Social media and online self-presentation: Effects on how we see ourselves and our bodies

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Chapter 3

The Effect of Social Network Site Use on Appearance Investment and Desire for Cosmetic Surgery among Adolescent Boys and Girls

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Abstract

Although adolescents frequently use social network sites, little is known about whether the highly visual and self-presentation-centered character of such sites affects body-related outcomes such as investment in appearance and appearance-changing strategies. The aim of the current study was to investigate the relationships between social network site use, appearance investment, and desire for cosmetic surgery among adolescents, and to compare the experiences of boys and girls. We used data from a two-wave panel study among 604 Dutch adolescents (aged 11-18). Structural equation modeling showed that social network site use indirectly augmented adolescents’ desire to undergo cosmetic surgery through increasing appearance investment. The relationships found between social network site use, investment in appearance, and cosmetic surgery desire applied to boys and girls and were not moderated by gender. However, girls reported higher levels of appearance investment and cosmetic surgery desire than boys.
In their daily lives, adolescents experience appearance pressures from several sources. For example, peers regularly comment on adolescents’ physical appearance and provide tips on how to look best. Furthermore, teen magazines and TV shows frequently portray people who fit the stringent beauty ideals and advertise appearance-changing strategies. The degree to which individuals experience these appearance pressures has been shown to correlate with desire to engage in costly and risky appearance-changing strategies, such as cosmetic surgery (e.g., Woertman & van den Brink, 2009). In 2011, cosmetic surgery was performed on 76,755 patients aged 19 or younger in the US (American Society of Plastic Surgeons, 2012a). Furthermore, cosmetic surgery was considered by 30% of US adolescents (Pearl & Weston, 2003). The interest in these procedures is remarkable given the health risks and financial costs involved (Zuckerman & Abraham, 2008). Moreover, cosmetic surgery among adolescents is especially controversial because their body and body image are still developing (Sarwer, Infield, & Crerand, 2009; Steinberg & Morris, 2001; Zuckerman & Abraham, 2008).

Appearance pressures have also been found to predict appearance investment (Slevec & Tiggemann, 2010; White & Halliwell, 2010). Appearance investment refers to the degree to which physical attractiveness is important to a person and his/her behavior and thoughts center on appearance (Thompson, 2004). High investment in appearance, in turn, is believed to result in negative consequences, in particular engaging in appearance-changing behaviors which may pose health risks, such as exercise dependence (White & Halliwell, 2010), unhealthy forms of dietary restraint (Cash, Melnyk, & Hrabosky, 2004), and cosmetic surgery (Slevec & Tiggemann, 2010). As a result, research has suggested that appearance pressures may lead to appearance-changing strategies through increased investment in appearance (White & Halliwell, 2010).

Although research has been conducted to explain the relations between appearance pressures, appearance investment, and appearance-changing strategies (e.g., White & Halliwell, 2010), there are several gaps in our knowledge. First, with the exception of a recent study among Flemish adolescent girls (Vandenbosch & Eggermont, 2012), research has nearly exclusively focused on the effects of appearance pressures from traditional media, notably TV and magazines, and face-to-face communication (e.g., Slevec & Tiggemann; White & Halliwell, 2010). However, adolescents nowadays frequently use the internet to communicate and seek entertainment, in particular on social network sites, such as Facebook (Lenhart, Purcell, Smith, & Zickuhr, 2010). Social network sites may form a new appearance
pressure, because evaluating one's own and others' physical attractiveness is an important part of social network site use (Ringrose, 2011; Siibak, 2009, 2010). Therefore, social network site use may influence adolescents' appearance investment and attitudes toward cosmetic surgery.

Second, most research regarding appearance pressures, appearance investment, and appearance-changing strategies has focused on girls and women because females seem to experience greater appearance pressures than males do. However, males also perceive appearance pressures and it is unclear if, among males, such pressures result in similar appearance-changing strategies through comparable processes (Moradi, 2010). Thus, research that assesses and compares such processes in males and females is necessary to fully understand the effects of appearance pressures and the role of gender. Third, to date most research linking appearance pressures, appearance investment, and appearance-changing strategies has been cross-sectional (e.g. Slevec & Tiggemann, 2010; Vandenbosch & Eggermont, 2012, White & Halliwel, 2010). As a result, the causal directions of the effects remain unclear.

In the current study, we aim to address these three gaps. Specifically, the goal of the current study was to investigate, in a longitudinal design, the relationship between social network site use, appearance investment, and desire to undergo cosmetic surgery among Dutch adolescents (age 11-18), and to compare the experiences of boys and girls. In this way, the current study aims to advance our understanding of the effects of media and communication on adolescents' body modification strategies.

**Objectification Theory**

One theoretical framework for the investigation of the impact of adolescents' social network site use and the pertinent appearance pressures on appearance-changing strategies is objectification theory (Fredrickson & Roberts, 1997). We chose objectification theory as a basis for the current study for three reasons. First, objectification theory fits our research aims as it predicts links between appearance pressures, appearance investment, and appearance-changing strategies (Fredrickson & Roberts, 1997; Moradi, 2010). Second, the main tenets of objectification theory have received consistent empirical support (Aubrey, 2006; Moradi & Huang, 2008; Parent & Moradi, 2011). Third, objectification theory has been shown to be applicable to adolescents and adults, to males and females, and to persons from different cultural backgrounds (Moradi, 2010; Slater & Tiggemann,
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We therefore expected objectification theory to be applicable to adolescent boys and girls in the Netherlands.

Objectification theory posits that objectification, that is, when a person is valued primarily in terms of his/her physical attractiveness, leads to viewing the self in an objectifying way (Fredrickson & Roberts, 1997). Objectification can be direct or indirect. Direct objectification entails that a person is valued predominantly based on her/his appearance. Indirect objectification, in turn, entails viewing another person who is valued predominantly based on appearance. Within objectification theory, appearance pressures can be seen as a form of objectification (Moradi, 2010). For example, adolescents’ scrutinizing each other’s appearance by teasing those who do not fit the appearance norms constitutes a form of direct objectification. Indirect objectification occurs, for example, when adolescents view idealized airbrushed pictures of slim models in magazines.

Appearance Pressures on Social Network Sites

Although not yet empirically documented, it is plausible that social network sites exert appearance pressures on their users. Generally, the visual, picture-oriented character of social network sites, along with the possibility to post comments, invites users to view and comment on the personal pictures that other users present on their profiles (Pempek, Yermolayeva, & Calvert, 2009). The profile owners’ physical appearance seems to play an important role when other social network site users look at, and comment on, these pictures (Ringrose, 2011; Siibak, 2009; Wang, Moon, Kwon, Evans, & Stefanone, 2010). For example, in a survey among Estonian adolescents, participants reported good looks as the most relevant factor determining popularity on social network sites (Siibak, 2009).

The strong focus on physical appearance on social network sites may result in appearance pressures that can be experienced in two ways. First, adolescents who present themselves in a profile on a social network site are directly subjected to the objectifying gaze and comments of other users. For example, British teenage girls who were interviewed about their experiences on a social network site reported that they frequently received remarks about their physical attractiveness through their social network site profile (Ringrose, 2011). Second, adolescents may witness that others are subjected to an objectifying gaze on social network sites. Such indirect appearance pressures may occur, for example, when adolescents read others’ comments about a friend’s appearance.
The appearance pressure that social network sites may exert on adolescents is also reflected in adolescents’ behavior on social network sites. For example, in a survey among Estonian adolescents (Siibak, 2009), “good looks” was the most often named criterion for choosing a certain social network site profile picture. Furthermore, most young adults, especially females, “untag” pictures of themselves if they are unhappy with their appearance in a photo that was uploaded by a friend (Pempek et al., 2009). Some adolescents also edit their photos to create a physically attractive image of themselves on social network sites (Ringrose, 2011). In sum, existing research suggests that social network sites may constitute an appearance pressure for adolescents.

**Appearance Pressures and Cosmetic Surgery**

Objectification theory predicts that appearance pressures, exerted for example by peers and the media, lead people to engage in appearance-changing strategies, such as dieting and excessive exercise (Fredrickson & Roberts, 1997; Moradi, 2010). In several studies appearance pressures have also been associated with cosmetic surgery attitudes and the propensity to undergo cosmetic surgery (Australia: Slevec & Tiggemann, 2010; UK: Calogero, Pina, Park, & Rahemtulla, 2010; US: Henderson-King & Brooks, 2009). However, existing research on appearance pressures and cosmetic surgery attitudes and intentions has focused exclusively on adults. To our knowledge, no research has tested if appearance pressures also increase adolescents’ desire to undergo cosmetic surgery. This is surprising because appearance pressures have been found to predict other appearance-changing strategies among adolescents, such as dieting behaviors among adolescent boys and girls and exercise behaviors among adolescent boys (Australia: McCabe & Ricciardelli, 2003; Hungary: Papp, Urbán, Czeglédi, Babusa, & Túry, 2013; US: Shroff & Thompson, 2006). It therefore seems likely that appearance pressures also predict the desire to undergo cosmetic surgery among adolescents. Specifically, as social network sites are likely to exert appearance pressures, adolescents’ use of such sites can be expected to increase their desire to undergo cosmetic surgery.

**Appearance Pressures and Appearance Investment**

Objectification theory also predicts that appearance pressures result in increased importance of appearance and increased behavior and thought centering on appearance. In other words, appearance pressures may lead to increased appearance investment. Research among adolescents and adults has
provided evidence for this prediction. For example, in a study among Australian women, appearance investment was found to be positively correlated with reading appearance-focused magazines (Slevec & Tiggemann, 2010). Similarly, among British adolescents, higher perceived pressures to lose weight and build muscle were associated with increased appearance investment (White & Halliwell, 2010). Furthermore, among female undergraduates in the US, appearance-related comments correlated positively with appearance investment (Herbozo & Thompson, 2006). In summary, theory and research among adolescents and adults indicate that appearance pressures may lead to appearance investment. Against this backdrop, we expected that more frequent social network site use, due to the pertinent appearance pressures associated with this use, would increase appearance investment among adolescents.

**Appearance Investment and Cosmetic Surgery**

Objectification theory further posits that if appearance is important to a person and his/her behavior and thought center around appearance, this person will be more likely to use appearance-changing strategies. Research among adults has confirmed that appearance investment is an important predictor of appearance-changing strategies. For example, appearance investment was positively associated with dietary restraint and exercise dependency among Canadian female undergraduates (Lamarche & Gammage, 2012). As cosmetic surgery is also an appearance-changing strategy, greater investment in appearance has also been found to be related to more positive attitudes about cosmetic surgery and a greater wish to undergo cosmetic surgery among both male and female adults (US: Frederick, Lever, & Peplau, 2007; Sarwer et al., 2005; Norway: von Soest, Kvalem, Skolleborg, & Roald, 2006).

Although research has consistently shown an association between appearance investment and cosmetic surgery desire among adults, no study to date has tested if appearance investment also predicts cosmetic surgery desire among adolescents. However, there is some tentative indication that the associations between appearance investment and appearance-changing activities established among adults may also hold among adolescents. Research in the UK, for example, has shown that adolescent boys and girls who reported greater investment in appearance also reported greater need for exercise (White & Halliwell, 2010). We therefore expected that appearance investment would predict cosmetic surgery desire among adolescents.
Effect of Social Network Sites on Cosmetic Surgery through Appearance Investment

If, as just outlined, appearance pressures predict appearance investment, and if, at the same time, appearance investment results in appearance-changing strategies, the influence of appearance pressures on appearance-changing strategies may be mediated by appearance investment. Research indeed suggests that appearance pressures impact appearance-changing strategies, including cosmetic surgery, through increased appearance investment. For example, among Australian adult women, appearance investment partially explained the link between magazine exposure and cosmetic surgery attitudes (Slevec & Tiggemann, 2010). Similarly, in a study among British adolescents, the effect of appearance pressures on a related appearance-changing strategy, namely compulsive need for exercise, also ran indirectly through investment in appearance (White & Halliwell, 2010). In line with these findings, we expected that the effect of social network site use on cosmetic surgery desire among adolescents would be mediated by increased investment in appearance. Specifically, we expected that adolescents’ more frequent social network site use would result in greater appearance investment, which would in turn result in greater desire for cosmetic surgery.

The Role of Gender: Direct Effects

Objectification theory was originally developed to describe the effects of the objectifying experiences of women (Fredrickson & Roberts, 1997). Women and girls were theorized to be judged more on the basis of their appearance than men and boys. In line with objectification theory, there is evidence from studies done in various countries that girls and women experience greater appearance pressures than boys and men. For example, Irish adolescent girls reported having more frequent conversations about appearance with their peers than boys (Lawler & Nixon, 2011). Similarly, Hungarian adolescent girls experienced greater appearance pressures from the media as well as from peers than boys (Papp et al., 2013). Finally, both US and Swiss girls felt greater media pressures to look physically attractive than boys (Ata, Ludden, & Lally, 2007; Knauss, Paxton, & Alsaker, 2008).

As described previously, objectification theory and previous research together predict that increased appearance pressures lead people to engage more in appearance-changing behaviors, including cosmetic surgery. As females are believed to experience more appearance pressures (Knauss et al., 2008; Lawler & Nixon, 2011; Papp et al., 2013), they may also be expected to be more inclined
to want to undergo cosmetic surgery. In line with this prediction, women have been shown to be more likely to consider cosmetic surgery than men both in the US (American Society of Plastic Surgeons, 2012b; Frederick et al., 2007) and in the Netherlands (Woertman & van den Brink, 2008). These gender differences in the desire to undergo cosmetic surgery among adults may be present already during adolescence, as can be concluded from related research on dieting (McCabe & Ricciardelli, 2001). We therefore expected that, compared to boys, adolescent girls would report greater desire for cosmetic surgery.

As appearance pressures are also related to greater investment in physical appearance (Herbozo & Thompson, 2006; Sievec & Tiggemann, 2010; White & Halliwell, 2010), the gender differences in appearance pressures may also translate into gender differences in appearance investment. In fact, compared to males, females consistently report higher levels of appearance investment in diverse samples, including Dutch adults (Woertman & van den Brink, 2008), US college students (Cash et al., 2004) and British adolescents (White & Halliwell, 2010). It, therefore, seems likely that appearance investment is higher among adolescent girls than among adolescent boys in the Netherlands too.

The Moderating Role of Gender

Initial evidence has emerged that the gender differences in appearance pressures experienced from traditional media and social interactions also occur on social network sites. Compared to males, females generally seem to be more strongly evaluated on the basis of their physical appearance on social network sites (US: Manago, Graham, Greenfield, & Salimkhan, 2008) and more attention is paid to females’ than males’ physical appearance on social network sites (US: Seidman & Miller, 2013). Possibly as a result of increased appearance pressures on social network sites, girls have also been found to invest more heavily into a favorable outer appearance on social network sites than boys (Siibak, 2009). In comparison to boys, the adolescent girls in Siibak’s (2009) Estonian sample were more likely to report good looks as the most important reason to choose the social network site profile picture. Furthermore, female students reported posting more pictures of themselves on their social network profile than their male peers (US: Pempek et al., 2009; Rui & Stefanone, 2013). In addition, compared with male students, female students were also more likely to “untag” photos of themselves that they did not like (US: Pempek et al., 2009; Rui & Stefanone, 2013). As girls thus seem to experience greater appearance pressures during their social network site use, we
expected that the aforementioned effect of frequency of social network sites use on appearance investment would be stronger among girls than boys.

Gender may also moderate the effects of appearance investment on cosmetic surgery. Generally, appearance modification strategies are gendered. While the ideal for men is to be muscular and low in body fat (Cafri et al., 2005), the ideal for women is to be curvaceously slim (Harrison, 2003). Consequently, adolescent girls experience more pressure to lose weight whereas adolescent boys experience more pressure to build muscle (UK: White & Halliwell, 2010; US: Ata et al., 2007). In contrast to the male ideal, the female ideal can usually not be obtained without surgical treatments, for example surgical enlargement of the breasts (Harrison, 2003). Therefore, a girl or woman who heavily invested in her appearance may have a greater desire to undergo cosmetic surgery than a man or boy who is invested in his appearance to the same extent. We therefore expected that the predicted effect of appearance investment on cosmetic surgery desire would be stronger among adolescent girls than among boys. In addition, because we expected stronger effects of social network sites on appearance investment as well as of appearance investment on cosmetic surgery desire among girls, we also expected that the indirect effect of social network site use on desire to undergo cosmetic surgery would be stronger among girls.

The Present Study
The present study focused on social network site use as a medium exerting a new appearance pressure for adolescents. More specifically, we explored the effects of social network site use on appearance investment and cosmetic surgery desire among adolescents in the Netherlands through a two-wave panel survey. The effects were explored for both boys and girls, with a special interest in how the main variables and their relations would be impacted by gender. Based on the theory and research described above, we formulated three sets of hypotheses. In the first set of hypotheses, we specified an effect of social network site use on desire to undergo cosmetic surgery through appearance investment:

H1a: As adolescents use social network sites more frequently, their desire to undergo cosmetic surgery will increase.

H1b-d: (b) As adolescents use social network sites more frequently, their appearance investment will increase, which in turn (c) will result in a greater desire to undergo cosmetic surgery. (d) The effect of adolescents’ use of social network sites on their desire to undergo
cosmetic surgery (see H1a) will thus at least partly be mediated by increased investment in appearance.

In our second set of hypotheses, we specified the main effects of gender on our focal variables:

H2a: Girls will report higher levels of desire to undergo cosmetic surgery than boys.
H2b: Girls will report higher levels of appearance investment than boys.

In our third set of hypotheses, we specified the moderating effects of gender on our focal influences:

H3a: The effect of frequency of social network sites use on appearance investment is stronger among girls than boys.
H3b: The effect of appearance investment on desire to undergo cosmetic surgery is stronger among girls than among boys.
H3c: The indirect effect of social network site use on desire to undergo cosmetic surgery through appearance investment is stronger among girls than among boys.

Method

Sample and Procedure

The current study is a secondary analysis of a two-wave panel survey conducted by the Netherlands Youth Institute (Nederlands Jeugdinstituut) and Rutgers WPF (Dutch Expert Centre on Sexuality) in 2008 and 2009. The survey investigated adolescents’ (sexual) media use, sexual attitudes and behaviors, and body image. A screening questionnaire was sent to all 3,160 members of the Intomart GfK panel who had at least one child between the ages 11 and 18. Intomart GfK is an online access panel, which consists of 25,000 members who have indicated to be willing to participate in surveys. Intomart recruits their sample across the whole Netherlands, in this way increasing generalizability in comparison with convenience samples. Internet access in the Netherlands was 98% among people under 25 (Centraal Bureau voor de Statistiek, 2012). Therefore, a coverage bias due to the online nature of the survey is unlikely.

Of the contacted parents, 50.6% responded, filled out the screening completely and gave Intomart GfK permission to contact their child. Subsequently, 1,600 adolescents received an invitation to participate in the survey in July through
September 2008. Of these 1,600 adolescents, 1,294 adolescents (80.9%) completed this first questionnaire. In December 2009, the adolescents who had completed the first questionnaire and had indicated that they were willing to participate again in the second wave were contacted with a request to complete a questionnaire similar to the first. In total, 604 adolescents completed all measures that were of interest for the current study at both time points, which equaled a retention rate of 54.2% across the two waves. Respondents who did not complete the second survey differed from respondents who completed the survey at both time points only in one respect: they were four months older on average, \( t(1292) = -3.32, p = .001 \). There were no differences between these two groups in terms of gender, \( t(1292) = .082, p > .05 \), or level of education, \( t(1292) = -1.09, p > .05 \). The age of the adolescents who completed the survey at both time points ranged between 11 and 18 (\( M = 14.7, SD = 1.7 \) at time 1). This sample did not deviate from official Dutch population statistics in terms of gender (50.7% girls). However, adolescents who attended higher levels of education and adolescents whose parents were born in the Netherlands were over-represented in the sample.

Measures

Social network site use. Adolescents’ frequency of social network site use was measured with the question: “How often did you visit Hyves.nl in the past six months?” Hyves.nl was the most popular social network site among Dutch adolescents at the time the study was conducted (Mijn Kind Online, 2009). In its goal, set-up, and technological possibilities, Hyves.nl is comparable to Facebook. The response options ranged from 0 (never) to 4 (always) (\( M = 2.4, SD = 1.5 \) at time 1; \( M = 2.6, SD = 1.4 \) at time 2).

Appearance investment. Appearance investment was assessed by a Dutch translation of the Appearance Orientation subscale of the Multidimensional Body-Self Relations Questionnaire (Cash, 1994; Woertman & van den Brink, 2008), a measure which has shown excellent reliability and validity (Brown, Cash, & Mikulka, 1990). The 12-item scale measures cognitive-behavioral investment in physical appearance by assessing how important the own physical appearance is to the respondent, and to what degree behavior and thought centers around appearance (Thompson, 2004). The scale includes items, such as: “It is important that I always look good,” and, “I check my appearance in the mirror whenever I can.” The response options ranged from 0 (definitely disagree) to 4 (definitely agree). Therefore scores could range between 0 and 48, with higher scores indicating
that the participant is more invested in how he or she looks and undertakes more behaviors to optimize this appearance. Cronbach’s alpha was .91 at both time points ($M = 24.6, SD = 9.3$ at time 1; $M = 25.1, SD = 8.9$ at time 2).

**Desire to undergo cosmetic surgery.** To measure participants’ desire to undergo cosmetic surgery, they were asked: “If you could let a cosmetic surgeon change something about your appearance free of charge, would you do it?” A comparable question has successfully been used in earlier research in the Netherlands (Woertman & van den Brink, 2008, 2009). The response categories ranged from 0 (**definitely not**) to 4 (**definitely**) ($M = .98, SD = 1.1$ at time 1; $M = .87, SD = 1.0$ at time 2).

**Data Analysis**

In an initial exploration of our hypotheses, we first analyzed the zero-order correlations between social network site use, appearance investment and cosmetic surgery at both time points. We then tested our hypotheses more rigorously using structural equation modeling (SPSS, AMOS version 19). The 12 items of the appearance investment measure were combined into three parcels using the item-to-construct balanced procedure suggested by Little, Cunningham, Shahar, and Widaman (2002). Items were parceled because this results in more parsimonious models and reduces the chance of double loadings, as well as the impact of sampling error (Little et al., 2002). Social network site use, desire to undergo cosmetic surgery, and gender were included into the models as manifest variables because these measures consisted of only one item.

The modeling followed recommendations by Cole and Maxwell (2003) for testing indirect effects in structural equation models. In line with these recommendations, previous levels of the focal variables were included in the models. This procedure considerably reduces the chance of obtaining spurious influences because, by including autoregressive effects, the model controls for past behavior and thus increases the validity of the influence of the predictor variable at time one on the outcome variable at time two (Cudeck, 1991; Gollob & Reichardt, 1991).

Shapiro-Wilk tests showed that our data were not normally distributed. Therefore the assumption of multivariate normality required for the traditional parametric tests was not met. The bootstrapping method is often used to alleviate statistical problems which may arise from the violation of the assumption of normality (Efron & Tibshirani, 1993). We therefore applied the bootstrap method (1,000 bootstrap samples, $N = 604$ each) to the model and report both the
results of the parametric tests and the bootstrap bias–corrected and accelerated 95% confidence intervals of the bootstrap procedure for the estimates. We only accepted an estimate as significant if both the parametric test and the bootstrapping indicated a significant difference from zero.

Results

Descriptive Statistics

Descriptive information and gender differences regarding the main variables are displayed in Table 1.

<table>
<thead>
<tr>
<th></th>
<th>SNS use</th>
<th>Appearance investment</th>
<th>Desire to undergo cosmetic surgery</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Time 1</td>
<td>Time 2</td>
<td>Time 1</td>
</tr>
<tr>
<td>Girls</td>
<td></td>
<td></td>
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<tr>
<td>Boys</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>2.79***</td>
<td>2.03***</td>
<td>3.03***</td>
</tr>
<tr>
<td>SD</td>
<td>1.42</td>
<td>1.56</td>
<td>1.18</td>
</tr>
<tr>
<td>Minimum</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Maximum</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Girls</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Boys</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>27.05***</td>
<td>22.80***</td>
<td>.95*</td>
</tr>
<tr>
<td>SD</td>
<td>9.05</td>
<td>7.95</td>
<td>1.09</td>
</tr>
<tr>
<td>Minimum</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Maximum</td>
<td>48</td>
<td>43</td>
<td>4</td>
</tr>
</tbody>
</table>

Note. SNS use represents the frequency with which adolescent boys and girls visit social network site Hyves.nl (0 = never, 4 = always). Appearance investment is the degree to which adolescent boys and girls are focused on and behaviorally invested in their appearance (higher scores indicate greater investment in appearance). Desire to undergo cosmetic surgery represents the degree to which adolescent boys and girls indicated wanting to undergo cosmetic surgery if it was offered free of charge (0 = definitely not, 4 = definitely).

In addition to what is displayed in Table 1, it is interesting to note that at time 1 among boys 58.1% and among girls 79.1% visited the social network site “regularly” to “always”. At time 2 this was respectively: 66.5% and 87.3%. In contrast, at time 1 25.5% (time 2: 19.8%) of boys and 19.8% (time 2: 5.9%) of girls never used the social network site. At time 1, 7.4% of boys and 10.8% of girls reported that they probably or definitely would undergo cosmetic surgery if it was offered to them for free (4.7% of boys and 11.7% of girls at time 2). On the other hand, 77.2% of boys and 74.2% of girls reported definitely not or probably not wanting to undergo cosmetic surgery if it was offered to them for free (80.5% of boys and 70.9% of girls at time 2).
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Relations between Social Network Site Use, Appearance Investment and Cosmetic Surgery Desire

Table 2 Zero-Order Correlations

<table>
<thead>
<tr>
<th></th>
<th>SNS use</th>
<th>Appearance investment</th>
<th>Desire to undergo cosmetic surgery</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Time 1</td>
<td>Time 2</td>
<td>Time 1</td>
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<tr>
<td>SNS Use</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Time 1</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 2</td>
<td>.60***</td>
<td>—</td>
<td></td>
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<tr>
<td>Appearance</td>
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<td>investment</td>
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<td></td>
</tr>
<tr>
<td>Time 1</td>
<td>.28***</td>
<td>.30***</td>
<td>—</td>
</tr>
<tr>
<td>Time 2</td>
<td>.27***</td>
<td>.28***</td>
<td>.67***</td>
</tr>
<tr>
<td>Desire to undergo</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>cosmetic surgery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 1</td>
<td>.14**</td>
<td>.14**</td>
<td>.25***</td>
</tr>
<tr>
<td>Time 2</td>
<td>.14**</td>
<td>.19***</td>
<td>.21***</td>
</tr>
</tbody>
</table>

Note. * p < .05. ** p < .01. *** p < .001 (two-tailed)

As the zero-order correlations in Table 2 indicate, desire to undergo cosmetic surgery positively correlated with frequency of social network site use at and across time points, which is congruent with H1a. In line with H1b, frequency of social network site use and appearance investment were positively correlated, concurrently and over time. In line with H1c appearance investment was also significantly and positively correlated with desire to undergo cosmetic surgery, at and across both time points.

However, for a rigorous test of our first set of hypotheses, we tested the robustness and direction of the hypothesized relationships with the structural equation modeling techniques described in the methods section. To test H1a we first modeled the effect of social network site use at time 1 on cosmetic surgery desire at time 2, and of cosmetic surgery desire at time 1 on cosmetic surgery desire 2. This model achieved adequate fit, $\chi^2(df = 1, N = 604) = 2.154, p = .142$, CFI = .998, RMSEA = .044 (90% CI: .000/.127). In contrast with H1a, the effect of social network site use on cosmetic surgery desire was not significant, $\beta = .040$, $B = .027$, $SE = .004$, $p = .261$ (Bt bca 95% CI: -.021/.077).
H1b through H1d were tested in a second model. (For a simplified version, see Figure 1.) This model achieved an adequate fit, $\chi^2(df = 29, N = 604) = 67.76, p = .000, CFI = .991, RMSEA = .047 (90\% CI: .033/.062)$. The chi-square value was significant, but with samples greater than 200, the chi-square value tends to become significant easily (Byrne, 2001). The modeled effect of social network site use at time 1 on appearance investment at time 2 was positive and significant, $\beta = .066, B = .127, SE = .064, p = .046$. The bootstrap bias–corrected and accelerated 95% confidence interval (Bt bca 95% CI) ranged from .011 to .257. The CI does not include zero, thus indicating statistical significance. These results are in line with H1b. The effect of appearance investment at time 2 on cosmetic surgery at time 2 was also positive and significant, $\beta = .159, B = .055, SE = .013, p = .000$ (Bt bca 95% CI: .030/.080), which supports H1c. The hypothesized mediation effect of social network site use (time 1) on cosmetic surgery desire (time 2) through appearance investment (time 2) was also significant, $\beta = .011, B = .007, SE = .004, p = .021$ (Bt bca 95% CI: .001/.016), supporting H1d.
To check if there was an additional effect of social network site use on cosmetic surgery in addition to the hypothesized mediation effect through appearance investment, we modeled the direct effect of social network site use at time 1 on desire for cosmetic surgery at time 2. This direct effect was not significant, $\beta = .007, B = .005, SE = .024, p = .847$ (Bt bca 95% CI: -.044/.055). In addition, we compared the fit of two versions of model in Figure 1, namely when the direct path of social network site use on cosmetic surgery desire was constrained to 0 versus when this direct path was allowed to vary. The model with the constrained path did not lead to a significant change in fit, $\chi^2(1, N = 604) = .037, p = .847$, $\text{TLI}_{\text{change}} = -.001$. There was therefore no evidence of a direct effect of social network site use on cosmetic surgery desire.

**Gender Differences**

To test the second set of hypotheses, namely the main effects of gender, we first conducted t-tests. As predicted in H2a, girls reported greater desire to undergo cosmetic surgery on average compared with boys (time 1, $t(604) = 2.13$, $p = .033$; time 2, $t(604) = 4.10$, $p < .001$). Compared with boys, girls were also significantly more invested in their appearance, which is in line with H2b (time 1, $t(604) = 6.75$, $p < .001$; time 2, $t(604) = 6.50$, $p < .001$). In addition, adolescent girls on average visited social network sites significantly more frequently than boys did (time 1, $t(604) = 6.24$, $p < .001$; time 2, $t(604) = 7.74$, $p < .001$).

The results of the structural model also confirmed the hypothesized gender effects. In line with H2a, the modeled effect of gender on desire for cosmetic surgery (time 2) was significant, $\beta = .078, B = .159, SE = .073, p = .029$ (Bt bca 95% CI: .001/.322). The effect of gender on appearance investment (time 2) was also significant, $\beta = .070, B = .414, SE = .195, p = .034$ (Bt bca 95% CI: .017/.833), again supporting H2b. We also modeled the effect of gender on social network site use at time 2 to control for possible gender differences in social network site use. This effect was significant, with girls using social network sites more frequently than boys, $\beta = .164, B = .455, SE = .091, p < .000$ (Bt bca 95% CI: .275/.658).

**Moderation of Gender**

To test the third set of hypotheses, in which we specified the moderating effects of gender on our focal influences, we conducted multiple group analyses with gender as the grouping variable. We compared the unconstrained main model, illustrated in Figure 1, with three partly constrained models. Generally, when the
fits of the constrained and the unconstrained model differ significantly, the focal influence can be said to differ significantly between groups. In the first constrained model we constrained the path from social network site use (time 1) to appearance investment (time 2). In contrast to the prediction of H3a, the constrained model did not yield a significantly different fit than the unconstrained model, $\chi^2(1, N = 604) = .054, p = .816, \text{TLI}_{\text{change}} = - .001$. This suggests that the effect of social network site use on appearance investment was not moderated by gender.

To test H3b, which predicted that the effect of appearance investment on cosmetic surgery desire would be stronger among girls, we constrained the path of appearance investment (time 2) on cosmetic surgery desire (time 2) in a second model. The constrained model did not have a significantly different fit than the unconstrained model, $\chi^2(1, N = 604) = .117, p = .732, \text{TLI}_{\text{change}} = - .001$, contrary to the predictions of H3b. In the third constrained model, which tested whether the hypothesized indirect effect of social network site use on desire for cosmetic surgery through appearance investment would be stronger among girls (H3c), both previously mentioned paths were constrained. Again, fits of the constrained model and the unconstrained model did not differ significantly, $\chi^2(2, N = 604) = .171, p = .918, \text{TLI}_{\text{change}} = - .001$. H3c was not supported. In sum, the hypothesized influences were similar among female and male adolescents.

Additional Analyses

To obtain information about the robustness of our findings, we conducted four additional analyses. Due to space constraints, the results of the analyses described below will not be reported in detail here, but can be obtained from the corresponding author. First, to test if the effects would hold after controlling for possible relevant third variables, we ran the main model with control variables. We included age, internalization of sociocultural attitudes about appearance (the degree to which appearance norms in the media are used as a standard for the own appearance), BMI, and body satisfaction (all measured at time 1) as manifest variables, and modeled their influences on social network sites, appearance investment and cosmetic surgery desire at time 2. Previous research has suggested that these variables may confound the relationships between the key variables (Aubrey, 2006). We also modeled covariances among the key variables at time 1 and the control variables, as previous research has shown that these variables may correlate (McCabe & Ricciardelli, 2003). This model achieved a good fit and the analyses generally yielded a similar pattern of results as the main model, with
one exception. The influences of gender on social network site use, appearance investment and cosmetic surgery desire were not significant in the model with control variables.

Second, for hypothesis H1b, the hypothesized effect of social network site use on appearance investment, and H1c, the hypothesized effect of appearance investment on cosmetic surgery desire, the model in Figure 1 might produce biased results: The model includes more variables than the ones included in each of these hypotheses. Moreover, for the effect of appearance investment on desire for cosmetic surgery, a temporal order is missing as in Figure 1 only the time 2 values of the respective variables could be included, given the absence of a third wave. To test the hypotheses rigorously, we additionally estimated two separate autoregressive models: one in which only social network site use (time 1), appearance investment (time 1 and time 2) and gender (H1b) were included, and a second in which appearance investment (time 1), cosmetic surgery (time 1 and time 2) and gender (H1c) were included. Both models achieved adequate fits and generally elicited the same results as the analysis presented above.

Third, for an additional test of the third set of hypotheses, namely the moderating effects of gender, we conducted regression analyses. More specifically, the interaction between gender and social network site use (time 1) on appearance investment (time 2) (controlling for appearance investment at time 1) was included in a regression analysis as an additional test of H3a. Moreover, the interaction between gender and appearance investment (time 1) on desire for cosmetic surgery (time 2) (controlling for desire for cosmetic surgery at time 1) was included in a second regression analysis as an additional test of H3b. These regression analyses yielded the same results as the multiple group analyses.

Fourth, to test if the hypotheses and the resulting model were applicable to adolescents in general, or differed between specific age groups, we conducted multiple group analyses of the model in Figure 1, with age as the grouping variable. More specifically, the group was split into adolescents age 14 and younger (‘early adolescents’) and 15 and older (‘late adolescents’). The analyses revealed no moderating effect of age. In addition, we conducted the same regression analyses as described in the previous paragraph with age (instead of gender) as the moderating variable. Again, no moderating effect of age was found. Overall, these additional analyses, which used different models and statistical techniques, showed the robustness of our results.
Discussion

The current study is one of the first to explore the role that social network site use plays for outcomes related to adolescents’ body image. More specifically, the results of this longitudinal study among Dutch adolescents show that more frequent social network site use increases appearance investment among adolescents, and this increased appearance investment in turn augments their desire to undergo cosmetic surgery. In comparison with boys, girls reported more frequent use of social network sites, higher levels of appearance investment, and greater desire to undergo cosmetic surgery. However, in contrast to our expectations, the various effects of these variables on each other did not differ between boys and girls.

The findings of the present study provide at least three contributions to theory about appearance pressures and appearance-changing strategies. First, the study shows that appearance pressures can also be experienced online and are thus not constrained to face-to-face interactions and traditional media, which has been the focus of previous research. Second, the current study highlights increased appearance investment as an underlying mechanism for the effects of appearance pressures on appearance-changing strategies. We only investigated the effects of social network sites as an appearance pressure and cosmetic surgery as a body an appearance-changing strategy. However, there is some correlational evidence that the same process may occur for other appearance pressures and appearance-changing strategies (White & Halliwell, 2010). Third, the study contributes to knowledge about the role of gender: The findings suggest that the relationships between appearance pressures, appearance investment, and appearance-changing activities apply similarly to both adolescent boys and adolescent girls. However, the results also show that gender does impact the extent to which boys and girls experience appearance investment as well as their desire to engage in appearance-changing activities.

The findings of the present study also have a number of implications for research on adolescents’ body image development. Social network sites have come to play an important role in the lives of adolescents and young adults. A majority of US adolescents have a profile on at least one social network site (Lenhart et al., 2010), and Dutch adolescents spend on average 42 minutes per day on a social network site (SPOT, 2012). With the vast use of social network sites among adolescents, it is not surprising that previous research has shown that social network sites affect important aspects of adolescents’ development, such
as their relationships and self-esteem (Gentile, Twenge, Freeman, & Campbell, 2012; Valkenburg, Peter, & Schouten, 2006). The current study shows that social network sites may also play a role in adolescents’ body image, a central aspect of adolescent development. Our findings thus suggest that adolescents’ use of social network sites in general, and their self-presentation on such sites in particular, deserve more attention if we want to understand what affects adolescents’ body image development.

The findings that social network site use augments appearance investment and appearance-changing behaviors, may also have implications for the well-being of adolescents, especially for girls, who are more frequent users of social network sites and report higher levels of appearance investment and desire for cosmetics surgery than boys. If adolescents pursue their desire to engage in cosmetic surgery, this can sometimes have negative consequences for physical health and financial situations (Zuckerman & Abraham, 2008). Furthermore, the current findings may generalize to other appearance-changing strategies such as dieting and muscle-building. Previous research has suggested that these appearance-changing strategies, which are also predicted by appearance investment, result in negative affect (McCabe, Ricciardelli, & Banfield, 2001). Therefore, more frequent social network site use may increase adolescents’ negative affect through appearance investment and appearance-changing strategies. However, it is crucial that future research tests such ramifications rigorously before any conclusions are drawn.

In contrast to our expectations, the relationships between the variables were not moderated by gender. Apparently, social network site use may have the same consequences for the body image of boys and girls if used with similar frequency. One explanation for our unexpected findings may be that boys and men also experience appearance pressures. Studies done in countries as diverse as Ghana, Ukraine and the US have consistently shown that many men want to be more muscular (Frederick et al., 2007). Moreover, boys and men also seem to resort increasingly to sometimes unhealthy appearance-changing behaviors (Parent & Moradi, 2011). Finally, the lack of a moderation effect of gender in our study may result from specific gender beliefs in Dutch culture. According to Hofstede’s cultural dimension of masculinity/femininity, gender differences are less distinct in feminine cultures, such as the Netherlands, than in more masculine cultures, such as the US (Hofstede, 1998). Thus, if the same model is tested in the US or another more masculine culture, the effects of gender may be different.
Limitations and Future Directions

The results of our study need to be seen in the context of several limitations. First, because the current study tested the temporal relationships between three variables, a three-wave design would have been superior to our two-wave design. Our findings, therefore, need replication with more rigorous designs. Second, social network site use consists of many different activities, and experiences on social network sites differ between individuals. These activities and experiences may vary in the degree to which they put pressures on users to conform to appearance ideals. However, the current study only measured frequency of social network site use in general with one item. Third, we did not investigate which specific psychological processes underlie the relationship between social network site use and appearance investment and appearance-changing behavior. To better understand the role of social network site use in adolescents’ body image, future studies should investigate which specific aspects of social network site use trigger the processes that lead to appearance investment and appearance-changing behavior.

Fourth, the current study only investigated the effects of the use of one specific social network site, which was only popular in the Netherlands and has declined in popularity in the past years (Newcom Research & Consultancy, 2012). Conducting studies into the features and activities on online media rather than the use of one certain medium in general would increase the applicability of the research to the fast changing media landscape. Fifth, the current measurement of desire to undergo cosmetic surgery does not provide information on which types of cosmetic surgery are considered, for which reasons, and under which conditions. In addition, asking the respondent if he or she would consider cosmetic surgery if it was offered free of charge is suboptimal, as cosmetic surgery is in reality not offered for free. Future studies may thus consider a different measurement of desire to undergo cosmetic surgery. Sixth, the current study had a relatively low retention rate of 54.2%. However, the participants who completed both waves did not differ from participants who only completed one wave. Selective drop-out is therefore unlikely. Seventh, this study was only conducted among Dutch adolescents. In general, we can only fully understand the role of social network sites in body image if this research is extended to other populations, for example in terms of age, ethnicity and educational level, as demographical and cultural factors may impact the degree to which social network site use evokes appearance pressures and gender differences in this regard.
Our study is one of the first to test how social network sites and the pertinent appearance pressures are related to appearance investment and the desire to undergo cosmetic surgery. More research is needed to judge the robustness and generalizability of our findings. However, it seems safe to say that researchers, care-givers, and policy makers in the field of communication and body image should not discard the possibility that the use of online media such as social network sites may affect body-related outcomes among adolescent boys as well as girls.
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Chapter 3


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