Maternal Modeling Online: Assessing the Dynamics of Mother/Daughter Dyads on Social Networking Sites Using the Actor-Partner Interdependence Model

Sara Santarossa, Henry Ford Health, USA*
Sarah J. Woodruff, University of Windsor, Canada

ABSTRACT
This study explored the dynamics of mother/daughter dyads on social networking sites (SNSs). 40 mother/daughter dyads completed online surveys. Predictor variables included overall SNS use, photo activities, and interaction activities. Outcome variables included Rosenberg self-esteem scale (RSES), body shape satisfaction scale (BSSS), sociocultural attitudes towards appearance questionnaire-4 (SATAQ-4), children’s eating attitude test (ChEAT)/the eating attitudes test (EAT-26), and physical activity. A pooled regression actor-partner interdependence model was used. Notably, of daughter partner effects: Overall SNS use and RSES (t = -2.28), Overall SNS use and BSSS (t = -2.50), Overall SNS use and SATAQ-4 (t = 4.47), Overall SNS use and EAT-26/ChEAT (t = 4.59), SNS photo activities and SATAQ-4 (t = 4.03), SNS photo activities and EAT-26/ChEAT (t = 3.92), SNS interaction activities and RSES (t = 2.46), and SNS interaction activities and RSES (t = -3.83) were significant (p<.05); suggesting mothers need to foster positive SNS behavior.

KEYWORDS
actor-partner interdependence model, dyadic analysis, maternal modeling, mother/daughter relationship, pooled regression, social networking sites

INTRODUCTION
Research is comprehensive on mother/daughter relationships and a mother’s influence on her daughter’s beliefs, attitudes, subjective norms and ultimately behaviours are important. Daughters identify more closely with their mothers than their fathers and this sense of identification (e.g., ability to relate to) is viewed as a contributing factor in the ability for a mother to influence her daughter’s life (Starrels, 1994). Beliefs can be considered an individuals’ subjective estimates about whether a particular behaviour will lead to particular consequences (Bandura, 1986). Attitudes are determined by personal conceptions concerning a given object/behaviour and thus creating a learned disposition...
to respond in a consistently favorable or unfavorable manner with respect to a given object/behaviour (Fishbein & Ajzen, 1975). Finally, subjective norms are the expectation of other significant persons’ opinions and beliefs and the degree/social pressures to which an individual feels the motivation to comply (Fishbein & Ajzen, 1975). Research has shown that the mother/daughter relationship influences every stage of the daughter’s development, with particular influence in the formation of the adolescent girl’s perception of herself and her body (Flaake, 2005).

A mother’s conduct, together with her relationship with her daughter, can directly and indirectly influence her daughter’s self-esteem, body satisfaction, societal and interpersonal aspects of appearance ideals, eating disorder symptoms/concerns, and physical activity behaviours. Self-esteem can be described as how individuals feel about all the characteristics that make up their person (e.g., skills and abilities, interactions with others, and physical self-image; Piers & Herzberg, 2002). A mother’s parenting style (Szkody, Steele, & McKinney, 2021), behaviour, and own sense of self-esteem (Openshaw et al., 1984) is related to the positive and negative development of her daughter’s self-esteem. Body satisfaction denotes the degree of discrepancy between one’s actual and ideal body weight/shape (Stormer & Thompson, 1996); the subjective evaluation of one’s body (Stice & Shaw, 2002). Maternal modelling of body-image attitudes and behaviours act as social development precursor for daughters (Rieves & Cash, 1996) and are a direct influence on predicting body dissatisfaction (Vincent & McCabe, 2000). The feminine appearance or beauty ideal is the socially constructed notion that “physical attractiveness is one of women’s most important assets, and something all women should strive to achieve and maintain” (Baker-Sperry & Grauerholz, 2003, p.711) and evidence has supported the role of maternal modelling as a process through which this ideal is acquired in daughters (Pike & Rodin, 1991).

Development of eating habits in young adolescent girls, particularly those described as disordered are influenced by their mother’s eating attitudes and behaviours (Neumark-Sztainer et al., 2010; Woodruff & Hanning, 2008). Disordered eating has been described as eating attitudes and behaviours that are a particularly dangerous health risk, as they represent the subjective experiences and behaviours ranging from “normative discontent with weight and moderately dis-regulated eating, to clinical extremes of anorexia nervosa and bulimia nervosa” (Leung, Geller, & Katzman, 1996, p.253). Finally, physical activity (including sport participation) can be considered a form of leisure (Greendorfer & Ewing, 1981; Trost et al., 1997) and research suggests that through observation (i.e., modelling), mothers have an influence on their daughters’ leisure beliefs, attitudes, and behaviours. As maternal modelling in the development of beliefs, attitudes, social norms, and behaviours, exists offline, a similar influence could be exercised by the fast evolution of digital culture (e.g., social networking sites; SNSs). It is imperative that the online mother/daughter relationship be considered and investigated.

Spending time online and on SNSs appears to be a part of daily behaviour for most Canadians (Coyne et al., 2018; Statistics Canada, 2019). Both children and adults in North America have continual accessibility to the Internet and subsequently social media. SNSs are a category of social media that can generate direct communication and two-way interaction between users, thus generating networks (i.e., communities) of users. SNSs reveal important information on how individuals are interacting with one another and within the online world. Girls use SNSs more frequently and are more concerned with their online image than their male counterparts (Steeves, 2014). In addition, mothers, compared to fathers, are not only using popular SNS platforms more frequently, but also engage more often with their networks (e.g., frequent shares, posts; Duggan et al., 2015). In addition, mothers, compared to fathers, are not only using popular SNS platforms more frequently, but also engage more often with their networks (Duggan et al., 2015).

Research has examined the role of SNSs on psychosocial health (e.g., composed of mental, emotional, social, and spiritual dimensions; an individual’s psychological development in relation to or mediated through his/her social environment; Upton, 2013), and how duration/frequency of SNS use, as well as how specific SNS actions relate to various psychosocial health variables. Increased SNS use and activities in women and girls has been associated with decreased self-esteem (Santarossa & Woodruff, 2017; Steinsbekk et al., 2021), increased concern on appearance-related variables (Houge & Mills, 2019; Jong & Drummond, 2013; Meier & Gray 2014; Santarossa & Woodruff, 2017; Tiggemann &
Slater, 2013; Tiggemann & Slater, 2014), increased eating disorder symptoms/concerns (Santarossa & Woodruff, 2017), and support/providing companionship towards physical activity (Zhang et al., 2015). In addition, frequency and direct tone of the feedback left on the user’s profile can impact self-esteem and well-being (Desjarlais, 2020; Steinsbekk et al., 2021). Given the rapid growth of SNSs, and their potential associations to various psychosocial health variables, further research into this online media source is needed. Moreover, a recent study of 440 adolescents aged 12 to 19 (M=14.9, SD= 1.8, 47% female) has suggested that a more positive mother–adolescent relationship can be protective of the detrimental effects SNSs can have on body dissatisfaction (De Vries, Vossen, & van der Kolk–van der Boom, 2019). Research is needed that examines the pressure for daughters to internalize beauty ideals, adopt unhealthy eating or exercise behaviours, and how these pressures/messages may be conveyed by their mothers through a variety of channels (e.g., comments left on SNSs, images posted). Knowledge about if and how these pressures/messages are conveyed may help researchers educate mothers on how to promote a healthy, positive, and well-balanced use of SNS to their daughters.

It is hypothesized that how the parent chooses to self-present online (e.g., types of photos, posts, comments, sentiment of posts) may directly (Steinberg, 2016) or indirectly influence their child’s digital footprint (He et al., 2010). A digital footprint is the collective, ongoing record of one’s Web activity (O’Keeffe & Clarke-Pearson, 2011). In essence, a digital footprint can be positive or negative based on the context and content one leaves behind on the sites they visit. Adolescents and young adults (11 to 21 years) tend to lack awareness and understanding that “what goes online stays online”, often posting inappropriate messages, comments, pictures, and videos (O’Keeffe & Clarke-Pearson, 2011). Research suggests that learning safe online practices begin at home, and parents need to be educated about how to teach their children to be responsible users of the online world (Barnes, 2006) even though children need to learn how to contribute positively to their own digital footprint. Parental education is needed regarding their posts, pictures, and videos and the potential negative effects these SNS postings may have on their children.

**Theoretical Approaches**

**Social Cognitive Theory**

Patterns of behaviour are learned and acquired in part based on the behaviour individuals observe in others and the perceived consequences of those behaviours (Bandura, 1986). Described as the social cognitive theory, Bandura (1986) stresses observational learning, imitation, and modelling as ways in which behaviour is learned and acquired. From a developmental perspective, modelling is considered one of the “most powerful means of transmitting values, attitudes and patterns of thought and behaviour” (Bandura, 1986, p. 47). Specifically, social learning occurring either “deliberately or inadvertently by observing the actual behaviour of others and the consequences for them” (Bandura, 1989, p. 21), is a concept that may help to explain how maternal influence underlies the development and maintenance of beliefs, attitudes, social norms, and behaviours in their young adolescent daughters. Identification and internalized standards are two central concepts in understanding social learning. Identification is an indirect process whereby daughters internalize standards of evaluation and self-reinforcement exhibited by exemplary models. Additionally, the latter concept internalized standards, involves the evaluation of one’s own performance relative to the internalized standards and acting as one’s own reinforcing agent, suggesting daughters may evaluate themselves as their mothers evaluate themselves and model their mothers’ behaviour when their performances are similar to their mother. Thus, if mothers serve as an important model for their daughters, then their daughters’ behaviour may be influenced by what they observe in their mothers. Potentially, mothers’ SNS photographs may be a source of social comparison for children as parents’ SNS posts/engagement (e.g., likes, comments, emojis) may convey societal standards and virtually support beauty ideals, which could lead to body dissatisfaction, low self-esteem, and/or unhealthy behaviours in their daughter.

Although previous research has suggested that for young adult women (17 to 27 years), social media engagement with a female family member does not affect state body image (Hogue & Mills,
research into adolescent girls is needed. In addition, the aforementioned research study did not specifically focus on the mother/daughter relationship, as participants \( n = 62 \) were asked to look and comment on, what was considered, a “not-more-attractive” female family member’s social media (Hogue & Mills, 2019). Sales (2016) suggests the mothers may be competing (in terms of their posts and pictures) with their adolescent daughters on SNSs which could further exacerbate social comparison if a daughter feels strongly about the need to upstage her mother online. If daughters see their mothers engaging in certain forms of SNS behaviour, they may want to imitate that behaviour. Given the popularity of SNSs among mothers and the potential associations between SNS consumption and body comparison and pressure of societal beauty standards in women, further research into the online relationship between mothers and daughters is warranted.

**Sociocultural Model**

Much of the work investigating SNSs and psychosocial health outcomes to date has utilized the Sociocultural Model which emphasizes the role of culture and society on individual development (Davydov, 1995; Vygotsky, 1978). For women, the Sociocultural Model (Tiggemann, 2011) attributes the negative effects of exposure to idealized images and content of what women should do and look like, with the ideal (i.e., comparisons on both dimensions of thinness and tone are likely to be upwards, resulting in body dissatisfaction). This pervasive societal pressure to meet idealized standards is often accompanied by social anxiety, depression, eating disturbances, and poor self-esteem (Cash & Pruzinsky, 2004). Children learn in the context of their social and cultural environment (Davydov, 1995; Greenfield, 2009; Vygotsky, 1978). Since individuals spend significant amounts of time in digital learning environments it is reasonable to believe that the digital world is an important influence on growing social cognition beginning at a very young age, continuing through adolescence, and beyond. According to the constructs of the Sociocultural Model (i.e., media, peers, and family), SNSs are particularly powerful transmitters of messages about weight and appearance. Learning how mother/daughter dyads use the online environment will enable researchers to begin to understand subjective norms created on SNSs and how a merged influence (i.e., media, peers, and family) convey societal standards and virtually support different types of behaviours.

**Purpose and Hypotheses**

Given the rapid growth of SNSs, and their potential associations to various psychosocial health variables, coupled with the role mother’s play in their daughter’s development of these psychosocial health variables, further research into this online media source is needed. Specifically, research is needed that examines the pressure for daughters to internalize beauty ideals, adopt unhealthy eating or exercise behaviours, and how these pressures/messages may be conveyed by their mothers through a variety of channels. Knowledge about if and how these pressures/messages are conveyed may help researchers educate mothers on how to promote a healthy, positive, and well-balanced use of SNS to their daughters. This study aimed to understand the dyadic relationships between SNS behaviours and various psychosocial health variables among mothers and their daughters.

The following hypotheses were addressed:

Hypothesis 1 (actor effects): Greater overall SNS use, photo activities, and interaction activities will be associated with lower levels of own self-esteem and higher levels of own body dissatisfaction, societal and interpersonal aspects of appearance ideals, eating disorder symptoms/concerns, and physical inactivity.

Hypotheses 2 (partner effects):

H2a.) Greater mother’s overall SNS use, photo activities, and interaction activities will be associated with lower levels of daughter’s self-esteem and higher levels of daughter’s body dissatisfaction, societal and interpersonal aspects of appearance ideals, eating disorder symptoms/concerns, and physical inactivity (daughters’ partner effect).

H2b.) None of the daughters’ predictor variables will have a direct effect on mothers’ outcome variables (mothers’ partner effect).
METHOD

Participants

A total of 56 dyads showed interest in the study, however, only dyads where both members responded were included in the final sample (N = 40). Most of the mothers were married (n = 35; 87.5%), working full-time for pay (n = 26; 65.0%), had a total household income from $90,563 to $140,388 (n = 12; 30.0%), and had finished College/University (n = 31; 77.5%). Most daughters were born in 2003 (n = 13; 32.5%). Inclusion criteria for the dyad comprised of mother and daughter using at least one of the same SNSs and in some manner having access to each other’s account. The daughters must have been born within 2003-2007; 11-14ys in the calendar year that the study was conducted. This age range was chosen because some are considered underage based on age restrictions of most SNSs (Steeves, 2014) and they tend to engage in more risky behaviours versus older adolescents (Pfeifer et al., 2011). Dyads were recruited through SNSs and snowball sampling. A standard dyadic design (Kenny et al., 2006) was used.

Procedure

After obtaining ethical clearance, for dyads meeting inclusion criteria, mothers were sent an email that included an individual one-time login link to an online survey using parallel questions (via Qualtrics, 2018) and a unique research identification number (RID) for themselves as well as their daughters. RIDs were linked for the dyad (e.g., M001; D001). In addition, to ensure that members of the dyad completed the survey independently various strategies were used. Participants were instructed to complete the survey within 14 days of receiving their login information. Prior to commencing the online survey active, written consent was obtained from both the mothers and the daughters. The daughters were considered competent to consent for themselves; however, their mother was made aware of their participation in the study as she would have provided her one-time login link and appropriate RID.

Materials

Alpha scores for applicable measures can be found in Table 1.

Predictor Variables

Overall SNS Use

SNS usage was measured using the question: “What is the average amount of time you spend on SNSs a day?” (Cohen et al., 2017). Options were recorded on a 12-point Frequency-response scale ranging from 1 (0-15mins) to 12 (≥10hrs). Frequency of checking profile was measured using “How many times do you access/check your SNS accounts daily?” (Cohen et al., 2017). Options were recorded on a 7-point Likert-type response scale ranging from 1 (hardly ever) to 7 (More times than I can count). Overall SNS Use was computed by summing the standardized scores (i.e., z-scores) of the two above questions, with higher scores indicating greater SNS use-frequency.

SNS Photo Activities

The Photo Subscale of the Facebook Questionnaire (Cohen et al. 2017; Meier & Gray, 2014), an 8-item measure scored on a 5-point Frequency-response scale ranging from 0 (never) to very often (4), was used. A ninth item was added: “Filter/edit your photos before posting them on a SNS” (Santarossa & Woodruff, 2017). Items were summed with overall score representing users’ photo-based activity and appearance exposure (Meier & Gray, 2014).

SNS Interaction Activities

Determined by providing participants with two statements: “I comment on my [daughter’s/ mother’s] photos and/or posts…” and “I “like” or “react2” to my [daughter’s/mother’s] photos and/or posts…”.
Responses were recorded on a 5-point Frequency-response scale ranging from 0 (never) to very often (4) and summed, with higher scores indicating greater SNS interaction activity.

**Outcome Variables**

**Rosenberg Self-Esteem Scale (RSES)**

This 10-item measure (Rosenberg, 1965, 1979) was used to assess global trait self-esteem, on a 4-point Likert-type response scale ranging from 1 (strongly disagree) to 4 (strongly agree), with higher scores indicating higher self-esteem.

**Body Shape Satisfaction Scale (BSSS)**

A modified version (Correa, 2014; *The Project EAT Survey*) was used to measure the level of satisfaction on a 5-point Likert-type response scale ranging from 1 (very dissatisfied) to 5 (very satisfied) with 10 areas of the body. Items were summed with higher scores indicating higher body satisfaction.

**Sociocultural Attitudes Towards Appearance Questionnaire-Female (score, 22-110)**

Using five subscales, this 22-item measure assesses the internalization of appearance ideals and appearance pressures (Schaefer et al., 2015). Items from all subscales were scored on a 5-point Likert-
type response scale ranging from 1 (definitely disagree) to 5 (definitely agree) and then summed together, with higher scores indicating greater internalization.

*Children’s Eating Attitude Test (ChEAT; Daughters Only)*

This 26-item measure for children, was used for the assessment of eating behaviour (Maloney et al., 1988). Items were scored on a 6-point Likert-type response scale ranging from 0 (never, rarely, sometimes) to 3 (always) with higher summed scores indicating greater eating disorder symptoms/concerns.

*The Eating Attitudes Test (EAT-26; mothers only)*

This 26-item measure was used to assess self-reported symptoms/concern characteristics of eating disorders (Garner et al., 1982). Items were scored on a 4-point Likert-type response scale ranging from 0 (never, rarely, sometimes; #1-25) to 3 (always; #1-25), with reverse coding on question 26. The EAT-26 also asks questions to assess the behavioural symptoms representative of an eating disorder, however, the ChEAT (Maloney et al., 1988) does not have a comparable subscale and, therefore, these questions were not included.

*Physical Activity Behaviours*

Modified from the Canadian Assessment of Physical Literacy Questionnaire (Healthy Active Living and Obesity Group, 2014) weekly activity time was measured using: “During the past week (7 days), think of all the time you spent in activities that increased your heart rate and made you breathe hard; consider work, leisure, home. On each day, how long were you active for?” For each of the 7 days options were on a 6-point Likert-type response scale, increasing in 15min increments ranges (i.e., 1-15mins, 16-30mins, etc.), ranging from 1 (0mins; was not active this day) to 6 (>2hrs). Items were summed, with higher scores indicating higher amounts of physical activity.

*Demographic Variables*

Questions around family social economic status, marital status, employment, and education status of mother were present on the mothers’ survey only (Correa, 2014; The Project EAT Survey). Three questions to inform dyad relationship/communication (Correa, 2014; The Project EAT Survey) and a question regarding hidden social media behaviour were obtained (see Table 2). Using modified questions from EU Kids Online (2010; see Table 2) the percentage of supportive forms of active mediation and co-use by mothers; the percentage for whom rules, or restrictions apply; and percentage of mother monitoring on their daughter during or after use of SNSs were computed based on Livingstone and colleagues’ (2011) calculation method.

*Data Analysis*

Exploratory data analyses were conducted to describe the participants’ characteristics and check for assumptions. A pooled regression Actor-Partner Interdependence model (APIM) approach (see Appendix A) that is appropriate for smaller sample sizes (e.g., at least 28 dyads, Lim, 2014; Tambling et al., 2011), was conducted a total of 15 times (i.e., once for each of the five outcome variables and for each of the three predictor variables; see Figure 1 for example model). All analyses were calculated with the use of the Statistical Package for Social Sciences (IBM, 2012) and hand computations. Based on previous literature (Perneger, 1998; Rothman, 1990) a Bonferonni adjustment was deemed unnecessary and therefore was not used. All hypotheses were tested with a $p<0.05$ criterion of significance for a two-sided test.

**RESULTS**

Of the 40 dyads, the most popular SNS used was Instagram ($n = 35; 87.5\%$), followed by Snapchat ($n = 27; 67.5\%$). Most of the dyads used two of the same SNSs ($n = 23; 50.5\%$), with Instagram and Snapchat being the most popular ($n = 12; 52.1\%$). Refer to Table 2 for a list of other demographic variables. Dyads
Table 2. Descriptive statistics comparing mother/daughter differences on study variables

<table>
<thead>
<tr>
<th>Mother/Daughter Relationship/Communication</th>
<th>Mothers (n = 40)</th>
<th>Daughters (n = 40)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>How much do you feel your daughter talks [you talk] to you [your mom] about her [your] problems?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>A little</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td>Somewhat</td>
<td>11</td>
<td>27.5</td>
</tr>
<tr>
<td>Quite a bit</td>
<td>24</td>
<td>60</td>
</tr>
<tr>
<td>Very much</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>How much do you feel your daughter [your mom] cares about you?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>A little</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>Somewhat</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Quite a bit</td>
<td>5</td>
<td>12.5</td>
</tr>
<tr>
<td>Very much</td>
<td>32</td>
<td>80</td>
</tr>
<tr>
<td>Compared to others (i.e., your friends), how strict would you say you are [your mom is] with your daughter [you]?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>A little</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Somewhat</td>
<td>15</td>
<td>37.5</td>
</tr>
<tr>
<td>Quite a bit</td>
<td>18</td>
<td>45</td>
</tr>
<tr>
<td>Very much</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>Hidden Social Media Behaviour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you believe your daughter has [you have] hidden what she has [you have] done on social media from you [your mom] (e.g., has a secret account, be friends/talk to people they [you] shouldn’t or don’t know, breaks a rule, sent inappropriate pictures or messages, etc…)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>13</td>
<td>32.5</td>
</tr>
<tr>
<td>Rarely</td>
<td>16</td>
<td>40</td>
</tr>
<tr>
<td>Sometimes</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>Often</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Usually</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>Always</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Percentage of Supportive Forms of Active Mediation and Co-Use by Mothers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you [does your mom] do the following with your daughter [you]?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sit with her [you] while she uses [you use] social media</td>
<td>28</td>
<td>70</td>
</tr>
<tr>
<td>Stay near her [you] when she uses [you use] social media</td>
<td>27</td>
<td>67.5</td>
</tr>
<tr>
<td>Encourage her [you] to explore and learn things on social media on her [you] own</td>
<td>19</td>
<td>47.5</td>
</tr>
<tr>
<td>Do shared activities together on social media</td>
<td>18</td>
<td>45</td>
</tr>
<tr>
<td>Talk to her [you] about what she does [you do] on social media</td>
<td>39</td>
<td>97.5</td>
</tr>
</tbody>
</table>

continued on following page
Table 2. Continued

<table>
<thead>
<tr>
<th>Percentage for Whom Rules or Restrictions Apply</th>
<th>Mothers (n = 40)</th>
<th>Daughters (n = 40)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Use instant messaging</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>Download music or films</td>
<td>13</td>
<td>32.5</td>
</tr>
<tr>
<td>Have her [your] own social media accounts</td>
<td>18</td>
<td>45</td>
</tr>
<tr>
<td>Give out personal information to others</td>
<td>38</td>
<td>95</td>
</tr>
<tr>
<td>Upload photos, videos, or music to share with others</td>
<td>21</td>
<td>52.5</td>
</tr>
<tr>
<td>Watch video clips</td>
<td>5</td>
<td>12.5</td>
</tr>
</tbody>
</table>

Percentage of Mother Monitoring

When your daughter uses [you use] the internet at home, do you [does your mother] sometimes check any of the following things afterwards…

| Which websites she [you] visited                | 24   | 60   | 16    | 40   |
| The messages in her [your] email or instant messaging | 27   | 67.5 | 15    | 37.5 |
| Her [Your] profile on social media or an online community | 39   | 97.5 | 24    | 60   |
| Which friends or contacts your daughter [you] add to her [your] social media profile or instant messaging service | 32   | 80   | 21    | 52.5 |

Figure 1. The actor-partner interdependence model (APIM)

\(a\) = actor effect (i.e., the effect of an individual’s predictor variable on their own outcome variable); \(p\) = partner effect (i.e., the effect of an individual’s predictor variable on their partner’s outcome variable); \(e\) = residual. Note that effects are labelled by referring to the dyad member of the outcome variable; thus, a direct effect from mothers’ predictor variable to daughters’ outcome variable is referred to as the daughters’ partner effect \((p1)\). A direct effect from a daughters’ predictor variable to mothers’ outcome variable is referred to as the mothers’ partner effect \((p2)\).
were compared on major study variables (see Table 1) using paired samples t-tests. Bivariate correlations are presented in Table 3. The bivariate correlations between mothers’ and daughters’ variables were low, ranging from $r = -0.05$ to $r = 0.34$. The within-dyad correlation was relatively higher for daughters than mothers ranging from $r = 0.01$ to $r = 0.65$ and $r = 0.01$ to $r = 0.63$, respectively.

**Hypothesis Testing**

Pooled regression results for Hypothesis 1 and 2 are presented in Table 4.

**Hypothesis 1**: Actor Effects of Overall SNS use, SNS photo activities, and SNS interaction activities on self-esteem, body satisfaction, societal and interpersonal aspects of appearance ideals, eating disorder symptoms/concerns, and physical activity.

The actor effects between Overall SNS use and RSES ($t = 2.60, p < 0.05$) was significant for mothers, indicating greater use of SNSs was related to an increase in self-esteem. A significant actor effect was found between SNS photo activities and BSSS ($t = -2.22, p < 0.05$) for daughters, indicating greater photo activities/exposure on SNSs was related to lower body satisfaction.

The actor effects between SNS interaction activities and RSES ($t = -3.54, p < 0.05$), BSSS ($t = -2.83, p < 0.05$), SATAQ-4 ($t = 4.10, p < 0.05$), and EAT-26 ($t = 3.01, p < 0.05$) were significant for mothers. This indicates that mothers who interact more with their daughter’s photos/posts on SNSs have lower self-esteem, lower body satisfaction, higher internalization of beauty standards, and higher eating disorder symptoms/concerns. The actor effects between SNS interaction activities and physical activity were significant for both mothers ($t = -3.16, p < 0.05$) and daughters ($t = 2.75, p < 0.05$). This indicates that mothers who interact more with their daughter’s photos/posts on SNSs have a lower physical activity frequency, however, daughters who interact more with their mother’s photos/posts on SNSs have a higher physical activity frequency.

**Hypotheses 2**: Partner Effects of Overall SNS use, SNS photo activities, and SNS interaction activities on self-esteem, body satisfaction, societal and interpersonal aspects of appearance ideals, eating disorder symptoms/concerns, and physical activity.

H2a.) For the daughter partner effects, eight relationships were significant: 1) Overall SNS use and RSES ($t = -2.28, p < 0.05$), 2) Overall SNS use and BSSS ($t = -2.50, p < 0.05$), 3) Overall SNS use and SATAQ-4 ($t = 4.10, p < 0.05$), 4) Overall SNS use and EAT-26 ($t = 3.01, p < 0.05$), 5) SNS photo activities and BSSS ($t = -2.22, p < 0.05$), 6) SNS interaction activities and SATAQ-4 ($t = 4.10, p < 0.05$), 7) SNS interaction activities and EAT-26 ($t = 3.01, p < 0.05$), 8) SNS interaction activities and RSES ($t = -2.28, p < 0.05$).

**Table 3. Pearson correlations between study variables**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSES</td>
<td></td>
<td>-0.15</td>
<td>-0.48</td>
<td>-0.50</td>
<td>-0.15</td>
<td>-0.04</td>
<td>0.22</td>
<td>0.29</td>
</tr>
<tr>
<td>BSSS</td>
<td></td>
<td></td>
<td>-0.05</td>
<td>-0.41</td>
<td>-0.43</td>
<td>0.08</td>
<td>-0.25</td>
<td>-0.05</td>
</tr>
<tr>
<td>SATAQ-4</td>
<td></td>
<td>-0.45</td>
<td>-0.60</td>
<td>0.24</td>
<td>0.48</td>
<td>-0.11</td>
<td>-0.13</td>
<td>0.07</td>
</tr>
<tr>
<td>EAT26/ChEAT26</td>
<td>-0.45</td>
<td>-0.42</td>
<td>0.54</td>
<td>0.24</td>
<td></td>
<td>0.03</td>
<td>-0.14</td>
<td>0.01</td>
</tr>
<tr>
<td>PA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.38*</td>
<td>0.43*</td>
<td>-0.01</td>
<td>0.11</td>
</tr>
<tr>
<td>Overall SNS use</td>
<td>-0.28</td>
<td>-0.44</td>
<td>0.56</td>
<td>0.45</td>
<td>-0.14</td>
<td>0.11</td>
<td>0.50*</td>
<td>0.37*</td>
</tr>
<tr>
<td>SNS photo activities</td>
<td>-0.01</td>
<td>-0.06</td>
<td>0.51</td>
<td>0.38</td>
<td>0.02</td>
<td>0.56*</td>
<td>0.22</td>
<td>0.32*</td>
</tr>
<tr>
<td>SNS interaction activities</td>
<td>0.15</td>
<td>0.09</td>
<td>-0.02</td>
<td>-0.22</td>
<td>-0.25</td>
<td>-0.03</td>
<td>0.24</td>
<td>0.34*</td>
</tr>
</tbody>
</table>

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

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

Note. Mothers above, daughters below, and between mothers and daughters along the diagonal; RSES=Rosenberg Self-Esteem Scale; BSSS=Body Shape Satisfaction Scale; SATAQ-4=Sociocultural Attitudes Towards Appearance Questionnaire; EAT26=The Eating Attitudes Test ChEAT=Children’s Eating Attitude Test; PA=Physical Activity Behaviours; SNS=Social Networking Site.
and SATAQ-4 \( (t = 4.47, p < .05) \), 4) Overall SNS use and EAT-26/ChEAT \( (t = 4.59, p < .05) \), 5) SNS photo activities and SATAQ-4 \( (t = 4.03, p < .05) \), 6) SNS photo activities and EAT-26/ChEAT \( (t = 3.92, p < .05) \), 7) SNS interaction activities and RSES \( (t = 2.46, p < .05) \), and 8) SNS interaction activities and physical activity frequency \( (t = -3.83, p < .05) \). This indicates that mothers’ overall SNS use was related to the daughters’ lower self-esteem, lower body satisfaction, higher internalization of beauty standards, and higher eating disorder symptoms/concerns. Furthermore, mothers’ photo activity/exposure was related to the daughters’ higher internalization of beauty standard, and higher eating disorder symptoms/concerns. Lastly, mothers’ SNS interaction activities with daughters was related to daughters’ higher self-esteem and lower physical activity frequency.

H2b.) There were no mothers’ partner effect observed in any of the possible relationships, indicating none of the daughters’ predictor variables had a direct effect on mothers’ outcome variables.
DISCUSSION

The overall goal of the current study was to better understand the online mother/daughter relationship. To date, there appears to be a paucity of empirical research on maternal modelling in digital culture, specifically, SNSs. To capture the complex and mutually influential nature of relationship dynamics in mother/daughter pairs, the current study used the APIM (Kenny et al., 2006) to explore at the dyadic level. Guided the social cognitive theory (Bandura, 1986) and the Sociocultural Model (Davydov, 1995; Vygotsky, 1978), online surveys were used to explore the dynamics of mother/daughter dyads on SNSs and the influence of mothers’ SNS use on various psychosocial health variables in their daughters. Hypotheses were partially supported and overall, study findings demonstrate a need for further research into the online mother/daughter relationship, the need to foster positive SNS behaviour, and the importance of discouraging negative maternal modelling behaviours.

Findings from the current study suggest that mothers with greater SNS use have increased self-esteem. This actor effect is contrary to previous findings that suggest increased SNS usage in women is associated with low self-esteem (Vogel et al., 2014). As self-esteem is calibrated to cues of inclusion or rejection within the social environment it could be that mothers’ SNS usage is creating positive development (Diafarova & Trofimenko, 2017) of self-esteem through potential moderators such as positive feedback (e.g., likes on Facebook) or feeling a sense of purpose online (Burrow & Rainone, 2017). In addition, the hypothesis known as “rich get richer”, which assumes that persons with a high level of self-esteem also receive strong gratification on the Internet (Zywica & Danowski, 2008), may help to explain the findings in the current study. The “rich get richer” hypothesis (Zywica & Danowski, 2008) could suggest that mothers who manage well in the offline world will also manage well in the virtual world (e.g., are active online, have large number of friends) thus potentially experiencing an increase in self-esteem. Moreover, the mothers’ who interact (i.e., comment, like, react) more with their daughter’s photos/posts on SNSs had lower self-esteem, lower body satisfaction, higher internalization of beauty standards, and higher eating disorder symptoms/concerns.

Research has suggested that mothers may use the appearance of their child to establish their identities as mothers and to verify their identities as “good mothers” (Collett, 2005). For example, their daughter’s appearance online may be an integral part of their own self-presentation and may be an underlying reason for using interaction as a tool towards impression management, projecting their beliefs, attitudes, and social norms, by reinforcing the behaviour they want their daughter to display on SNSs. In addition, the mother could in turn be looking for validation through interaction (e.g., like for a like), as previous research has suggested that feelings of low self-esteem and insecurity underpinned women SNS users’ efforts in a quest for recognition online (Chua & Chang, 2016). As likes/reactions can be seen as an indicator of popularity and can assist in the transmission of ideals about beauty and body shapes, as users learn what the social norm is in their SNS community (Jong & Drummond, 2013), mothers need to consider the potential impacts of their interactions with their daughters online. The current study suggests that mothers who interact (i.e., comment, like, react) more with their daughter’s photos/posts have a lower physical activity frequency, which could be a result of SNS behaviour as a form of sedentary behaviour. However, the current study does not take into account the nature of feedback provided by mothers and daughters. This is an important shortcoming, as the type of feedback (e.g., confirming dominant appearance ideals or not) may greatly influence whether or not daughters will internalize appearance ideals or other beliefs or attitudes and act accordingly, and is an important consideration for future research in this area.

The current study suggests that daughters experiencing greater photo activities/exposure on SNSs have a lower body satisfaction. This is consistent with pervious literature exploring the role photo-based activity on SNSs can play on appearance concern and investment (Holland & Tiggemann, 2016; Meier & Gray, 2014; Mingoia et al., 2019). In their systematic review, Holland and Tiggemann (2016) concluded photo-based activity compared to just increased SNS use is particularly significant in developing body concerns. Furthermore, Mingoia et al. (2019) suggested a large association between
a user’s level of photo investment on SNSs and the tendency to engage in appearance comparisons. Photo activities/exposure predicting daughters’ body satisfaction may then be related to daughters engaging in more frequent appearance comparisons. Moreover, the fact that mothers’ SNSs can be a space for comparison (Sales, 2016) may help to explain why daughters who interact more with their mother’s on SNSs have a higher physical activity frequency. It could be that mothers are modelling physical activity behaviours on SNSs. As maternal modelling may lead to daughters wanting to imitate the behaviour of their mother (e.g., engaging in physical activity, dieting/weight loss behaviour), further research is needed to understand the motivations daughters’ may gain from their interaction with mothers’ SNSs. Uncovering motivations of daughters will assist in a better understanding of the intention of the daughters’ behaviour and if it was positive or based on appearance investment.

Moreover, future research should consider exploring maternal modelling on SNSs in relation to constructs such as anxiety and depression as upward comparisons to idealized standards have been found to accompany these dimensions of psychosocial health as well (Cash & Pruzinsky, 2004; Tiggemann, 2011). Anxiety and depression, in adolescents, can be elevated by compulsive SNS (Dhir et al., 2018) and/or being emotionally invested in SNSs (Woods & Scott, 2016). It has been observed that anxious SNS users invest in different coping strategies (Primack et al., 2017) and tend to be more engaged with SNS to ally their anxious state (e.g., searching for attention or support on SNSs; Vannucci et al., 2017) compared to non-anxious SNS users. Previous literature has recommended that parents and guardians monitor and moderate the excessive social media use of adolescents (Dhir et al., 2018) and be cognisant of other psychosocial health behaviours such as anxiety or depression.

Further supporting the ideal of maternal modelling on SNSs, results suggests that mothers’ overall SNS use was associated with daughters’ lower self-esteem, lower body satisfaction, higher internalization of beauty standards, and higher eating disorder symptoms/concerns. Our findings concur with previous evidence concerning the associations between maternal modelling in the offline world and the influence mothers have on their daughters’ body image, self-esteem, and eating habits (Handford et al., 2018). Specifically, mothers’ photo activity/exposure was related to the daughters’ higher internalization of beauty standards, and higher eating disorder symptoms/concerns. Perhaps maternal modelling exists on SNSs, directly and indirectly impacting these psychosocial health variables in their daughters. Mothers may be expressing their expectations and beliefs about physical appearance and eating behaviour through their SNSs use and photo-based activity.

As Instagram was the most popular SNSs used between dyads and has been suggested to have a stronger relationship with appearance comparison compared to other platforms (Turner & Lefevre, 2017), further research specifically exploring mothers’ Instagram use is warranted. Mothers may be competing (in terms of their posts and pictures) with their daughters on SNSs (Sales, 2016) which could further exacerbate social comparison if a daughter feels strongly about the need to upstage her mother online. However, further research is needed to fully understand what exact content or behaviour on SNSs, which a mother engages in, is in fact influencing their daughters’ development. Findings from the current study suggest the importance of working with mothers to help them provide an online environment that nurtures a girls’ lifestyle patterns. Therefore, future research should include linking self-reports of SNS use and related outcomes with an analysis of the actual content of SNS posts by mothers and daughters. Mothers need to be concerned with how they are presenting themselves online so to help foster positive expectations and beliefs among their daughters.

Several limitations of the current study need to be acknowledged. As the sample was predominately comprised of mothers who were married, work-full time for pay, had high socioeconomic status, and were well educated, future studies need to explore a more diverse sample to make findings generalizable. Further, race/ethnicity data was not collected in the current study and is recognized as a major shortcoming. Despite attempts to recruit a more diverse community sample, the mother/daughter relationship does not serve the same needs across cultures (Gore, Frederick, & Ramkissoon, 2018) and attempts should be made to extend these findings to other populations and accurately measure these important demographic variables. Moreover, sampling bias may exist as results suggested the
majority of the mother/daughter dyads reported having a ‘good relationship’ (e.g., talking about problems, caring, not hiding behaviour) and thus, may have been more likely to participate in the study than those dyads who do not have a ‘good relationship’. Results should also be taken with caution as causal interpretations are not possible due to the correlational nature of the current study and future longitudinal studies would provide more compelling evidence of causation. In addition, the measurement of Overall SNS use may not be an exhaustive measurement of SNS use/frequency as it relies on self-report. Moreover, it should be noted as a limitation that a simple sum score may not be adequate for the RSES due to the positive and negative phrasing (Hyland et al., 2014; Marsh et al., 2010). Lastly, a larger sample size would allow for adequate power to use a Structural Equation Modelling approach to account for the measurement error (Peugh et al., 2013), detect further associations (i.e., mother effects) of interest, and learn more about the dyads in the context of the online world.

Despite these limitations, the present study delivers a better understanding mothers and their daughters in the online world. This study suggests that SNS behaviours predict outcome variables for both mothers and daughters individually. In addition, maternal modelling exists on SNSs, as several relationships where the mothers’ predictor variables were associated with the daughters’ outcome variables were statistically significant. Thus, mothers need to foster positive SNS behaviour and discourage negative modelling behaviours online. Further research in this area is warranted and researchers should create tools that help mothers navigate the online world and better understand the role they can play in the creation of their daughter’s digital footprint.

ACKNOWLEDGEMENT

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REFERENCES


ENDNOTES

1  Mother was defined as person identified in the primary woman care giver role, and daughter was anyone who identified as such and fit the other inclusion criteria.

2  Facebook reactions facilitate emotional conversation and at the time of this study included a series of 6 emojis that social media users can select to respond to a post.
APPENDIX A

The type of mother/daughter dyads in this study are considered “distinguishable dyads” (i.e., can be distinguished if there is a variable that allows the researcher to differentiate members). Given that traditional research analytic strategies are inappropriate for use with dyadic data because they violate assumptions of independence and generate biased estimates of statistical significance (Kenny et al., 2006), dyadic analyses (APIM) were used to capture the complex and mutually influential nature of relationship dynamics in mother/daughter pairs. Prior to analysis, all study variables were assessed for adherence to the assumptions of regression and data screening showed that 0% of the data were missing. As recommended by Kenny and colleagues (2006) for the general analyses, it was necessary to create a dyadic dataset with dyadic variables by computing the average of each member’s score in the variables of interest and the difference of each member score in the variables of interest. The predictor variables were mean centered (i.e., subtracting the (arithmetic) mean from all its values) in order to give zero a meaningful value and to aid in the interpretation of the results (Aiken et al., 1991).

Within-dyad and between-dyads regression equations.

\[
DV_{\text{diff}} = b_{w1}(IV_{\text{diff}}) + b_{w2}(R_{\text{diff}}) + b_{w3}(IVIN_{\text{diff}}) + E_{wi}
\]
\[
DV_{\text{avg}} = b_{b0} + b_{b1}(IV_{\text{avg}}) + b_{b2}(IVIN_{\text{avg}}) + E_{bi}
\]

Definition of Symbols:

- \(DV_{\text{diff}}\) = the difference between each partner’s scores on the outcome variable
- \(IV_{\text{diff}}\) = the difference between each partner’s scores on the predictor variable
- \(R_{\text{diff}}\) = the difference between each partner’s scores on the role (mother/daughter role)
- \(IVIN_{\text{diff}}\) = the difference in the interaction between the predictor variable and role
- \(DV_{\text{avg}}\) = the dyad mean of the outcome variable
- \(IV_{\text{avg}}\) = the dyad mean of the predictor variable
- \(IVIN_{\text{avg}}\) = the dyad average of the interaction between the predictor variable and role
- \(b_{w1}\) = unstandardized regression coefficients for the within-dyads regression
- \(b_{w2}\) = unstandardized regression coefficients for the between-dyads regression
- \(E_{wi}\) = error term for the within-dyads regression
- \(E_{bi}\) = error term for the between-dyads regression

Next, the path coefficients of the two regression equations are used to compute the actor (i.e., the estimate of an individual’s impact on herself; they are intraindividual effects) and partner effects (i.e., interdependence is modeled through the partner effect and is the degree to which a person’s outcome is influenced by the partner’s score on the predictor variable).

Actor and partner effects equations.

Actor Effects = \(b_{h1} + b_{w1}/2\)
Partner Effects = \(b_{h1} - b_{w1}/2\)

Pooled standard errors and pooled degrees of freedom must then be estimated in order to calculate the \(t\) statistic for assessing the significance level of the actor and partner effects (see Tambling et al., 2011).