

Concurrent and Prospective Analyses of Peer, Television and Social Media Influences on Body Dissatisfaction, Eating Disorder Symptoms and Life Satisfaction in Adolescent Girls

Christopher J. Ferguson · Mónica E. Muñoz ·
Adolfo Garza · Mariza Galindo

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Abstract The degree to which media contributes to body dissatisfaction, life satisfaction and eating disorder symptoms in teenage girls continues to be debated. The current study examines television, social media and peer competition influences on body dissatisfaction, eating disorder symptoms and life satisfaction in a sample of 237 mostly Hispanic girls. 101 of these girls were reassessed in a later 6-month follow-up. Neither television exposure to thin ideal media nor social media predicted negative outcomes either concurrently nor prospectively with the exception of a small concurrent correlation between social media use and life satisfaction. Social media use was found to contribute to later peer competition in prospective analysis, however, suggesting potential indirect but not direct effects on body related outcomes. Peer competition proved to be a moderate strong predictor of negative outcomes both concurrently and prospectively. It is concluded that the negative influences of social comparison are focused on peers rather than television or social media exposure.

Keywords Mass media · Television · Social media · Body dissatisfaction · Eating disorders

Introduction: Media, Peers, Body Dissatisfaction and Eating Disorder Symptoms

The degree to which media does or does not influence behavior continues to be an issue hotly contended in the

scholarly literature and public discourse. Although concerns about media influences touch upon a number of areas, the potential influence of media on women and girl's body dissatisfaction continues to be one that is often discussed and debated. Some believe that media influences on body dissatisfaction may extend to eating disorder symptoms, possibly explaining increases in eating disorders such as bulimia nervosa across the twentieth century in Western nations (e.g., Becker et al. 2002). Other scholars contend that links between media and body dissatisfaction are not consistent, may be explained by other variables such as personality traits or family environment (e.g., Holmstrom 2004), or may apply only to some girls¹ but not others (e.g., Roberts and Good 2010). At present, few studies of girls have examined media effects in the context of other influences, such as peer effects (e.g., Ferguson et al. 2011a). Also, relatively few studies have examined for differential effects for girls with differing levels of pre-existing body dissatisfaction (e.g., Roberts and Good 2010). The present study aims to fill some of these gaps in the existing literature by examining the differential influences of peer and media effects on girls' body dissatisfaction, eating disorder symptoms and life satisfaction.

The Phenomenology of Body Dissatisfaction and Eating Disorder Symptoms in the West

The degree to which body dissatisfaction and eating disorder symptoms are culturally bound issues connected to and caused (at least in part) by media portrayals of thin

C. J. Ferguson (✉) · M. E. Muñoz · A. Garza · M. Galindo
Department of Psychology and Communication, Texas A&M
International University, 5201 University Blvd., Laredo, TX
78041, USA
e-mail: CJFerguson1111@aol.com

¹ Since the current study relates to adolescent girls, the term "girls" will be used henceforth in this manuscript, unless referring to the sample of a specific study. It is worth noting that, despite much of the general public's focus on impacts for girls, the majority of research in this field is conducted with adult college women.

ideals remains an issue of debate and contention (Ferguson et al. 2011b; Levine and Murnen 2009). According to Sumathipala et al. (2004, p. 200), “[c]ulture-bound syndrome is a term used to describe the uniqueness of some syndromes in specific cultures.” However, Grabe et al. (2008) point out that increased incidence of eating disorders across the early and mid-twentieth century seem to coincide with trends in the media toward emphasizing thinness in women. Keel and Klump (2003) note that bulimia symptoms, in particular, demonstrated a rising trend across the early to mid-twentieth century, although they note that the underlying pathology of bulimia simply may have manifested in other symptoms during other historical periods. In contrast to bulimia rates, anorexia rates generally have displayed smaller increases and more stability over time (Currin et al. 2005; Keel and Klump 2003). Discerning causal links between the rise in bulimia and increased emphasis on thin ideal media is a fraught undertaking and invites the potential for ecological fallacy. It may be that the media merely reflects the culture’s changing attitudes toward beauty rather than causing those changes. Further, some evidence suggests that the prevalence of eating disorders may have declined beginning in the final years of the twentieth century, despite no decline in media thin ideals (Currin et al. 2005; Pyle et al. 1991); however, other studies suggest that rates have remained stable (van Son et al. 2006).

Compared to clinical eating disorders, which remain relatively rare, non-clinical body dissatisfaction is very common, affecting 50 % of girls and young women (Grabe et al. 2008). Both males and females tend to view the pursuit of beauty as important for females (Markey and Markey 2012). This primary importance attributed to female beauty can contribute to relatively higher body dissatisfaction levels among women (Ferguson et al. 2011b). Trends over time in body satisfaction are less clear than they are for eating disorders. However, according to Roberts et al. (2006), the available data suggest that body dissatisfaction prevalence may have increased earlier in the century, but is currently declining for both Caucasians and African-Americans.

Ethnicity, Eating Disorder Symptoms and Body Dissatisfaction

As noted above, eating related pathology is often conceptualized as culturally bound, given different prevalence rates among whites and non-whites. These issues reflect well documented differences in underlying body dissatisfaction among whites and non-whites (Wildes and Emery 2001). In fact, as Wildes and Emery (2001) note, ethnic differences in body dissatisfaction are greater than for clinically significant eating pathology which tends to show

lower ethnic differences. Although noting the same ethnic difference on body dissatisfaction, Grabe and Hyde (2006) described this difference as small. Warren et al. (2005) found that body dissatisfaction was lower in Hispanic females compared to non-Hispanic whites and suggested that culture, particularly minimization of thin ideals, can be protective for body dissatisfaction issues.

Regarding clinically significant eating pathology, reviews have suggested differences between ethnic groups. For instance Crago et al. (1996) found that eating pathology was more common in white and Hispanic females compared to African American or Asian American females, and were also more common among better educated women and women who had acculturated more to the majority culture. Although studies of Hispanic females are relatively few, some studies (e.g., Fitzgibbon et al. 1998) suggest that certain types of eating pathology such as binge eating may be particularly high in Hispanic women.

Media Effects on Body Dissatisfaction and Eating Disorder Symptoms in Teen Girls

The most recent meta-analysis of media effects on body dissatisfaction and eating disorders (Ferguson, in press) estimated that a little over 200 studies examined media effects on body dissatisfaction and eating disorder symptoms. Ferguson concluded that the evidence was largely inconsistent, with small overall links between media ideals and body dissatisfaction in women already predisposed to body dissatisfaction, but not other women. Evidence for a link with eating disorders was largely absent. Most of the studies were, however, with young adult college students. Studies of adolescent girls were comparatively fewer, numbering a few dozen. Although experiments with adolescent girls demonstrated significant relationships between media ideals and body dissatisfaction overall, correlational and longitudinal studies did not provide consistent evidence for links. Grabe et al.’s (2008) meta-analysis similarly suggested fewer effects for eating disorder symptoms in adolescent females compared to young-adult samples, although differences for body dissatisfaction were not observed. An earlier meta-analysis (Groesz et al. 2002) found that links between media images and body dissatisfaction may be most pronounced among vulnerable populations.

It is important to acknowledge that few scholars consider media effects on adolescent girls in a theoretical vacuum. Media effects on body dissatisfaction and eating disorders are generally considered only one risk factor among many for negative outcomes. However, the argument has been raised (Ferguson et al. 2011b; Holmstrom 2004) that there is great value in considering a risk and resilience approach to examining media effects, in which

media effects are considered in combination with other risk factors such as peer effects. It may be that correlations, either concurrent or prospective, between media ideals and negative outcomes may vanish when proper controls are employed. In the related area of media violence and aggression, this has been found to be the case (Savage 2004; von Salisch et al. 2011). Within the area of thin media ideals, some evidence suggests the case also may be that media effects diminish, particularly when peer effects and preexisting problems are controlled (Ferguson et al. 2011a; Jones et al. 2004; McCabe and Ricciardelli 2005), or when peers are a critical mediating variable between media and body dissatisfaction (Clark and Tiggemann 2006).

Most previous research on media effects has considered television and magazines (Ferguson, in press; Grabe et al. 2008). In recent years, teen social media use has increased (Feinstein et al. 2012). To date, relatively little research has examined the potential impact of social media use, outside of specific pro-Anorexia (pro-Ana) websites, where initial evidence suggests the potential for significant links with negative outcomes (Juarez et al. 2012). However, outside of pro-Ana websites, it would be worth considering the potential impact of more general social media use. Social media may provide one outlet for the promulgation of the thin-ideal through advertisements and conversations among peers. To date, few studies have examined the potential impact of social media and body dissatisfaction on eating disorder symptoms in teenage girls.

Peer Influences on Body Dissatisfaction and Eating Disorder Symptoms in Teen Girls

In contrast to the literature on media effects, comparatively consistent evidence has linked peer influences with body dissatisfaction and eating pathology in females. Gondoli et al. (2011) found that peer pressure for thinness was a main predictor of body dissatisfaction among adolescent girls, particularly in proximity with potential opposite-sex mates. Helfert and Warschburger (2011) similarly found that both peer and parental pressure for thinness predicted body dissatisfaction in adolescent girls. Ferguson et al. (2011a, b) found that peer competition, but not television effects, predicted body dissatisfaction in adolescent girls. Thus, it is possible that preventative attention may be better spent focusing on peer issues rather than media issues.

Much of the focus of this literature has been on direct criticisms of and thinness conversations with peers (e.g., Lawler and Nixon 2011). However indirect competition for potential mates, even absent vocal criticisms, can play a role in perceived body inadequacy. From this view point, Ferguson et al. (2011b) proposed a Catalyst Model to explain, from an evolutionary standpoint, body dissatisfaction in females. From this model, body dissatisfaction is

a direct result of interfemale competition for mates. Such competition is expected to be higher in cultures in which females have more free choice in selecting mates, where females remain in the dating pool longer by marrying later, where abundant food focuses on thinness as a signal of health, etc., thus explaining some of the observed cultural differences in thin ideals and body dissatisfaction. The Catalyst Model suggests that awareness to peer competition and resultant body dissatisfaction is a rational if distressing reaction to mate selection pressures.

In addition to genetic and evolutionary factors, the Catalyst Model suggests that peer influences are likely to have a greater influence on body dissatisfaction than media images. This is because viewers of media are able to distinguish between fictional media and real-life competition. Put another way, women understand they are competing for sexual partners with their peers, not women on television. Thus, media influences are too distal to have much impact according to the Catalyst Model.

With the Catalyst Model in mind, it is unclear what impact social media may have. Arguably social media potentially may have more influence than television, given that social media involves interaction with other human beings, rather than fictional images. By contrast, it is possible that interacting with peers at a distance over social media may be less impactful than interactions with real-life peers, given that individuals far removed geographically are unlikely to be competitive for mates. To the extent that girls interact with some peers both in real life and on social media, it is unclear to what degree social media may exacerbate existing peer competition.

The Current Study

The current study concerns itself with the question of whether media variables involving television or social media use will predict body dissatisfaction or eating disorder symptoms beyond the predictive influence of peers. The current study is intended to expand upon previous work by considering the influence of television and social media, and peer influences on teenage girls in both concurrent and prospective analyses. Further, the current study will examine the potential for television and social media effects to influence some groups of teenage girls, particularly those with preexisting concerns, but not others (Roberts and Good 2010). We hypothesized that the influence of both television and social media would diminish with peer effects controlled. We further hypothesized that television and social media effects would interact with pre-existing body dissatisfaction, such that those with preexisting issues would be more prone to media related effects (Roberts and Good 2010).

Method

Participants

Participants in the current study were 237 pre-adolescent and adolescent females between ages 10 and 17 ($M = 14.11$, $SD = 2.08$). Almost all participants were Hispanic ($n = 223$, 94.1%)—this is reflective of the community where the university is located which is approximately 95% Hispanic. Smaller numbers of Caucasians ($n = 6$, 2.5%) and “other” ethnicities ($n = 8$, 3.4%) were reported. The Hispanic majority sample is simply a matter of geography; Hispanics were not recruited specifically. However, studies of Hispanics in this field are relatively few, and the utility of a Hispanic majority sample in broadening the field is considerable.

Predictor Measures

Body Mass Index

As part of the demographic information collected, girls were asked to report on their height and weight (questions on eye color and hair color were included to make these questions a little less obvious). This was used to calculate body mass index (BMI) for each participant using the formula ($\text{weight in lbs} \times 703 / (\text{height in inches}^2)$). Girls were further categorized into four body mass categories (thin, normal, overweight, and obese) based on the World Health Organization’s classification criteria (WHO; World Health Organization 2012). Although BMI is not as precise as other approaches to measuring body fat composition, it presents a useful estimate of a girl’s actual body mass relative to the thin ideal. BMI is used as a continuous variable in regressions, although some categorical analyses with BMI using the WHO criteria are also conducted, as discussed below.

Television Exposure

Accurately measuring media exposure to key variables has been historically difficult for the field. Across studies media variables are often measured differently, and different measurement approaches can influence outcomes (Fikkers et al. 2012). In the area of video game violence, the use of standardized Entertainment Software Ratings Board ratings of video games have been found to be highly reliable and valid (Ferguson 2011). However, in relation to exposure to thin ideals in television media, no comparable standardized measurement system exists.

Although certainly less ideal than using a standardized, objective system such as the ESRB, another common approach used for television research is to have participants

list the shows they most often watch and provide estimates of the key content in those shows, in this case, thin, attractive females. Thus, similar to past studies, (Ferguson et al. (2011a, b)) participants were asked to name their three favorite television shows and to rate the attractiveness of the female actresses in those shows. This approach allows for sampling of a wider variety of shows, particularly given the current explosion of shows on cable and satellite television, and it also provides a phenomenological approach. Television exposure was calculated by multiplying time watched by ratings of actresses and summing across the three shows. This coding scheme is a standardized approach used in previous studies with similar measures (e.g., Ferguson et al. (2011a, b)). Coefficient alpha for this measure in the current study was .74 at both points in time.

Peer Competition

Feelings of inferiority in response to other girls were measured using the *Female Competition Stress Test* (FCST; Salmon 2008). This twenty-six item Likert-type scale measures feelings of low status or dominance in relation to other females. Item examples include, “I am anxious about my appearance as compared to other girls” and “I feel weak or timid in relation to the other girls.” This measure was included to assess general feelings of inferiority and how these contrast with body image dissatisfaction. Higher scores reflect feelings of inferiority compared to other girls. Coefficient alpha for the present sample was .91 at T1 and .89 at T2.

Social Media Use

Social media use was assessed with 7 items assessing the frequency with which they used various forms of social media, from social networking sites to on-line gaming to Twitter to blogging. In each case participants were asked to rate how often they used the media on a 5-point scale. Examples were provided for each category (e.g., DGames, Club Penguin for social gaming sites). The seven categories were social media web-sites (e.g., Facebook), social gaming sites, on-line MMOs (massively multiplayer on-line games), Twitter or other microblogs, blogging (e.g., Wordpress), photo/video sharing (e.g., Youtube), and an “other” category. Coefficient alpha was .71 at both points in time.

Outcome Measures

Unless specified otherwise, all measures noted below used Likert-type scaled items and had psychometric properties consistent with those recommended for use in regression

analyses. Variables related to parentally rated depressive symptoms, family violence exposure and perceptions of parental love were skewed and were square-root transformed to meet the assumption of normality required for inclusion in regression analyses. For measures assessed at both time 1 (T1) and time 2 (T2) in the prospective analyses, coefficient alpha is reported for both points in time.

Body Image Dissatisfaction

The *Body Esteem Scale for Adolescents and Adults* (BESAA; Mendelson et al. 2001) is a 21-item Likert-type scale designed to assess body satisfaction. This scale has been well validated in previous studies and is often used in body image research. With the current sample, coefficient alpha was .91 at T1 and .82 at T2.

Eating Disorder Symptoms

Eating disorder symptoms were assessed using the 26-item version of the *Eating Attitudes Test* (EAT-26; Garner et al. 1982). Individual items ask about restriction of calories, vomiting, avoiding eating and feelings of guilt when eating. Past research has indicated the validity of the EAT-26 as an indicator of clinical eating disorder problems (Koslowsky et al. 1992). Coefficient alpha of the EAT-26 was .86 at T1 and .89 at T2.

Life satisfaction

Life satisfaction (SLS; Diener et al. 1985) is a 5-item Likert-scale measure which is designed to briefly assess overall satisfaction with life. The SLS is included here to measure the overall impact of body dissatisfaction on life satisfaction among girls, with other variables controlled. Coefficient alpha with the present sample is .89 at T1 and .76 at T2.

Covariates

Anxiety

Anxiety was assessed using the *Beck Anxiety Inventory* (BAI; Beck 1990). The BAI is a 21-item Likert-type scale used to assess symptoms of anxiety and is commonly used clinically to test for anxiety disorder symptoms. Coefficient alpha with the current sample was .91 at T1 and .88 at T2.

Depressive Symptoms (Teen Rated)

Self-reported depressive symptoms was assessed using the *Zung Depression Inventory*, a 20-item Likert-type scale which assesses depressive symptoms (Zung 1965). The *Zung* is commonly used and well validated. Coefficient

alpha with the current sample was .74. Given that mood symptoms correlate with body dissatisfaction, depressive symptoms and anxiety were included as control variables to control for their influence on body dissatisfaction.

Depressive Symptoms (Parent Rated)

The withdrawal/depression scale of the *Child Behavior Checklist* (CBCL; Achenbach and Rescorla 2001) was used to collect data from parents about their teens' depressive symptoms. Coefficient alpha of the scale with the current sample was .73.

Parenting Styles

Authoritative and authoritarian parenting styles were assessed using the *Parenting Styles Questionnaire* (PSQ; Robinson et al. 1995). This questionnaire includes 13 items pertaining each to authoritative and authoritarian parenting. Coefficient alpha in our sample was .92 and .87 respectively. These variables were included to give a sense of how parenting styles might influence outcomes.

Perceptions of Parental Affection

To examine the degree to which a girl's perception of her parents' love and affection for her influenced body dissatisfaction, the parental affection subscale of the *Family Conflict Scale* (FCS; Ferguson et al. 2008) was also included. Items on this 5-item true–false scale include, “My parents or caregivers were comfortable in expressing their love for me” and “My parents or caregivers acted kindly toward me.” Coefficient alpha with the current sample was .77.

Verbal Abuse

The degree to which individuals were exposed to verbal abuse at the hands of their parents was assessed using the verbal abuse subscale of the *Family Conflict Scale* (FCS; Ferguson et al. 2008). The FCS is included here to examine family influences on body dissatisfaction—this subscale consists of 9 true–false items measuring exposure to harsh or insulting verbal statements by parents. Examples include, “One or both of my parents often told me that they hated me” and “One or both of my parents often told me that I was ugly.” Past research has found this to be a valid measure of verbal abuse exposure (Ferguson et al. 2008). Coefficient alpha with the current sample was .79.

Procedure

Participants were initially recruited using snowball sampling through members of the local and university

community. Although non-random, this approach is typically effective in reaching underrepresented subgroups, thus securing a more heterogeneous sample. Information was obtained from both parents and youth in order to reduce the potential for single-responder bias effects. All participants had parental consent and youth assent for participation in the study. All recruitment procedures passed local IRB and were designed to meet APA standards for ethical human participation. Using G*Power we calculate our analyses could detect effects with the range of $r = .16$ with a sample of this size, effects which are generally considered small.

Main analyses consisted of hierarchical multiple regression equations. Separate hierarchical multiple regressions were run for each of the outcome measures related to body dissatisfaction, eating disorder symptoms and life satisfaction. In each case, age, child anxiety and child depressive symptoms were entered on the first step, along with BMI; family variables, including family violence, verbal abuse, perceptions of parental love and parenting styles were entered on the second step; peer competition was entered on the third step; and exposure to thin ideal television and social media were entered on the fourth step. This hierarchy was designed theoretically to extend from most proximal variables outward (e.g., Bronfenbrenner 1979). Multicollinearity was examined using tolerance and VIF statistics and found to be acceptable in all cases. Highest VIF values were 1.78, and lowest tolerance values were .56. Supplemental analyses are discussed in the results section.

6-Month Follow-Up

During the cross-sectional portion of the study, we asked whether participants would be willing to be contacted by phone 6 months later for a follow-up. Despite not offering incentives for the follow-up, a fair number of participating families did agree. In order to maximize the willingness of participants to agree to the follow-up without incentive, it was decided that a short phone follow-up would be the best recourse. All outcome variables, as well as media use variables, current anxiety and peer competition were reassessed.

For the T2 assessment, 101 teen girls and families agreed to participate and had up-to-date contact information. This group did not differ demographically from the girls and families who did not participate in the follow up. The T1 outcome measures also were assessed using *t* test analyses to determine whether differences existed between those who were reassessed compared to those who did not volunteer or who were unavailable at T2. No differences were found between these groups, suggesting that there were no selective differences between volunteers and non-volunteers.

As with the cross-sectional portion of the study, main outcomes were analyzed using hierarchical regressions. Because of the smaller number of participants, the number of variables was trimmed to include only those which had demonstrated value in the correlational analysis, as well as the media variables. In each case, age and child depressive symptoms were entered on the first step, along with the T1 outcome variable and BMI; perceptions of parental love was entered on the second step; concurrent peer competition was entered on the third step; and exposure to thin ideal television and social media were entered on the fourth step. Interaction terms between preexisting body dissatisfaction (T1) and media exposure (television and social media) were entered on the fifth step, namely, to test the hypothesis that media might interact with preexisting body dissatisfaction. All variables in the interaction terms were first centered to prevent multicollinearity. Highest VIF values were 1.98, and lowest tolerance values were .51.

Results

BMI and Body Satisfaction

Initially we sought to examine which range of BMI, according to WHO categories, experienced the highest levels of body satisfaction. As noted above, girls were divided into categories based on WHO (2012) defined BMI ranges. As defined by the WHO, BMI under 18.5 is underweight, from 18.5 through 24.9 is the ideal weight range, from 25.0 through 29.9 is overweight (i.e., preobesity), and 30 and above defines obesity. 217 girls volunteered height and weight information in order to calculate BMI. Of these 32 (14.7 %) were underweight, 139 (64.1 %) were within the WHO weight ideal, 32 (14.7 %) were overweight and 14 (6.5 %) were in the obese range.

A one-way ANOVA examining body satisfaction across these four categories was significant [$F(3, 213) = 12.17, p < .001$]. Tukey post hoc-analyses revealed that no significant differences existed between underweight and health-ideal girls, or between overweight and obese girls. However body dissatisfaction was significantly lower among underweight girls ($M = 47.69, SD = 15.10$) than overweight ($M = 66.00, SD = 15.36$) (Hedges $g = -1.19$) and obese ($M = 70.14, SD = 16.58$) girls (Hedges $g = -1.42$). Body dissatisfaction was also significantly lower among health-ideal girls ($M = 52.35, SD = 16.81$) than overweight (Hedges $g = -1.05$) or obese (Hedges $g = -0.82$) girls. This data is presented in Fig. 1.

Figure 2 presents scatterplot data related to BMI scores and body dissatisfaction scores.

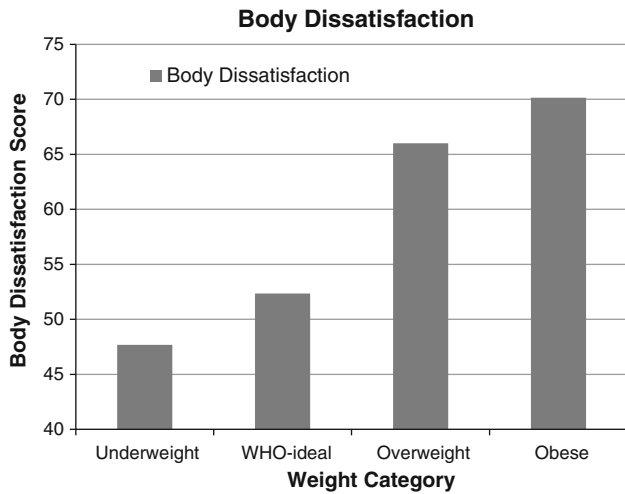


Fig. 1 Body dissatisfaction by WHO BMI category in teenage girls

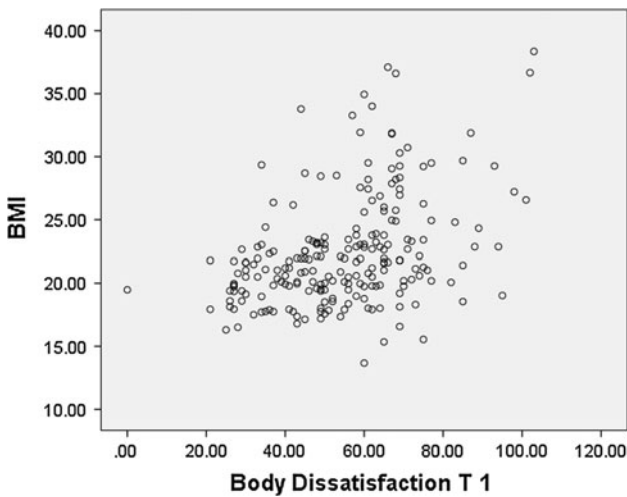


Fig. 2 Scatterplot for the relationship between BMI and body dissatisfaction in teenage girls

Media Consistency Over Time

Social media use at T1 correlated ($r = .31, p < .01, 95\% \text{ CI} = .14, .42$) with social media use at T2. Television exposure to thin ideals at T1 correlated ($r = .26, p < .05, 95\% \text{ CI} = .07, .43$) with television exposure at T2. Television exposure and social media use did not significantly correlate at either point in time.

Social Media Use and Internalizing Symptoms

Recently the American Academy of Pediatrics (2011) suggested that teens may experience a “Facebook Depression” due to social media use, although this claim was criticized by some scholars (Magid 2011). As we had some data pertaining to this, we decided to analyze the

relationship between social media use and internalizing symptoms.

Social media use at T1 did not correlate concurrently with either parent or child rated depressive symptoms ($r = -.08$ and $.09, p > .05$, respectively), although it correlated with T1 anxiety ($r = .14, p < .05$) but not T2 anxiety ($r = .01, p > .05$). However, the concurrent relationship became non-significant when age was controlled in regression.

Concurrent Predictive Analyses

The first regression concerned concurrent predictors of body dissatisfaction. The overall model was statistically significant [$R = .69, \text{Adj } R^2 = .34, F(13, 187) = 5.56, p < .001$]. Results are presented in Table 1. Significant predictors of concurrent body dissatisfaction included T1 child-rated depressive symptoms ($\beta = .38$), BMI ($\beta = .25$), and peer competition ($\beta = .36$). Perceptions of parental love were inversely related to body dissatisfaction ($\beta = -.12$), although this relationship was weak and the CI crossed the zero line warranting caution in interpretation. Neither television exposure to thin ideals nor social media use predicted body dissatisfaction.

The second regression concerned eating disorder symptoms (EAT-26). The overall model was statistically significant [$R = .75, \text{Adj } R^2 = .53, F(13, 187) = 18.00, p < .001$]. Significant predictors of concurrent eating disorder symptoms included current anxiety ($\beta = .24$), current child-rated depressive symptoms ($\beta = .15$), and BMI ($\beta = .17$). Neither television exposure to thin ideals nor social media use predicted eating disorder symptoms, nor in this case did peer competition.

The third regression concerned life satisfaction. The overall model was statistically significant [$R = .68, \text{Adj } R^2 = .42, F(13, 187) = 12.30, p < .001$]. Significant predictors of life satisfaction included age ($\beta = -.20$), current child-rated depressive symptoms ($\beta = -.41$), perceptions of parental love ($\beta = .15$), peer competition ($\beta = -.28$) and social media use ($\beta = -.13$). Television use did not predict life satisfaction. Previous research (Ferguson et al. (2011a, b)) has suggested that body dissatisfaction correlates highly with reduced life satisfaction. When the regression was rerun with body dissatisfaction included in step 1, body dissatisfaction proved to be a significant predictor of life satisfaction ($\beta = -.29$), although its inclusion did not influence the significance of the other predictors.

Prospective Analysis

The first regression concerned prospective predictors of body dissatisfaction. The overall model was statistically

Table 1 Multiple regression results for concurrent outcomes (n = 237)

Predictor variable	Body dissatisfaction	EAT-26	Life satisfaction
Age	-.04	.04	-.20 (-.08, -.32)*
Anxiety	-.01	.24 (.12, .36)*	.07
Depressive symptoms (P)	.00	.01	.01
Depressive symptoms (C)	.38 (.27, .48)*	.15 (.02, .27)*	-.41 (-.30, -.51)*
BMI	.25 (.13, .37)*	.17 (.04, .29)*	.07
ΔR^2	.43*	.24*	.35*
Family violence	-.02	-.04	.03
Verbal abuse	.02	.00	.04
Perception of parental love	-.12 (.01, -.24)*	-.01	.15 (.02, .27)*
Authoritarian parenting	-.07	-.06	-.01
Authoritative parenting	.02	-.09	.03
ΔR^2	.02	.01	.03
Peer competition	.36 (.25, .46)*	.14	-.28 (-.16, -.39)*
ΔR^2	.10*	.01	.07*
Television	-.03	.10	.10
Social media	.05	-.07	-.13 (-.00, -.25)*
ΔR^2	.00	.01	.02*

Numbers in parentheses represent 95 % confidence interval for standardized regression coefficients. Confidence intervals included only for significant results. Double lines on the table represent steps in the regression model. Adjusted R^2 is reported for each step in the hierarchical models. Depressive Symptoms (P) = Parent reported; Depressive Symptoms (C) = Child reported
*Denotes statistical significance

significant [$R = .65$, $Adj R^2 = .34$, $F(10, 70) = 5.03$, $p < .001$]. Results are presented in Table 2. Significant predictors of concurrent body dissatisfaction included T1 body dissatisfaction ($\beta = .37$), and concurrent peer competition ($\beta = .23$). Neither television exposure to thin ideals nor social media use predicted body dissatisfaction 6 months later, nor did media interact with preexisting body dissatisfaction.

The second regression concerned eating disorder symptoms (EAT-26) in a prospective analysis. The overall model was statistically significant [$R = .73$, $Adj R^2 = .47$, $F(10, 70) = 8.08$, $p < .001$]. Significant predictors of prospective eating disorder symptoms included T1 eating disorder symptoms ($\beta = .33$), concurrent peer competition ($\beta = .42$) and BMI ($\beta = .30$). Neither television exposure to thin ideals nor social media use predicted prospective eating disorder symptoms.

The third regression concerned life satisfaction in prospective analysis. The model was statistically significant [$R = .45$, $Adj R^2 = .09$, $F(8, 72) = 2.05$, $p < .05$], although only through the fourth step of the model. Only previous T1 life satisfaction predicted T2 life satisfaction ($\beta = .31$).

Testing Alternate Effects Models in Prospective Analyses

As follow up analyses, different causal and interactional models were tested with the prospective data. Path analyses were examined using AMOS software. First a basic model was constructed, based on the regression analyses, with T1 body dissatisfaction and eating disorder symptoms on

causal paths for T2 outcomes, with T1 body dissatisfaction causing T2 eating disorders symptoms. Peer competition was included as a causal contributor to both T2 body dissatisfaction and eating disorder symptoms. BMI was also included as contributing to T2 eating disorder symptoms. Television and social media were included in the base model as separate non-causal variables. This initial model was a good fit to the data [$\chi^2(18) = 28.5$, $p = .06$, CFA = .93, RMSEA = .08].

Next, we extended the model to the traditional “media effects” model with causal contributions for T1 television exposure to thin images and social media use to both T2 body dissatisfaction and eating disorder symptoms. This resulted in worse fitting models, whether television and social media were entered together or separate, for only one outcome or for both. Parameter estimates for television (.09 for body dissatisfaction, .07 for eating disorder symptoms) and social media (.01 for body dissatisfaction, .12 for eating disorder symptoms) were generally low. These results suggest that the traditional “media effects” model of direct causal influence is not an improvement on the basic “null media effects” model.

Next we examined models in which peer competition potentially mediated influences between media variables and outcome variables. First, a model was constructed in which television exposure to thin ideals contributed to peer competition, which in turn contributed to the outcome variables. This model did not improve upon the null media effects model. However, a model in which social media was included as a contributor to peer competition, improved slightly on the basic null media effects model [$\chi^2(17) = 25.4$, $p = .08$, CFA = .94, RMSEA = .07].

Table 2 Multiple regression results for prospective outcomes (n = 101)

Predictor variable	Body dissatisfaction	EAT-26	Life satisfaction
Age	-.04	.07	-.07
Depressive symptoms (C)	.11	.02	-.24
BMI	.09	.30 (.11, .47)*	.02
Time 1 outcome variable	.37 (.19, .52)*	.33 (.15, .48)*	.31 (.12, .48)*
ΔR^2	.33*	.35*	.16*
Perception of parental love	-.12	-.04	-.16
ΔR^2	.03	.00	.02
Peer competition	.23 (.04, .41)*	.42 (.25, .57)*	.03
ΔR^2	.04*	.15*	.00
Television	.10	.11	.02
Social media	-.01	.07	.14
ΔR^2	.01	.01	.01
Television \times Preexist	.08	.11	.12
Social \times Preexist	.01	-.10	-.10
ΔR^2	.01	.01	.02

Numbers in parentheses represent 95 % confidence interval for standardized regression coefficients. Confidence intervals included only for significant results. Double lines on the table represent steps in the regression model. Adjusted R^2 is reported for each step in the hierarchical models. Depressive Symptoms (C) = Child reported; Television \times Preexist = Interaction between T1 television thin ideal exposure and preexisting (T1) body dissatisfaction; Social \times Preexist = Interaction between T1 social media use and preexisting (T1) body dissatisfaction

*Denotes statistical significance

When the model was altered slightly such that peer effects and social media use were considered as covariates, rather than applying causal attributions, the model was an equally good fit. Given that the correlational model was just as good as the causal model, for the sake of conservative reporting, the correlational version of this model is presented as Fig. 3.

Peer Competition and Social Media Use: The Chicken and the Egg?

The above results left unanswered questions about whether peer competition contributes to social media use, or the inverse, or whether a dual process model exists. These questions were examined using subsequent path analyses with AMOS software. If a model with T1 peer competitiveness causing T2 social media use was a good fit to the data, but not the inverse, this would argue that peer competition leads to social media use, but that social media use does not lead to peer competition. The opposite would be true for inverse results. As such we tested several opposing models: a base model with peer competition and social media use having no interaction, a model in which social media caused later peer competition, a model in which peer competition caused later social media use, and a dual process model.

The basic “no interaction” model proved to be a good fit to the data [$X^2(4) = 5.2$, $p = .27$, CFA = .98,

RMSEA = .06). T1 variables contributed to T2 variables, not surprisingly, but no cross-causal effects were presumed in this basic model. The model in which peer competition led to later social media use did not substantially improve the goodness of fit, nor did the dual process model. However, the inverse model in which social media contributed to later peer competition did [$X^2(3) = 1.2$, $p = .78$, CFA = 1.00, RMSEA = .00). This model is presented at Fig. 4.

Discussion

The relative impact of media and peers on body dissatisfaction, life satisfaction and eating disorder symptoms continues to be debated in the academic community. Researchers remain divided regarding whether media contributes to body dissatisfaction and eating disorder symptoms (e.g., Grabe et al. 2008), has no influence (e.g., Holmstrom 2004), or effects only certain girls and women (Roberts and Good 2010). Further, little research has examined potential media effects in the context of peer effects (Ferguson et al. (2011a, b)). Our study sought to address gaps in the literature by examining whether television and social media use could predict body dissatisfaction and eating disorder symptoms in teen girls, beyond what would be expected from peer competition in real life. Our results suggest that only peer competition, not television or social media use, predicted negative outcomes.

Fig. 3 Final path analysis model for peer, media and outcome variables

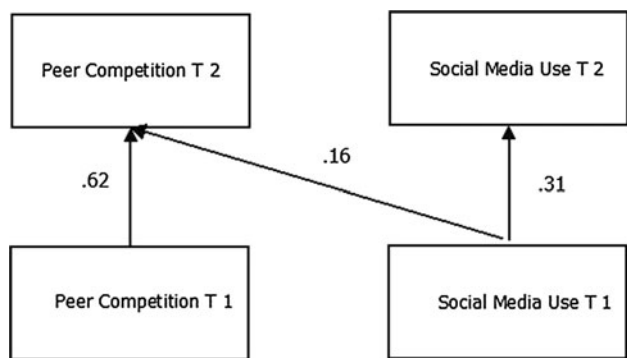
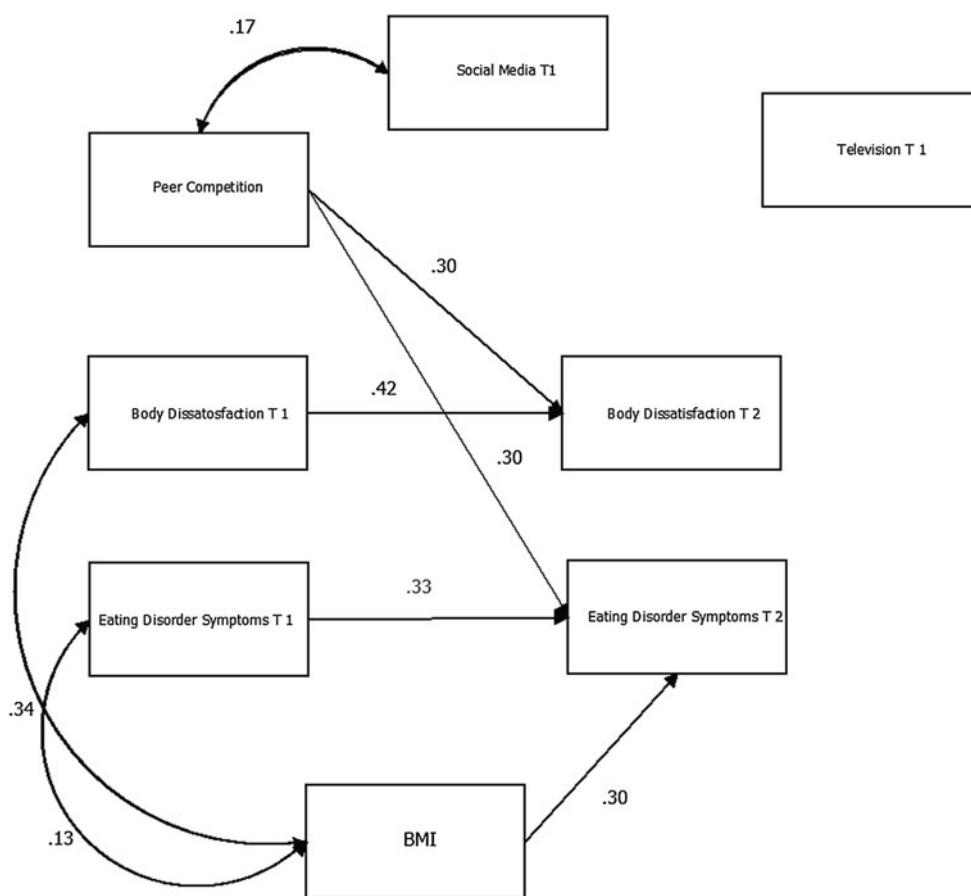


Fig. 4 Final path analysis model for social media and peer competition

However, social media use had a small predictive relationship with peer competition, suggesting that social media may be one arena in which peer competition for potential mates is carried out.

The current study contributes to the existing literature by considering television and social media, as well as peer competition, together in the same concurrent and prospective analyses. Overall, results suggested that neither television exposure to thin ideals nor social media use predicted negative outcomes, with the exception of a small correlation between social media use and reduced life

satisfaction concurrently, but not prospectively. By contrast, peer competition was a moderately strong predictor of most negative outcomes, both concurrently and prospectively. The exceptions to this were eating disorder symptoms concurrently and life satisfaction prospectively. These results suggest that peer competition, rather than television or social media exposure, is more salient to body and eating issues in teenage girls. However, social media use did predict later peer competition, suggesting possible indirect effects for this type of media.

Interestingly, although our results indicate that increased body dissatisfaction was related to larger BMIs in teenage girls, we found no significant difference between underweight girls and girls within the WHO health-ideal BMI range. As Fig. 1 reveals, there was an inclining trend across categories, although the difference between underweight girls and health-ideal girls was not statistically significant in post hoc analyses, nor was the difference between overweight and obese girls. The scatterplot for this data is presented as Fig. 2. As can be seen in the scatterplot, variance in body dissatisfaction increases with BMI. Girls with lower BMIs (i.e., lower than 24) show less variance in body dissatisfaction than do girls higher in BMI (25 or higher). This suggests that, although lower BMIs tend to be associated with higher body satisfaction, higher BMIs do

not *necessarily* associate with body dissatisfaction in all girls.

As for the relationship between television and social media use and negative outcomes, results were generally consistent. Results indicated that neither television viewing of thin images nor social media use correlated with negative outcomes. The only exception was that social media use correlated with concurrent, but not prospective, life satisfaction, although this correlation was small. However, social media use did predict later peer competition, which in turn predicted negative outcomes. Some scholars have suggested that social media may be one avenue by which people may express dissatisfaction with life (Feinstein et al. 2012). The American Academy of Pediatrics (2011) has gone further with claims of a “Facebook Depression” in which teen users may be more prone to depressive symptoms, although fact checking of their claims by one scholar (Magid 2011) revealed that the AAP had ignored data conflicting with their claims and misrepresented some research. We do not take our results as evidence of a “Facebook Depression,” particularly as social media use in our sample did not correlate with either parent or child rated depressive symptoms ($r = -.08$, and $.09$ respectively); nor did social media use correlate with T1 anxiety (with age controlled) or T2 anxiety. However, comments by Feinstein et al. (2012) about social media being potentially used as an outlet to discuss life dissatisfaction may have merit. Even if social media is conceived as closer to peer effects than traditional media effects, it does not appear that social media use adds much influence over perceived peer competition. However, our results do suggest that social media may open up new avenues for peer competition, possibly making peer competition more intense. Thus, although our results do not suggest direct effects for social media use, indirect effects remain possible.

Television thin ideals did not predict concurrent or prospective body dissatisfaction or eating disorder symptoms, contrary to what may have been expected under traditional social comparison theories. However, Ferguson et al. (2011), in their Catalyst Model, suggest some evolutionary-based refinements to social comparison, suggesting that peer competition is more critical to body dissatisfaction issues than are media comparisons. Put another way, social comparison is indeed important, but teenage girls are more likely to compare themselves to high-status peers than characters on television. Our data support this assertion. It should be noted that our analyses consider exposure to thin ideal media specifically, rather than more general television use. However, there appears to be little theoretical reason why general television use would have an influence where specific exposure to thin images did not.

Indeed, although results were not fully consistent (peer competition did not predict concurrent eating disorder

symptoms) peer competition emerged as one of the strongest and most consistent predictors of negative outcomes in our analyses. We suggest that there may be value in spending more time examining this variable as it relates to body dissatisfaction in young girls. Although few scholars would suggest that peer and media effects are necessarily mutually exclusive, our results suggest that they are not equal predictors of body dissatisfaction related issues in teenage girls. This is consistent with the views expressed by other scholars that peer influences may constitute a “normative” developmental process influencing body dissatisfaction concerns (Markey 2010).

Our results support the Catalyst Model’s inclusion of peer competition as a key variable for the development of body dissatisfaction. The Catalyst Model suggests that this is, in effect, a rational if distressing reaction to the pragmatics of competing for potential romantic/sexual partners. It is expected that body dissatisfaction will increase among women when competition is heightened and an individual female’s success attracting mates in relationship to her peers may not be what she wishes it to be. As expected, television exposure contributed little to teen girls’ outcomes, likely given that television viewers have no expectation of competing with females on television. However, although social media did not contribute directly to negative outcomes, our results suggest that social media may become an additional realm in which peer competition may occur.

Previous research (Ferguson, in press; Groesz et al. 2002; Roberts and Good 2010) has suggested that media effects may influence individuals who have preexisting concerns regarding body dissatisfaction. Somewhat surprisingly, our current analyses did not support this, at least for television and social media. Nonetheless, we believe that there is value in continuing to examine this hypothesis through other means. For example, it may be that issues such as neurotic personality traits may interact more with media thin ideals than do preexisting body dissatisfaction concerns. We did not test for neurotic personality traits in the current analysis. Further, it may be possible that interaction effects witnessed in previous Caucasian-majority samples simply may not hold for a predominantly Hispanic sample. There would be value in future research continuing to examine this possibility. Further, it is important to note that our research considered only television and social media use. A plurality of previous research considered magazine exposure (Ferguson, in press) and it is possible that magazines have certain influences that television and social media do not.

Arguably, one concern about media effects literature, broadly speaking, is that media effects tend to be conceptualized in terms of binary relationships (i.e., “media is/not bad for X”). Such an approach lacks both a functional developmental perspective and a nuanced perspective of user experiences. Lost in such an approach is a

consideration of why an individual would imitate negative behaviors witnessed in media? This is not to say it is never possible, but rather to emphasize media effects research rarely takes a functional developmental approach to theory (Sherry 2004). Given that real-world environmental contingencies to behavior may plainly differ from those in fictional media, few media effects theories have sufficiently addressed the question of why media consumers would fail to make such a distinction.

By contrast, that competition with peers would have potential consequences makes functional sense. It is thus not surprising to find that peer influences on body dissatisfaction and eating disorder symptoms are often considerable (Forney et al. 2012). Developmentally, we would expect these effects to become more pronounced from early childhood into the teen and early adult years, then to taper off when a monogamous mate-selection has occurred. However, future research would be necessary to test this developmental trajectory. Nonetheless, models of body dissatisfaction and eating disorder symptoms would benefit greatly from taking more of a developmental perspective. At present, they remain too focused on *hypodermic needle* approaches (theoretical models which purport that behaviors and cognitions are directly inserted into passive viewers who automatically model what they see), often insistent on ideological purity and too often patronizing of media viewers (Gill 2012).

As with most studies, ours has limitations. First, our data are correlational in nature and cannot be used to make causal inferences. Second, the sample for our prospective analysis was comparatively small, reducing power. There would be obvious value in using larger samples across longer prospective periods. Third, our outcomes do not include clinically validated diagnoses of eating disorders. Few such studies do, particularly given the relative rarity of eating disorder syndromes (Ferguson, in press), although there would be value in future research considering clinical syndromes as outcomes. Lastly, as noted, optimal television and other media exposure measures remain lacking in this field. We used an approach we believed was most optimal in the absence of a standardized rating system such as the ESRB system for video games. No such system exists for exposure to thin ideals in media. We are cognizant that measurement approach can influence outcome results (Fikkers et al. 2012) and development of a standardized and well-validated measure of television and social media exposure to thin ideals would be welcome to advance the field.

In conclusion, our research indicates that peer competition, rather than media effects, is most salient in regard to body dissatisfaction issues in teenage girls. However, social media use may provide a new arena for peer competition, even if it does not directly influence negative body

outcomes. This falls in line with previous research suggesting that teen body dissatisfaction and media use occupy parallel rather than causal developmental paths (Tiggemann 2006). It is probably time to move beyond traditional hypodermic needle media effects models (Gill 2012) in favor of a more nuanced approach which considers media use from a functional developmental perspective. Research perspectives that have been used in other fields such as Self-Determination Theory (Przybylski et al. 2010) or the Catalyst Model proposed here may provide more nuanced avenues for understanding media use or body dissatisfaction, respectively. This field would likely benefit from focusing away from media viewers as passive victims of a media that is *done to* them but active shapers and consumers of media. We expect that debate on these issues will continue and hope that future research will increasingly consider the nuances of media effects on teenage girls. We hope that our study provides some small addition to the extant literature.

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Author contributions Christopher J. Ferguson conceptualized the study and study design, analyzed the data and wrote the first draft of the manuscript. Monica E. Munoz conceptualized the study and study design, and assisted in writing and editing the submitted draft of the manuscript. Adolfo Garza collected the data and conducted participant interviews and assisted in writing and editing the submitted draft of the manuscript. Mariza Galindo collected the data and conducted participant interviews and assisted in writing and editing the submitted draft of the manuscript.

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Author Biographies

Christopher J. Ferguson is department chair of psychology and communication at Texas A&M International University. His research interests focus on media effects, ranging from violent video games to media and body image.

Mónica E. Muñoz is an assistant professor of psychology at Texas A&M International University. Her research interests involve ethnic minority psychology and media and body dissatisfaction.

Adolfo Garza is a graduate student at Texas A&M International University. His research interests have focused on media effects on behavior.

Mariza Galindo is an undergraduate student at Texas A&M International University. Her research interests have focused on media effects on behavior.