#SocialMedia: Exploring the Relationship of Social Networking Sites on Body Image, Self-Esteem, and Eating Disorders

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Abstract
The aim of this study was to investigate whether problematic social networking site (SNS) use (i.e., degree of dependent relationship with SNSs), total SNS time/day, total SNS friends, and specific SNS activities were related to body image (BI), self-esteem (SE), and eating disorder (ED) symptoms/concerns. A sample of young adults (N = 147) completed an online survey which measured SNS usage, problematic SNS use, BI, SE, and ED symptom/concerns. The findings revealed that females and males spent 4.1 ± 3.9 and 2.9 ± 2.8 hr on SNS, respectively, with the majority of time spent lurking (i.e., looking at another users’ profile but not actually communicating with them). Furthermore, problematic SNS use was found to be related to BI, SE, and ED symptoms/concerns. Moreover, SNS activities, such as lurking and posting comments on others’ profiles, were found to be related to BI, whereas SNS total time was found to be related to ED symptoms/concerns. Overall, this study demonstrates the possible correlational influence of SNSs on BI, SE, and ED symptoms/concerns.

Keywords
social networking sites, body image, self-esteem, eating behaviors, youth

Introduction
Body dissatisfaction (Eisenberg, Neumark-Sztainer, Story, & Perry, 2005) and disordered eating (Neumark-Sztainer, Wall, Larson, Eisenberg, & Loth, 2011) are common problems among young adults (YAs). Low self-esteem (SE) has been found to be reciprocally predictive of body dissatisfaction (Etcoff, Orbach, Scott, & D’Agostino, 2004; Paxton, Neumark-Sztainer, Hannan, & Eisenberg, 2006; Tiggemann, 2005; van den Berg et al., 2007; Webster & Tiggemann, 2003) and an important predictor of the development of eating pathology (Button, Sonuga-Barke, Davies, & Thompson, 1996; French, Story, Neumark-Sztainer, Fulkerson, & Hannan, 2001). The literature suggests that exposure to media cultivating beauty ideals impacts body image (BI), eating behaviors (EBs), and SE in males (Harrison & Cantor, 1997; Lavine, Sweeney, & Wagner, 1999; Muris, Meesters, van de Blom, & Mayer, 2005) and females (Harrison, 2000; Irving, 1990; Stice, Schupak-Neuberg, Shaw, & Stein, 1994). Yet, media use is rapidly evolving, and the Internet, including social networking sites (SNSs), is quickly becoming the primary media source used by YAs (Bair, Kelly, Serdar, & Mazzeo, 2012; Tiggemann & Slater, 2013).

SNSs differ from traditional forms of media by their immediacy, interactivity, active participation, and circle of connectedness (Pempek, Yermolayeva, & Calvert, 2009). The most popular SNSs with today’s YAs are Facebook, Twitter, Instagram, and Pinterest (Duggan & Smith, 2014). Interestingly, a new phenomenon of problematic SNS use (degree of dependent relationship with SNSs) has become of interest and has been shown to be associated with decreased SE, happiness, satisfaction with life, and increased depression, and loneliness in YAs (Spraggins, 2009). Given the rapid growth of SNSs, and the potential associations between media consumption and BI, EBs, and SE, further research into these online media sources is needed, in both females and males. Recently, positive correlations have been
observed between SNS usage and BI concern in YAs (Fardoully & Vartanian, 2015) and adolescents (Meier & Gray, 2014; Tiggemann & Slater, 2013), dieting in adolescents (Tiggemann & Slater, 2014), disordered eating level in YAs (Hummel & Smith, 2015; Mabe, Forney, & Keel, 2014), and low SE in YAs (Mehdizadeh, 2010). However, these studies have only looked at limited (i.e., Facebook) and somewhat outdated (i.e., MySpace, Friendster) types of SNSs, and males were underrepresented, making generalizability of results difficult for today’s ever-changing online world. Furthermore, many of these studies (Mehdizadeh, 2010; Tiggemann & Slater, 2013, 2014) have only focused on total time usage, which is uninformative given the wide array of features available on SNSs, as user activity may vary widely in time spent posting photos, videos, status updates, chatting, private messaging, or lurking. Finally, it is also important to note that within the literature, a discussion has evolved as to process and effect when it comes to SNS and negative health behaviors, and further research within this area has been placed of high importance among leading scholars (Perloff, 2014; Turner, 2014).

Specifically, it is of particular importance to investigate newer SNSs as these applications are constantly updating with features that enhance interactive, active participation, and/or circle of connectedness. These updates are changing frequently to stay competitive with other SNS applications, as well as stay popular and relevant with SNS users. For example, Facebook and Instagram have recently added a “Start Live Video” feature where users can stream live footage. Not only is the “Start Live Video” feature creating interactive and active participation but as other users can comment and react to the footage potentially generating connectedness or a sense of community. This circle of connectedness may influence psychosocial factors like BI, EBs, and SE, as past research had found a relationship between sense of community and well-being (i.e., happiness, worrying, and person coping; Davidson & Cotter, 1991; Obst & Stafurik, 2010). Moreover, many new SNSs and SNS features are appearance-mediated or image-driven, which may lead to more opportunities or avenues for social comparison, which may in turn influence BI, EBs, and SE.

According to the Sociocultural Model (Stice, 1994), the media, peers, and family are important vehicles through which messages about weight and appearance are transmitted to members of society. For females, the Sociocultural Model suggests that BI disturbances are the result of pervasive societal pressure to be thin (Halliwell & Harvey, 2006; Stice, 1994; Vandereycken, 1993) and lose weight (McCabe & Ricciardelli, 2005), whereas for males, the ideal body should be tall, muscular, and mesomorphic (McCabe & Ricciardelli, 2005; McCreary & Sasse, 2000; McKinley, 1998). According to the constructs of the Sociocultural Model (i.e., media, peers, and family), SNSs can be particularly powerful transmitters of messages about weight and appearance. This is because users can interact with friends/peers, their family, and members of the media (celebrities, athletes, etc.), which could influence societal standards and virtually support beauty ideals and, in turn, encourage body dissatisfaction. Past research with adolescents has suggested that online friend interactions correlate with BI (Tiggemann & Slater, 2013). Specifically, Tiggemann and Slater (2013) found the number of friends Facebook users have to be significantly correlated with each BI concern components, including internalization, body surveillance, and drive for thinness.

YAs are mainly using SNSs to facilitate pre-existing relationships, interacting with people they know/trust (Ellison, Steinfield, & Lampe, 2007; Pempek et al., 2009; Spraggs, 2009; Stefanone, Lackaff, & Rosen, 2011). Interactive/active SNS behavior includes likes and comments that can be generated by SNS users to represent acceptance, create a circle of connectedness (i.e., social norms), and could be seen as an indicator of popularity, thereby assisting in the transmission of ideals about beauty and body shapes in adolescents (Jong & Drummond, 2013). With the use of comments and likes, users gain an understanding of the type of pictures that are expected and respected by the social networking community, in turn reproducing and maintaining the culturally endorsed norms with their own pictures and posts (Jong & Drummond, 2013). Moreover, maladaptive Facebook use (i.e., the tendency to seek out negative evaluations and/or engage in social comparisons) predicted increases in negative eating pathology in YAs (i.e., bulimic symptoms, over-eating; Smith, Hames, & Joiner, 2013). This effect was partially mediated by body dissatisfaction, suggesting that Facebook use may impact eating pathology via body dissatisfaction (Smith et al., 2013). In a recent study by Meier and Gray (2014), elevated appearance exposure (i.e., the use of photo-related features on Facebook), but not overall Facebook time, was correlated with measures of BI disturbance in adolescents. Furthermore, a recent Australian study by Fardoully and Vartanian (2015) reported that the relationship between Facebook usage and BI concerns is specifically mediated by appearance comparisons in general (i.e., their tendency to compare their own appearance to others on Facebook) for YAs. Finally, the online environment is filled with pictures of peers and celebrities, creating opportunities for social comparisons. Negative comparisons can (theoretically) occur when SNS users compare their online pictures with others not knowing whether photographs have been digitally altered (Perloff, 2014).

Adolescent users’ SE has been suggested to be directly related to the valence of responses received about information posted on their personal page/profile (i.e., positive feedback led to positive SE and negative feedback led to negative SE; Valkenburg, Peter, & Schouten, 2006). Recently, in a study (consisting mostly of female YAs) that examined the effects of seeking and receiving negative feedback styles,
results indicated that individuals with a negative feedback-seeking style, who received a high number of comments on Facebook, were more likely to report disordered eating attitudes and weight/shape concerns (Hummel & Smith, 2015). Replication of these findings (i.e., associations between SNSs use and eating pathology) is necessary before establishing any strong conclusions.

Furthermore, future research needs to explore the other popular and current forms of SNSs (i.e., Twitter, Instagram, and Pinterest). This is because, although Facebook is still popular among YAs, its overall use has slowed and Twitter, Instagram, and Pinterest continue to see increases in usership (Duggan, Ellison, Lampe, Lenhart, & Madden, 2015). Moreover, to gather more meaningful and reliable results, investigations should look to include a more gender-balanced sample. Finally, much of the research has focused on adolescents and a limited amount of research is available on YAs’ SNS use and its relationship to BI, SE, and eating disorder (ED) symptoms/concerns. The authors believe it is important to explore these constructs within this age group (YAs) as their behavior patterns, developmental phase (Bjork et al., 2004), and identity development (Kroger, 2007) differ from those of adolescents; thus, SNS may influence them differently. Therefore, the aim of this study was to investigate whether problematic SNS use, total SNS time/day, total SNS friends, and specific SNS activities (e.g., posting pictures on profile, posting text-based comments on profile, looking at profile, looking at pictures on others’ profiles, looking at posts on others’ profiles, leaving posts/comments on others’ profiles, filtering/editing pictures before posting them on a SNS) predicted BI, SE, and ED symptoms/concerns in YAs. Based on previous research and theory, we specifically hypothesize that greater problematic SNS use and total SNS time/day will be related to an increased BI concern, decreased SE, and increase ED symptoms/concerns. Moreover, it is hypothesized that specific SNS activities (e.g., posting pictures on profile, posting text-based comments on profile, looking at profile, looking at pictures on others’ profiles, looking at posts on others’ profiles, leaving posts/comments on others’ profiles, filtering/editing pictures before posting them on a SNS) will be related to BI, SE, and ED symptoms/concerns in different ways.

Methods

Participants and Procedure

A convenience sample of YAs (18-29 years; Duggan & Smith, 2014) was recruited from a first-year mandatory undergraduate course (N=212) offered at a Canadian University. Following approval by the University of Windsor Research Ethics Board, the optional survey was administered electronically to all participants via the online class site, during class time. Survey administration took place via FluidSurveys and took ~30 min. All participants had access to Wi-Fi and had been asked to bring a Wi-Fi-enabled device to class. An e-mail link to the survey was sent via the course website which remained active for 48 hr (for students who wished to participate but were not in class, or for students who did not want to complete the survey during class time). All participants provided informed consent at the onset of the survey. Finally, upon completion of the survey, participants were directed to a page where they could leave their name and e-mail for a chance to win one of four prize packages.

Measures: Dependent Variables

BI

Sociocultural Attitudes Toward Appearance Questionnaire. The 30-item Sociocultural Attitudes Toward Appearance Questionnaire (SATAQ-3; Female Version) (Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004) and 29-item Sociocultural Attitudes Toward Appearance Questionnaire–Male Version (SATAQ-M) (Karazsia & Crowther, 2008) were used to assess the internalization of beauty ideals. Response options are scored on a 5-point Likert scale ranging from 1 (definitely disagree) to 5 (definitely agree) and are summed. Higher scores indicated greater internalization of beauty ideals. A sample question is “I compare my body to the bodies of people who appear in magazines.” In the current sample, Cronbach’s alpha was .94 and .95 among females and males, respectively.

Body Image States Scale. The six-item Body Image States Scale (BISS) (Cash, Fleming, Alindogan, Steadman, & Whitehead, 2002) was used to assess the evaluative/affective experience of one’s physical appearance. Responses to each item are on 9-point Likert scale that is bipolar (i.e., both positive and negative experiences), ranging from 1 (extremely dissatisfied) to 9 (extremely satisfied), with reverse scoring when appropriate. Higher scores indicate greater body satisfaction. A sample question is “Right now I feel ________ with my body size and shape.” In the current sample, Cronbach’s alpha was .75 and .67 among females and males, respectively.

Body Esteem Scale for Adolescents and Adults; Attribution Subscale. The 23-item Body Esteem Scale for Adolescents and Adults (BESAA) is a measure designed to assess level of body satisfaction on three subscales; subscales may be used together or individually (Mendelson, Mendelson, & White, 2001). In this study, only the five-item attribution scale, which measures positive evaluations attributed to others about one’s body and appearance (Mendelson et al., 2001), was used. Responses to each item are on 5-point Likert scale, ranging from 0 (never) to 4 (always), and are summed. Higher scores indicated greater body esteem. A sample question is “Other people consider me good looking.” In the current sample, Cronbach’s alpha was .87 and .91 among females and males, respectively.
SE

State Self-Esteem Scale. The 20-item State Self-Esteem Scale (SSES) (Heatherton & Polivy, 1991) was used to measure short-lived (i.e., state) changes in SE. Items are scored on a 5-point Likert scale ranging from 1 (not at all) to 5 (extremely), with reverse scoring when appropriate and then summed. Higher scores indicate greater state SE. A sample question is “I feel satisfied with the way my body looks right now.” In the current sample, Cronbach’s alpha was .94 and .91 among females and males, respectively.

Rosenberg Self-Esteem Scale. The 10-item Rosenberg Self-Esteem Scale (RSES) (Rosenberg, 1965, 1979) was used to measure global trait SE. Items are scored on a 4-point scale ranging from 1 (strongly agree) to 4 (strongly disagree), with reverse scoring when appropriate and then summed. Higher scores indicate greater global trait SE. A sample question is “I take a positive attitude toward myself.” In this study, Cronbach’s alpha was .89 and .89 among females and males, respectively.

ED Symptoms/Concerns

The Eating Attitudes Test. The 26-item Eating Attitudes Test (EAT-26) (Garner, Olmsted, Bohr, & Garfinkel, 1982) was used to measure self-reported symptoms and concern characteristics of EDs. Items are scored on a 6-point Likert scale ranging from 0 (never; rarely; sometimes; Nos 1-25) to 3 (always; Nos 1-25), with reverse coding on question 26. Items are then summed to obtain a total score, with any score of 20, or higher, considered at risk. A sample question is “In the past 6 months, have you exercised more than 60 min a day to lose or to control your weight?” In this study, Cronbach’s alpha was .88 and .93 among females and males, respectively.

Measures: Independent Variables

Problematic SNS Use. The 29-item Generalized Problematic SNS Use Scale (GPIUS) (Caplan, 2002), based on Davis’ (2001) cognitive-behavioral model of Problematic Internet Use (PIU), was modified to examine levels of problematic SNS (Spraggins, 2009). The modified GPIUS, whereby the word “Internet” or “online” was replaced with the words “social networking sites” (Spraggins, 2009), was used to determine the degree to which respondents have a problematic/dependent relationship with SNSs. Items are scored on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) and are summed. There are seven subscales: Mood Alteration, Perceived Social Benefit, Perceived Social Control, Compulsivity, Excessive SNS Use, and Negative Outcomes. Items are then scored and can range from 29 to 145; however, there is no definite cut-off point that exists, and a higher score simply represents a higher degree of problematic SNS use. A sample question is “I use social networking to make myself feel better when I am down.” In this study, Cronbach’s alpha was .93 and .95 among females and males, respectively.

SNS Daily Usage. Participants were asked to physically type the number of hours and minutes they spend daily, on each of the listed SNSs (i.e., Facebook, Twitter, Instagram, and Pinterest). This question was modified from a previous question, where participants were asked to report on average daily Internet use (Tiggemann & Slater, 2013). The SNSs’ daily use data were then manipulated to be expressed in total hours for each SNS, as well as SNS total time (i.e., summation of total hours spent on individual SNSs).

Number of Followers and Number Following. Participants were asked to physically type the number of users who follow them and that they follow for each of the listed SNSs they use. This question was modified from a previous question, where participants were asked how many friends they had on both MySpace and Facebook (Tiggemann & Slater, 2013). Due to the nature of Facebook (i.e., all user friendships are mutual), only the number of users that they follow was used for analysis. These data were then summed to create the variable SNS total friends.

SNS Activity. To determine specific SNS activity (SNSa), participants were provided with the statement “I usually spend a lot of time . . . “ (see Table 1). This question was modified from a previous study (Meier & Gray, 2014), where participants were asked to indicate their use of each Facebook feature on a 5-point scale. Additionally, the responses selected for this question were based on six common SNSas that were applicable to Facebook, Twitter, Instagram and Pinterest (i.e., lurking; Pempek et al., 2009). Responses were recorded on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

SNS Photographs. To determine the degree at which participants modify their photographs before posting them on an SNS, participants were asked “I usually filter/edit my photos before posting them . . . “ This question was also modified from previous research (Meier & Grey, 2014), alongside the idea that SNS users unknowingly compare themselves to digitally altered photographs (Perloff, 2014). Responses were recorded using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Data Analysis

Dependent Variables. Similar to past research (Pendley, Dahlquist, & Dreyer, 1997), to ensure a comprehensive and multidimensional assessment of BI, a composite variable was created that combined all the BI measures in this study. The BI composite variable was calculated by summing the z-scores of the overall BISS, BESAA, and SATAQ/SATAQ-M scores for each case. The composite variable is thought to
reflect how participants chose to view themselves based on internalization of social norms and the perceptions of others just as one does on SNSs. The SE variable used for analysis was created by summing the \( z \)-scores of the overall RSES and SSES scores for each case. The composite variable is thought to reflect a participant’s global and state SE. Total EAT-26 score was used as the ED symptoms/concerns independent variable. Three separate multiple regression analyses, using the “Enter” method, were performed for each dependent variable.

**Data Cleaning.** All data were analyzed using SPSS version 21.0 for Windows (IBM Corp., 2012). Prior to analysis, data were checked for accuracy of entry and missing values. A multiple regression analysis using the “Enter” method was performed for each dependent variable (BI, SE, ED symptoms/concerns), including all independent variables (SNS total time, SNS total friends, generalized problematic SNS use, the six SNSa, SNS photographs [SNSp], and gender). Descriptive analyses were performed on each variable to check for the presence of outliers. Overall, 13 outlier cases were identified and removed from the data. Assumptions of sample size, linearity, no measurement error, lack of multicollinearity and singularity, and the assumption of independence of residuals were examined and satisfied. Data also were checked for the assumption homoscedasticity; this assumption was not satisfied, and for this reason, a remedial bootstrapping method (at 1,000 samples) was used.

**Results**

**Participants**

Out of a possible 212 total students enrolled in the class, 191 started the survey and 160 completed it in its entirety (76% response rate). After outliers were removed, the sample \( N=147 \) was 55% female \( n=81 \), 45% male \( n=66 \), and ranged from 18 to 27 years, with 85% being 18 and 19 years old. Participants in the sample were predominantly White (81%). Further descriptive statistics can be found in Table 1.

A multiple linear regression analysis was performed to evaluate whether independent variables (SNS total time, SNS total friends, generalized problematic SNS use, six SNSa, SNSp) and gender were predictors of BI. For BI, a significant regression equation was found, \( F(11, 135) = 4.970, p < .001 \). Within the model, the predictor variables accounted for \( -23\% \) of the variance associated with the dependent variable (adjusted \( R^2= .230 \)). Each predictor was then examined to determine whether it significantly contributed to the model (Table 2).

### Table 1. Social Networking Site, Body Image, Self-Esteem, and Eating Behavior/Eating Disorder Variables Among Males (\( n=66 \)) and Females (\( n=81 \)).

|                      | Males, mean (SD) | Females, mean (SD) |
|----------------------|------------------|-------------------|
| Social networking site total time (hr/day) | 2.9 (2.8)        | 4.1 (3.9)         |
| Facebook time (hr/day) | 0.8 (1.4)        | 1.1 (1.4)         |
| Twitter time (hr/day)  | 1.1 (1.3)        | 1.2 (1.4)         |
| Instagram Time (hr/day)| 1.0 (1.1)        | 1.5 (1.8)         |
| Pinterest time (hr/day) | 0.0 (0.0)        | 0.2 (0.5)         |
| Social networking site total friends | 1,300.0 (925.2)  | 1,474.0 (962.7)  |
| While on social networking sites, I usually spend a lot of time . . . (mean score, range 1-5) | 2.1 (1.1)        | 3.2 (1.0)         |
| SNSa1: Posting pictures on my profile | 2.1 (0.9)        | 2.8 (1.1)         |
| SNSa2: Posting text-based comments on my profile | 2.3 (1.1)        | 2.4 (1.1)         |
| SNSa3: Looking at my own profile | 1.9 (0.8)        | 2.5 (1.1)         |
| SNSa4: Looking at photos on others’ profiles | 3.8 (0.9)        | 4.1 (0.8)         |
| SNSa5: Looking at posts on others’ profiles | 4.0 (0.9)        | 3.9 (0.9)         |
| SNSa6: Leaving posts or comments on others’ profiles | 2.5 (1.0)        | 2.7 (1.0)         |
| SNSp: I usually filter/edit my photos before posting them on a social networking site . . . (mean score, range 1-5) | 2.1 (1.1)        | 3.2 (1.0)         |
| Generalized Problematic Internet Use Scale (score, 29-145) | 60.8 (18.0)      | 72.1 (17.9)       |
| Sociocultural Attitudes Toward Appearance Questionnaire–Female (score, 30-150) | –                | 99.0 (18.5)       |
| Sociocultural Attitudes Toward Appearance Questionnaire–Male (score, 29-145) | 77.2 (20.0)      | –                |
| Body Image States Scale (score, 9-54) | 35.6 (4.9)       | 31.7 (4.7)        |
| Body Esteem Scale for Adolescents and Adults: Attribution subscale (score, 0-20) | 12.1 (4.3)       | 11.5 (3.3)        |
| State Self-Esteem Scale (score, 20-100) | 75.7 (12.7)      | 67.8 (14.9)       |
| Rosenberg Self-Esteem Scale (score, 10-40) | 32.4 (5.1)       | 28.8 (4.9)        |
| The Eating Attitudes Test (score, 0-78) | 10.6 (8.4)       | 12.1 (11.4)       |

SD: standard deviation.
looking at my own profile (SNSa3; $t=3.659, p=.002$), looking at photos on others’ profiles (SNSa4; $t=2.524, p=.023$), and leaving posts or comments on others’ profiles (SNSa6; $t=1.973, p=.024$) significantly contributed to the model.

A multiple linear regression analysis was performed to evaluate whether the independent variables and gender were predictors of SE. For SE, a significant regression equation was found, $F(11, 135)=6.515$, $p\leq.001$. Within the model, the predictor variables accounted for $\sim30\%$ of the variance associated with the dependent variable (adjusted $R^2=.294$, $R^2_{adj}=.347$). Each predictor was then examined to determine whether it significantly contributed to the model (Table 3). Results suggest that GPIUS ($t=-6.043, p=.001$) significantly contributed to the model.

Finally, a multiple linear regression analysis was performed to evaluate whether independent variables and gender were predictors of ED symptoms/concerns. For ED symptoms/concerns, a significant regression equation was found, $F(11, 135)=3.981$, $p\leq.001$. Within the model, the predictor variables accounted for $\sim18\%$ of the variance associated with the dependent variable (adjusted $R^2=.183$, $R^2_{adj}=.245$). Each predictor was then examined to determine whether it significantly contributed to the model (Table 4). Results suggest that SNS total time ($t=2.365, p=.006$) and GPIUS ($t=4.112, p=.004$) significantly contributed to the model.

**Discussion**

The aim of this study was to investigate whether problematic SNS use, total SNS time/day, total SNS friends, and specific SNS activities had a relationship to BI, SE, and ED symptoms/concerns in YAs. Results of this study suggest that greater symptoms of problematic SNS use is concerning as it was associated with having a lower BI, lower SE, and higher ED symptoms/concerns. The current results are similar to those of past research that reported that increased symptoms of problematic SNS use were associated with decreased SE, happiness, satisfaction with life, and increased depression, and loneliness (Spraggins, 2009). Based on this study’s finding, problematic SNS use may be the most consistent predictor across outcome variables because people who have problematic SNS may be predisposed to these negative health behaviors based on their psychosocial status, which is then being further exacerbated by SNS. However, it is difficult to substantiate this claim without further research in this area. The findings of our study, then, encourage further investigation of problematic SNS use and its possible relationship with BI, SE, and ED symptoms/concerns.

The current findings, where specifically BI was related to SNS activities such as looking at one’s own profile, looking at others’ profiles, and leaving comments on others’ profiles, could perhaps be explained in that SNSs provide a communication platform for peer groups and may serve as host to the many peer influences known to impact adolescent BI (Meier & Gray, 2014). For example, SNSs frequently use photographs as a form of communication (i.e., “appearance conversations” as coined by Jones, Vigfusdottir, & Lee, 2004). The frequent “appearance conversations” may act to reinforce or exacerbate existing BI issues via comparing one’s own body to the viewed images. As an example, “pro-anorexia” groups on SNSs are focused on social interactions (Juarascio, Shoaib, & Timko, 2010) where members support and encourage each other’s ED symptoms/concerns, thus further perpetuating unsafe and unhealthy behaviors/beliefs.

Overall SNS time did not have a significant relationship with BI or SE, but was significantly related to higher ED symptoms/concerns. Similarly, in a previous study (Tiggemann & Slater, 2014), time spent on the SNSs
(i.e., MySpace and Facebook) was associated with higher levels of dieting. SNSs create an environment with multiple social comparisons, often made to somewhat idealized images, as users are likely to post only photographs showing themselves looking good or doing something cool (Tiggemann & Slater, 2014). Although the specific attributes of SNSs responsible for ED symptoms/concerns cannot be identified, it is perhaps the multiple appearance messages (i.e., blogs, comments/posts, digitally altered or filtered photographs) across the sites that reinforce or create these behaviors. Furthermore, previous research reported SNS use and BI concerns to be mediated by appearance comparisons in general (Fardouly & Vartanian, 2015). Moreover, BI concerns have led individuals to want to change how they look by using disordered eating habits (Stice, 2001) and/or EDs (Polivy & Herman, 2002). Therefore, this study’s findings could be attributed with spending more time on SNS; there is a greater ease to connect with peers and/or a greater chance for social comparison. With a greater number of possible social comparisons, SNS users may feel more concerned about their body and, therefore, participate in unhealthy EBs because they compare their appearance to others more frequently (Fardouly & Vartanian, 2015). Future studies, as suggested by previous research (Valkenburg et al., 2006), should investigate how other users have responded (i.e., liked, disliked, specific comments) to a participant’s posts and pictures as this may provide greater insight into what is causing this. This could be accomplished by using a hashtag associated with the study, allowing researchers the ability to directly track pictures/posts and analyze the tone of comments and view the number of likes a user has received. Another possible idea would be to add survey questions, similar to those of previous research (Valkenburg et al., 2006), that specifically ask about the frequency and tone of reactions (i.e., “The reactions that I receive on my profile are . . .” and “The reactions that I receive on what I tell about my friends are . . .”). An important step in future research would be to further analyze how SNS members are using each individual SNS, giving a deeper understanding of how each SNS impacts BI, SE, and EBs/EDs, and perhaps what behaviors/activities should be avoided. For example, experimental designs that manipulate exposure and prospective designs that track SNS use and BI, SE, and EBs/EDs over time are required to further explore the possible negative consequences of SNS use. Finally, this study used a gender-balanced sample, as it was felt this had been lacking in previous literature. Interestingly, results did not differ for gender on any of the constructs. This perhaps could be attributed to the fact that the authors used gender-specific tools when available (i.e., SATAQ-3 and SATAQ-M) as other authors have often not included (Hummel & Smith, 2015; Mehdizadeh, 2010).

Table 3. Linear Model of Predictors of Self-Esteem (Bootstrapped).

|                  | SE b | b—95% CI      | b      | β      | rs      | p value |
|------------------|------|---------------|--------|--------|---------|---------|
| Constant         | 11.247 | [100.195, 144.081] | 122.764 | –      | –       | .001    |
| Total time       | 0.495  | [−1.626, 0.363] | −0.837 | −1.55  | −1.40   | .073    |
| GPIUS            | 0.089  | [−0.699, −0.328] | −0.521 | −5.12  | −4.20   | .001    |
| Total friends    | 0.001  | [−0.002, 0.004] | 0.001  | 0.025  | 0.022   | .731    |
| SNSa1: Posting pictures on my profile | 1.776  | [−1.413, 5.411] | 2.171  | .125   | .089    | .246    |
| SNSa2: Posting text-based comments on my profile | 1.516  | [−1.781, 4.010] | 1.155  | .066   | .047    | .445    |
| SNSa3: Looking at my own profile | 1.522  | [−3.523, 2.630] | −0.457 | −0.251 | −0.20   | .771    |
| SNSa4: Looking at photos on others’ profiles | 2.218  | [−2.104, 6.920] | 2.257  | .100   | .078    | .297    |
| SNSa5: Looking at posts on others’ profiles | 2.013  | [−5.379, 2.610] | −1.390 | −0.63  | −0.53   | .496    |
| SNSa6: Leaving posts or comments on others’ profiles | 1.438  | [−2.160, 3.331] | 0.408  | .022   | .018    | .778    |
| SNSp: I usually filter/edit my photos before posting them on a social networking site | 1.616  | [−4.415, 1.784] | −1.175 | −0.074 | −0.058  | .465    |
| Gender           | 3.447  | [−1.142, 12.084] | 5.443  | .143   | .115    | .114    |

b = β-weight (unstandardized coefficient); CI: confidence interval; SE: standard error; β: beta weight (standardized coefficient); rs: regression structure coefficient; GPIUS: Generalized Problematic Internet Use Scale; SNSa: SNS activity; SNSp: SNS photographs. Results are based on 1,000 bootstrap samples.
Findings should be understood in the context of several limitations. A convenience sample was used, and subjects were predominantly Caucasian. Future research on this topic should incorporate a large, more diverse participant sample. This could be accomplished through another cross-sectional study that looks at a different cohort of individuals (i.e., different/more classes from other faculties) or through a longitudinal study that would look at the impact of SNSs over time. The inability to directly measure variables (e.g., SNS usage, SNS activities, number of friends/followers) could be an issue. All data collected were self-report, which may suffer from memory recall issues and a possible social desirability bias. Future research should consider the use of computer tracking, similar to that of Hummel and Smith (2015). Additionally, this study’s findings are limited to only four SNSs, and future studies should seek to continue exploring a broad range of SNSs. Finally, the findings presented in this study are correlational and cross-sectional and, therefore, do not allow for conclusions on causality. Cross-sectional, correlational data are important in SNS research as they can help to better explain/understand how populations are using technologies and the relationship these technologies have on health (i.e., psychosocial well-being) (Brusse, Gardner, McAullay, & Dowden, 2014). Further research is required to determine whether it is in fact SNS use that impacts BI, SE, and ED symptoms/concern or whether it is a dissatisfied self-perception that predicts SNS use, or it could perhaps be that relationship between SNSs and BI, SE, and ED symptoms/concern is bidirectional. An interesting model, presented by Perloff (2014) and further discussed by Turner (2014), should be incorporated into future research as it describes a transactional process to which social media effects YA women.

In conclusion, this study demonstrates the possible correlational influence of SNSs on BI, SE, and ED symptoms/concerns. Problematic SNS use may lower BI and SE and increase ED symptoms/concerns. Importantly, participation in specific SNSs activities may predict BI, and the amount of time spent on SNSs may influence ED symptoms/concerns.

Declarations of Conflicting Interests
The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding
The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Funding was provided by a Canadian Graduate Scholarship from the Canadian Institute of Health Research (CIHR).

References
Bair, C. E., Kelly, N. R., Serdar, K. L., & Mazzeo, S. E. (2012). Does the Internet function like magazines? An exploration of image-focused media, eating pathology, and body dissatisfaction. *Eating Behaviors, 13*, 398–401. doi:10.1521/jscp.23.6.768.54799
Bjork, J. M., Knutson, B., Fong, G. W., Caggiano, D. M., Bennett, S. M., & Hommer, D. W. (2004). Incentive-elicited brain activation in adolescents: Similarities and differences from young adults. *Journal of Neuroscience, 24*, 1793–1802.
Brusse, C., Gardner, K., McCaulay, D., & Dowden, M. (2014). Social media and mobile apps for health promotion in Australian Indigenous populations: Scoping review. *Journal of Medical Internet Research*, 16(12), e280.

Button, E. J., Sonuga-Barke, E. J. S., Davies, J., & Thompson, M. (1996). A prospective study of self-esteem in the prediction of eating problems in adolescent schoolgirls: Questionnaire findings. *British Journal of Clinical Psychology*, 35(2), 193–203. doi:10.1111/j.2044-8260.1996.tb01176.x

Caplan, S. E. (2002). Problematic Internet use and psychosocial well-being: Development of a theory-based cognitive-behavioral measure. *Computers in Human Behavior, 18*, 533–575. doi:10.1016/S0747-5632(02)00004-3

Cash, T. F., Fleming, E. C., Alindogan, J., Steadman, L., & Whitehead, A. (2002). Beyond body image as a trait: The development and validation of the Body Image States Scale. *Eating Disorders, 10*, 103–113.

Davidson, W. B., & Cotter, P. R. (1991). The relationship between sense of community and subjective well-being: A first look. *Journal of Community Psychology, 19*, 246–253.

Davis, R. A. (2001). A cognitive-behavioral model of pathological Internet use. *Computers in Human Behavior, 17*, 187–195. doi:10.1016/S0747-5632(00)00041-8

Duggan, M., Ellison, N. B., Lampe, C., Lenhart, A., & Madden, M. (2015). Social media update 2014. Pew Research Center’s Internet & American Life Project. Retrieved from http://www.pewinternet.org/2015/01/09/social-media-update-2014/

Duggan, M., & Smith, A. (2014). Social media update 2013. Pew Research Center’s Internet & American Life Project. Retrieved from http://www.pewinternet.org/Reports/2013/Social-Media-Update.aspx

Eisenberg, M. E., Neumark-Sztainer, D., Story, M., & Perry, C. (2005). The role of social norms and friends’ influences on unhealthy weight-control behaviors among adolescent girls. *Social Science & Medicine, 60*(6), 1165–1173. doi:10.1016/j.socscimed.2004.06.055

Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook “friends.” Social capital and college students’ use of online social network sites. *Journal of Computer-Mediated Communication, 12*, 1143–1168. doi:10.1111/j.1083-6101.2007.00367.x

Etcoff, N., Orbach, S., Scott, J., & D’Agostino, H. (2004). “The real truth about beauty: A global report. Findings of the global study on women, beauty and well-being.” Strategy One Applied Research Firm, New York. Retrieved from www.campaignforrealbeauty.ca

Fardouly, J., & Vartanian, L. R. (2015). Negative comparisons about one’s appearance mediate the relationship between Facebook usage and body image concerns. *Body Image, 12*, 82–88. doi:10.1016/j.bodyim.2014.10.004

French, S. A., Story, M., Neumark-Sztainer, D., Fulkerson, J. A., & Hannan, P. (2001). Fast food restaurant use among adolescents: Associations with nutrient intake, food choices and behavioral and psychosocial variables. *International Journal of Obesity and Related Metabolic Disorders: Journal of the International Association for the Study of Obesity*, 25(12), 1823–1833. doi:10.1038/sj.ijo.0801820

Garner, D. M., Olmsted, M. P., Bohr, Y., & Garfinkel, P. E. (1982). The eating attitudes test: Psychometric features and clinical correlates. *Psychological Medicine, 12*, 871–878.

Halliwell, E., & Harvey, M. (2006). Examination of a sociocultural model of disordered eating among male and female adolescents. *British Journal of Health Psychology, 11*(2), 235–248. doi:10.1348/135910705X39214

Harrison, K. (2000). The body electric: Thin-ideal media and eating disorders in adolescents. *Journal of Communication, 50*, 119–143. doi:10.1111/j.1460-2466.2000.tb02856.x

Harrison, K., & Cantor, J. (1997). The relationship between media consumption and eating disorders. *Journal of Communication, 47*, 40–67. doi:10.1111/j.1460-2466.1997.tb02692.x

Heatherton, T. F., & Polivy, J. (1991). Development and validation of a scale for measuring self-esteem. *Journal of Personality and Social Psychology, 60*, 895–910.

Hummel, A. C., & Smith, A. R. (2015). Ask and you shall receive: Desire and receipt of feedback via Facebook predicts disordered eating concerns. *International Journal of Eating Disorders, 48*(4), 436–442. doi:10.1002/eat.22336

IBM Corp. (2012). IBM SPSS Statistics for Windows, Version 21.0 [Computer software]. Armonk, NY: Author.

Irving, L. M. (1990). Mirror images: Effects of the standard of beauty on the self- and body-esteem of women exhibiting varying levels of bulimic symptoms. *Journal of Social and Clinical Psychology, 9*, 230–242. doi:10.1521/jscp.1990.9.2.230

Jones, D. C., Vigfusdottir, T. H., & Lee, Y. (2004). Body image and the appearance culture among adolescent girls and boys: an examination of friend conversations, peer criticism, appearance magazines, and the internalization of appearance ideals. *Journal of Adolescent Research, 19*, 323–339.

Jong, S. T., & Drummond, M. J. (2013, November 27–29). Shaping adolescent girls’ body image perceptions: The effect of social media on Australian adolescent girls. In *Proceedings of the 28th ACHPER International Conference*, Melbourne, Victoria, Australia.

Juaregacio, A. S., Shoaib, A., & Timko, C. A. (2010). Pro-eating disorder communities on social networking sites: A content analysis. *Eating Disorders, 18*, 393–407.

Karazia, B. T., & Crowther, J. H. (2008). Psychological and behavioral correlates of the SATAQ-3 with males. *Body Image, 5*, 109–115.

Kroger, J. (2007). *Identity development: Adolescence through adulthood*. Thousand Oak, CA: SAGE.

Lavine, H., Sweeney, D., & Wagner, S. H. (1999). Depicting women as sex objects in television advertising: Effects on body dissatisfaction. *Personality and Social Psychology Bulletin, 25*, 1049–1058. doi:10.2753/JOA0091-3367390404

Mabe, A. G., Forney, K. J., & Keel, P. K. (2014). Do you “like” my photo? Facebook use maintains eating disorder risk. *International Journal of Eating Disorders, 47*, 516–523. doi:10.1002/eat.22254

McCabe, M. P., & Ricciardelli, L. A. (2005). A prospective study of pressures from parents, peers, and the media on extreme weight change behaviors among adolescent boys and girls. *Behaviour Research and Therapy, 43*(5), 653–668.

McCready, D. R., & Sasse, D. K. (2000). An exploration of the drive for muscularity in adolescent boys and girls. *Psychology, Health & Medicine*, 5, 182–197. doi:10.1080/14760890075032314

McKinley, N. M. (1998). Gender differences in undergraduates’ body esteem: The mediating effect of objectified body consciousness and actual/ideal weight discrepancy. *Sex Roles, 39*(1–2), 113–123.
Meh dizadeh, S. (2010). Self-presentation 2.0: Narcissism and self-esteem on Facebook. Cyberpsychology, Behavior, and Social Networking, 13, 357–364. doi:10.1089/cyber.2009.0257

Meier, E. P., & Gray, J. (2014). Facebook photo activity associated with body image disturbance in adolescent girls. Cyberpsychology, Behavior, and Social Networking, 17, 199–206. doi:10.1089/cyber.2013.0305

Mendelson, B. K., Mendelson, M. J., & White, D. R. (2001). Body-esteem scale for adolescents and adults. Journal of Personality Assessment, 76, 90–106.

Muir, P., Meesters, C., van de Blom, W., & Mayer, B. (2005). Biological, psychological, and sociocultural correlates of body change strategies and eating problems in adolescent boys and girls. Eating Behaviors, 6, 11–22. doi:10.1016/j.eatbeh.2004.03.002

Neumark-Sztainer, D., Wall, M., Larson, N. I., Eisenberg, M. E., & Loth, K. (2011). Dieting and disordered eating behaviors from adolescence to young adulthood: Findings from a 10-year longitudinal study. Journal of the American Dietetic Association, 111(7), 1004–1011. doi:10.1016/j.jada.2011.04.012

Obst, P., & Stafurik, J. (2010). Online we are all able bodied: Online psychological sense of community and social support found through membership of disability-specific websites promotes well-being for people living with a physical disability. Journal of Community & Applied Social Psychology, 20, 525–531.

Paxton, S. J., Eisenberg, M. E., & Neumark-Sztainer, D. (2006). Prospective predictors of body dissatisfaction in adolescent girls and boys: A five-year longitudinal study. Developmental Psychology, 42(5), 888–899. doi:10.1037/0012-1649.42.5.888

Pempek, T. A., Yermolayeva, Y. A., & Calvert, S. L. (2009). College students’ social networking experiences on Facebook. Journal of Applied Developmental Psychology, 30, 227–238. doi:10.1016/j.appdev.2008.12.010

Pendley, J. S., Dahlquist, L. M., & Dreyer, Z. (1997). Body image and psychosocial adjustment in adolescent cancer survivors. Journal of Pediatric Psychology, 22, 29–43.

Perloff, R. M. (2014). Social media effects of young women’s body image concerns: Theoretical perspectives and an agenda for research. Sex Roles, 71, 363–377. doi:10.1007/s11199-014-0384-6

Polivy, J., & Herman, C. P. (2002). Causes of eating disorders. Annual Review of Psychology, 53, 187–213. doi:10.1146/annurev.psych.53.100901.135103

Rosenberg, M. (1965). Society and the adolescent self-image. Princeton, NJ: Princeton University Press.

Rosenberg, M. (1979). Conceiving the self. New York, NY: Basic Books.

Smith, A. R., Hames, J. L., & Joiner, T. E., Jr. (2013). Status update: Maladaptive Facebook usage predicts increases in body dissatisfaction and bulimic symptoms. Journal of Affective Disorders, 149, 235–240. doi:10.1016/j.jad.2013.01.032

Sponcil, M., & Gitimu, P. (2012). Use of social media by college students: Relationship to communication and self-concept. Journal of Technology Research, 4, 1–13.

Spraggins, A. (2009). Problematic use of online social networking sites for college students: Prevalence, predictors, and association with well-being (Unpublished doctoral dissertation). University of Florida, Gainesville, FL.

Stefanone, M. A., Lackaff, D., & Rosen, D. (2011). Continuities of self-worth and social-networking-site behavior. Cyberpsychology, Behavior, and Social Networking, 14, 41–49. doi:10.1089/cyber.2010.0049

Stice, E. (1994). Review of the evidence for a sociocultural model of bulimia nervosa and an exploration of the mechanisms of action. Clinical Psychology Review, 14, 633–661. doi:10.1016/0272-7358(94)90002-7

Stice, E. (2001). A prospective test of the dual-pathway model of bulimic pathology: Mediating effects of dieting and negative affect. Journal of Abnormal Psychology, 110(1), 124–135. doi:10.1037/0021-843X.110.1.124.

Stice, E., Schupak-Neuberg, E., Shaw, H. E., & Stein, R. I. (1994). Relation of media exposure to eating disorder symptomatology: An examination of mediating mechanisms. Journal of Abnormal Psychology, 103(4), 836. doi:10.1037/0021-843X.103.4.836

Thompson, J. K., van den Berg, P., Roehrig, M., Guarda, A. S., & Heinberg, L. J. (2004). The sociocultural attitudes towards appearance scale-3 (SATAQ-3): Development and validation. International Journal of Eating Disorders, 35, 293–304.

Tiggemann, M. (2005). Body dissatisfaction and adolescent self-esteem: Prospective findings. Body Image, 2(2), 129–135. doi:10.1016/j.bodyim.2005.03.006

Tiggemann, M., & Slater, A. (2013). NetGirls: The Internet, Facebook, and body image concern in adolescent girls. International Journal of Eating Disorders, 46, 630–633. doi:10.1002/eat.22141

Tiggemann, M., & Slater, A. (2014). NetTweens: The Internet and body image concerns in preteenage girls. The Journal of Early Adolescence, 34, 606–620. doi:10.1177/0277790913501083

Turner, J. S. (2014). Negotiating a media effects model: Addendums and adjustments to Perloff’s framework for social media’s impact on body image concerns. Sex Roles, 71, 393–406. doi:10.1007/s11199-014-0431-3

Valkenburg, P. M., Peter, J., & Schouten, A. P. (2006). Friend networking sites and their relationship to adolescents’ well-being and social self-esteem. CyberPsychology & Behavior, 9, 584–590. doi:10.1089/cpb.2006.9.584

van den Berg, P., Paxton, S. J., Keery, H., Wall, M., Guo, J., & Neumark-Sztainer, D. (2007). Body dissatisfaction and body comparison with media images in males and females. Body Image, 4(3), 257–268.

Vandereycken, W. (1993). The sociocultural roots of the fight against fatness: Implications for eating disorders and obesity. Eating Disorders, 1(1), 7–16. doi:10.1080/10640269302842626

Webster, J., & Tiggemann, M. (2003). The relationship between women’s body satisfaction and self-image across the life span: The role of cognitive control. The Journal of Genetic Psychology, 164(2), 241–252. doi:10.1080/00221320309597980

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