



Article

Intrasexual Competition and Unhealthy Weight Control Behaviors among Late Adolescent Females

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Abstract: The purpose of this study was to test a mediating model whereby competitiveness among females for mates affects body dissatisfaction and dysfunctional diet and exercise through its influence on social comparison and fear of being negatively evaluated by others. The hypothesized model draws from several empirical models, including the sexual competition hypothesis and the tripartite influence model. Approximately 218 female college students completed an online survey. Most participants were heterosexual, White, and between the ages of 19 and 20. The proposed model was tested with MPlus 8.0 using maximum likelihood estimation (MLE). The hypothesized model was a good fit to the data, revealing both direct and indirect paths that were positive and statistically significant. The results suggest that body dissatisfaction may be intensified in environments such as schools wherein peer competition for mates is high and where adolescent females may feel that they cannot successfully compete. They may experience feelings of inadequacy about their bodies, which may result in the adoption of dysfunctional diets, exercise, or other practices that may be unhealthy and potentially life threatening in an effort to change their physical appearance.



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Keywords: intrasexual competition; evaluation apprehension; social comparison; body dissatisfaction; unhealthy weight control behaviors

1. Introduction

It has been estimated that approximately one-third to one-half of adolescent and young adult women engage in unhealthy eating or weight management practices, including various forms of food restriction, purging, or harmful dieting [1–3]. These behaviors are often associated with an increased risk of eating disorders [4], depression and low self-worth [2], substance use [5], and other negative health consequences. Media, including social media, promotes the perception that a slender and toned look is both desirable and achievable [6,7], and these and other sociocultural environments and ideals are what have shaped the public's perspective for the desired female body type [8]. Research has shown that adolescent and young adult women experience unhappiness and significant uneasiness with their physical appearance and acknowledge the implicit need to have self-control over one's body size and display a socially acceptable and/or idealized body shape [9,10]. Women who do not naturally possess the idealized thin body may be motivated to lose weight to change their appearance, engaging in more extreme dieting strategies and eating disordered behaviors (e.g., excluding food groups, fasting, using laxatives and diet pills, binge eating and purging) to force their body to conform to societal standards [11,12]. In addition, some individuals may replace engagement in unhealthy eating behaviors with excessive exercise, which may place them at even greater risk for developing eating disorders [13].

Intrasexual Competition (ISC) originates from Darwin's theory of sexual selection, where members of the same sex compete for access to mates of the opposite sex [14]. Since heterosexual males value signs of youth and fertility in their mates, the degree to

which individuals can embody reproductive benefits makes some women more desirable than others. The sexual competition hypothesis (SCH) suggests that efforts to attract and retain mates may lead to unhealthy weight management practices as an adaptive strategy, stemming from preoccupation with physical attractiveness driven by intersexual and intrasexual competition (ISC) [15–17]. However, the pathway from ISC and unhealthy weight management practices is not well understood. On the other hand, according to the tripartite model of disordered eating, individual differences in eating behaviors may be influenced by the media, parents, or peers, which may directly or indirectly encourage individuals to engage in greater social comparison or feel anxious due to the perceived negative evaluation of others [18,19]. For sexually competitive women, these anxieties may lead to increased body dissatisfaction and a propensity to pursue unhealthy weight control practices, such as excessive dieting or disordered eating. This connection between social comparison, fear of negative body evaluation, and body dissatisfaction could explain the mediating processes by which ISC influences unhealthy weight control behaviors (see Figure 1).

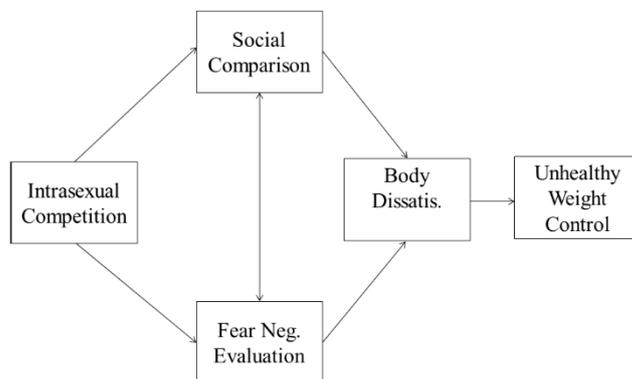


Figure 1. Proposed path model of intrasexual competition among women and unhealthy weight control practices.

The objective of this study was to test an integrated model of the maintenance of unhealthy weight management practices among young adult women, with ISC as an influential contributing factor (see Figure 1). The hypothesized model to be tested draws from several empirical models, including the sexual competition hypothesis [16] and the tripartite influence model [18,19]. Unlike the tripartite model, which identifies peer influence in the context of criticism or teasing about weight or size, the model to be tested places the competition for mates as a key relational predictor influencing body dissatisfaction and unhealthy weight control behaviors among young women. Collectively, the evidence would suggest that intrasexual competition may be a more proximal, instinctual, and psychological route to unhealthy weight control behaviors through its influence on social comparison, the fear of negative evaluation, and body dissatisfaction. With growing evidence of the impacts of intrasexual competition on human behavior, this exploratory study is the first to examine the mechanisms by which the proclivity for ISC influences the development and persistence of unhealthy weight control behaviors.

2. Materials and Methods

2.1. Participants

The sample included 218 female undergraduate students at a university in the southeastern USA. Only one participant was removed due to missing data ($n = 217$). While the inclusion criteria were based on the participants' biological sex at birth, 99.5% identified their gender as being female, while 0.5% preferred not to answer the question on gender identity. Among the participants, preferences for sexual orientation were reported as follows: heterosexual or straight (95.4%), gay, lesbian or homo-sexual (0.9%), bisexual (3.2%), and other (0.5%). Most were late adolescents 19 to 20 years of age (32.6% and 29.4%,

respectively), and second- and third-year undergraduates (36.2% and 33.0%, respectively). Based on the United States Census Bureau racial classification system, the sample was predominantly White (78%), followed by Black or African American (13.8%), Asian or Asian American (7.8%), American Indian or Native American (1.8%), and other (4.1%). Most did not identify as having a Central or South American ethnic heritage (e.g., Hispanic or Latinx categories in the US; 79.4%).

2.2. Procedures

This study used a non-experimental, cross-sectional design. Participants at the university were recruited from seven large enrollment courses in traditionally female dominated disciplines (human development and family sciences, human nutrition, health sciences). Participants were invited to complete an online questionnaire that included informed consent, basic demographic information (i.e., gender/gender identity, sexual orientation, race/ethnicity, age, year in school) and five measurement tools for assessing the variables included in the model (see Figure 1).

2.3. Measures

2.3.1. Competitiveness for Mates

Competitiveness for mates was measured using the Female Competition for Mates Scale (FCMS), which contains eight statements that are rated on a six-point response format from 'strongly disagree' to 'strongly agree' [16]. A higher score indicates higher competitiveness for mates. The original scale has been found to have good internal consistency ($\alpha = 0.89$), with the shortened scale continuing to demonstrate adequate Cronbach's alpha in this study at $\alpha = 0.79$. Items were modified to consider non-heterosexual relationships.

2.3.2. Social Comparison

Appearance-related social comparison was measured using The Physical Appearance Comparison Scale-Revised (PACS-R). The PACS-R is an 11-item self-report measure designed to assess an individual's tendency to compare their own appearance to the appearance of others in a wide variety of contexts [20]. Response options are on a five-point scale from 'never' to 'always', with higher scores indicating more frequent social comparisons. Internal consistency with this sample was $\alpha = 0.96$.

2.3.3. Fear of Negative Evaluation

The Fear of Negative Appearance Evaluation Scale was used to assess fears about being negatively evaluated based on one's physical appearance [21]. A shortened six-item version of the scale was used in this study. The six-item version displayed good internal consistency in this study at $\alpha = 0.93$.

2.3.4. Body Dissatisfaction

To assess how dissatisfied participants were with their weight, body shape, and appearance, a shortened eight-item version of the original Body Shape Questionnaire (BSQ-34) was used [22,23]. Higher scores indicate higher frequency of negative body-related thoughts and higher levels of body dissatisfaction. The scale showed excellent internal consistency in this study at $\alpha = 0.92$.

2.3.5. Unhealthy Weight Control Behaviors

Unhealthy weight control behaviors (UWCBs) were assessed using seven items adapted from the Eating Attitudes Test (EAT) that specifically focused on weight control behaviors over the past six months [24]. Higher scores measure greater prevalence of unhealthy behaviors to help control one's weight. The adapted scale yielded satisfactory internal consistency at $\alpha = 0.72$.

2.4. Data Analysis

Descriptive statistics were run for each of the scale scores to examine the data for outliers, skew, kurtosis, and randomness of missing data (Little's MCAR test). Finding no threats to the statistical assumptions, the parameters of the mediation path model proposed in Figure 1 were tested with maximum likelihood estimation (MLE) using MPLUS 8.0 software. Model fit was evaluated using several indices, including the comparative fit index (CFI), a normed index comparing the hypothesized model with the independent model, and the Tucker Lewis Index (TLI), a non-normed index that is affected less by sample size (both are interpreted as follows: values above 0.95 indicate a good fit, while values above 0.90 indicate a moderate fit). Model fit was also evaluated based on the standardized root mean square residual (SRMR), which compensates for complex models, with coefficients of 0.08 and below described as an acceptable fit and 0.05 and below described as a good fit [25]. The χ^2 statistic will be reported, but due to its sensitivity to sample size, it will not be used to evaluate goodness of fit.

3. Results

As shown in Table 1, bivariate correlations between the variables included in the model were in the expected direction. All were significantly positively related to one another. Of note, however, was the high correlation between social comparison and evaluation apprehension ($r = 0.74, p < 0.001$) and social comparison and body shape dissatisfaction ($r = 0.73, p < 0.001$). To determine whether the high correlations between variables may be cause for concern, the social comparison variable was regressed onto the other variables and the variance inflation factors (VIFs) were evaluated using SPSS 25.0. A general rule is that VIF coefficients over 4.0 may be a cause for concern [26]. All VIF coefficients were well below this cutoff, suggesting that the regression model estimation of standard errors was unbiased [27].

Table 1. Descriptive statistics and correlations.

Variable	M	SD	1	2	3	4	5	6	7
1. White (race)	0.78	0.41		−0.07	0.24 *	0.28 *	0.29 *	0.20 *	−0.02
2. BMI	23.59	4.35			0.04	0.19 *	0.06	0.35 *	0.18 *
3. Competition for Mates	3.32	0.83				0.55 *	0.58 *	0.49 *	0.34 *
4. Physical Appearance Comparison	3.20	0.99					0.74 *	0.73 *	0.39 *
5. Fear of Negative Evaluation	2.90	1.04						0.67 *	0.27 *
6. Body Dissatisfaction	3.12	1.21							0.52 *
7. Unhealthy Weight Control Practices	1.42	0.59							

* $p < 0.05$

The test of the proposed path model showed excellent fit to the data ($\chi^2 = 18.45, p < 0.05$; CFI = 0.98; TFI = 0.96; SRMR = 0.03). Values in Figure 2 represent standardized estimates and bootstrapped ($n = 5000$) confidence intervals. As expected, all paths were positive and statistically significant. Controlling for both race (white/non-white) and BMI, intrasexual competition for mates was a significant statistical predictor of both appearance-related social comparisons ($\beta = 0.50, p < 0.001$) and the fear of negative evaluation ($\beta = 0.53, p < 0.001$). These two endogenous variables were correlated highly with one another ($\beta = 0.60, p < 0.001$) and were significant statistical predictors of body dissatisfaction ($\beta = 0.47, p < 0.001$ and $\beta = 0.31, p < 0.001$, respectively). Perceived body dissatisfaction was a significant statistical predictor of unhealthy weight control behaviors ($\beta = 0.53, p < 0.001$).

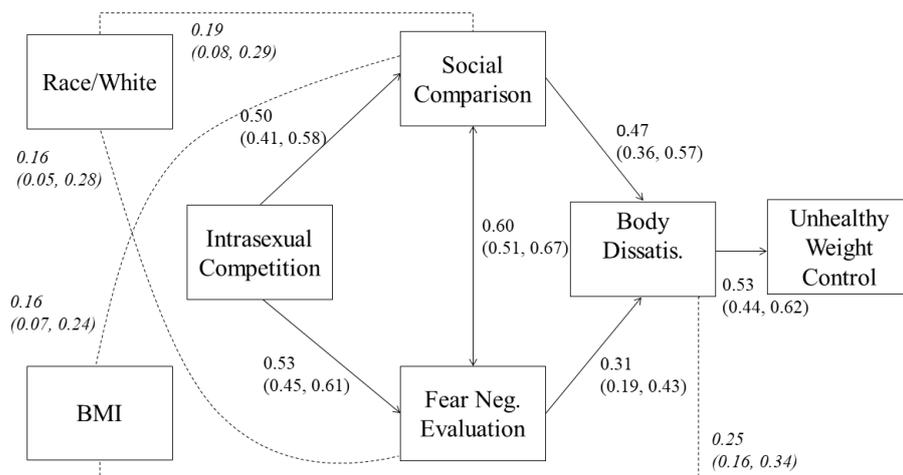


Figure 2. Path analysis of the proposed model with measured variables using maximum likelihood estimation (MLE) and bootstrapping for estimated confidence intervals. Standardized estimates are included with confidence intervals in parentheses. The model demonstrated an excellent fit to the data: $\chi^2 = 18.45$, $p < 0.05$; comparative fit index (CFI) = 0.98; TLI = 0.96; standardized root mean square residual (SRMR) = 0.03; $R^2 = 0.28$.

Indirect effects were examined, with intrasexual competition for mates demonstrating a statistically significant indirect effect on body dissatisfaction through appearance-related social comparison ($\beta = 0.24$, $p < 0.001$) and fear of negative evaluation ($\beta = 0.17$, $p < 0.001$). In addition, the indirect effects of intrasexual competition on unhealthy weight control practices were also statistically significant through appearance-related social comparison and body dissatisfaction ($\beta = 0.13$, $p < 0.001$) and fear of negative evaluation and body dissatisfaction ($\beta = 0.09$, $p < 0.001$). Overall, the model explained 28% ($R^2 = 0.284$) of the variance in unhealthy weight control practices.

Since the data are cross-sectional and causation/mediation cannot be evaluated, an alternative model was tested and compared to the hypothesized model. In the alternative model, intrasexual competition for mates was examined as an adjacent predictor of unhealthy weight control practices. Exogenous variables included both appearance-related social comparison and fear of negative evaluation. Both exogenous variables were hypothesized to be directly associated with body dissatisfaction, which was directly related to unhealthy weight control practices. Intrasexual competition was hypothesized to statistically mediate the relationship between body dissatisfaction and unhealthy weight control practices. Using maximum likelihood estimation and controlling for race and BMI, the model was a poorer fit to the data ($\chi^2 = 38.84$, $p < 0.001$; CFI = 0.94; TLI = 0.69; SRMR = 0.05). A test of the difference in χ^2 values, using difference scores for χ^2 and degrees of freedom, showed that the alternative model had a significantly poorer fit to the data ($\chi^2_{diff} = 20.39$, $df_{diff} = 4$, $p < 0.001$).

4. Discussion

Historically, women have learned that value is placed on their appearance, and as a result, many women have subsequently learned to be discontent with their bodies. Through the pervasive lens of the contemporary cultural ideal of thinness, many women have developed a disturbing preoccupation with body image and weight [28,29]. The sexual competition hypothesis proposes that female ISC is a root biological cause for body dissatisfaction and a drive to be thin and/or youthful in appearance [30]. However, there has been minimal research that applies the integration of both sociocultural and evolutionary perspectives to the body image literature. Frederick and Reynolds [31] emphasize the value of integrating these approaches, including evolutionary processes and sociocultural pressures that interact to shape attractiveness, self-perception, and appearance management practices in each context. However, researchers have principally studied

these factors separately from one another. This research is unique in that it sought to contribute to what is known about appearance-related social comparison, fear of negative evaluation, and body dissatisfaction by studying intrasexual competition as an instinctual and psychological antecedent. Results revealed that the hypothesized model was a good fit to the data, with both direct and indirect paths being positive and statistically significant.

The results are consistent with other research where women who engaged in social comparison also engaged in intrasexual competition, particularly among peers who are exceedingly more relevant to one's comparative mate value [14]. If it is perceived to be important, women who may be naturally more inclined to compete compare their bodies to gauge how they rank amongst their peers and strive to measure up to the same level of desirability in a contest for attaining a desired partner [15,32]. Likewise, as competition for the mating pool increases, women may strive to increase their potential mate value to be notably more appealing than their rivals and to gain the attention and investment of a mate. Studies have established a link between sex ratio and self-promotion tactics, such as appearance enhancement behaviors, where individuals may imitate the characteristics possessed by desirable peers to competitively build up their own mate value [33,34]. This increase in perceived competition and preoccupation with physical attractiveness may explain why the women in this study were also at greater risk for unhealthy weight control behaviors.

In addition, while there is no known pre-existing research directly examining the relationship between ISC for mates and fear of negative evaluation, the findings of this study mirror conclusions from other research that examines competition as a defensive behavior to protect one's self. Pliner et al. [35] acknowledge that people will engage in various strategies to protect their self-evaluations, including competition and indirect aggression. If women believe that their worth is not equivalent to their appearance and are worried about how their physique is judged by others, they might compete to conform to sociocultural norms and expectations of thinness so that those expectations will not be counted against them [36]. At the same time, being evaluated unfavorably has emotional implications, as the anxiety associated with this preoccupation can lead to greater dissatisfaction with one's body [37,38].

Indirect pathways from ISC for mates to body dissatisfaction, as well as social comparison/fear of negative evaluation to unhealthy weight control behaviors, were also significant. This is consistent with previous studies that found that ISC for mates and mere exposure to competitive/high mate status women resulted in disordered eating patterns, including more restrictive and avoidant eating attitudes, as well as a wider range of unhealthy eating behaviors in pursuit of thinness [15,16]. Ferguson et al. [39] speculated that body dissatisfaction may be intensified in an environment wherein peer competition for mates is high. Young women have various social opportunities in which they can engage prospective mates. In each situation, if one does not feel that they can contend against the competition, they may experience feelings of inadequacy about their bodies or even defeat, especially if they do not receive the expected attention from an accessible mate. This could reaffirm the damaging belief that a woman's worth is found in their appearance. Constantly being surrounded by and encountering others their age in a college setting may make young women predisposed to find themselves in social settings where the potential to compare themselves to others is inevitable, making them vulnerable to feeling distressed about their appearance and engaging in unhealthy eating-related behaviors.

It is interesting to note that the model tested in this study did not find a statistically significant relationship between BMI and ISC. While a testable hypothesis was not proposed for this study, researchers had previously speculated that given the evidence that BMI is linked to perceptions of attractiveness [40], BMI may be inversely related to ISC. However, consistent with other recent research, we did not find a relationship between BMI and ISC [41]. It may be that the relationship is curvilinear rather than linear in nature, and future research should explore this possibility.

The findings from this study have important implications for prevention and intervention programs targeting adolescent and young adult women with risk factors for unhealthy diet and exercise behaviors. While the sexual competition hypothesis would propose that female ISC may have evolutionary biological roots, research suggests that it may manifest as various behaviors, including indirect aggression [42], ridicule, and manipulation [43]. This suggests that in addition to addressing the sociocultural roots of body dissatisfaction as is proposed in dissonance-based interventions to reduce the internalization of a thin body ideal, programs should also target interpersonal relationship skills that address conflict resolution and attributional biases that may go unacknowledged. For example, dissonance-based interventions that focus on reducing the internalization of an appearance (thin) ideal have shown great success in reducing body dissatisfaction and eating disordered symptoms [44]. More recently, however, evidence suggests that a peer-led version of the intervention may be slightly superior to a clinician-led version of the intervention [45,46], suggesting that the peer-led intervention may encourage the creation of a peer norm that challenges implicit cultural assumptions of attractiveness and promote relatedness over competition in relationships.

Limitation

As an exploratory study with data collected at one point in time from late adolescent and young adult women attending a single university, the results from this study are not generalizable to all young women in the United States, nor to those who are attending college. In addition, the cross-sectional design of the study limited the ability to draw cause and effect conclusions. The proposed model was a stronger fit to the data compared to the alternative; however, the design did not allow for temporal ordering of variables. On the questionnaires, anonymity may not have prevented respondents from inaccurately responding to the measurement items due to the potentially sensitive nature of the subject matter (e.g., topics of comparison, evaluation apprehension, competitiveness, body dissatisfaction, and weight-related practices). Likewise, the online format of the questionnaires was convenient and efficient but did not prevent some respondents from failing to fully complete the questionnaire or answer each item, resulting in the possibility of missing data. Finally, some of the measures used in this study have never been used in combination before, while one was developed for use for the first time here using self-report data, which may impact both the reliability and validity of the data [47].

5. Conclusions

This study's findings provide evidence that competition for mates may influence unhealthy weight control behaviors through the mediating mechanisms of social comparison, evaluation apprehension, and body dissatisfaction. ISC for mates may be the missing piece in literature for understanding these relationships. Young adulthood is a time when finding one's place and seeking a relationship or a long-term partner are important. Intra-sexual competition for mates may prompt the fear of being negatively evaluated and the desire to feel accepted to affirm one's value, which can be achieved by means of unhealthy weight control to conform to the cultural perception of physical attractiveness and a thin ideal body.

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Data Availability Statement: The data from this study are not publicly available. Inquiries can be directed to the second author.

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Conflicts of Interest: The authors declare no conflict of interest.

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