example, fitness level can have a great impact on your physical self-concept regardless of whether you consider yourself to be physically fit, not physically fit, or any level in between.

Please first consider all attributes simultaneously, and record your rank ordering by writing the ranks in the rightmost column.

**IMPORTANT: Do Not Assign The Same Rank To More Than One Attribute!**

9 = greatest impact  
8 = next greatest impact  
1 = next to least impact  
0 = least impact

When considering your *physical self-concept* . . .

- 1 . . . what rank do you assign to *physical coordination* ? \_\_\_\_\_
- 2 . . . what rank do you assign to *health*? \_\_\_\_\_
- 3 . . . what rank do you assign to *weight*? \_\_\_\_\_
- 4 . . . what rank do you assign to *strength*? \_\_\_\_\_
- 5 . . . what rank do you assign to *sex appeal*? \_\_\_\_\_
- 6 . . . what rank do you assign to *physical attractiveness*? \_\_\_\_\_
- 7 . . . what rank do you assign to *energy level (e.g., stamina)*? \_\_\_\_\_
- 8 . . . what rank do you assign to *firm/sculpted muscles*? \_\_\_\_\_
- 9 . . . what rank do you assign to *physical fitness level*? \_\_\_\_\_
- 10 . . . what rank do you assign to *measurements (e.g., chest, waist, hips)*? \_\_\_\_\_

## APPENDIX F:

### FACEBOOK QUESTIONNAIRE

*Please circle the appropriate answer to each question.*

- 1. Do you have daily internet access available (at home, school, workplace, etc.)?** Yes/No

*If you answered yes to question 1, please continue on to the next questions. If you answered no, please skip the remainder of the Internet & Social Networking Site Questionnaire and move on to page 5.*

- 2. On average, how frequently do you use the Internet (outside of instructor-led classroom activities, on any device (desktop, laptop, tablet, mobile phone, etc.)?)**
- |                               |                              |
|-------------------------------|------------------------------|
| a. Never/almost never         | d. 1-2 hours per day         |
| b. Less than 1/2 hour per day | e. 2-3 hours per day         |
| c. 1/2 - 1 hour per day       | f. More than 3 hours per day |

- 3. Do you have an active Facebook account?** Yes/No

*If you answered yes to question 3, please continue on to the next question. If you answered no, please skip the remainder of the Internet & Social Networking Site Questionnaire and move on to page 5.*

**Approximately how long have you had an active Facebook account?** \_\_\_\_\_

- 4. In a typical week, how frequently do you use Facebook (on any device)? While daily time spent may vary, please estimate daily use as an average across the week.**
- |                               |                                      |
|-------------------------------|--------------------------------------|
| a. Never/almost never         | d. Between 1/2 hour – 1 hour per day |
| b. Less than 1 hour per week  | e. 1-2 hours per day                 |
| c. Less than 1/2 hour per day | f. More than 2 hours per day         |
- 5. Your privacy settings are currently set to:**
- |                 |
|-----------------|
| a. Public       |
| b. Private      |
| c. Custom       |
| d. I don't know |
- 6. Approximate number of current Facebook friends** \_\_\_\_\_
- 7. Approximate number of photos of you on Facebook** \_\_\_\_\_
- 8. Your current Facebook Profile photo is best described as:**
- |   |
|---|
| a. A photo of just me, waist and above visible          |
| b. A photo of just me, full body visible                |
| c. A photo of me and friend(s), waist and above visible |
| d. A photos of me and friend(s), full body visible      |

- e. A photo image of a person other than me
- f. A photo/image with no people in it
- g. Other/I don't know

**Please mark an X in the box that best fits approximately how often you do the following on your Facebook account:**

	More often than once a month 5	On average, about once a month 4	Every few months 3	A few times a year 2	Almost never or never 1	I don't know 0
9. Create an event <i>βT</i>						
10. Create a group <i>βT</i>						
11. Write a Facebook Note <i>βT</i>						
12. Create/share a Facebook Quiz <i>βT</i>						
13. Create a Photo album w/photos of yourself and friends/family <i>€Φ T</i>						
14. Create a Photo album featuring artwork/photography (photos of subjects besides yourself, friends or family) <i>βT</i>						
15. Join 'Groups' <i>βT</i>						
16. Update my profile photo <i>€ΦT</i>						
17. Update my profile interests ( <i>books, movies, TV, activities</i> ) <i>βT</i>						

**Please mark an X in the box that best fits approximately how often you do the following activities when visiting Facebook:**

	Nearly every time I log on 5	Often 4	Once in a while 3	Rarely 2	Almost Never 1	Don't Know 0
18. Use Facebook Chat						
19. Play games (Farmville, etc.)						

	Nearly every time I log on 5	Often 4	Once in a while 3	Rarely 2	Almost Never 1	Don't Know 0
20. Send/receive private messages						
21. Post a photo € Φ T						
22. Post a status update β T						
23. Post a link to a news story, video, website, etc. β T						
24. View friends' photos that they've added of me € Φ						
25. View friends' photos of themselves € ♦						
26. View friends' status updates						
27. View friends' links to news stories, videos, websites, etc.						
28. Comment on friends' photos € ♦ T						
29. Comment on friends' status updates β T						
30. Comment on friends' links to news stories, videos, websites, etc. β T						
31. Tag myself in friends' photos € Φ T						
32. Un-tag myself in friends' photos € Φ						

€: Appearance Related Score (N=8)

♦: Other-photo Appearance Related Score (N=2)

Φ: Self-photo Appearance Related Score (N=6)

β: Presence Management Score – No Photos (N=11)

T: Presence Management Score – Photos (N=16)

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