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Adolescents' online appearance preoccupation: A 5-year longitudinal study of the influence of peers, parents, beliefs, and disordered eating

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ABSTRACT

Online behaviors, especially those concerning appearance preoccupation, have been related to poorer mental health, but early risk factors for online appearance preoccupation are not well understood. In this study, data were collected in the first years of adolescence (age 10–13 years) to investigate correlates of later online appearance preoccupation (ages 15–18 years). Drawing data from a longitudinal study, 261 Australian adolescents (48% male; $M_{age} = 12.0$, $SD = 0.89$) completed surveys to report on social pressures, personal beliefs and attitudes, and body change and eating behaviors at the start of the study (when age 10 to 13). They also reported their online appearance preoccupation (appearance comparison/presentation, and appearance-related activity) five years later at age 15 to 18. Results demonstrated that the most prominent risks for online appearance preoccupation and activity in later adolescence were social in origin. Specifically, appearance-related conversations with friends in early adolescence emerged as the most salient preceding risk factor for boys' and girls' online appearance preoccupation five years later. Also, there were distinct early risks in models estimated separately for boys and girls; these included parents' appearance-related attitudes and behaviors for boys and internalization of appearance ideals and emotional eating for girls.

1. Introduction

Adolescents report some of the highest social networking site use, with recent reports suggesting that over 95% of 13- to 17-year-olds in the USA use the internet daily and over a third of adolescents report almost constant use of at least one of five major online platforms (Vogels et al., 2022). With the surge of social networking sites and use, researchers have become increasingly interested in the impacts of various online behaviors on young peoples' mental health and wellbeing. Of interest in the current study was identifying risk factors for one form of online behavior - adolescents' *online* appearance preoccupation. More generally, appearance preoccupation involves an anxious focus on and concern (i.e., preoccupation) with personal physical deficits that are often not noticeable to others, and is a term used to describe the time spent thinking negatively about one's own appearance (American Psychiatric Association, 2013). It shares salient features with appearance anxiety, or the fear of having one's appearance negatively evaluated by others (Levinson et al., 2013). It also covaries with appearance rejection sensitivity (appearance-RS), which involves anxious expectations of rejection, based on perceived appearance flaws (Park, 2007; Webb et al., 2017). When performed online and especially via social media, appearance preoccupation involves engaging in behaviors such as carefully formulating one's self-presentation, engaging in appearance comparisons with others, and other general appearance-related activities that include engaging with appearance-based content (Choukas-Bradley et al., 2022; Hawes et al., 2020; Zimmer-Gembeck, Hawes, & Pariz, 2021).

Although *online appearance preoccupation* is a relatively new concept in the social media and body image literature, there is growing evidence – both cross-sectional and longitudinal – that engagement in online appearance comparisons and judgements representative of online appearance preoccupation are associated with greater depression and social anxiety among adolescents (Fardouly et al., 2020; Hawes et al., 2020; Maheux et al., 2022). For instance, Nesi et al. (2021) reported positive associations between the use of strategies to maximize physical attractiveness in selfies online and depressive symptoms among

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adolescent girls and boys. Similarly, research has highlighted links between online appearance comparison and several appearance sensitivities, such as appearance anxiety or symptoms of body dysmorphic disorder (BDD) (Hawes et al., 2020; Seekis et al., 2020; Yang et al., 2020; Zimmer-Gembeck et al., 2022), body dissatisfaction (Cohen et al., 2017; Kim & Chock, 2015; Perloff, 2014), and appearance-RS (Hawes et al., 2020; Ryding & Kuss, 2020), as well as being associated with lower general life and appearance satisfaction (Fardouly et al., 2018; Frison & Eggermont, 2016). In a longitudinal study, Markey and Daniels (2022) outlined that appearance-focused use of social media among preadolescent girls was associated with more negative body image when compared to communication-focused use, echoing earlier findings of Cohen et al. (2017). Further, Bailey and Ricciardelli (2010) found that upward appearance comparison (i.e., comparing oneself to others who are believed to be better looking) is one of the strongest correlates of body dissatisfaction among adolescents, and Fardouly et al. (2017) demonstrated that online upward comparisons were associated with more negative outcomes (life satisfaction and mood) than in-person comparisons.

While online appearance preoccupation has received some research attention and demonstrates clear links with mental health *outcomes* among adolescents and young adults, there has been little longitudinal research that has been able to identify *early risk factors* for online appearance preoccupation itself. However, the broader body of research on body dissatisfaction, disordered eating, appearance anxiety, and appearance RS strongly suggests that social pressures, personal attitudes, and disordered eating- and body change-related behavior would be risks for online appearance preoccupation, which are amenable to intervention (see Bowker et al., 2013; Buhlmann & Wilhelm, 2004; Choukas-Bradley et al., 2022; Lavell et al., 2014, 2018; Levinson & Rodebaugh, 2012; Park et al., 2009; Veale, 2004; Webb et al., 2017; Zimmer-Gembeck et al., 2018; Zimmer-Gembeck et al., 2020). Thus, identifying which of these are early risk factors would help to identify adolescents who report elevated levels of online appearance preoccupation as they get older. Our aim in the current 5-year longitudinal study was to identify early risk factors, occurring at ages 10–13 years, for online appearance preoccupation measured five years later at ages 15–18 years. Such research is critical for developing targeted early intervention strategies and programs to mitigate future negative outcomes.

1.1. Teasing, pressure, modeling, and socialization by peers, parents and media

Messages from peers, parents, and the media about the importance of achieving ideals of appearance and body shape and size are known correlates of appearance anxiety and disordered eating (e.g., Buhlmann & Wilhelm, 2004; Webb et al., 2015; Zimmer-Gembeck et al., 2018). Adolescents who report more weight-related and other appearance teasing by parents, siblings, and peers also report more appearance anxiety symptoms compared to their peers without a history of teasing (Mastro et al., 2016). More broadly, the tripartite sociocultural influence model of body dissatisfaction and disturbed eating (Thompson et al., 1999) posits that the three domains of peers, family, and media can each be a source of clear and strong messages directed at children and adolescents about appearance ideals and expectations by which self-worth is measured. Testing this model for body dissatisfaction, Webb et al. (2017) found that appearance-related teasing by peers and parents, internalized pressure to be attractive to peers, and internalization of media ideals (i.e., incorporation and acceptance of socially defined – often unrealistic – ideals of attractiveness into one's own values and beliefs; Lawler & Nixon, 2011) were positively associated with appearance concerns (specifically, appearance-RS). Recently, we extended this research to focus on social pressures and online appearance preoccupation, finding that face-to-face teasing about appearance by peers was concurrently associated with online appearance preoccupation (Zimmer-Gembeck, Rudolph, et al., 2021).

Parents' attitudes and beliefs about appearance can also model or socialize their adolescents to place more value and attention on an ideal appearance or body. Supporting this model of parent modeling and socialization, parents' weight and eating behaviors and negative attitudes about their own bodies and appearance have been found to be positively related to child eating disturbances and poor appearance attitudes (Abraczinskas et al., 2012; Haines et al., 2008). Studies have shown that mothers' appearance-based self-objectification and materialistic behaviors and attitudes, as well as mothers' body dissatisfaction, are associated with their daughters' body dissatisfaction and appearance concerns, and mothers' attitudes correlate with their children's levels of body dissatisfaction when as young as 5–8 years old (Lowes & Tiggemann, 2003; Slater & Tiggemann, 2016).

Although peers and parents can each model and influence adolescents' values, attitudes and behavior, peers are an especially important socio-cultural influence for adolescents, perhaps especially during early adolescence (Rogers & Rosseau, 2022). However, as the time spent (both in person and online) with close friends and other peers increases throughout adolescence (Furman & Buhrmester, 1992; Furman & Shaffer, 1999; Zimmer-Gembeck et al., 2001), young people, especially adolescent girls but also adolescent boys, place considerable emphasis and value on the expectations and opinions or attitudes of their peers about appearance (Choukas-Bradley et al., 2022; Nesi et al., 2018). Thus, conversations or interactions with friends and other peers can frequently focus on appearance. Jones (2004) termed adolescents' conversations with friends about appearance (e.g., clothes, looks, body size, and attractiveness) as "appearance training," (p. 824) and suggested that such conversations both highlight the importance of appearance as an attribute, and encourage physical evaluation and comparison of the self to others.

Appearance-based interactions with peers, including conversations with friends and peer appearance teasing or criticism, as well as shared appearance norms, can also serve to reinforce appearance ideals, and have been found to be associated with body dissatisfaction and appearance-RS (Jones, 2004; Jones et al., 2004; Paxton et al., 1999; Webb & Zimmer-Gembeck, 2014). For example, research has consistently demonstrated that adolescents who report engaging in more frequent conversations about appearance with friends are more likely to endorse greater internalization of body and appearance standards that, in turn, are related to greater feelings of dissatisfaction with one's body (e.g., Clark & Tiggemann, 2006; Jones et al., 2004; Lawler & Nixon, 2011).

The media is also a strong source of sociocultural pressure to conform with idealized appearance stereotypes and standards. Notably, a meta-analysis of 77 experimental and correlational studies highlighted small to moderate effect sizes and supported the notion that exposure to media images depicting the thin ideal is related to body image concerns for women (Grabe et al., 2008). Body image concerns and dissatisfaction occur when one feels unable to conform to these standards (Shroff & Thompson, 2006; Stice & Whitenton, 2002; Thompson & Stice, 2001). Beyond social media, images in the media in general (e.g., television, movies) are also responsible for transmitting salient messages about appearance ideals, that attract adolescents' time and attention, especially for girls (Jones et al., 2004; Rousseau et al., 2018). Further, viewing advertisements featuring idealized appearance images has been linked with increased appearance anxiety (Monro & Huon, 2005; Trekels & Eggermont, 2017). Viewing appearance-based content in the media (Park et al., 2009; Webb et al., 2017), as well as in our data on appearance-based activity on social media, has also been associated with appearance-RS (Hawes et al., 2020; Zimmer-Gembeck, Hawes, & Pariz, 2021).

1.2. Internalization of ideals, body dissatisfaction, and body change and eating behaviors

In addition to examining the social pressures and message from parents, peers, and the media, there are four other factors that we examined as potential early risk factors for the emergence of online appearance preoccupation in late adolescence. These risk factors included two beliefs or attitudes – internalization of appearance ideals and body dissatisfaction, and two body change and eating behaviors – extreme body change behaviors (e.g., purging of food, bingeing on food, using pills and powders to change body size or shape) and emotional eating (overeating in response to negative affect; Webb et al., 2021; Zeeck et al., 2010). We examined internalization of appearance ideals and body dissatisfaction because, as also described in the previous section, theory and research highlight the role of *internalization* of messages of appearance ideals from peers, families, and the media in body dissatisfaction and appearance preoccupation. Furthermore, media exposure, body dissatisfaction and an internalized critical self-view have previously demonstrated concurrent and longitudinal associations with appearance anxiety, appearance-RS, and appearance preoccupation (Gerrard et al., 2021; Park et al., 2009; Trekels & Eggermont, 2017; Veale, 2004; Webb et al., 2017). There is also evidence that body dissatisfaction should be a risk for online appearance preoccupation; a positive relationship between body dissatisfaction and engagement with appearance-related social media content has been found in cross-sectional (Caso et al., 2020; Fox & Rooney, 2015; Veldhuis et al., 2020; Wang, 2019) and longitudinal research (Rousseau et al., 2017; Vandenbosch & Eggermont, 2016).

Not much is known about whether early adolescent body change- and eating-related behaviors, which usually involve disordered eating but could involve other behaviors to change weight or body shape, act as risk factors for appearance preoccupation (or related appearance concerns, such as appearance anxiety). However, internalization of appearance ideals and body dissatisfaction, which covary with body surveillance and body shame (Barlett et al., 2008; Butkowski et al., 2019; Grabe et al., 2008; Rodgers et al., 2015; Seekis et al., 2020; Vandenbosch & Eggermont, 2012), are all disturbances in attitudes and perceptions related to the body and appearance, which can lead to attempts to modify one's body or appearance through disordered eating behaviors such as purging or using pills or powders. For example, Levinson and Rodebaugh (2012) found that social appearance anxiety and fear of negative evaluation were uniquely associated with weight, eating, and shape concerns, which are known risk factors for eating disorders. For adolescents specifically, appearance anxiety and associated risk factors such as peer and parent appearance-related teasing have demonstrated links with disordered eating (Fairweather-Schmidt & Wade, 2017; Lavell et al., 2018; Shroff & Thompson, 2006; Webb et al., 2015). Foundational research on appearance-RS and eating found that university students or adults who reported more appearance-RS in association with poorer self-esteem, also reported more disordered eating such as food restriction and purging (Park, 2007; Park et al., 2010). Similar relationships exist for appearances-RS, with appearance-RS associated with more body change and disordered eating behaviors among adolescents (Bowker et al., 2013; Densham et al., 2017).

More closely related to online appearance preoccupation, Lonergan et al. (2020) found that increased photo investment on social media – towards one's own photos and the photos of others – was associated with greater odds of having anorexia nervosa, bulimia, and binge eating disorder. Moreover, in their review of studies of social media use and eating, Rounsefell et al. (2020) described the role of social comparison online in increased desire for body change, helping to explain the associations found between social media use and disordered eating. Overall, it is clear that there are associations between appearance-RS, appearance anxiety, and body change and disordered eating behaviors. Given these associations, disordered eating behaviors occurring in early adolescence, which have been found to covary with internalization of appearance ideals and body dissatisfaction, may also be early risk factors for later online appearance preoccupation.

1.3. Gender

It has been widely understood for decades that girls and women are often objectified and valued most for their appearance, which means it is almost impossible for girls to avoid the onslaught of messages that portray women as sexual objects, the enormous pressure to conform to appearance ideals, and the resulting internalization of these messages and pressure that result in women linking their appearance to their value and worth (Choukas-Bradley et al., 2022; Fredrickson & Roberts, 1997; Seekis et al., 2020; Veldhuis et al., 2020). Thus, it is not surprising that research finds girls and women are more anxious and preoccupied with their appearance relative to boys and men. During adolescence, girls report more appearance anxiety symptoms (Bjornsson et al., 2013; Enander et al., 2018; Veale et al., 2014), increases in social anxiety in general (Rief et al., 2006; Zimmer-Gembeck et al., 2018), and more appearance-RS (Bowker et al., 2013; Zimmer-Gembeck, Hawes, & Pariz, 2021) than boys. Further, relative to boys, girls report more body and appearance dissatisfaction (Thompson et al., 1999; Thompson & Lougheed, 2012; Vincent & McCabe, 2000; Wertheim et al., 2009) especially when influenced by media, relative to other social and personal influences (see Holland & Tiggemann, 2016 for a review). Negative body image and weight control behaviors are also known to disadvantage girls' psychological wellbeing (self-esteem and depressive symptoms) during adolescence more than boys (Vogt Yuan, 2010).

With regards to gendered patterns of problematic social media use, there is also some evidence of difference. For example, although there is research that suggests photo-based social media use is related to body dissatisfaction in both men and women (see Lonergan et al., 2020), our past research points to girls having more online appearance preoccupation than boys (Hawes et al., 2020; Zimmer-Gembeck, Hawes, & Pariz, 2021). Further, other research has found girls to have more problematic social media use overall (i.e., preoccupation, mood modification, tolerance, withdrawal, unsuccessful attempts to limit use and interpersonal conflict) than boys (Andreassen et al., 2016; Choukas--Bradley et al., 2022; Monacis et al., 2017). However, some research has reported no significant difference between boys' and girls' problematic social media use (Boursier et al., 2020).

The predominant focus on girls in past research can make it difficult to draw conclusions about gender differences in the risks for online appearance preoccupation (or appearance-related social media use). Yet, evidence is mounting that girls and boys are concerned and engaged in appearance-related activities online, but that there are also important differences. For instance, Baker et al. (2019) outlined that adolescent boys and girls experience distinct, gender-specific appearance ideals and facets of body dissatisfaction, including the masculine ideal of lean muscularity among boys, versus the thin-ideal (or thin/fit ideal; Uhlmann et al., 2020) among girls. It appears that gendered norms and appearance ideals translate to online spaces; in a study by Yau and Reich (2019), adolescent boys reported conveying masculinity and muscularity in their photos on social media, whereas girls report actively engaging in efforts to create attractive or 'favorable' self-presentations online, by taking more time to choose and edit photos. Although there has been a rapid increase in studies that have explored appearance-related concerns among boys (or among both girls and boys), there remains a need for more consideration of gender.

1.4. Overview of the current study

In summary, research across many areas of adolescent development, body image, and social media use patterns suggests that online appearance preoccupation will co-occur with a range of appearance-focused social interactions, overidentification with and internalization of appearance ideals, body dissatisfaction, body change strategies, and

disordered eating behaviors. However, there is no research that has determined whether these social influences, attitudes, body dissatisfaction, and body change- and eating-related behaviors are also early risk factors for online appearance preoccupation behaviors in later adolescence. Indeed, only one recent longitudinal study that we conducted has considered online appearance preoccupation as an outcome of prior experiences – specifically focusing only on peer appearance teasing and victimization in a 1-year longitudinal study of both high school and university students (Zimmer-Gembeck, Rudolph, et al., 2021). Thus, the general aim of the current study was to identify risk factors measured in the first years of adolescence (early risk factors, ages 10–13 years) for online appearance preoccupation measured five years later (ages 15–18 years). We focused only on early risks that may be targeted by interventions for adolescents, an already high-risk period for appearance concerns and body image disturbances (Shagar et al., 2017; Voelker et al., 2015; Zimmer-Gembeck, Hawes, & Pariz, 2021). We hypothesized that, when more elevated, all measured social influences, attitudes, and body change- and eating-related behaviors would incur risk for adolescents' online appearance preoccupation later in adolescence (Hypothesis 1). Yet, considering peers are a salient force in adolescence (Furman & Buhrmester, 1992; Furman & Shaffer, 1999; Zimmer-Gembeck et al., 2001), the abundance of research on the positive correlations between victimization and teasing, appearance anxiety and appearance-RS (Mastro et al., 2016; Schmidt & Martin, 2019; Webb et al., 2015, 2017; Zimmer-Gembeck et al., 2018), as well as our findings of longitudinal associations between face-to-face victimization and both offline and online appearance preoccupation (Zimmer-Gembeck, Rudolph, et al., 2021), we hypothesized that teasing and victimization by peers about appearance would be the most salient risk factor (Hypothesis 2). Finally, considering the literature on body dissatisfaction, appearance anxiety, appearance-RS, and appearance preoccupation already highlights the imbalance between boys and girls, we expected to identify a wider range of significant risk factors for girls compared to boys (Hypothesis 3).

2. Method

2.1. Participants

Participants were 261 Australian students aged 10–13 years at T1 (48% male; $M_{age} = 12.0$, $SD = 0.89$) from three low to middle-high income urban schools who completed a survey at T1 or T2 and at T7 of a 7-wave longitudinal study conducted over five years. Most (84%) of the participants endorsed white Australian, 18% instead or in addition endorsed Asian, two endorsed Australian First Peoples/Torres Strait Islander/Pacific Islander, and 11 described other backgrounds. Parents also completed a short survey and 49% reported some university education, 30% reported some technical or other training after high school, and 21% reported no education after high school.

The participants were generally representative of the schools and the community from which they were drawn but had a slightly higher representation of girls and more educated families. The participating schools reported that their student population was approximately 52% boys, with 1% Australian First Peoples or Pacific Islander, and about 20% speaking a language other than English at home. They reported that 10% of students were in the lowest income quartile, 61% were in the middle two income quartiles, and 29% were in the highest income quartile. In the region, 64% of adults were born in Australia, 1.7% endorsed Australian First Peoples or Pacific Islander, 17% of adults had a university degree (18% Year-12 high school maximum, 12% Year-10 high school maximum, with 53% reporting some education beyond high school), and 45% were married.

Another 111 participants at T1 were not included in the study because they did not participate five years later. There were no significant differences in early risk factors when participants retained were compared to those who were not, $t(1, 371)$ ranged from −0.09 to 1.50, all $p > .135$. In addition, six participants were missing a total score for one or more measures, and given this small amount of missing data, these missing values were replaced with the mean of the other participants.

2.2. Procedure

Data were drawn from the first two waves and the seventh wave of a longitudinal study on adolescent social relationships and appearance concerns, which was conducted over the span of five years. The Griffith University Human Research Ethics Committee granted approval for the study (Protocol #2013/13). T1, T2 and T7 were used for this study, given our aim to examine early adolescent predictors (T1 and T2) of online appearance-related behaviors in middle and later adolescence (T7). The online behaviors that were the focus of this study were only measured at T6 and T7, with T6 used to pilot some new measures and T7 including the most comprehensive set of online behaviors of interest in this study (Zimmer-Gembeck, Hawes, & Pariz, 2021).

Local urban schools were contacted via email and telephone and the first three consenting schools were included in the study at T1. All students were eligible to participate, and students took consent forms home to their parents for completion and returned them to the school. Fifty eight percent of consent forms were returned, and 84% of these agreed to participate in the first three years of the longitudinal study (T1 to T5). No student with parent consent declined T1 participation. T1 to T5 surveys were completed during school time with research assistant supervision. The portions of the survey included in this study were completed in approximately 30 min. At T1, the height and weight of each participant was measured to calculate body mass index (BMI). A small gift (e.g., key ring) was given to students after each data collection session.

To reduce the time burden on schools and participants involved in this research, a planned missingness design (Little et al., 2014) was used for T1 and T2, whereby a subset of measures was administered to 50% of participants at either T1, reversing this at T2. There was a lag of 6 months between T1 and T2. In addition, some measures had to be shortened to reduce the length of the time commitment from the school at both T1 and T2. In this study, planned missingness involved the following measures: internalization of appearance ideals; emotional eating; parent, peer, and media pressures; social anxiety; and negative affect. To create a single complete set of early risk factor measures for this study, the single measure (collected at T1 or T2) was used when only one report was available. For all other measures, we averaged T1 and T2 item responses before forming total risk factor scores for use in this study. *We refer to these merged T1 and T2 datasets as Time 1 (T1) below*.

Following the first five times of data collection, all parents were recontacted to request consent for their children to participate in two additional waves of data collection; with T6 data collected two years after T5, and T7 collected one year after T6. Overall, 79% of parents consented; 55 participants could not be contacted, and 279 participants completed the survey at T6, and 261 at T7. For Time 7, *referred to as Time 2 (T2) below*, students from two schools completed the survey online (because of school preference) and students from the remaining school completed the survey in hard copy format at school in their regular classrooms under the supervision of research assistants. Each student received a $30 gift voucher for T7 participation.

2.3. Time 1 measures

2.3.1. Social influence measures

2.3.1.1. Appearance-related parental attitudes and behaviors. Six items from the Attitudes and Behavior Scale (ABS) were used to collect adolescents' reports of their parents' negative attitudes and behaviors regarding appearance (Baker et al., 2000). Item responses (e.g., "My

mum/dad worry about how they look") ranged from 1 (*never*) to 5 (*always*). Composite scores were formed by averaging items, with higher scores indicating more reports of negative attitudes and behaviors from parents, Cronbach's α = 0.77.

2.3.1.2. Peer and parent appearance teasing. Three items derived from the weight teasing subscale of the Perceptions of Teasing Scale (Thompson et al., 1995), which had been validated in our previous research (Webb & Zimmer-Gembeck, 2016), were used to assess the frequency of perceived appearance teasing by peers (two items; same-sex and other-sex) and parents (one item) and the associated distress. Items were revised to focus on appearance in general, rather than only weight ("make fun of or tease you about your weight or looks"). Regarding parents, participants reported how often parent(s) "tease you about your weight or looks." Frequency responses ranged from 1 (*never*) to 5 (*very often*). Distress ratings ranged from 1 (*not at all upset*) to 5 (*very upset*). The products of frequency and distress ratings were computed and items for peer teasing were averaged. Cronbach's α was 0.94 ($r = 0.89$) for peer teasing items.

2.3.1.3. Appearance-related sociocultural pressure. Eight items from the Perceived Sociocultural Pressure Scale (PSPS) were used to measure perceived sociocultural pressure to conform to appearance ideals, with items tapping pressure from peers (four-items, α = 0.85), family (two-items, α = 0.80, $r = 0.66$), and the media (two-items, α = 0.82, $r = 0.69$) (e.g., "I've felt pressure to look good from people in my family"; Stice & Agras, 1998). Item responses ranged from 1 (*none*) to 5 (*a lot*). Composite scores were formed by averaging items, with higher scores indicating more perceived pressure.

2.3.1.4. Appearance-related conversations with friends. Six items from the Appearance Conversations with Friends Subscale were used to measure how frequently bodies and appearance-related issues were discussed with friends (e.g., "My friends and I talk about how we look in our clothes"; Jones et al., 2004). Item responses ranged from 1 (*never*) to 5 (*very often*). Composite scores were formed by averaging items, with higher scores indicating more frequent conversations with friends, Cronbach's α = 0.93.

2.3.2. Personal beliefs and attitudes measures

2.3.2.1. Internalization of appearance ideals. Six items from The Sociocultural Attitudes Toward Appearance Questionnaire (SATAQ; Heinberg et al., 1995) were modified to reflect both male and female appearance ideals (Webb et al., 2014), and were used to assess internalization of media ideals (e.g., "I would like my body to look like the people who are in movies"; "I do not try to look like people on TV"- reverse). Reponses ranged from 1 (*strongly disagree*) to 5 (*strongly agree*) and a total score was formed by averaging all items, Cronbach's α = 0.84.

2.3.2.2. Body dissatisfaction. The widely used, shortened, 12-item self-report Body Image Ideals Questionnaire (BIQ) was used to examine the discrepancies and importance of internalized physical ideal characteristics (Cash & Szymanski, 1995). Six-items, with responses measured on a 4-point Likert scale (0 = *exactly as I am* to 3 = *very unlike me*), focused on the discrepancy between the adolescents actual and ideal perception of six body parts (e.g., "My ideal complexion is"). The other six-items, with responses measured on a 4-point Likert scale (0 = *not important*, to 3 = *very important*), tapped into the importance of each body part (e.g., "How important to you is your ideal skin complexion?"). Pairs of responses were multiplied before forming a composite score as the average of the six multiplicative scores, with higher scores indicating more body dissatisfaction (i.e., a greater discrepancy between the perceived actual and ideal body), Cronbach's α = 0.84.

2.3.3. Eating and body change behaviors

3.3.3.1. Extreme body change behaviors. Drawn from the Eating Attitudes Test-26 (EAT-26; Garner et al., 1982), five items were used to measure extreme body change behaviors (; e.g., "Gone on eating binges where you feel that you may not be able to stop eating?"). Items asked about bingeing on food, purging food, use of laxatives, diet pills or diuretics, excessive exercise (>60 min/day) and consumption of pills or powders to reduce fat or change muscle mass. Participants were required to indicate the frequency with which they engaged in the behaviors over the past six months from 1 (*never*) to 6 (*once a day or more*). Averaging all items formed a total score to reflect average use of one or more of the behaviors. Cronbach's α = 0.41, confirming that these items tapped a range of behaviors that could occur on their own or in conjunction with other extreme body shaping behaviors.

2.3.3.2. Emotional eating. A five-item self-report subscale of emotional eating, from the Dutch Eating Behavior Questionnaire, measured the individuals desire to eat when experiencing emotional discomfort (van Strien et al., 1986). Responses to scale items (e.g., "Do you have a desire to eat when you are disappointed?") were measured on a 5-point Likert scale (1 = *never* to 5 = *very often*). Composite scores were formed by averaging items, with higher scores indicating greater frequency of emotional eating. Cronbach's α = 0.85.

2.3.4. Control variables: social anxiety, negative affectivity, and BMI

2.3.4.1. Social anxiety symptoms. Social anxiety symptoms were measured with the 18-item Social Anxiety Scale for Adolescents (SAS-A; La Greca & Lopez, 1998; e.g., "I worry what others say about me"). Response options for all items ranged from 1 (*not true*) to 5 (*very true*). The SAS-A contains items that focus on Fear of Negative Evaluation (8 items), Social Avoidance and Distress in New Situations (6 items), and General Social Avoidance and Distress (4 items). Items for each area were averaged and then the three subscale scores were averaged to produce a composite social anxiety symptom score, with higher scores indicating greater social anxiety symptoms, Cronbach's α = 0.92.

2.3.4.2. Negative affectivity. Negative affectivity was measured with the 13-item Short Mood and Feelings Questionnaire (SMFQ; Angold & Costello, 1987; e.g., "I felt lonely"). Response options for all items were modified from the original to range from 1 (*not true*) to 5 (*very true*), rather than the original 1 (*not true*) to 3 (*true*). This modification was made to integrate these items in a list of the SAS-A and to increase the precision of measurement given our purpose was to examine change and development. A total score was formed by averaging items, with scores indicating greater depressive symptoms, Cronbach's α = 0.92.

2.3.4.3. Body mass index. BMI (weight kg/height m^2) was calculated for each participant, using measurements taken individually. Each participant could select whether to 1) have their weight and height measured by a researcher in private or 2) to go behind a screen to step on a digital scale to measure their own weight and height using an easy-to-use digital scale and a wooden height ruler. If self-directed, the participant recorded their weight and height on a sheet of paper and handed the information to the researcher as they exited.

2.4. Time 2 measure (5 Years later) of online appearance preoccupation and activity

The 18-item Social Media Appearance Preoccupation Scale (SMAPS; Zimmer-Gembeck, Hawes, & Pariz, 2021) was used to measure online appearance preoccupation represented by two subscales: online appearance comparison and self-presentation (13 items; e.g., "I feel inadequate in appearance compared to my friends on social media," and

"I prefer to only upload photos of myself to social media where I look fit and healthy"), and appearance-related activity (five items; e.g., "When on social media I post, comment on, share or like content about staying fit and/or muscular"). Responses options ranged from 1 (*strongly disagree*) to 7 (*strongly agree*) with subscale scores calculated by averaging item scores. Cronbach's α = 0.91 for appearance comparison and presentation items, and α = 0.87 for appearance-related activity items.

3. Results

3.1. Descriptive statistics, gender differences, and correlations between all variables

Means (*M*s) and standard deviations (*SD*s) of all variables, for the total sample and separately for males and females, are presented in Table 1. Table 1 also reports the results of comparing boys and girls on all measures. Appearance preoccupation was above the mean possible score overall, whereas most risk factors were moderate to low, on average. Females, compared to males, reported more online appearance preoccupation. Females also scored higher on 9 of the 13 measured early risk factors. Females reported more peer and parent appearance teasing, peer and media pressure, conversations with friends about appearance, body dissatisfaction, internalization of appearance ideals, and emotional eating. Females were also higher in social anxiety symptoms and negative affectivity than males.

Appearance preoccupation and online appearance-related activity were each significantly positively associated with every risk factor measured five years earlier, as well as with social anxiety and negative affect (see Table 2). There were only two exceptions to this pattern: the associations of appearance-related activity with extreme body change behaviors and negative affect. Most of the risk factors, as well as social anxiety and negative affectivity, were also intercorrelated with each other, with the strongest associations between appearance-related social influence measures. Participant age and BMI were not significantly associated with T2 appearance preoccupation or T2 general online appearance-related activity but they were positively correlated with multiple T1 risk factors.

Given their associations with other measures at T1, age, BMI, social anxiety, and negative affectivity were included as covariates in the remaining analyses. Also, given gender differences, follow-up models were estimated for girls as separate from boys.

3.2. Unique risks for online appearance comparison/presentation

We used a series of four regression models to identify the early risk factors that were most strongly associated with appearance preoccupation five years later. In each model, we also included the T1 covariates of age, BMI, social anxiety, and negative affect. We fit a series of models to focus first on the social risk factors separate from beliefs and separate from body change- and eating-related risk factors. Thus, as can be seen in Table 3, we entered the social influence measures in the first model, the personal beliefs and attitudes measures (body dissatisfaction and internalization of appearance ideals) in the second model, and the two body change- and eating-related measures (extreme body change behaviors and emotional eating) in the third model. Finally, in a fourth model, we entered all possible risk factors (plus covariates) simultaneously.

Significant preceding risk correlates were found in each model and all models were significant. Parents' personal appearance attitudes, conversations with friends about appearance, body dissatisfaction, internalization of appearance ideals, and social anxiety symptoms were risk factors significantly associated with online appearance preoccupation across the first three models. In the final model entering all risk factors, which accounted for 26% of the variance in appearance comparison/presentation, adolescents' perceptions of their parents' personal appearance attitudes, reports of their conversations with friends about appearance, and social anxiety symptoms were uniquely associated with more online appearance preoccupation.

3.3. Unique risks for general online appearance-related activity

To identify the preceding risk factors that were most strongly associated with general appearance-related activity five years later, we estimated another four models following the same strategy as above (see Table 4). Again, early risk factors were found in each model and all models were significant. Conversations with friends about appearance, internalization of appearance ideals, emotional eating, and (intermittently) social anxiety symptoms were risk factors significantly associated with higher general online appearance-related activity across the first three models. In the final model entering all risk factors, which accounted for 17% of the variance in online appearance-related activity, only conversations with friends about appearance was uniquely associated with more online appearance-related activity.

Table 1
Means (M) and standard deviations (SD) of all measures and comparisons of boys and girls.

	Full sample (*N* = 261)		Boys (n = 124)		Girls (n = 137)		Comparison between Boys and Girls	
Measures	*M*	*SD*	*M*	*SD*	*M*	*SD*	*t(259)*	*p*-value
T2 Online appearance-related behaviors (age 15 to 18)								
Appearance preoccupation	3.37	1.49	2.70	1.23	3.97	1.44	−7.62	<.001
Appearance activity	2.57	1.39	2.25	1.22	2.86	1.48	−3.61	<.001
T1 Social influences (age 10–13)								
Parent appearance attitudes	2.04	0.65	1.98	0.63	2.09	0.65	−1.47	.142
Peer appearance teasing	5.02	7.45	4.02	5.42	5.92	8.81	−2.08	.039
Parent appearance teasing	3.15	3.78	2.63	3.18	3.61	4.21	−2.10	.037
Peer pressure	2.05	0.99	1.85	0.85	2.24	1.08	−3.22	.001
Family pressure	1.62	0.91	1.72	0.93	1.54	0.88	1.60	.110
Media pressure	1.77	1.01	1.56	0.87	1.96	1.08	−3.22	.001
Friend conversations	1.72	0.74	1.46	0.48	1.96	0.84	−5.82	<.001
T1 Beliefs and attitudes (age 10–13)								
Body dissatisfaction	0.91	1.73	0.56	1.14	1.22	2.09	−3.14	.002
Internalization	2.59	0.99	2.43	0.95	2.74	1.01	−2.60	.010
T1 Eating and body change behaviors (BCB) (age 10–13)								
Extreme BCB	1.33	0.42	1.33	0.38	1.33	0.46	−0.10	.925
Emotional eating	1.99	0.84	1.85	0.75	2.12	0.90	−2.68	.008
T1 Covariates (age 10-13)								
Social anxiety	2.17	0.78	1.95	0.64	2.37	0.84	−4.55	<.001
Negative affect	1.69	0.72	1.55	0.59	1.82	0.81	−3.12	.002
Body mass index	18.40	2.81	18.40	3.13	18.40	2.50	0.00	.987

Table 2
Correlations between all measures (N = 261).

	Measures	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	T2 App Pre	–															
2	T2 App Act	.59***	–														
3	Parent att	.27***	.17**	–													
4	Peer teasing	.25***	.17**	.17**	–												
5	Parent teasing	.17**	.15*	.30***	.43***	–											
6	Peer press	.35***	.28***	.29***	.41***	.31***	–										
7	Family press	.13*	.15*	.23***	.34***	.27***	.46***	–									
8	Media press	.29***	.15*	.20**	.36***	.18**	.64***	.42***	–								
9	Friend conv	.41***	.34***	.21**	.28***	.18**	.64***	.21**	.49***	–							
10	Body dis	.33***	.17**	.33***	.42***	.37***	.47***	.23***	.36***	.39***	–						
11	Internalization	.27***	.22***	.15*	.35***	.24***	.47***	.24***	.49***	.46***	.31***	–					
12	Extreme BCB	.17**	.11	.27***	.40***	.23***	.28***	.34***	.31***	.27***	.29***	.30***	–				
13	Emotional eat	.18**	.19**	.26***	.23***	.17**	.36***	.29***	.36***	.31***	.31***	.23***	.31***	–			
14	Social anxiety	.32***	.19**	.26***	.44***	.39***	.39***	.27***	.36***	.34***	.42***	.28***	.20**	.30***	–		
15	Neg affect	.23***	.09	.21***	.50***	.34***	.46***	.33***	.49***	.38***	.48***	.31***	.31***	.39***	.45***	–	
16	Age	.04	.06	.14*	.07	−.04	.21***	.07	.17**	.23***	.18**	.14*	.07	.10	.06	.08	–
17	BMI	.10	.07	.23***	.17**	.23***	.13*	.25***	.16*	.08	.34***	.17**	.36***	.12	.09	.15*	.23***

*$p < .05$. **$p < .01$. ***$p < .001$.
Note. T2 = age 15 to 18. All other measures were completed at T1 (age 10–13). BCB = Body change behaviors. App Pre = appearance preoccupation. App Act = appearance activity. Att = attitudes. Press = pressure. Conv = conversations. Dis = dissatisfaction. Eat = eating. Neg = negative. BMI = Body mass index.

3.4. Risk factors associated with boys' online appearance behaviors

Table 5 summarizes the results of two models for boys only – the first regressed online appearance preoccupation and the second regressed online appearance-related activity on all preceding risk factors and the covariates. There were unique risk factors in each model: Boys who perceived that their parents had more negative attitudes about their personal appearance reported more appearance preoccupation five years later, and boys who perceived that their parents had more negative attitudes about their personal appearance, and who had more friend conversations about appearance, reported more online appearance-related activity five years later.

3.5. Risk factors associated with girls' online appearance behaviors

Table 6 summarizes the results of the same two models as above for girls only. In the first model, girls who reported more friend conversations about appearance reported more appearance preoccupation five years later. In the second model, girls who reported more friend conversations, more internalization of appearance ideals, and more emotional eating reported more online appearance-related activity five years later. Girls who reported more media pressure to confirm to appearance ideals reported less online appearance-related activity five years later.

4. Discussion

This is the first 5-year longitudinal study that has consolidated information on social influences, beliefs, and body change- and eating-related behaviors as early risks (at ages 10–13 years) for online appearance preoccupation and, separately, for appearance-related activity more generally. These online behaviors were measured at ages 15–18 years, which was five years following the measurement of all preceding risk factors. We founded the study aims on theory (e.g., Thompson et al., 1999) and research (Hawes et al., 2020; Webb et al., 2015; Zimmer-Gembeck, Hawes, & Pariz, 2021) that point to the many risks and negative correlates of appearance anxiety, body dysmorphic symptoms, and appearance-RS, reasoning that these would share common risk factors with online appearance preoccupation because they all share the common thread of preoccupation with valuing appearance for personal and social worth. Using this reasoning, we identified social experiences and interactions, personal beliefs and attitudes, and body change- and eating-related behaviors as potential early risk factors preceding online appearance preoccupation measured five years later.

4.1. Early risks for online appearance preoccupation and appearance-related activity

As hypothesized, all measured social influences, beliefs, and disordered body-change and eating behaviors were correlated with later online appearance preoccupation, and all but one (extreme body change behavior) were positively associated with later general online appearance-related activity. Moreover, the early risks measured in the current study were also quite intercorrelated with each other (as suggested in previous research, including Clark & Tiggeman, 2006; Grabe et al., 2008; Jones et al., 2004; Lavell et al., 2018; Fairweather-Schmidt & Wade, 2017; Slater & Tiggeman, 2016). Thus, these interrelations suggest that young adolescents who are feeling teased or pressured about their appearance, are also more likely to be embedded in a social world that is more focused on appearance generally: moreover, they are more dissatisfied with their bodies and more likely to internalize the messages they hear about appearance ideals, and they lean towards engaging in extreme behaviors to change their bodies and they may engage in emotional eating. They also may be more socially anxious and negative in mood. Thus, taken together, social influences, beliefs, and body change- and eating-related behaviors co-occur and young

Table 3
Results of regressing appearance preoccupation (social comparison and self-presentation) on social risks, beliefs and attitudes, and eating-related risks (N = 261).

Independent variables	Model 1			Model 2			Model 3			Model 4		
	$R^2 = .25$			$R^2 = .17$			$R^2 = .12$			$R^2 = .26$		
	$F(11,249) = 7.57, p < .001$			$F(6,254) = 8.70, p < .001$			$F(6,254) = 5.92, p < .001$			$F(15,245) = 5.71, p < .001$		
	B	*SE (B)*	β	*B*	*SE (B)*	β	*B*	*SE (B)*	β	*B*	*SE (B)*	β
Age	−0.14	0.10	−.09	−0.06	0.10	−.04	0.00	0.10	.00	−0.17	0.10	−.10
Body mass index	0.02	0.03	.05	−0.01	0.03	−.01	.02	.03	.03	0.01	0.03	.02
Social anxiety	0.29	0.13	.15*	0.37	0.13	.19**	0.50	0.13	.26***	0.26	0.13	.14*
Negative affect	−0.09	0.15	−.05	0.00	0.14	.00	0.14	0.14	.07	−0.13	0.15	−.06
Parent attitudes	0.39	0.14	.17**							0.38	0.14	.16**
Peer teasing	0.02	0.01	.09							0.02	0.02	.08
Parent teasing	−0.02	0.03	−.04							−0.02	0.03	−.05
Peer pressure	0.10	0.13	.07							0.06	0.14	.04
Family pressure	−0.11	0.11	−.07							−0.10	0.11	−.06
Media pressure	0.07	0.11	.05							0.06	0.12	.04
Friend conversation	0.59	0.15	.29***							0.57	0.16	.28***
Body dissatisfaction				0.17	0.06	.21**				0.10	0.06	.11
Internalization				0.24	0.09	.16*				0.06	0.10	.04
Extreme BCB							0.25	0.24	.07	−0.08	0.24	−.02
Emotional eating							0.09	0.12	.05	−0.03	0.11	−.02

*$p < .05$. **$p < .01$. ***$p < .001$.
BCB = Body change behaviors.

Table 4
Results of regressing appearance-related activity on social risks, beliefs and attitudes, and eating-related risks (N = 261).

Independent variables	**Model 1**			**Model 2**			**Model 3**			**Model 4**		
	$R^2 = .16$			$R^2 = .07$			$R^2 = .06$			$R^2 = .17$		
	$F(11,249) = 4.16, p < .001$			$F(6,254) = 3.37, p = .003$			$F(6,254) = 2.76, p = .013$			$F(15,245) = 3.30, p < .001$		
	B	***SE (B)***	**β**	***B***	***SE (B)***	**β**	***B***	***SE (B)***	**β**	***B***	***SE (B)***	**β**
Age	−0.05	0.10	−.03	0.02	0.10	.01	0.05	0.10	.03	−0.05	0.10	−.04
Body mass index	0.01	0.03	.01	0.00	0.03	.00	0.01	0.03	.02	0.01	0.03	.03
Social anxiety	0.11	0.13	.06	0.24	0.13	.13	0.29	0.12	.16*	0.09	0.13	.05
Negative affect	−0.27	0.15	−.14	−0.13	0.14	−.07	−0.12	0.14	−.06	−0.30	0.15	−.15[1]
Parent attitudes	0.16	0.14	.08							0.17	0.14	.08
Peer teasing	0.01	0.01	.07							0.02	0.02	.09
Parent teasing	0.01	0.03	.03							0.01	0.03	.03
Peer pressure	0.12	0.13	.08							0.10	0.14	.07
Family pressure	0.08	0.11	.05							0.08	0.11	.05
Media pressure	−0.10	0.11	−.07							−0.14	0.12	−.10
Friend conversations	0.59	0.15	.31***							0.56	0.16	.30***
Body dissatisfaction				0.07	0.06	.09				−0.02	0.06	−.02
Internalization				0.25	0.09	.18**				0.10	0.10	.07
Extreme BCB							0.12	0.23	.04	−0.19	0.24	−.06
Emotional eating							0.25	0.11	.15*	0.18	0.11	.11

*$p < .05$. **$p < .01$. ***$p < .001$.[1]p = .052.
BCB = body change behaviors.

adolescents who report more of any one of them are more likely to report elevations in online appearance preoccupation and appearance activity in late adolescence.

Overall, all of the intercorrelations of risk factors and associations of risk factors with later online appearance preoccupation suggest a complicated intermingling of risks for later online appearance-related activities, social comparison, and concerns about online self-presentation. However, another study aim was to identify the risk factors that stood out as particularly relevant when all were simultaneously considered in multivariate analyses. These findings demonstrated that the most prominent preceding risks for online appearance preoccupation were social in origin – particularly conversations with friends about appearance and parents' personal appearance-related attitudes. Finding unique roles of friend conversations and parent attitudes is not completely surprising given that social influences are expected to be the primary precursors of an unfolding of internalization of social messages, and a range of preoccupations and negative views of appearance and the body in the tripartite influence model of body dissatisfaction and disturbed eating (Thompson et al., 1999; Webb et al., 2017). It may be that these unfolding attitudes and associated behaviors would have been the most proximal and the most strongly related to online appearance preoccupation and activity in late adolescence if we had been able to examine pathways across the entire adolescent period with multiple points of measurement.

Yet, these findings were not exactly anticipated for two reasons. First, this finding is contrary to our hypothesis that it would be direct negative experiences related to appearance within the peer group, such as teasing about appearance by peers (and perceived pressure) during early adolescence, that would be the most prominent risk factor preceding later online appearance preoccupation. Such a view regarding the importance of these direct negative experiences is found in multiple theories of the development of body dysmorphia and body dissatisfaction (e.g., the diathesis-stress model, see Fang & Wilhelm, 2015; Longobardi et al., 2022; Veale, 2004; Webb et al., 2016, and the Tripartite Model, see Thompson et al., 1999) and research that has tested peer and family influences on body dysmorphic symptoms, appearance anxiety, appearance-RS, and body dissatisfaction (e.g., Buhlmann & Wilhelm, 2004; Jones et al., 2004; Mastro et al., 2016;

Table 5
Results of regressing boys' (1) appearance preoccupation (social comparison and self-presentation) and (2) appearance-related activity on social risks, beliefs and attitudes, and eating-related risks (n = 124).

Independent variables	Appearance comparison/ presentation			Appearance-related activity		
	$R^2 = .16$			$R^2 = .22$		
	$F(15,108) = 1.35, p = .186$			$F(15,108) = 2.06, p = .017$		
	B	*SE (B)*	β	*B*	*SE (B)*	β
Age	−0.13	0.13	−.10	−0.09	0.12	−.07
Body mass index	0.00	0.04	.00	0.06	0.04	.16
Social anxiety	0.18	0.19	.09	−0.04	0.18	−.02
Negative affect	−0.03	0.24	−.02	−0.30	0.23	−.15
Parent attitudes	0.53	0.20	.27**	0.45	0.19	.23*
Peer teasing	−0.01	0.03	−.04	0.01	0.03	.05
Parent teasing	−0.03	0.04	−.09	−0.05	0.04	−.12
Peer pressure	0.23	0.17	.16	0.18	0.17	.13
Family pressure	0.01	0.15	.01	0.13	0.15	.10
Media pressure	0.16	0.16	.11	0.14	0.16	.10
Friend conversations	−0.01	0.28	−.01	0.67	0.27	.27*
Body dissatisfaction	0.07	0.11	.06	−0.01	0.11	−.01
Internalization	0.05	0.14	.04	−0.11	0.13	−.09
Extreme BCB	0.04	0.33	.02	−0.60	0.33	−.19
Emotional eating	−0.23	0.17	−.14	−0.08	0.17	−.05

*$p < .05$. **$p < .01$.
BCB = body change behaviors.

Table 6
Results of regressing girls' appearance comparisons/presentation and appearance-related activity on social risks, beliefs and attitudes, and eating-related risks (n = 137).

Independent variables	Appearance comparison/ presentation			Appearance-related activity		
	$R^2 = .25$			$R^2 = .22$		
	$F(15,121) = 2.75, p = .001$			$F(15,121) = 2.21, p = .009$		
	B	*SE (B)*	β	*B*	*SE (B)*	β
Age	−0.06	0.16	−.03	0.04	0.16	.02
Body mass index	0.02	0.06	.03	−0.08	0.06	−.14
Social anxiety	0.18	0.18	.10	0.13	0.18	.07
Negative affect	−0.14	0.20	−.08	−0.18	0.21	−.10
Parent attitudes	0.27	0.20	.12	−0.13	0.21	−.06
Peer teasing	0.03	0.02	.16	0.01	0.02	.03
Parent teasing	−0.03	0.04	−.10	0.05	0.04	.14
Peer pressure	−0.05	0.21	−.04	0.01	0.22	.00
Family pressure	0.11	0.17	.07	0.14	0.18	.08
Media pressure	−0.17	0.17	−.13	−0.36	0.17	−.26*
Friend conversation	0.58	0.20	.34**	0.45	0.21	.25*
Body dissatisfaction	0.11	0.08	.15	0.03	0.08	.04
Internalization	0.09	0.15	.06	0.32	0.16	.22*
Extreme BCB	−0.04	0.33	−.01	−0.06	0.35	−.02
Emotional eating	0.07	0.15	.04	0.32	0.16	.20*

*$p < .05$. **p < .01.
BCB = body change behaviors.

Slater & Tiggemann, 2016; Thompson et al., 1999; Webb et al., 2017; Webb & Zimmer-Gembeck, 2014). Given that bullying and victimization are perhaps some of the most overt and negative interpersonal interactions with peers that occur in adolescents' lives, we equally anticipated they would result in the most excess concern and preoccupation with appearance, and this would be exhibited as heightened online appearance-related behaviors in later adolescence.

Second, in contrast to our hypotheses about peer teasing and pressure, our findings in the multivariate models instead suggest that it may be more of a culture where appearance is viewed as valued and important, either with friends or within family, that relates to later online behaviors most strongly, rather than the experience of overtly negative comments and teasing about appearance. Although early adolescents place considerable value on their friendships, they do continue to look to their parents for information and advice (Brown & Larson, 2009), which our findings suggest make both parents and friends relevant risk domains for adolescents' online behaviors, even five years later. These findings are consistent with past research that has argued about the prospective and formative role of parents (during childhood and the early teen years) and peers for the development of disordered eating and negative appearance attitudes (Haines et al., 2008; Ricciardelli & McCabe, 2001; Slater & Tiggemann, 2016; Webb et al., 2017).

Regarding appearance conversations with friends as a preceding risk correlate of appearance preoccupation online, another possibility is that friendships from early adolescence, in which appearance conversations take place, could be maintained into late adolescence or that new friends have similar values to friends in early adolescence. Thus, the conversations that took place mostly outside social media in early adolescence may have moved onto social media (with the same or a similar friendship group) in later adolescence. Adolescents who have a peer appearance culture, which may be mostly offline in early adolescence, possibly increase their engagement in this appearance culture as it moves online – interacting with friends who now curate their photos, and viewing, sharing, and comparing themselves to photos of nonfriends and influencers (see Choukas-Bradley et al., 2022). Considering the increasing prevalence of social media use among adolescents over the last decade, and the consensus that young people are most often interacting with friends or known others online (Reich et al., 2012; Scott et al., 2021), it can indeed be expected that appearance-related conversations with friends and an overall appearance culture move into social media settings. In this new context, conversations about appearance continue and include social comparisons with friends, appearance self-presentation between friends, and appearance-related activity that is shared with friends. This interpretation may particularly apply to general online appearance activity, where the measure of friendship conversations was the only unique risk factor in the final model. It is also worth noting that, compared to appearance preoccupation, general appearance activity online has not been found to be as strongly associated with personal emotional problems or appearance-related anxiety and concerns (Zimmer-Gembeck, Hawes, & Pariz, 2021). This suggests that some appearance activity may occur between friends on or off social media (or online and offline) and these interactions may not themselves be concerning if not also accompanied by excessive preoccupation with social comparisons and self-presentation online.

4.2. *Differences in the unique correlates for boys and girls*

Much of the available research on body dissatisfaction, appearance-RS, and appearance anxiety has focused on women and girls and there continues to be a pressing concern about how these environments and appearance messages and preoccupation affect girls in particular (see Choukas-Bradley et al., 2022). It also has become quite important to understand the differences and the similarities in social media use, appearance preoccupation and mental health in girls and boys. Thus, consistent with the findings from some available literature that has pointed to the importance of including both boys and girls in body image and appearance research (McCabe & Ricciardelli, 2003; Parent, 2013), our gender analyses, as a follow-up of our main analyses, identified similarities but also some different significant correlates of online appearance preoccupation in late adolescent boys compared to girls that could be investigated further in future research. More specifically regarding similarity, social influences were unique correlates of both boys' and girls' appearance preoccupation and appearance-related activity. However, these social influences slightly differed, with parent attitudes only significantly related to boys' appearance preoccupation and activity, and conversation with friends related to girls' appearance preoccupation and both boys' and girls' appearance activity. Thus, in general, the role of parents is dominant in boys' preoccupation online, but the role of friends is dominant in girls' preoccupation online. These findings are somewhat consistent with what is known about influences on boys' and girls' body image. Some research (e.g., Jones & Crawford,

2005) demonstrates that girls report more appearance conversations with friends, and this may increase the influence of these experiences for girls and restrict this influence in boys. In contrast, as described by Ricciardelli et al. (2000), boys may get the majority of their messages about appearance from within the family, where there could be modeling of exercise and body concern, or encouragement, praise, compliments or other comments about boys' appearance, size, and shape. Nevertheless, this focus on boys and girls separately also reveals a limitation of the measures included in this study. We did not include a measure of friends' attitudes about appearance, which could also model attention to appearance. It could be that boys are influenced more by friends' appearance-, size-, or shape-related behaviors, such as exercise, rather than conversations. Future research could address this possibility directly.

For girls only, two non-social risk factors were also related to online appearance activity (but not preoccupation); girls who reported more internalization of appearance ideals and more emotional eating reported more appearance-related activity online. Thus, internalization and emotional eating were risks for girls. Surprisingly, at the same time, girls who reported more media pressure reported less online appearance activity when measured five years later. Thus, media pressure in early adolescence was a preceding correlate of less appearance activity when considered net of all other early risk factors and covariates. This could possibly be the effect of statistical suppression, given media pressure had a small positive association with appearance activity in the correlational analysis ($r = .15$, $p < .05$) and the negative association between media pressure and girls' appearance-related online activity only emerged in the multivariate model. However, it could also be that girls who feel more media pressure in early adolescence purposely turn away from appearance-related activities by late adolescence in response to this pressure. After all, this is the aim of social media literacy training, which gives young people messages about changing use patterns, restricting interactions, and the skills to think critically about their interactions with friends and the content they view and engage with online. Promoting social media literacy may be particularly important among young adolescents (especially girls) for combatting body dissatisfaction and appearance-related activity online, as interactions online may involve selective (and even digitally modified) self-presentation by others and increase internalized pressure to conform to appearance ideals. To prevent body dissatisfaction and disordered eating, social media literacy interventions should directly integrate content designed to counteract the idealization of, and comparison with, appearance ideals and images on social media (see Paxton et al., 2022 for a review). Further, recent research demonstrates that higher social media literacy and engagement with social media literacy programs are protective against body dissatisfaction and the internalization of appearance ideals after viewing digitally modified or idealized appearance images online (e.g., Bell et al., 2021; Tamplin et al., 2018; Vendemia & DeAndrea, 2018).

4.3. Age and BMI

T1 Age and T1 BMI were each associated with most of the early risk factors but were not associated with online appearance preoccupation or appearance-related activity five years later. Furthermore, when entered into the multivariate models, neither age nor BMI had unique associations with online appearance preoccupation or appearance-related activity online five years later. Nevertheless, considering age and BMI in future research remains an important direction for understanding social media use patterns, appearance-related behaviors, the development of peer relationships, and many of the other important adolescent developmental tasks that could be changing rapidly as social media becomes integrated into everyday life (Choukas-Bradley et al., 2022; Nesi et al., 2018). For example, past research has reported that young adolescents are the most susceptible to social media influences (Orben et al., 2022; Rogers & Rosseau, 2022), and, even prior to the introduction of social media, researchers reported that young adolescents were more susceptible to peer influence than older adolescents (Brown et al., 1986; Sessa & Steinberg, 1991; Steinberg & Monahan, 2007; Sumter et al., 2009; see Zimmer-Gembeck & Collins, 2003 for a review). For BMI, its particularly strong correlation with body change behaviors and its significant association with all other early risk factors measured here suggest that BMI is important to consider in future longitudinal research. For example, an early elevated BMI relative to same age peers could be an even earlier risk factor underlying the development of social pressure and body dissatisfaction that, in turn, are associated with online appearance preoccupation and associated mental health problems that develop in later adolescence and beyond.

4.4. Study limitations, future research, and implications

Although this study has many strengths, including a long follow-up period and good sample size, there are four limitations to address. First, the sample was comprised of only Australian adolescents, who primarily reported they were White or Asian Australian. Thus, to determine whether the findings are generalizable beyond the current sample, it is important to test the associations in other geographical areas and with other ethnic groups. Also, the historical time when this study was conducted should also be considered when interpreting and generalizing the findings. Some social media platforms commonly in use today did not even exist (or at least were not widely used) when this study was initiated (in 2013) and social media is now being accessed more frequently by younger age groups.

Second, there were some limitations with the measures. We were limited by not having a measure of online appearance preoccupation and activity at T1. To determine whether the preceding risk factors do, in fact, relate to changes in online appearance preoccupation, longitudinal research is needed that measures online appearance preoccupation alongside the identified risk factors at Time 1. However, when T1 data were collected (2013), most popular social media platforms restricted participation for those under age 13, and most participants were below this age. Thus, we expected online activity to be localized and minimal at T1 (and we adjusted for age in all analyses). Related to this, adolescents had to participate at the last time of data collection, when they reported on their online appearance preoccupation and appearance-related activity, to be included in the study. In addition, our measure of body change behaviors, as an early risk factor, was limited to five items that were selected to capture multiple behaviors that were accessible to young adolescents 13 years and younger. We combined these items into a single composite score, but the Cronbach's α was low, which suggests the need for more items to allow for a focus on multiple subscales of behavior in future research.

Third, all information relied on adolescent self-report. The measurement of social risk factors, in particular, could benefit from reporting from another source, such as parents, peers at school, or friends. Reports from the self about social experiences (e.g., teasing) are known to have only small to moderate correlations with reports from others (Zimmer-Gembeck & Webb, 2017). All measures here must be interpreted as perceptions of the adolescents themselves, which may not perfectly represent the perceptions of parents, peers, or friends.

A final limitation related to the analyses of boys and girls separately. We had a fairly equal split of boys and girls, but these analyses were based on smaller sample sizes. Because all participants had to complete the final time of measurement for this study, this reduced the sample size and limited our power to conduct thorough analyses of gender and gender moderation of all associations.

Keeping these limitations in mind, the current results are useful for considering how early to focus on social media literacy, appearance concerns, and eating problems. In particular, these findings add more support to other voices that argue we need to start early (before adolescence) with information to mitigate against the message that appearance is the most important and most direct source of attention

and success. However, we do not advocate, based on these findings, that it would be enough to raise awareness of social influences or try to put in place strategies (such as restrictive parent control over media use, which may not be as effective as other strategies for reducing media-related risks; Chen & Shi, 2019) to reduce offline and online appearance-related activities. Instead, we align our views with others who have proposed that we need to think carefully about prevention and intervention messages that can assist young people to develop their own personal strengths that can put up barriers to the huge tide of subtle and not-so-subtle messages they cannot avoid. For example, our efforts are probably better spent on programs that are designed to give young people opportunities to develop social media literacy (McLean et al., 2016; Tamplin et al., 2018), but this will not be enough. Young people need coping tools and real alternatives. The pull of social media and the positive rewards that adolescents find in these online interactions are strong. Thus, equal attention needs to go towards identifying how adolescents find their own ways to manage and use behavioral and cognitive strategies (e.g., unfollowing unrealistic content) to mitigate against negative body image messages on social media, as well as helping with the development of coping strategies that have solid evidence of their benefits (such as body appreciation, Andrew et al., 2015; or self-compassion, Gobin et al., 2022). Again, however, this may not be enough. We also need programs that focus on developing competencies, goals, and interests - shifting values and providing positive experiences of success outside of the domain of appearance and the body (Adams et al., 2017; Crocker et al., 2003). The aim would be to reduce appearance as the primary source of self-worth (Crocker, 2002; Labre, 2002; Overstreet & Quinn, 2012; Phillips et al., 2011). Thus, regardless of where the social messages about appearance ideals and pressures come from, these programs are our best bet for reducing appearance preoccupation and related problems (e.g., eating or emotional disorders) in both boys and girls.

4.5. Conclusion

Adolescents' offline and online worlds of friends, information, entertainment, information-seeking, and advice-sharing are becoming almost inseparable. One challenge for research is to identify the many opportunities and risks associated with online environments for adolescents' personal and social development. In this longitudinal study, parent attitudes and behaviors, peer relationships, and beliefs of early adolescents (age 10–13 years) were found to be unique preceding risk factors for heightened online appearance preoccupation (including engaging in social comparison and tasks to enhance self-presentation) and general appearance-related activity measured five years later. More specifically, the unique early risks were parents' appearance-related attitudes and behaviors among boys, and internalization of appearance ideals and emotional eating among girls. Notably, however, appearance-related conversations with friends in early adolescence emerged as the most salient risk factor for boys' and girls' online appearance preoccupation and appearance-related activity later on. We encourage concentrating on interventions that include appearance-based and social media education and on developing young adolescents' coping strategies related to self-awareness and self-compassion. Although a big challenge, if effective strategies can be found for reducing the influence of appearance-related messages from parents and friends, and internalization of these messages, this should interfere with the development of excessive appearance preoccupation and the emotional, social, and eating problems that have been associated with this preoccupation.

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Contributions

Melanie J. Zimmer-Gembeck: Conceptualization, Methodology, Formal Analysis, Writing-Original Draft, Writing-Review & Editing, Visualization, Supervision, Funding acquisition. Tanya Hawes: Methodology, Formal Analysis, Writing-Original Draft, Project administration. Riley Scott: Writing-Original Draft, Writing-Review & Editing. Tia Campbell: Writing-Original Draft, Writing-Review & Editing. Haley Webb: Conceptualization, Writing-Original Draft, Supervision, Funding acquisition.

Declaration of competing interest

The authors do not have any conflicts of interest to report.

Data availability

Data will be made available on request.

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References

Abraczinskas, M., Fisak, B., & Barnes, R. D. (2012). The relation between parental influence, body image, and eating behaviors in a nonclinical female sample. *Body Image, 9*(1), 93–100. https://doi.org/10.1016/j.bodyim.2011.10.005

Adams, K. E., Tyler, J. M., Calogero, R., & Lee, J. (2017). Exploring the relationship between appearance-contingent self-worth and self-esteem: The roles of self-objectification and appearance anxiety. *Body Image, 23*, 176–182. https://doi.org/10.1016/j.bodyim.2017.10.004

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). https://doi.org/10.1176/appi.books.9780890425596

Andreassen, C. S., Billieux, J., Griffiths, M. D., Kuss, D. J., Demetrovics, Z., Mazzoni, E., & Pallesen, S. (2016). The relationship between addictive use of social media and video games and symptoms of psychiatric disorders: A large-scale cross-sectional study. *Psychology of Addictive Behaviors, 30*(2), 252–262. https://doi.org/10.1037/adb0000160

Andrew, R., Tiggemann, M., & Clark, L. (2015). The protective role of body appreciation against media-induced body dissatisfaction. *Body Image, 15*, 98–104. https://doi.org/10.1016/j.bodyim.2015.07.005

Angold, A., & Costello, E. J. (1987). *Mood and feelings Questionnaire (MFQ)*. Duke University.

Bailey, S. D., & Ricciardelli, L. A. (2010). Social comparisons, appearance related comments, contingent self-esteem and their relationships with body dissatisfaction and eating disturbance among women. *Eating Behaviors: International Journal, 11*(2), 107–112. https://doi.org/10.1016/j.eatbeh.2009.12.001

Baker, J. H., Higgins Neyland, M. K., Thornton, L. M., Runfola, C. D., Larsson, H., Lichtenstein, P., & Bulik, C. (2019). Body dissatisfaction in adolescent boys. *Developmental Psychology, 55*(7), 1566–1578. https://doi.org/10.1037/dev0000724

Baker, C. W., Whisman, M. A., & Brownell, K. D. (2000). Studying intergenerational transmission of eating attitudes and behaviors: Methodological and conceptual questions. *Health Psychology, 19*(4), 376–381. https://doi.org/10.1037//0278-6133.19.4.376

Barlett, C. P., Vowels, C. L., & Saucier, D. A. (2008). Meta-analyses of the effects of media images on men's body-image concerns. *Journal of Social and Clinical Psychology, 27*(3), 279–310. https://doi.org/10.1521/jscp.2008.27.3.279

Bell, B. T., Taylor, C., Paddock, D., & Bates, A. (2021). Digital bodies: A controlled evaluation of a brief classroom-based intervention for reducing negative body image among adolescents in the digital age. *British Journal of Educational Psychology, 92*(1), 280–298. https://doi.org/10.1111/bjep.12449

Bjornsson, A. S., Didie, E. R., Grant, J. E., Menard, W., Stalker, E., & Phillips, K. A. (2013). Age at onset and clinical correlates in body dysmorphic disorder. *Comprehensive Psychiatry, 54*(7), 893–903. https://doi.org/10.1016/j.comppsych.2013.03.019

Boursier, V., Gioia, F., & Griffiths, M. D. (2020). Do selfie-expectancies and social appearance anxiety predict adolescents' problematic social media use? *Computers in Human Behavior, 110*. https://doi.org/10.1016/j.chb.2020.106395

Bowker, J. C., Thomas, K. K., Spencer, S. V., & Park, L. E. (2013). Examining appearance-based rejection sensitivity during early adolescence. *Journal of Research on Adolescence, 23*(2), 375–388. https://doi.org/10.1111/jora.12003

Brown, B. B., Clasen, D. R., & Eicher, S. A. (1986). Perceptions of peer pressure, peer conformity dispositions, and self-reported behavior among adolescents. *Developmental Psychology, 22*, 521–530. https://doi.org/10.1037/0012-1649.22.4.521

Brown, B. B., & Larson, J. (2009). Peer relationships in adolescence. In R. M. Lerner, & L. Steinberg (Eds.), *Handbook of adolescent psychology: Contextual influences on adolescent development* (pp. 74–103). John Wiley & Sons, Inc. https://doi.org/10.1002/9780470479193.adlpsy002004.

Buhlmann, U., & Wilhelm, S. (2004). Cognitive factors in body dysmorphic disorder. *Psychiatric Annals, 34*(12), 922–926. https://doi.org/10.3928/0048-5713-20041201-14

Butkowski, C. P., Dixon, T. L., & Weeks, K. (2019). Body surveillance on Instagram: Examining the role of selfie feedback investment in young adult women's body image concerns. *Sex Roles, 81*, 385–397. https://doi.org/10.1007/s11199-018-0993-6

Cash, T. F., & Szymanski, M. L. (1995). The development and validation of the body-image ideals questionnaire. *Journal of Personality Assessment, 64*(3), 466–477. https://doi.org/10.1207/s15327752jpa6403_6

Caso, D., Schettino, G., Fabbricatore, R., & Conner, M. (2020). Change my selfie": Relationships between self-objectification and selfie-behavior in young Italian women. *Journal of Applied Social Psychology, 50*(9), 538–549. https://doi.org/10.1111/jasp.12693

Chen, L., & Shi, J. (2019). Reducing harm from media: A meta-analysis of parental mediation. *Journalism & Mass Communication Quarterly, 96*(1), 173–193. https://doi.org/10.1177/1077699018754908

Choukas-Bradley, S., Roberts, S. R., Maheux, A. J., & Nesi, J. (2022). The perfect storm: A developmental-sociocultural framework for the role of social media in adolescent girls' body image concerns and mental health. *Clinical Child and Family Psychology Review*. https://doi.org/10.1007/s10567-022-00404-5

Clark, L., & Tiggemann, M. (2006). Appearance culture in nine- to 12-year-old girls: Media and peer influences on body dissatisfaction. *Social Development, 15*(4), 628–643. https://doi.org/10.1111/j.1467-9507.2006.00361.x

Cohen, R., Newton-John, T., & Slater, A. (2017). The relationship between Facebook and Instagram appearance-focused activities and body image concerns in young women. *Body Image, 23*, 183–187. https://doi.org/10.1016/j.bodyim.2017.10.002

Crocker, J. (2002). The costs of seeking self-esteem. *Journal of Social Issues, 58*, 597–615. https://doi.org/10.1111/1540- 4560.00279

Crocker, J., Luhtanen, R. K., Cooper, M. L., & Bouvrette, A. (2003). Contingencies of self-worth in college students: Theory and measurement. *Journal of Personality and Social Psychology, 85*, 894–908. https://doi.org/10.1037/0022-3514.85.5.894

Densham, K., Webb, H. J., Zimmer-Gembeck, M. J., Nesdale, D., & Downey, G. (2017). Early adolescents' body dysmorphic symptoms as compensatory responses to parental appearance messages and appearance-based rejection sensitivity. *Body Image, 23*, 162–170. https://doi.org/10.1016/j.bodyim.2017.09.005

Enander, J., Ivanov, V. Z., Mataix-Cols, D., Kuja-Halkola, R., Ljótsson, B., Lundström, S., Pérez-Vigil, A., Monzani, B., Lichtenstein, P., & Rück, C. (2018). Prevalence and heritability of body dysmorphic symptoms in adolescents and young adults: A population-based nationwide twin study. *Psychological Medicine, 48*(16), 2740–2747. https://doi.org/10.1017/S0033291718000375

Fairweather-Schmidt, A. K., & Wade, T. D. (2017). Weight-related peer-teasing moderates genetic and environmental risk and disordered eating: Twin study. *British Journal of Psychiatry, 210*(5), 350–355. https://doi.org/10.1192/bjp.bp.116.184648

Fang, A., & Wilhelm, S. (2015). Clinical features, cognitive biases, and treatment of body dysmorphic disorder. *Annual Review of Clinical Psychology, 11*(1), 187–212. https://doi.org/10.1146/annurev-clinpsy-032814-112849

Fardouly, J., Magson, N. R., Johnco, C. J., Oar, E. L., & Rapee, R. M. (2018). Parental control of the time preadolescents spend on social media: Links with preadolescents' social media appearance comparisons and mental health. *Journal of Youth and Adolescence, 47*(7), 1456–1468. https://doi.org/10.1007/s10964-018-0870-1

Fardouly, J., Magson, N. R., Rapee, R. M., Johnco, C. J., & Oar, E. L. (2020). The use of social media by Australian preadolescents and its links with mental health. *Journal of Clinical Psychology, 76*(7), 1304–1326. https://doi.org/10.1002/jclp.22936

Fardouly, J., Pinkus, R. T., & Vartanian, L. R. (2017). The impact of appearance comparisons made through social media, traditional media, and in person in women's everyday lives. *Body Image, 20*, 31–39. https://doi.org/10.1016/j.bodyim.2016.11.002

Fox, J., & Rooney, M. C. (2015). The dark triad and trait self-objectification as predictors of men's use and self-presentation behaviors on social networking sites. *Personality and Individual Differences, 76*, 161–165. https://doi.org/10.1016/j.paid.2014.12.017

Fredrickson, B. L., & Roberts, T.-A. (1997). Objectification theory: Toward understanding women's lived experiences and mental health risks. *Psychology of Women Quarterly, 21*(2), 173–206. https://doi.org/10.1111/j.1471-6402.1997.tb00108.x

Frison, E., & Eggermont, S. (2016). Exploring the relationships between different types of Facebook use, perceived online social support, and adolescents' depressed mood. *Social Science Computer Review, 34*(2), 153–171. https://doi.org/10.1177/0894439314567449

Furman, W., & Buhrmester, D. (1992). Age and sex differences in perceptions of networks of personal relationships. *Child Development, 63*(1), 103–115. https://doi.org/10.1111/j.1467-8624.1992.tb03599.x

Furman, W., & Shaffer, L. A. (1999). A story of adolescence: The emergence of other-sex relationships. Special issue: Development of other-sex relationships during adolescence. *Journal of Youth and Adolescence, 28*(4), 513–522. https://doi.org/10.1023/A:1021673125728

Garner, D. M., Olmsted, M. P., Bohr, Y., & Garfinkel, P. E. (1982). The eating attitudes test: Psychometric features and clinical correlates. *Psychological Medicine, 12*(4), 871–878. https://doi.org/10.1017/S0033291700049163

Gerrard, O., Galli, N., Santurri, L., & Franklin, J. (2021). Examining body dissatisfaction in college men through the exploration of appearance anxiety and internalization of the mesomorphic ideal. *Journal of American College Health, 69*(5), 560–566. https://doi.org/10.1080/07448481.2019.1704412

Gobin, K. C., McComb, S. E., & Mills, J. S. (2022). Testing a self-compassion micro-intervention before appearance-based social media use: Implications for body image. *Body Image, 40*, 200–206. https://doi.org/10.1016/j.bodyim.2021.12.011

Grabe, S., Ward, L. M., & Hyde, J. S. (2008). The role of the media in body image concerns among women: A meta-analysis of experimental and correlational studies. *Psychological Bulletin, 134*(3), 460–476. https://doi.org/10.1037/0033-2909.134.3.460

Haines, J., Neumark-Sztainer, D., Hannan, P., & Robinson-O'Brien, R. (2008). Child versus parent report of parental influences on children's weight-related attitudes and behaviors. *Journal of Pediatric Psychology, 33*(7), 783–788. https://doi.org/10.1093/jpepsy/jsn016

Hawes, T., Zimmer-Gembeck, M. J., & Campbell, S. M. (2020). Unique associations of social media use and online appearance preoccupation with depression, anxiety, and appearance rejection sensitivity. *Body Image, 33*, 66–76. https://doi.org/10.1016/j.bodyim.2020.02.010

Heinberg, L. J., Thompson, J. K., & Stormer, S. (1995). Development and validation of the sociocultural attitudes towards appearance questionnaire. *International Journal of Eating Disorders, 17*(1), 81–89. https://doi.org/10.1002/eat.22590

Holland, G., & Tiggemann, M. (2016). A systematic review of the impact of the use of social networking sites on body image and disordered eating outcomes. *Body Image, 17*, 100–110. https://doi.org/10.1016/j.bodyim.2016.02.008

Jones, D. C. (2004). Body image among adolescent girls and boys: A longitudinal study. *Developmental Psychology, 40*(5), 823–835. https://doi.org/10.1037/0012-1649.40.5.823

Jones, D. C., & Crawford, J. K. (2005). Adolescent boys and body image: Weight and muscularity concerns as dual pathways to body dissatisfaction. *Journal of Youth and Adolescence, 34*, 629–636. https://doi.org/10.1007/s10964-005-8951-3, 2005.

Jones, D. C., Vigfusdottir, T. H., & Lee, Y. (2004). Body image and the appearance culture among adolescent girls and boys: An examination of friend conversations, peer criticism, appearance magazines, and the internalization of appearance ideals. *Journal of Adolescent Research, 19*(3), 323–339. https://doi.org/10.1177/0743558403258847

Kim, J. W., & Chock, T. M. (2015). Body image 2.0: Associations between social grooming on Facebook and body image concerns. *Computers in Human Behavior, 48*, 331–339. https://doi.org/10.1016/j.chb.2015.01.009

La Greca, A. M., & Lopez, N. (1998). Social anxiety among adolescents: Linkages with peer relations and friendships. *Journal of Abnormal Child Psychology, 26*(2), 83–94. https://doi.org/10.1023/A:1022684520514

Labre, M. P. (2002). Adolescent boys and the muscular male body ideal. *Journal of Adolescent Health, 30*, 233–242. https://doi.org/10.1016/S1054-139X(01)00413-X

Lavell, C. H., Webb, H. J., Zimmer-Gembeck, M. J., & Farrell, L. J. (2018). A prospective study of adolescents' body dysmorphic symptoms: Peer victimization and the direct and protective roles of emotion regulation and mindfulness. *Body Image: An International Journal of Research, 24*, 17–25. https://doi.org/10.1016/j.bodyim.2017.11.006

Lavell, C. H., Zimmer-Gembeck, M. J., Farrell, L. J., & Webb, H. J. (2014). Victimization, social anxiety, and body dysmorphic concerns: Appearance-based rejection sensitivity as a mediator. *Body Imssage, 11*(4), 391–395. https://doi.org/10.1016/j.bodyim.2014.06.008

Lawler, M., & Nixon, E. (2011). Body dissatisfaction among adolescent boys and girls: The effects of body mass, peer appearance culture and internalization of appearance ideals. *Journal of Youth and Adolescence, 40*, 59–71. https://doi.org/10.1007/s10964-009-9500-2

Levinson, C. A., & Rodebaugh, T. L. (2012). Social anxiety and eating disorder comorbidity: The role of negative social evaluation fears. *Eating Behaviors: International Journal, 13*(1), 27–35. https://doi.org/10.1016/j.eatbeh.2011.11.006

Levinson, C. A., Rodebaugh, T. L., White, E. K., Menatti, A. R., Weeks, J. W., Iacovino, J. M., & Warren, C. S. (2013). Social appearance anxiety, perfectionism, and fear of negative evaluation. distinct or shared risk factors for social anxiety and eating disorders? *Appetite, 67*, 125–133. https://doi.org/10.1016/j.appet.2013.04.002

Little, T. D., Jorgensen, T. D., Lang, K. M., & Moore, E. W. G. (2014). On the joys of missing data. *Journal of Pediatric Psychology, 39*(2), 151–162. https://doi.org/10.1093/jpepsy/jst048

Lonergan, A. R., Bussey, K., Fardouly, J., Griffiths, S., Murray, S. B., Hay, P., Mond, J., Trompeter, N., & Mitchison, D. (2020). Protect me from my selfie: Examining the association between photo-based social media behaviors and self-reported eating disorders in adolescence. *International Journal of Eating Disorders, 53*(5), 485–496. https://doi.org/10.1002/eat.23256

Longobardi, C., Badenes-Ribera, L., & Fabris, M. A. (2022). Adverse childhood experiences and body dysmorphic symptoms: A meta-analysis. *Body Image, 40*, 267–284. https://doi.org/10.1016/j.bodyim.2022.01.003

Lowes, J., & Tiggemann, M. (2003). Body dissatisfaction, dieting awareness and the impact of parental influence in young children. *British Journal of Health Psychology, 8*(2), 135–147. https://doi.org/10.1348/135910703321649123

Maheux, A. J., Roberts, S. R., Nesi, J., Widman, L., & Choukas-Bradley, S. (2022). Longitudinal associations between appearance-related social media consciousness and adolescents' depressive symptoms. *Journal of Adolescence, 94*, 264–269. https://doi.org/10.1002/jad.12009

Markey, C. H., & Daniels, E. A. (2022). An examination of preadolescent girls' social media use and body image: Type of engagement may matter most. *Body Image, 42*, 145–149. https://doi.org/10.1016/j.bodyim.2022.05.005

Mastro, S., Zimmer-Gembeck, M. J., Webb, H. J., Farrell, L., & Waters, A. (2016). Young adolescents' appearance anxiety and body dysmorphic symptoms: Social problems, self-perceptions and comorbidities. *Journal of Obsessive-Compulsive and Related Disorders, 8*, 50–55. https://doi.org/10.1016/j.jocrd.2015.12.001

McCabe, M. P., & Ricciardelli, L. A. (2003). Sociocultural influences on body image and body changes among adolescent boys and girls. *The Journal of Social Psychology, 143* (1), 5–26. https://doi.org/10.1080/00224540309598428

McLean, S. A., Paxton, S. J., & Wertheim, E. H. (2016). Does media literacy mitigate risk for reduced body satisfaction following exposure to thin-ideal media? *Journal of Youth and Adolescence, 45*(8), 1678–1695. https://doi.org/10.1007/s10964-016-0440-3

Monacis, L., De Palo, V., Griffiths, M. D., & Sinatra, M. (2017). Social networking addiction, attachment style, and validation of the Italian version of the Bergen Social Media Addiction Scale. *Journal of Behavioral Addictions, 6*(2), 178–186. https://doi.org/10.1556/2006.6.2017.023

Monro, F., & Huon, G. (2005). Media-portrayed idealized images, body shame, and appearance anxiety. *International Journal of Eating Disorders, 38*(1), 85–90. https://doi.org/10.1002/eat.20153

Nesi, J., Choukas-Bradley, S., Maheux, A. J., Roberts, S. R., Sanzari, C. M., Widman, L., & Prinstein, M. J. (2021). Selfie appearance investment and peer feedback concern: Multimethod investigation of adolescent selfie practices and adjustment. *Psychology of Popular Media, 10*(4), 488–499. https://doi.org/10.1037/ppm0000342

Nesi, J., Choukas-Bradley, S., & Prinstein, M. J. (2018). Transformation of adolescent peer relations in the social media context: Part 1-A theoretical framework and application to dyadic peer relationships. *Clinical Child and Family Psychology Review, 21*(3), 267–294. https://doi.org/10.1007/s10567-018-0261-x

Orben, A., Przubulski, A. K., Blakemore, S., & Kievit, R. A. (2022). Windows of developmental sensitivity to social media. *Nature Communications, 13*, 1649. https://doi.org/10.1038/s41467-022-29296-3

Overstreet, N. M., & Quinn, D. M. (2012). Contingencies of self-worth and appearance concerns: Do domains of self-worth matter? *Psychology of Women Quarterly, 36*, 314–325. https://doi.org/10.1177/0361684311435221

Parent, M. C. (2013). Clinical considerations in etiology, assessment, and treatment of men's muscularity focused body disturbance. *Psychology of Men and Masculinity, 14*, 88–100. https://doi.org/10.1037/a0025644

Park, L. E. (2007). Appearance-based rejection sensitivity: Implications for mental and physical health, affect, and motivation. *Personality and Social Psychology Bulletin, 33* (4), 490–504. https://doi.org/10.1177/0146167206296301

Park, L. E., Calogero, R. M., Young, A. F., & DiRaddo, A. M. (2010). Appearance-based rejection sensitivity predicts body dysmorphic disorder symptoms and cosmetic surgery acceptance. *Journal of Social and Clinical Psychology, 29*(5), 489–509. https://doi.org/10.1521/jscp.2010.29.5.489

Park, L. E., DiRaddo, A. M., & Calogero, R. M. (2009). Sociocultural influence and appearance-based rejection sensitivity among college students. *Psychology of Women Quarterly, 33*(1), 108–119. https://doi.org/10.1111/j.1471-6402.2008.01478.x

Paxton, S. J., McLean, S. A., & Rodgers, R. F. (2022). My critical filter buffers your app filter": Social media literacy as a protective factor for body image. *Body Image, 40*, 158–164. https://doi.org/10.1016/j.bodyim.2021.12.009

Paxton, S. J., Schutz, H. K., Wertheim, E. H., & Muir, S. L. (1999). Friendship clique and peer influences on body image concerns, dietary restraint, extreme weight-loss behaviors, and binge eating in adolescent girls. *Journal of Abnormal Psychology, 108* (2), 255–266. https://doi.org/10.1037/0021-843X.108.2.255

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

Phillips, B., Moulding, R., Kyrios, M., Nedeljkovic, M., & Mancuso, S. (2011). The relationship between body dysmorphic disorder symptoms and self-construals. *Clinical Psychologist, 15*, 10–16. https://doi.org/10.1111/j. 1742-9552.2011.00004.x

Reich, S. M., Subrahmanyam, K., & Espinoza, G. (2012). Friending, IM'ing, and hanging out face-to-face: Overlap in adolescents' online and offline social networks. *Developmental Psychology, 48*, 356–368. https://doi.org/10.1037/a0026980

Ricciardelli, L. A., & McCabe, M. P. (2001). Children's body image concerns and eating disturbance: A review of the literature. *Clinical Psychology Review, 21*(3), 325–344. https://doi.org/10.1016/S0272-7358(99)00051-3

Ricciardelli, L. A., McCabe, M. P., & Banfield, S. (2000). Body image and body change methods in adolescent boys: Role of parents, friends, and the media. *Journal of Psychosomatic Research, 49*, 189–197. https://doi.org/10.1016/s0022-3999(00)00159-8

Rief, W., Buhlmann, U., Wilhelm, S., Borkenhagen, A., & Brahler, E. (2006). The prevalence of body dysmorphic disorder: A population-based survey. *Psychological Medicine, 36*, 877–885. https://doi.org/10.1017/S0033291706007264

Rodgers, R. F., McLean, S. A., & Paxton, S. J. (2015). Longitudinal relationships among internalization of the media ideal, peer social comparison, and body dissatisfaction: Implications for the tripartite influence model. *Developmental Psychology, 51*(5), 706–713. https://doi.org/10.1037/dev0000013

Rogers, R. F., & Rosseau, A. (2022). Social media and body image: Modulating effects of social identities and user characteristics. *Body Image, 41*, 284–291. https://doi.org/10.1016/j.bodyim.2022.02.009

Rounsefell, K., Gibson, S., McLean, S., Blair, M., Molenaar, A., Brennan, L., Truby, H., & McCaffrey, T. A. (2020). Social media, body image and food choices in healthy young adults: A mixed methods systematic review. *Nutrition and Dietetics, 77*(1), 19–40. https://doi.org/10.1111/1747-0080.12581

Rousseau, A., Eggermont, S., & Frison, E. (2017). The reciprocal and indirect relationships between passive facebook use, comparison on facebook, and adolescents' body dissatisfaction. *Computers in Human Behavior, 73*, 336–344. https://doi.org/10.1016/j.chb.2017.03.056

Rousseau, A., Trekels, J., & Eggermont, S. (2018). Preadolescents' reliance on and internalization of media appearance ideals: Triggers and consequences. *The Journal of Early Adolescence, 38*(8), 1074–1099. https://doi.org/10.1177/0272431617714330

Ryding, F. C., & Kuss, D. J. (2020). The use of social networking sites, body image dissatisfaction, and body dysmorphic disorder: A systematic review of psychological research. *Psychology of Popular Media, 9*(4), 412–435. https://doi.org/10.1037/ppm0000264

Schmidt, J., & Martin, A. (2019). Appearance teasing and mental health: Gender differences and mediation effects of appearance-based rejection sensitivity and dysmorphic concerns. *Frontiers in Psychology, 10*. https://doi.org/10.3389/fpsyg.2019.00579, 579-579.

Scott, R. A., Stuart, J., & Barber, B. L. (2021). Contemporary friendships and social vulnerability among youth: Understanding the role of online and offline contexts of interaction in friendship quality. *Journal of Social and Personal Relationships, 38*(12), 3451–3471. https://doi.org/10.1177/02654075211029384

Seekis, V., Bradley, G. L., & Duffy, A. L. (2020). Appearance-related social networking sites and body image in young women: Testing an objectification-social comparison model. *Psychology of Women Quarterly, 44*(3), 377–392. https://doi.org/10.1177/0361684320920826

Sessa, F. M., & Steinberg, L. (1991). Family structure and the development of autonomy during adolescence. *The Journal of Early Adolescence, 11*, 38–55. https://doi.org/10.1177/0272431691111003

Shagar, P. S., Harris, N., Boddy, J., & Donovan, C. L. (2017). The relationship between body image concerns and weight-related behaviours of adolescents and emerging adults: A systematic review. *Behaviour Change, 34*(4), 208–252. https://doi.org/10.1017/bec.2018.3

Shroff, H., & Thompson, J. K. (2006). The tripartite influence model of body image and eating disturbance: A replication with adolescent girls. *Body Image, 3*(1), 17–23. https://doi.org/10.1016/j.bodyim.2005.10.004

Slater, A., & Tiggemann, M. (2016). The influence of maternal self-objectification, materialism and parenting style on potentially sexualized 'grown up' behaviors and appearance concerns in 5–8year old girls. *Eating Behaviors: International Journal, 22*, 113–118. https://doi.org/10.1016/j.eatbeh.2016.05.002

Steinberg, L., & Monahan, K. D. (2007). Age differences in resistance to peer influence. *Developmental Psychology, 43*(6), 1531–1543. https://doi.org/10.1037/0012-1649.43.6.1531

Stice, E., & Agras, W. S. (1998). Predicting onset and cessation of bulimic behaviors during adolescence: A longitudinal grouping analysis. *Behavior Therapy, 29*(2), 257–276. https://doi.org/10.1016/S0005-7894(98)80006-3

Stice, E., & Whitenton, K. (2002). Risk factors for body dissatisfaction in adolescent girls: A longitudinal investigation. *Developmental Psychology, 38*(5), 669–678. https://doi.org/10.1037/0012-1649.38.5.669

van Strien, T., Frijters, J. E. R., Bergers, G. P. A., & Defares, P. B. (1986). The Dutch Eating Behavior Questionnaire (DEBQ) for assessment of restrained, emotional, and external eating behavior. *International Journal of Eating Disorders, 5*(2), 295–315. https://doi.org/10.1002/1098-108X(198602)5:2<295::AID-EAT2260050209>3.0.CO;2 (-T).

Sumter, S. R., Bokhorst, C. L., Steinberg, L., & Westenberg, P. M. (2009). The developmental pattern of resistance to peer influence in adolescence: Will the teenager ever be able to resist? *Journal of Adolescence, 32*(4), 1009–1021. https://doi.org/10.1016/j.adolescence.2008.08.010

Tamplin, N. C., McLean, S. A., & Paxton, S. J. (2018). Social media literacy protects against the negative impact of exposure to appearance ideal social media images in young adult women but not men. *Body Image, 26*, 29–37. https://doi.org/10.1016/j.bodyim.2018.Frouss05.003

Thompson, J. K., Cattarin, J., Fowler, B., & Fisher, E. (1995). The perception of teasing scale (pots): A revision and extension of the physical appearance related teasing scale (parts). *Journal of Personality Assessment, 65*(1), 146–157. https://doi.org/10.1207/s15327752jpa6501_11

Thompson, S. H., & Lougheed, E. (2012). Frazzled by facebook? An exploratory study of gender differences in social network communication among undergraduate men and women. *College Student Journal, 46*(1), 88–98.

Thompson, J. K., & Stice, E. (2001). Thin-ideal internalization: Mounting evidence for a new risk factor for body-image disturbance and eating pathology. *Current Directions in Psychological Science: A Journal of the American Psychological Society, 10*(5), 181–183. https://doi.org/10.1111/1467-8721.00144

Thompson, J. K., Thompson, J. K., Heinberg, L. J., Altabe, M., & Tantleff-Dunn, S. (1999). *Exacting beauty: Theory, assessment, and treatment of body image disturbance* (1st ed.). American Psychological Association. https://doi.org/10.1037/10312-000

Trekels, J., & Eggermont, S. (2017). Linking magazine exposure to social appearance anxiety: The role of appearance norms in early adolescence. *Journal of Research on Adolescence, 27*(4), 736–751. https://doi.org/10.1111/jora.12311

Uhlmann, L., Donovan, C., & Zimmer-Gembeck, M. J. (2020). Beyond the thin ideal: Development and validation of the fit ideal internalization test (FIIT) for women. *Psychological Assessment, 32*, 140–153. https://doi.org/10.1037/pas0000773

Vandenbosch, L., & Eggermont, S. (2012). Understanding sexual objectification: A comprehensive approach toward media exposure and girls' internalization of beauty ideals, self-objectification, and body surveillance. *Journal of Communication, 62*, 869–887. https://doi.org/10.1111/j.1460-2466.2012.01667.x

Vandenbosch, L., & Eggermont, S. (2016). The interrelated roles of mass media and social media in adolescents' development of an objectified self-concept: A longitudinal study. *Communication Research, 43*(8), 1116–1140. https://doi.org/10.1177/0093650215600488

Veale, D. (2004). Advances in a cognitive behavioural model of body dysmorphic disorder. *Body Image, 1*(1), 113–125. https://doi.org/10.1016/S1740-1445(03)00009-3

Veale, D., Eshkevari, E., Kanakam, N., Ellison, N., Costa, A., & Werner, T. (2014). The Appearance Anxiety Inventory: Validation of a process measure in the treatment of body dysmorphic disorder. *Behavioural and Cognitive Psychotherapy, 42*(5), 605–616. https://doi.org/10.1017/S1352465813000556

Veldhuis, J., Alleva, J. M., de Vaate, B., Nadia, A. J. D., Keijer, M. G., & Konijn, E. A. (2020). Me, my selfie, and I: The relations between selfie behaviors, body image, self-objectification, and self-esteem in young women. *Psychology of Popular Media, 9*(1), 3–13. https://doi.org/10.1037/ppm0000206

Vendemia, M. A., & DeAndrea, D. C. (2018). The effects of viewing thin, sexualized selfies on Instagram: Investigating the role of image source and awareness of photo editing practices. *Body Image, 27*, 118–127. https://doi.org/10.1016/j.bodyim.2018.08.013

Vincent, M. A., & McCabe, M. P. (2000). Gender differences among adolescents in family, and peer influences on body dissatisfaction, weight loss, and binge eating behaviors. *Journal of Youth and Adolescence, 29*(2), 205–221. https://doi.org/10.1023/A:1005156616173

Voelker, D. K., Reel, J. J., & Greenleaf, C. (2015). Weight status and body image perceptions in adolescents: Current perspectives. *Adolescent Health, Medicine and Therapeutics, 6*, 149–158. https://doi.org/10.2147/AHMT.S68344

Vogels, E. A., Gelles-Watnick, R., & Massarat, N. (2022). *Teens, social media, and technology 2022*. Pew Research Center https://www.pewresearch.org/internet/2022/08/10/teens-social-media-and-technology-2022/.

Vogt Yuan, A. S. (2010). Body perceptions, weight control behavior, and changes in adolescents' psychological well-being over time: A longitudinal examination of gender. *Journal of Youth and Adolescence, 39*(8), 927–939. https://doi.org/10.1007/s10964-009-9428-6

Wang, D. (2019). A study of the relationship between narcissism, extraversion, body-esteem, social comparison orientation and selfie-editing behavior on social networking sites. *Personality and Individual Differences, 146*, 127–129. https://doi.org/10.1016/j.paid.2019.04.012

Webb, H. J., Kerin, J., & Zimmer-Gembeck, M. J. (2021). Increases in emotional eating during early adolescence and associations with appearance teasing by parents and peers, peer victimization, depression and social anxiety. *The Journal of Early Adolescence, 41*(5), 754–777. https://doi.org/10.1177/0272431620950469

Webb, H. J., & Zimmer-Gembeck, M. J. (2014). The role of friends and peers in adolescent body dissatisfaction: A review and critique of 15 Years of research. *Journal of Research on Adolescence, 24*(4), 564–590. https://doi.org/10.1111/jora.12084

Webb, H. J., & Zimmer-Gembeck, M. J. (2016). A longitudinal study of appearance-based rejection sensitivity and the peer appearance culture. *Journal of Applied Developmental Psychology, 43*, 91–100. https://doi.org/10.1016/j.appdev.2016.01.004

Webb, H. J., Zimmer-Gembeck, M. J., & Mastro, S. (2016). Stress exposure and generation: A conjoint longitudinal model of body dysmorphic symptoms, peer acceptance, popularity, and victimization. *Body Image, 18*, 14–18. https://doi.org/10.1016/j.bodyim.2016.04.010

Webb, H. J., Zimmer-Gembeck, M. J., Mastro, S., Farrell, L. J., Waters, A. M., & Lavell, C. H. (2015). Young adolescents' body dysmorphic symptoms: Associations with same-and cross-sex peer teasing via appearance-based rejection sensitivity. *Journal of Abnormal Child Psychology, 43*(6), 1161–1173. https://doi.org/10.1007/s10802-014-9971-9

Webb, H. J., Zimmer-Gembeck, M. J., Waters, A. M., Farrell, L. J., Nesdale, D., & Downey, G. (2017). Pretty pressure" from peers, parents, and the media: A longitudinal study of appearance-based rejection sensitivity. *Journal of Research on Adolescence, 27*(4), 718–735. https://doi.org/10.1111/jora.12310

Wertheim, E. H., Paxton, S. J., & Blaney, S. (2009). Body image in girls. In L. Smolak, & J. K. Thompson (Eds.), *Body image, eating disorders, and obesity in youth: Assessment, prevention, and treatment* (pp. 47–76). American Psychological Association. https://doi.org/10.1037/11860-003.

Yang, H., Wang, J. J., Tng, G. Y. Q., & Yang, S. (2020). Effects of social media and smartphone use on body esteem in female adolescents: Testing a cognitive and affective model. *Children, 7*(9), 1. https://doi.org/10.3390/children7090148

Yau, J. C., & Reich, S. M. (2019). It's just a lot of work": Adolescents' self-presentation norms and practices on Facebook and Instagram. *Journal of Research on Adolescence, 29*(1), 196–209. https://doi.org/10.1111/jora.12376

Zeeck, A., Stelzer, N., Woolfgang Linster, H., Joos, A., & Hartmann, A. (2010). Emotion and eating in binge eating disorder and obesity. *European Eating Disorders Review, 19*, 426–437. https://doi.org/10.1002/erv.1066

Zimmer-Gembeck, M. J., & Collins, W. A. (2003). Autonomy development during adolescence. In G. R. Adams, & M. Berzonsky (Eds.), *Blackwell handbook of adolescence* (pp. 175–204). Blackwell Publishers.

Zimmer-Gembeck, M. J., Hawes, T., & Pariz, J. (2021). A closer look at appearance and social media: Measuring activity, self-presentation, and social comparison and their associations with emotional adjustment. *Psychology of Popular Media, 10*(1), 74–86. https://doi.org/10.1037/ppm0000277

Zimmer-Gembeck, M. J., Rudolph, J., Webb, H. J., & Henderson, L. (2021). Face-to-face and cyber-victimization: A longitudinal study of offline appearance anxiety and online appearance preoccupation. *Journal of Youth and Adolescence, 50*, 2311–2323. https://doi.org/10.1007/s10964-020-01367-y

Zimmer-Gembeck, M. J., Siebenbruner, J., & Collins, W. A. (2001). Diverse aspects of dating: Associations with psychological functioning from early to middle adolescence. *Journal of Adolescence, 24*(3), 313. https://doi.org/10.1006/jado.2001.0410

Zimmer-Gembeck, M. J., & Webb, H. J. (2017). Body image and peer relationships: Unique associations of adolescents' social status and competence with peer- and self-reported appearance victimization. *Journal of Adolescence, 61*(1), 131–140. https://doi.org/10.1016/j.adolescence.2017.10.002

Zimmer-Gembeck, M. J., Webb, H. J., Farrell, L. J., & Waters, A. M. (2018). Girls' and boys' trajectories of appearance anxiety from age 10 to 15 years are associated with earlier maturation and appearance-related teasing. *Development and Psychopathology, 30*(1), 337–350. https://doi.org/10.1017/S0954579417000657

Zimmer-Gembeck, M. J., Webb, H. J., Kerin, J., Farrell, L. J., & Waters, A. M. (2020). Risk factors and temporal patterns of disordered eating differ in adolescent boys and girls: Testing gender-specific appearance anxiety models. *Development and Psychopathology, 33*(3), 856–867. https://doi.org/10.1017/S0954579420000188

Zimmer-Gembeck, M. J., Rudolph, J., & Pariz, J. (2022). A cascade of rejection and appearance preoccupation: Adolescents' body dysmorphic symptoms and appearance rejection sensitivity over 4 years. *British Journal of Developmental Psychology, 40*(1), 17–34. https://doi.org/10.1111/bjdp.12377