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Is Friendship Network Weight Status Associated with One's Own Psychological Well-being? It Depends on One's Own Weight Status

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Abstract

Drawing on multiple theoretical perspectives (e.g., social comparison theory, reward theory, evolutionary theory), the present research examined the relations of self and friendship network weight status to body satisfaction, self-esteem, and depression. A diverse, population-based sample of adolescents completed measures of well-being and were measured for height and weight. Boys had greater self-esteem if their male friendship networks' weight status mismatched, versus matched, their own weight status ($d = .23$). Conversely, boys had greater body satisfaction if their female friendship networks' weight status matched, versus mismatched, their own weight status ($d = .18$). For girls, the relations of male and female friendship networks' weight status with well-being did not vary by one's own weight status. Evolutionary theory appears to best explain the observed pattern of results, and clinicians may want to consider friends' weight status when dealing with adolescents' body satisfaction issues.

Keywords

body mass index; peer influence; psychological well-being

A growing body of research has examined the interrelations among behaviors (e.g., dieting and disordered eating) or characteristics [e.g., body satisfaction, depression, and body mass index (BMI)] of members of adolescent social networks (e.g., de la Haye, Robins, Mohr, & Wilson, 2011; Eisenberg et al., 2012; Hutchinson & Rapee, 2007; Paxton, Schutz, Wertheim, & Muir, 1999; Valente, Fujimoto, Chou, & Spruijt-Metz, 2009; Van Zalk, Kerr, Branje,

Stattin, & Meeus, 2010). This research typically looks at similarity (homophily) in a particular behavior or attribute (e.g., BMI) among network members, but generally does not explore how that particular behavior or attribute is related to additional, more internalized psychosocial factors that are important to peer relationships and also important potential predictors or consequences of the behavior (e.g., body satisfaction). The present investigation applied this less utilized approach by examining the relation of one peer attribute to another—specifically the relations of weight status to body specific well-being (i.e., body satisfaction) and more global aspects of well-being (i.e., depression and self-esteem). That is, the present analysis asked whether or not adolescents' well-being was related to friend weight status and whether or not one's own weight status modified the association between friend weight status and well-being. In considering these relations, the general association of weight status with psychological well-being was examined, followed by a discussion of theoretical perspectives that may elucidate the role of friend weight status in psychological well-being. This investigation has the potential to inform interventionists and clinicians dealing with issues of weight status and well-being.

Relation of Weight Status to Well-being

There are a number of reasons why being overweight (vs. non-overweight) could be related to poorer psychological well-being including weight bias and prejudice (e.g., Puhl & Brownell, 2001; Puhl & Latner, 2007), social marginalization (e.g., Apolloni, Marathe, & Pan, 2011; Valente et al., 2009), and negative comparisons to body shape/weight ideals and standards (e.g., Myers & Crowther, 2009). In a review of literature examining the relation of weight status to well-being, Wardle and Cooke (2005) concluded that within population-based samples, overweight adolescents, relative to non-overweight adolescents, had greater body dissatisfaction but did not vary in terms of depression or self-esteem (clinical samples showed stronger relations). Loth, Mond, Wall, and Neumark-Sztainer (2011) also found that weight status was related to body satisfaction. Additionally, they found that within some, but not all, subgroups of the adolescent population the relation of overweight status to well-being extended beyond body satisfaction to self-esteem (older and younger male adolescents; younger female adolescents) and depression (younger male adolescents). Loth et al. (2011) also found that developmental changes in well-being were negatively impacted by being overweight (e.g., increases in depression were greater in overweight boys compared to non-overweight boys). Although Wardle and Cooke (2005) suggested that overweight girls are more at risk for well-being deficits relative to overweight males, Loth et al. (2011) found that overweight boys were just as susceptible as girls to lower well-being. Furthermore, a meta-analysis of empirical research looking at the relationship between overweight and self-esteem in adolescents found that overweight status was related to lower self-esteem for both genders and for children and adults (Miller & Downey, 1999). As a whole, these findings suggest that weight status is most consistently related to body satisfaction, whereas associations with more global aspects of well-being have been less consistently found.

Why Friend Weight Status Might be Related to One's Own Well-being

Weight status appears to be related to certain aspects of psychological well-being, in particular body satisfaction, but is there reason to believe that the weight status of close others would be associated with one's own well-being? A number of theoretical perspectives—social comparison theory, reward theory, interdependence theory, evolutionary theory—suggest that friend weight status may be related to psychological well-being and that one's own weight status may moderate the association of friend weight status with psychological well-being.

Social comparison theory (Festinger, 1954) proposes that people are motivated to assess their position in life and will compare themselves to relevant others and standards. An upward comparison (a comparison with someone whom one believes is better off than oneself) should lead to negative effects on one's well-being, whereas a downward comparison (a comparison with someone whom one believes is worse off than oneself) should lead to positive effects on one's well-being. A meta-analysis of social comparison with same-sex others and body dissatisfaction found that men and women experience increased body dissatisfaction after making upward, appearance-based comparisons (Myers & Crowther, 2009). This effect was stronger for women than for men and for younger versus older people. The object of comparison—media images, unfamiliar peers, or familiar peers—did not moderate the results. Research on naturally occurring social comparison found that compared to baseline levels, women had greater body dissatisfaction and negative affect following an upward comparison and lower body dissatisfaction and negative affect following a downward comparison (Leahey, Crowther, & Mickelson, 2007). These results suggest that having same-sex overweight friends may enhance well-being for non-overweight adolescents to the extent that they are engaging in downward social comparisons. For overweight adolescents, having only non-overweight same-sex friends, compared to having at least one overweight friend, may be related to lower well-being (to the extent that they are engaging in upward social comparisons). Put another way, having an overweight friend, versus no overweight friends, may be related to greater psychological well-being for all adolescents. Social comparison theory does not necessarily inform associations of opposite-sex friend weight status with well-being, as same-sex others are the most relevant targets of comparison for appearance.

Reward/reinforcement theory of interpersonal relationships (e.g., Byrne, 1971) proposes that we are attracted to people and situations that confer benefits (and not costs). Friends' weight status could confer benefits and costs. Adolescents' desire to affiliate with popular peers (Adler & Adler, 1998; Merten, 1997) appears to be driven by status that is gained by associating with popular peers (Dijkstra, Cillessen, Lindenberg, & Veenstra, 2010). Furthermore, physical attractiveness, which is strongly related to weight status (Thornhill & Grammer, 1999; Tovée, Hancock, Mahmoodi, Singleton, & Cornelissen, 2002), is a key predictor of popularity (Dijkstra et al., 2010; Dijkstra, Lindenberg, Verhulst, Ormel, & Veenstra, 2009). Therefore, overweight adolescents may benefit in terms of status from friendships with non-overweight friends, which could increase well-being. One may benefit psychologically just by perceiving that one is affiliated with high status or successful

individuals (or groups) through the process of “basking in reflected glory” (e.g., Cialdini et al., 1976; Dijkstra et al., 2010).

The opposite of “basking in reflected glory” is “cutting-off reflected failure” (Snyder, Lassegard, & Ford, 1986), whereby one cognitively and/or behaviorally distances oneself from low status or unsuccessful individuals (or groups). If one is non-overweight, one may wish to avoid weight bias from associating with overweight others (cutting off reflected failure). Overweight and obese individuals are often the object of prejudice and discrimination (Puhl & Brownell, 2001; Puhl & Latner, 2007), and this weight bias can be transferred to non-overweight individuals (i.e., stigma by association; Hebl & Mannix, 2003). Consistent with these ideas, some research on adolescent friendship selection suggests that non-overweight adolescents tend to befriend non-overweight peers and marginalize overweight peers (de la Haye et al., 2011). Affiliation effects, both rewards and punishments, could potentially apply to both same- and opposite-sex friends, and research on popularity has demonstrated that being friends with a popular peer of the opposite-sex is related to adolescents’ popularity (Dijkstra et al., 2010). Contrary to social comparison theory, reward theory would hypothesize that having an overweight friend, versus no overweight friends, would be related to lower psychological well-being for all adolescents.

Although reward theory suggests that adolescents will gain benefits by affiliating with non-overweight opposite-sex friends, other perspectives such as interdependence theory (Kelley & Thibaut, 1978) and evolutionary psychological theory (e.g. Buston & Emlen, 2003; Waynforth & Dunbar, 1995) suggest that this effect will be moderated by one’s own weight status. Interdependence theory proposes that relationship satisfaction depends on one’s comparison level (expectations based on prior relationships) and comparison level for alternatives (other relationships that one could reasonably expect to have). These expectations may temper one’s desire to affiliate with opposite-sex others who are more or less attractive. If one is non-overweight, one might expect to affiliate with opposite-sex others who are also non-overweight and one may be unsatisfied in a current relationship with an overweight other if one perceives that other more desirable relationships are available. If one is overweight, one might expect to affiliate with opposite-sex others who are also overweight and view non-overweight others as relatively unattainable. Research has supported these assertions. For example, people tend to choose to initiate relationships with opposite-sex others who are similar in terms of attractiveness (e.g., Berscheid, Dion, Walster, & Walster, 1971) and are more satisfied in relationships in which the partners are similar in attractiveness (e.g., White, 1980). The present analysis did not explicitly examine romantic partners. However, opposite-sex friendships are often marked by romantic interest (Kaplan & Keys, 1997), and even if the relationship is not romantic, a benefit of these relationships is gaining access to potential romantic partners (Hand & Furman, 2009).

Research based in evolutionary theory also suggests that one’s own personal attractiveness leads to differences in mate selection strategies (e.g. Buston & Emlen, 2003; Waynforth & Dunbar, 1995). These differences are not driven by differences in criteria for judging attractiveness, but instead appear to be driven by individuals of different attractiveness levels pursuing potential mates of a similar attractiveness in order to optimize the chance of successful courtship (Carmalt, Cawley, Joyner, & Sobal, 2008; George, Swami, Cornelissen,

& Tovée, 2008). These studies have implications for the relation of opposite-sex friend weight status to well-being such that non-overweight participants should have greater well-being when their opposite-sex friends are also non-overweight. Conversely, overweight participants should have greater well-being when they have an opposite-sex friend who is also overweight, thereby increasing their chances of successful courtship. Some research suggests that attractiveness is a more important attribute in the evaluation of a romantic partner for men versus women (e.g., Buss, Shackelford, Kirkpatrick, & Larsen, 2001; Regan & Anupama, 2003), whereas other research suggests that attractiveness is equally important for men and women (Carmalt et al., 2008).

The present investigation aimed to determine whether or not adolescents' well-being was related to friend weight status and whether or not this relation was moderated by one's own weight status. Based on prior research (e.g., Loth et al., 2011; Wardle & Cooke, 2005) it was expected that observed effects would be most pronounced for body satisfaction, with possible extensions to more global well-being. The theoretical perspectives outlined above suggest that the interrelation of self and friend weight status with well-being could vary for boys versus girls and opposite- versus same-sex friends. In summary, the theories under consideration would hypothesize the following:

- Social comparison theory suggests that non-overweight adolescents would benefit from downward social comparisons with overweight same-sex friends. Conversely, overweight adolescents would suffer from upward social comparisons with non-overweight same-sex friends. These comparisons suggest that well-being should be greater for both non-overweight and overweight adolescents who have overweight friends relative to those with no overweight friends. As suggested by meta-analysis (Myers & Crowther, 2009), women may be more susceptible to these processes than men. This theory would apply predominantly to same-sex friends as they are relevant targets for comparison.
- Reward theory and basking in reflected glory/cutting off reflected failure suggest that non-overweight adolescents would suffer from affiliating with overweight friends, whereas overweight adolescents would benefit from affiliating with non-overweight friends. These ideas suggest that well-being should be lower for both non-overweight and overweight adolescents who have overweight friends relative to those with no overweight friends. This pattern could apply to both same- and opposite-sex friends.
- Interdependence theory and evolutionary perspectives both suggest (through different mechanisms) that non-overweight adolescents would benefit from having non-overweight opposite-sex friends, whereas overweight adolescents would benefit from having overweight opposite-sex friends. Therefore, the relation of opposite-sex friend weight status with psychological well-being should be moderated by one's own weight status. Overall, well-being should be greater for adolescents whose weight status matches, versus mismatches, the weight status of their opposite-sex friends. Some evolutionary research suggests that these effects would be more pronounced for boys versus girls.

Method

Study Design and Population

Data come from EAT 2010 (Eating and Activity Among Teens), a study of weight status, dietary intake, physical activity, and weight control behaviors among adolescents. Trained research staff administered surveys and measured adolescents' height and weight during selected health, physical education, and science classes during the 2009–2010 academic year ($N = 2,793$). Participants were given a \$10 gift card for participation. Study procedures were approved by the University of Minnesota's Institutional Review Board Human Subjects Committee and by the research boards of the participating school districts. Among adolescents who were at school on the days of survey administration, 96% had parental consent and chose to participate.

The sample includes adolescents from 20 public middle schools and high schools in the Minneapolis/St. Paul metropolitan area of Minnesota. The mean age was 14.4 years ($SD = 2.0$); 46% were in middle school (6th–8th grades) and 54% were in high school (9th–12th grades). Participants were equally divided by gender (47% male, 53% female). The ethnic/racial backgrounds of the participants were as follows: 19% white, 29% African American or Black, 20% Asian American, 17% Hispanic, 4% Native American, and 12% mixed or other.

Participants were asked to nominate up to six of their fellow students as their friends (nominations could be made for friends in any grade), as has been done in previous studies (Hutchinson & Rapee, 2007; Jaccard, Blanton, & Dodge, 2005; Paxton et al., 1999; Trogon, Nonnemaker, & Pais, 2008). Alphabetized rosters organized by grade level were compiled for each school, and study staff created a unique identification (ID) number for each student. Using their school roster, participants recorded the IDs of their three closest female friends and three closest male friends. Generic codes were used to indicate having no friends or having friends who did not attend their school. Data provided by each nominated friend on his or her own survey was linked by ID number to each individual student. Participants nominated an average of 5.2 ± 1.3 friends and an average of 2.1 ± 1.7 of those friends participated in EAT 2010 themselves. Data from at least one nominated same-sex friend were available for 1,859 participants (68% of females, 65% of males), and data from at least one nominated opposite-sex friend were available for 1403 participants (49% of females, 58% of males). Participants with at least one nominated same-sex friend and one nominated opposite-sex friend were included in the present study (602 females, 534 males) to examine concurrent associations with same- and opposite-sex friends. Participants in the analytic sample versus those not in the analytic sample did not vary in terms of weight status ($r = -.004$), body satisfaction ($r = .004$), self-esteem ($r = .04$), or depression ($r = -.03$; p s $> .05$). Sampled friends were expected to be representative of all nominated friends in the school as data collection occurred in required, non-elective classes, which presumably included a random selection of students in any given class.

Measures

Weight status—BMI (kilograms/meters²) was calculated using anthropometric data assessed by study staff. Height was measured without shoes (to the nearest .1 cm) and weight was measured without heavy outerwear or shoes (to the nearest .5 pound). Using the CDC's sex-specific BMI-for-age growth charts and classifications (Ogden & Flegal, 2010), a participant was classified as overweight if her or his BMI was 85th percentile (38.6 % of females were overweight, 41.5 % of males were overweight). Female and male friendship networks were classified as overweight if any female friends were overweight (50.6% of participants had at least one overweight female friend) or any male friends were overweight (55.8% of participants had at least one overweight male friend). For both boys and girls, weight status was positively related to same-sex friendship network weight status (boys' $r = 0.18, p < .001$; girls' $r = 0.15, p < .001$) and opposite-sex friendship network weight status (boys' $r = 0.15, p < .001$; girls' $r = 0.13, p < .001$).

Other weight classification systems were considered such as number of overweight friends or majority of friends overweight or not. However, many participants had only one or two friends in the dataset, so counts and classifications such as "majority" were problematic. Nominated friends were used regardless of reciprocity based on the premise that friend influence is not dependent on whether the target friend similarly considers the participant a friend. Furthermore, participants could only list three friends of either sex and therefore, reciprocity may indeed exist if one were to consider a participant's entire friendship network.

Psychological well-being—Using a modified version of the Body Shape Satisfaction Scale (Pangtorre, Spring, & Garfield, 1997), satisfaction with 10 different body characteristics (e.g., face, body shape) was assessed using a 5-point scale ranging from *1 = completely dissatisfied* to *5 = completely satisfied*. Responses were summed to form a scale score ($\alpha = .93, M = 34.0, SD = 10.0$). Self-esteem was measured with six items from the Rosenberg (1965) Self-Esteem Scale using a 4-point Likert scale. This shortened version and the full version performed nearly identically in a validation study with adolescents (van den Berg & Keery, 2006). Responses were summed to create a scale score, with higher scores indicating greater self-esteem ($\alpha = .77, M = 18.1, SD = 3.6$). Depressive symptoms were measured with the six-item Depressive Mood Scale (Kandel & Davies, 1982; Patten et al., 1997) using the response scale *1 = not at all*, *2 = somewhat*, and *3 = very much*. Responses were summed to form a scale score ($\alpha = .83; M = 10.0, SD = 2.9$).

Data Analysis

Similar to other examinations of network data (Bruening et al., 2014; Eisenberg et al., 2012; Sirard, Bruening Kim, Wall, & Neumark-Sztainer, 2013), generalized estimating equation linear models were used to estimate the associations of interest while accounting for the lack of independence in observations and nesting of participants within schools. Main effects models examined the relations of one's own weight status, female friendship network weight status, and male friendship network weight status to each well-being variable. Moderation models added the interaction of self weight status with female friendship network weight status and the interaction of self weight status with male friendship network weight status.

Adjusted means for each of the four cells of an interaction were calculated fixing all covariates at their marginal sample values. Contrasts examining the effect of friendship network weight status conditional on one's own weight status were tested by comparing adjusted means from the interaction model. All analyses were stratified by gender and adjusted for age, race, SES (based on parental education level and employment status, family eligibility for public assistance, and eligibility for free or reduced-cost school meals; see Neumark-Sztainer, Story, Hannan, & Croll, 2002, for the scoring algorithm), and number of male and female nominated friends with usable data. For effect size comparisons of two means, Cohen's d was calculated using estimated marginal means and corresponding standard deviations.

Results

Main Effect Associations of Self and Friend Weight Status with Well-being

For boys, being overweight, relative to not overweight, was related to lower body satisfaction (overweight $M = 31.9$ versus non-overweight $M = 36.8$, $SE = 1.19$, $z = -4.19$, $p < .0001$, $d = -.51$), lower self-esteem (overweight $M = 18.3$ versus non-overweight $M = 18.8$, $SE = .26$, $z = -2.00$, $p = .046$, $d = -.15$), and greater depression (overweight $M = 9.6$ versus non-overweight $M = 8.8$, $SE = .25$, $z = 3.29$, $p < .001$, $d = .32$). For girls, being overweight was related to lower body satisfaction (overweight $M = 28.5$ versus non-overweight $M = 35.2$, $SE = 1.11$, $z = -6.10$, $p < .0001$, $d = -.67$), but not to self-esteem or depression. For boys and girls, neither same- nor opposite-sex friendship network weight status was related to depression, self-esteem, or body satisfaction.

Moderated Associations of Self and Friendship Network Weight Status with Well-being

Same-sex friends—Table 1 shows estimated self-esteem and body satisfaction means as a function of one's own weight status and same-sex friendship network weight status for boys and girls (depression results are omitted here and in Table 2 as no interactions were significant). For boys, one's own weight status interacted with male friendship network weight status to predict self-esteem ($z = -1.98$, $p = .047$; see Figure 1). Contrasts formed from the interaction found, for non-overweight boys, that having an overweight male friend, relative to having no overweight male friends, was marginally related to greater self-esteem (overweight $M = 19.2$ versus non-overweight $M = 18.4$, $SE = .43$, $z = 1.69$, $p = .09$, $d = .22$). For overweight boys, having an overweight male friend, relative to having no overweight male friends, was related to lower self-esteem (overweight $M = 17.8$ versus non-overweight $M = 18.7$, $SE = .42$, $z = -2.06$, $p = .04$, $d = -.25$). Collapsing across matching (self and network are either both non-overweight or overweight) and mismatching (self is non-overweight but network is overweight; self is overweight but network is non-overweight) weight status groups, contrasts formed from the interaction model found that boys had greater self-esteem if their male friendship networks' weight status mismatched, versus matched, their own weight status (mismatched $M = 18.9$ versus matched $M = 18.1$, $SE = .30$, $z = 2.60$, $p = .009$, $d = .23$).

Results for boys' body satisfaction showed a similar pattern, but the interaction of one's own weight status with male friendship network weight status was marginal ($z = -1.93$, $p = .053$).

Contrasts formed from the interaction found, for non-overweight boys, that having an overweight male friend, relative to having no overweight male friends, was marginally related to greater body satisfaction (overweight $M = 37.8$ versus non-overweight $M = 35.9$, $SE = 1.17$, $z = 1.66$, $p = .097$, $d = .20$). For overweight boys, having an overweight male friend, relative to having no overweight male friends, was unrelated to body satisfaction (overweight $M = 31.0$ versus non-overweight $M = 32.7$, $SE = 1.31$, $z = -1.29$, $p = .197$, $d = -.17$). However, collapsing across matching and mismatching weight status groups, contrasts formed from the interaction model found that boys had greater body satisfaction if their male friendship networks' weight status mismatched, versus matched, their own weight status (mismatched $M = 35.3$ versus matched $M = 33.5$, $SE = .72$, $z = 2.55$, $p = .011$, $d = .19$).

For girls, self weight status did not interact with female friendship network weight status to predict depression, self-esteem, or body satisfaction.

Opposite-sex friends—Table 2 shows estimated self-esteem and body satisfaction well-being means as a function of one's own weight status and opposite-sex friendship network weight status for boys and girls. For boys, one's own weight status interacted with female friendship network weight status to predict body satisfaction ($z = 2.43$, $p = .015$; see Figure 2). For non-overweight boys, having an overweight female friend, relative to having no overweight female friends, was unrelated to body satisfaction (overweight $M = 36.1$ versus non-overweight $M = 37.6$, $SE = 1.49$, $z = -1.06$, $p = .29$, $d = -.16$). For overweight boys, having an overweight female friend, relative to having no overweight female friends, was marginally related to greater body satisfaction (overweight $M = 32.9$ versus non-overweight $M = 30.9$, $SE = 1.07$, $z = 1.90$, $p = .058$, $d = .21$). Collapsing across matching and mismatching weight status groups, boys had greater body satisfaction if their female friendship networks' weight status matched, versus mismatched, their own weight status (matched $M = 35.3$ versus mismatched $M = 33.5$, $SE = .77$, $z = 2.30$, $p = .021$, $d = .18$).

For girls, although one's own weight status did not significantly interact with male friendship network weight status to predict body satisfaction ($z = 1.58$, $p = .11$), the pattern of means was similar to the pattern observed for boys. For example, among non-overweight girls, those with no overweight male friends had greater body satisfaction than those with overweight male friends (non-overweight male friendship network $M = 35.9$ versus overweight male friendship network $M = 34.6$, $SE = .59$, $z = 2.21$, $p = .027$, $d = .13$). The pattern was reversed, but not significant, for overweight girls (non-overweight male friendship network $M = 27.7$ versus overweight male friendship network $M = 29.2$, $SE = 1.40$, $z = -1.08$, $p = .28$, $d = -.15$).

Discussion

The purpose of the present research was to examine the relations of self and friendship network weight status to psychological well-being in a diverse, population-based sample of adolescents. Consistent with prior research (Wardle & Cooke, 2005; Loth et al., 2011; Miller & Downey, 1999), one's own weight status was related to certain aspects of psychological well-being, especially body satisfaction. As a main effect, neither same- nor opposite-sex friendship network weight status was related to any of the well-being variables. However, for

boys, the interaction of friendship network weight status and one's own weight status was related to well-being. Boys appeared to have greater self-esteem if their male friendship networks' weight status mismatched, versus matched, their own weight status. A different pattern emerged with opposite-sex friends. Boys appeared to have greater body satisfaction if their female friendship networks' weight status matched, versus mismatched, their own weight status. For girls, neither male nor female friendship network weight status interacted with one's own weight status to predict any well-being variables.

Evaluating Theoretical Accounts

Social comparison theory would suggest that well-being should be greater for adolescents who have overweight same-sex friends relative to those with no overweight same-sex friends (non-overweight adolescents may benefit from downward comparisons with overweight friends; overweight adolescents may suffer from upward comparison with non-overweight friends). Conversely, reward theory would suggest that well-being should be lower for adolescents who have overweight same-sex friends relative to those with no overweight same-sex friends (non-overweight adolescents may suffer from affiliating with overweight friends; overweight adolescents may benefit from affiliating with non-overweight friends). Neither theory was fully supported; as a main effect, same-sex friendship networks' weight status did not predict well-being for boys or girls. However, a social comparison effect may hold for non-overweight weight boys as having an overweight male friend, compared to having no overweight male friends, was marginally associated with greater body satisfaction and self-esteem. Conversely, an affiliation effect may hold for overweight boys as having no overweight male friends, compared to having an overweight male friend, was associated with greater self-esteem.

Overall, boys had greater body satisfaction and self-esteem if their male friendships networks' weight status mismatched, versus matched, their own weight status. This overall pattern of could reflect trade-offs in terms of competing with others and gaining access to resources and opportunities. From an evolutionary perspective, friendships involve a mixture of cooperation (to form coalitions and achieve group level goals) and competition (establishing status between groups and within one's coalition; Geary, Byrd-Craven, Hoard, Vigil, & Numtee, 2003). Boys, more so than girls, interact in larger groups with clearly defined hierarchies (Rose & Rudolph, 2006) and base friendships on agency characteristics such as status and attractiveness (Hall, 2011). The results for non-overweight boys could reflect a position of relative dominance within a friendship network, whereas the results for overweight boys could reflect affiliation with a relatively high-status friendship group.

For girls, one's own weight status did not interact with female friendship network weight status to predict well-being. Research on naturally occurring social comparison (measured via ecological momentary assessment) may shed light on these results. Specifically, Leahey and Crowther (2008) suggest that upward social comparisons are more detrimental if comparison targets are media images versus peers. Conversely, downward social comparisons are more beneficial if the comparison targets are media images versus peers. Even if social comparison was occurring with friends in the present study, comparisons with media images may be overwhelming any friend effects. Furthermore, girls, more so than

boys, base friendships on communal characteristics such intimacy, self-disclosure, and emotional support (Hall, 2011). Therefore, characteristics such as status and attractiveness may be less salient and influential in their same-sex friendships.

Interdependence theory (Kelley & Thibaut, 1978) and evolutionary perspectives (Buston & Emlen, 2003; Waynforth & Dunbar, 1995) both suggest that non-overweight adolescents would benefit from having non-overweight opposite-sex friends, whereas overweight adolescents would benefit from having overweight opposite-sex friends. That is, psychological well-being should be greater for adolescents whose weight status matches versus mismatches the weight status of their opposite-sex friendship networks. This pattern was observed for boys with respect to body satisfaction. Boys were more satisfied with their bodies when their female friendship networks' weight status matched their own relative to mismatches in weight status (a similar, non-significant, pattern was observed for girls). Associations did not extend to more general psychological well-being. These findings suggest that how boys feel about their bodies depend on the extent to which they can reasonably expect to attract possible romantic partners from their pool of friends. Supporting this view, research on the benefits of opposite-sex friendships suggests that a benefit of these relationships is meeting potential romantic partners (Hand & Furman, 2009).

Implications for Intervention

Loth et al. (2011) suggest that the pernicious association of weight status with psychological well-being is not resolved by normal developmental processes and that clinicians and others working with adolescents should be attentive to the psychological well-being of overweight adolescents. Although the present study was exploratory and no firm conclusions can be made, results support Loth et al.'s assertions and further suggest that one may need to consider the weight status of important others when considering the association between adolescent weight status and well-being. For example, body satisfaction was lowest for overweight boys with only non-overweight opposite-sex friends, suggesting that overweight status may be more problematic for adolescents who are not friends with overweight opposite-sex others, and therefore, may perceive themselves as less likely to attract a romantic partner. Interestingly, the opposite pattern emerged for boys in regard to same-sex friends—self-esteem and body satisfaction were lowest for overweight boys with overweight male friends. Clinicians may want to inquire about friends' weight status when dealing with a patient's body satisfaction issues, and consider how this social context may affect the individual's self-concept. Additionally, families may want to explicitly discuss adolescents' body satisfaction concerns with regards to peers/friends to get a fuller understanding of their experience of their own weight status. As a whole, these findings suggest that the influence of weight status does not exist in isolation and that it may be useful to consider the influence of close others when examining well-being. That said, findings do not suggest a simple, clear-cut pattern given differences across gender and friendship type.

Strengths, Limitations, and Future Directions

A clear strength of this study is that it used a diverse, population-based sample of adolescents to examine the relations of both one's own weight status and friend weight status (same- and opposite-sex) with various aspects of well-being. Furthermore, this is the

first analysis we know of that examined the moderated association of one's own weight status and friend weight status with well-being. The present analysis also considered diverse theoretical perspectives that give insight into these associations.

In terms of limitations, the extent to which individuals were making weight-based comparisons with nominated friends and the extent to which they perceived their friends to be overweight or not are not known. Myers and Crowther (2009) found that appearance-based comparison effects were larger when comparisons were measured rather than inferred. Furthermore, other participant characteristics could play an important role in these processes such as the extent to which individuals exhibit weight bias (i.e., the extent to which one associates 'good' with 'thin' and 'bad' with 'fat'; Gumblea & Carels, 2012), whether or not they are restrained or unrestrained eaters (Trotter, Polivy, & Herman, 2007), the extent to which their self-esteem is contingent on the approval of others (Patrick, Neighbors, & Knee, 2004), the importance they place on attractiveness (D. Henderson-King, Henderson-King, & Hoffman, 2001), and their ethnic/racial groups (Lanza, Echols, & Graham, 2013).

Because the number of nominated friends was restricted to 3 from each sex and not every nominated friend was in the sample, the classification of friend weight status was somewhat limited. Having a single overweight friend may have different implications than having many overweight friends. In future research it will be important to consider a greater number of network members (including romantic partners), the influence of individual differences in these processes (e.g., individuals who exhibit weight bias should be more influenced by friend weight status), and associations over time. For example, it will be important to determine the extent to which one's own weight status and friend weight status predict well-being over time and the extent to which well-being predicts one's own and friend weight status over time. Relatedly, it will be important to determine if the observed associations of one's own weight status and friend weight status with well-being are influenced by selection effects with respect to both weight status (de la Haye et al., 2011) and psychological adjustment (e.g., depression; Van Zalk et al., 2010). For example, an overweight boy may have limited options to affiliate with non-overweight peers. Finally, it would be informative to examine whether the observed associations hold for younger and older adolescents (e.g., examining middle schoolers versus high schoolers).

Although the observed effects were generally small, it is important to note the effects of friend weight status were above and beyond the main effects of one's own weight status (which show medium to large effect sizes with body satisfaction) and demographic variables associated with well-being (e.g., sex, age, SES, and race). Furthermore, we did not expect to find large effects as psychological well-being is related to a number of important factors such as genetics, the quality of social relationships, and academic achievements. In sum, the observed effects represent a first look into the interactive associations of self and friend weight status with psychological well-being, which offer exciting avenues for future research.

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Figure 1.
Boys' self-esteem by self weight status and male friendship network weight status.

Figure 2.
Boys' body satisfaction by self weight status and female friendship network weight status.

Predicted Body Satisfaction and Self-esteem Means as a Function of Self Weight Status and Same-Sex Friendship Network Weight Status by Gender

Table 1

Participants	Self Weight Status	Body Satisfaction			Self-esteem		
		Same-sex Friendship Network Weight Status		Interaction Test	Same-sex Friendship Network Weight Status		Interaction Test
		Non-overweight	Overweight		Non-overweight	Overweight	
Females	Non-overweight	34.3	36.2	$p=.44$	17.6	18.0	$p=.91$
	Overweight	27.9	29.0		16.8	17.2	
Males	Non-overweight	35.9	37.8	$p=.053$	18.4	19.2	$p=.047$
	Overweight	32.7	31.0		18.7	17.8	

Note. Means estimated controlling for race, SES, age, and number of nominated friends in the sample. *P*-values correspond to the test for interaction of self weight status and friendship network weight status.

Predicted Body Satisfaction and Self-esteem Means as a Function of Self Weight Status and Opposite-Sex Friendship Network Weight Status by Gender

Table 2

Participants	Self Weight Status	Body Satisfaction				Self-esteem			
		Opposite-sex Friendship Network Weight Status		Opposite-sex Friendship Network Weight Status		Opposite-sex Friendship Network Weight Status		Opposite-sex Friendship Network Weight Status	
		Non-overweight	Overweight	Interaction Test		Non-overweight	Overweight	Interaction Test	
Females	Non-overweight	35.9	34.6	$p=.11$		18.0	17.7	$p=.61$	
	Overweight	27.7	29.2			17.2	16.8		
Males	Non-overweight	37.6	36.1	$p=.015$		19.1	18.6	$p=.18$	
	Overweight	30.9	32.9			18.1	18.5		

Note. Means estimated controlling for race, SES, age, and number of nominated friends in the sample. *P*-values correspond to the test for interaction of self weight status and friendship network weight status.