

The Relationship Between Gender, BMI, Self-Esteem, and Body Esteem in College Students

ADRIANA PILAFOVA

George Mason University

D.J. ANGELONE*

Rowan University

KATRINA BLEDSOE

College of New Jersey

The purpose of this study was to examine the relationship between body esteem, self-esteem, and Body Mass Index (BMI) for college students. It was hypothesized that men would have higher self-esteem and body esteem than women. It also was hypothesized that lower BMI would be associated with greater self-esteem and body esteem. The sample consisted of 72 men and 81 women from a small northeastern college. In addition to several demographic questions, participants completed the Rosenberg Self-Esteem Scale and a Body-Esteem Scale for Adolescents and Adults. There were statistically significant relationships supporting both hypotheses. Compared to women, men had higher self-esteem and body esteem. For all participants, lower BMI scores were related to higher body esteem and higher self-esteem. Implications and limitations of this study are discussed.

There are many factors that can affect self-esteem and the way people view their own physical appearance. For example, men and women are often bombarded with images of individuals exemplifying a perfect physique (Hewitt, Flett, & Ediger, 1995), especially by the media. This focus may increase self-imposed pressure to maintain youth and meet the unrealistic beauty standards fostered by the media and imposed by society. These constant pressures, along with the need to receive approval and acceptance from others, may lead to decreased self-esteem (Crocker, Luhtanen, Cooper, & Bouvrette, 2003).

The evolutionary perspective presents one possible way of understanding the focus on physical appearance and attractiveness in society. This view suggests that reproductive potential is the most essential quality of a future female mate. Cues that signal this potential are seen as the most important determinants of attractiveness and may include good mothering ability, femininity, and resistance to diseases (Wade, Shanley, & Imm, 2004). Thus, men may be attracted to women who possess these characteristics, and women attempt to fit this "model" to attract men, further perpetuating the societal focus on appearance. According to the evolutionary view, women may attempt to main-

tain their attractiveness in order to fulfill those societal expectations (Wade, et al.). Evolutionary theory may also suggest that male species attempt to "spread their seed" to maximize dispersal of their genes through the next generation. One way to accomplish this is by being the alpha male. Thus, men may need to show dominance. Having a muscular physique will enable a man to exert this dominance. However, there are no other specific physical standards that men need to embrace in order to fulfill their evolutionary purpose. So, according to the evolutionary view, men may attempt to maintain a muscular appearance in order to fulfill their evolutionary purpose and perceived societal expectations.

Relatedly, appearance has been linked to self-esteem. Self-determination theory states that self-esteem is higher when it is based on more abstract variables, such as values and distinctive features of one's personality, than when it is based on tangible attributes such as appearance (Crocker, et al., 2003). According to this theory, people who base their self-

Author Note. Address correspondence to Adriana Pilafova, 10108 Mosby Woods Dr., Fairfax, VA, 22030. E-mail: adipilafova@gmail.com

* Faculty supervisor

esteem on variables such as appearance are likely to manifest lower self-esteem. Thus, women conforming to the above stated characteristics of attractiveness may have lower self-esteem than those who rely on more abstract variables.

Self-esteem has been defined in different ways. Some researchers have defined self-esteem as an individual evaluation of personal attributes (Coopersmith, 1967). Other researchers have defined it as a combination of positive and negative self-evaluations across a variety of domains (Piers & Harris, 1969), as well as a global construct without any specific domains (Rosenberg, 1979). Because of its wide acceptance, the current study used this latter definition. In general, there appears to be a relationship between weight and self-esteem during adolescence. Overweight adolescents and adults tend to have lower self-esteem than individuals of normal weight (Felker, 1968). For men, the relationship between weight and self-esteem is strongest during middle adolescence, with overweight men displaying lowest scores of self-esteem (Mendelson & White, 1985) compared to adult men. For women, the relationship between weight and self-esteem is strongest during late adolescence, with overweight women displaying lowest scores of self-esteem compared to adult women (Mendelson & White). However, the relationship between weight and self-esteem is less clear during late adolescence/early adulthood. In fact there are a variety of conflicting findings among studies using college student samples (Hyde, 2005); thus, self-esteem in undergraduate college students calls for further exploration.

Women are more likely than men to view themselves through the eyes of others and feel preoccupied with the tangible attributes of appearance (Crocker, et al., 2003). In line with the self-determination theory, this focus may then lead to decreased self-esteem. Moreover, women view being overweight as a predictor of socially inappropriate behaviors that are counter to societal standards of attractiveness, and likewise would decrease mate desirability (Mendelson, White, & Mendelson, 1996). On the other hand, women who view their appearance more positively and in line with societal standards tend to have higher levels of self-esteem (Mendelson, Mendelson, & White, 2001).

Evolutionarily speaking, a man needs to show dominance in order to secure his place as the alpha male and be able to retain women's attraction. In line with this theory, men could feel a pressure to have a muscular build (Olivardia, Pope, Borowiecki, & Cohane, 2004) in order to maintain their dominant status. Given that this may be an unattainable ideal, one's self-esteem could be affected. Thus, men who do not fit the muscular lean body type may experience changes in their self-esteem.

Whereas much research on self-esteem and appearance has concentrated on women, there is a paucity of research exploring these factors in men. Previous research has instead often combined self-esteem measures in men with measures of body mass and body esteem (Mendelson, Mendelson, & Andrews, 2000). body esteem is a global construct that refers to people's self-evaluation of their physical appearance (Mendelson, et al., 2000). Obese and overweight adults tend to have low body esteem (Hendry & Gillies, 1978). In addition, women tend to have lower body esteem than men (Gray, 1977). Regardless of weight, high body esteem is related to high self-esteem (Mendelson, et al., 2000).

Although researchers have reported gender differences in self-reports of self-esteem and body esteem, other researches have noted minimal gender differences in these domains (Hyde, 2005). For example, one study reported a lack of gender differences in self-esteem for young adults (Greene, & Wheatley, 1992). However, analyses were performed on a combined sample of men and women both attending college and not attending college (Greene, & Wheatley, 1992). Whereas there are likely to be similarities in these two groups, it is possible that the combined data masked possible differences in self-esteem between these groups, as well as a potential interaction effect of gender and sample (college vs. noncollege). In addition, over the past 20 years, women have reported increasingly more dissatisfaction with their bodies compared to men (Feingold, & Mazzella, 1998). However, these studies have been criticized for low effect size (Hyde) and the use of participants from all age groups (Feingold, & Mazzella; Mendelson, et al., 2000). As stated, specific investigations of adolescents have provided preliminary support for gender differences in specific age groups.

Given findings derived from different age groups and various samples, it is important to compare gender differences across samples from different age groups. In particular, examining the college population is essential because of the specific pressures individuals may experience in college. For example, in college most young adults are surrounded by individuals their own age. Thus, college students are constantly bombarded with images of their peers that may make them feel inadequate about their appearance. Specifically, there are social events and organizations that may foster the emphasis on physical appearance, increasing the probability that college students may place more emphasis on their appearance. Inability to meet standards of perceived attractiveness may in turn decrease self-esteem and body esteem. Therefore, it is important to study how male and female college students may be affected by this phenomenon.

Another important aspect that could affect self-esteem is one's development. According to one developmental theory, in late adolescence individuals are creating consistent self-concepts and self-presentation styles (Erikson, 1963). Thus, in college years there is a search for one's identity. Variables such as self-esteem and body esteem have been shown to play a major role in this development (Lyxell & Adamson, 1996). Moreover, it has been shown that eating disorders have a higher prevalence among college sophomore women (Hesse-Biber, 1992). Because eating pathology could affect self-esteem and body esteem, this further illustrates the need to study those variables in a college population.

In general, men and women experience great pressure to be physically appealing, although the rationale behind these pressures may differ by gender. For men, the ideal body consists of minimal body fat and muscular development (Olivardia, et al., 2004). Men tend to believe that their bodies were fatter and further from the ideal than actual measurements indicate, which is related to decreased self-esteem and body esteem (Olivardia, et al.). Interestingly, when women are asked to rate men's appearance they favored a significantly less muscular and lean body type. The way men view themselves does not directly relate with the way women perceive them (Olivardia, et al.). This might be due to the over idealization of the lean figure and the emphasis on weight reduction that has affected men and women in general (Garner, Garfinkel, Schwartz, & Thompson, 1980). However, in spite of this thinness ideal, contradictory evidence has shown that men are conforming to different social norms. That is, some men may view being overweight more positively which in turn results in higher self-esteem. (Mendelson, et al., 1996).

Most research, though, provides evidence that both genders, under significant pressure to maintain perfect body image, experience negative effects on their self-esteem (Mendelson, et al., 2000). The societal pressure to maintain a slender physical appearance has turned body mass index (BMI) into a standard of achievement. BMI is defined as a person's weight divided by a square of the person's height. It serves as a measure of leanness; a high score represents a less lean body, and a low score represents a more lean body.

BMI is a strong predictor of self-esteem for adolescent boys and girls, and this relationship does not differ between genders. People with high BMI scores tend to have lower self-esteem scores regardless of their gender (Mendelson, et al., 2000). In addition, boys and girls tend to have different expectations for ideal BMI. Boys are more satisfied with slightly higher BMI scores than girls.

Given the contradictory findings for gender in self-esteem and body esteem, additional data are necessary. Most of the research in this domain has grouped individuals from varying age groups such as middle school, high school, and college (Mendelson & White, 1985; Mendelson, et al., 1996). The analyses from these studies often combine these data, thus it is unknown whether the conclusions drawn can be generalized to the specific age groups, such as college students. Moreover, some of the recent studies identifying gender differences in these domains have focused on samples outside of the United States (Mendelson, et al., 2000). Thus, there appears to be a lapse of data examining potential relationships and influences of self-esteem and body esteem in college students from the United States.

The purpose of the current study is to investigate the connection between self-esteem, body esteem and BMI in undergraduate college students from the United States. Previous research suggests a relationship between self-esteem and physical appearance satisfaction. The current study will further investigate this relationship, specifically addressing possible gender differences. Based on the notion that adolescent boys have higher self-esteem than adolescent girls, we would expect this pattern to continue into adulthood. This is further strengthened by the elevated pressure women could experience from the media regarding their appearance. Thus, the first hypothesis is that male college students will have higher self-esteem and body esteem than female college students. Based on the notion that adolescents with lower BMI have higher self-esteem and body esteem, we would expect this pattern to continue into adulthood. Thus, the second hypothesis is that higher scores on self-esteem and body esteem measures will relate to lower scores on the BMI.

Method

Participants

Participants were male ($n = 72$) and female ($n = 81$) undergraduate students from a small northeastern college. Participants were sampled through a convenience ($n = 18$) and a cluster ($n = 135$) methodology. For the convenience sample, students signed up for the study via an online program and received credit for psychology courses. Students participated in groups with a maximum size of 10 in a college classroom. For the cluster sample, all dorm names were placed in a hat, and five dorms were randomly selected. Next, one floor was randomly selected from each dorm. All residents of the selected floor were asked to participate. Those who agreed to participate were given candy as an incentive. Students participated in groups with a maximum size of two in their dorm rooms.

The mean age of the participants was 19.4 years old ($SD = 0.87$). Regarding grade level, 12.4% of the participants were freshmen, 64.1% were sophomores, 15% were juniors, 7.2% were seniors, and 0.7% were graduate students. Regarding ethnicity, 82.4% of the participants self-identified as Caucasian, 3.3% as African American, 7.2% as Asian, 3.3% as Hispanic, and 3.3% self-identified as “other”.

Measures

The participants were asked to complete three questionnaires in the following order: (a) the Rosenberg Self-Esteem Scale (Rosenberg, 1965), (b) the Body-Esteem Scale for Adolescents and Adults (Mendelson, Mendelson, & White, 1997), and (c) Demographic Questionnaire, in which participants also reported weight and height approximations.

The Rosenberg Self-Esteem Scale (Rosenberg, 1965) was developed as a self-report measure of self-esteem. The scale has been shown to be highly reliable ($\alpha = 0.89$). Participants are asked to rate level of agreement with 10 statements on a 4-point Likert scale (1 = *strongly agree*, 2 = *agree*, 3 = *disagree*, and 4 = *strongly disagree*). For this scale, lower scores signify higher self-esteem. Sample questions include, “As a whole I am satisfied with myself”; “I feel that I’m a person of worth, at least on an equal plane with others”; and “All in all, I am inclined to feel that I am a failure”. Responses to the scale were averaged for all participants to provide a mean self-esteem score.

The Body-Esteem Scale for Adolescents and Adults (BESAA; Mendelson, White & Mendelson, 1997) is a measure of self-perceived appearance. Participants are asked to rate level of agreement with 23 statements on a 5-point Likert Scale (0 = *never*, 1 = *seldom*, 2 = *sometimes*, 3 = *often*, and 4 = *always*). For this scale, higher scores represent a higher body-esteem score. The scale consists of three subscales: Body-Esteem Appearance (10 items; $\alpha = 0.92$), Body-Esteem Weight (eight items; $\alpha = 0.94$) and Body-Esteem Attribution (five items, $\alpha = .81$). BE-Appearance highlights participants’ general feelings about their physical appearance. Some examples include “There are lots of things I’d change about my looks if I could”, and “I’m pretty happy with the way I look”. BE-Weight targets weight satisfaction. Some examples include: “Weighing myself depresses me” and “I really like what I weigh. BE-Attribution targets participant’s opinion on how others’ evaluate his or her body and appearance. Some examples include, “Other people consider me good looking” and “People my own age like my looks”. Responses to the scale were averaged for all participants to provide a mean body-esteem score.

The final measure was the Demographic Questionnaire. It consists of seven questions that were developed by the researchers. Participants are asked to disclose their age, gender, ethnicity, major, grade level, weight, and height. BMI was calculated using the formula, $(\text{Weight}/\text{Height}^2) \times 703$. BMI was examined as a continuous variable for all participants.

Procedure

Overall, participants responded to the measures within 20 to 45 min. For the convenience sample, participants were invited to complete the survey in a classroom. After all the individuals were seated, the informed consent form was distributed. Once the informed consent form was completed and collected, the participants were given the Rosenberg Self-Esteem Scale (Rosenberg, 1965). After participants completed the Self-Esteem Scale, they received the BESAA. Finally, participants were asked to complete the Demographics Questionnaire. Upon completion of all three questionnaires, all participants were fully debriefed. The names of the different questionnaires were only revealed to the participants in the debriefing form. Thus, unless participants recognized a certain scale, they were not aware of what the scale measured.

For the cluster sample, all participants completed the surveys in their dorm rooms. In order to ensure anonymous responding (given that their roommates may have also been completing the questionnaire), participants were instructed to sit at their desks. After they were settled in their desks, the informed consent was distributed and signed. Next, the three questionnaires were distributed in the order mentioned above, and the researcher waited outside the room for the students to finish. Once the participants had completed the questionnaire, they were asked to place it in a box to foster confidentiality. Next, participants were fully debriefed. Before leaving, the researcher provided candy to the participants as a reward for their participation.

Results

Two univariate analyses of variance and a sequential regression analysis were performed to determine any potential differences between the two samples. Analyses revealed a lack of statistically significant differences between the two samples; therefore all subsequent analyses include combined data from the convenience and cluster samples. The mean self-esteem score for all participants was 1.86, ($SD = 0.41$) and the mean body-esteem score was 2.33, ($SD = 0.61$). Most participants had a BMI score in the normal range ($M = 23.31$, $SD = 3.69$).

An exploratory analysis was performed to assess differences between men and women's BMI scores. A one-way ANOVA revealed that the differences were not statistically significant, $F(1, 152) = 3.5, p > .05$, partial $\eta^2 = .02$. These results showed that there are no significant differences between men and women and their BMI scores.

The first hypothesis that self-esteem and body esteem would vary by gender was examined using two separate univariate analyses of variance. Men ($M = 1.79, SD = 0.38$) reported higher self-esteem than women ($M = 1.93, SD = 0.43$), $F(1, 151) = 6.80, p = .01$, partial $\eta^2 = .03$. Observed power was equal to .55. In addition, men ($M = 2.50, SD = 0.52$) reported higher body esteem than women ($M = 2.17, SD = 0.64$), $F(1, 151) = 23.55, p < .01$, partial $\eta^2 = .07$. Observed power was equal to .92.

The second hypothesis that higher self-esteem and body-esteem scores would be associated with BMI scores was examined through a sequential multiple regression analysis. Given a significant difference self-esteem and body esteem between men and women, we decided to enter gender in the primary step of the analysis to reduce the variance attributed to gender. A sequential multiple regression was selected because it assesses how much variance was accounted for by each predictor above and beyond the variance accounted for by gender. An assessment of multicollinearity revealed that self-esteem and body esteem highly correlated, $r = .66, p < .01$. Thus, the predictor variables were not completely independent of each other, which could have decreased the power and effect size of the analyses.

The overall R was significantly different from zero, $F(2, 149) = 18.68, p < .01$. R^2 was equal to .22. An adjusted R^2 of .20 indicates about 20% of the variability in BMI was predicted by self-esteem and body esteem after controlling for gender effects. Overall effect size was measured by Lambda and was equal to .02. When examining individual predictors, self-esteem ($\eta = -.19, p = .05$) appeared to have a negative correlation with BMI but was not the strongest predictor of BMI, accounting for about 3% of the variance. Thus, high self-esteem is associated with lower BMI for both men and women. Body esteem ($\eta = -.56, p < .01$) appeared to have a high negative correlation with BMI and was the strongest predictor BMI, accounting for about 31% of the variance. Thus, high body esteem is associated with lower BMI for both men and women.

Discussion

Both hypotheses were supported by the findings of the study. For hypothesis one, men did demonstrate significantly higher self-esteem and body esteem than

women. For hypothesis two, lower scores on body mass index (BMI) were associated with higher self-esteem and body esteem. The differences in regard to self-esteem may indicate that the lower people's weights were in comparison with their heights, the better they feel about themselves.

This study is consistent with previous findings regarding self-esteem and physical appearance satisfaction. The evaluation of physical appearance is the strongest predictor of self-esteem (Crocker, et al., 2003). Furthermore, satisfaction levels of physical appearance are positively related with self-esteem (Mendelson, et al., 2001). The current study provided more insight into the relationship because it showed that college men had higher self-esteem than college women.

The current study found BMI to be a significant predictor for body esteem. This lends additional support to the findings of Mendelson, Mendelson, and Andrews (2000) who reported a relationship between BMI and body esteem. As shown in the current study, the lower people's BMI was, the higher their score was on the BESAA. Because BMI depends on the weight of participants, the relationship shows that the less individuals weigh compared to their height, the better they would feel about their outward appearance.

The current study extended previous findings of gender differences. Mendelson, Mendelson, and Andrews (2000) stated that there were significant differences between men and women only in regard to body satisfaction. In the current study, there was a significant difference between men and women in regard to self-esteem. Men were found to have higher self-esteem and body esteem than women. Some of the differences may be attributed to the variations in images of appearance that men and women are bombarded with. For men, there seems to be a more uniform look that centers around having a muscular body build. Because in colleges body building equipment and gyms may be more accessible, it may enable men to meet this criteria easier. Thus, college men may have less muscle belittlement and muscle displeasure (Olivardia, et al., 2004) and therefore may be happier with themselves (Morrison, Morrison, Hopkins, & Rowan, 2004). For women, there seems to be no uniform image that they need to follow. The media, college organizations, and peers may all project different body types that are found attractive. Some may portray the lean body as attractive, but others may place emphasis on a more toned and muscular physique. Thus, it may be more difficult for women to conform to any particular ideal. This could increase their frustration with their bodies and could in turn lead to lower body esteem and self-esteem.

Some of the gender differences may be due to eating disorder problems in women. Hesse-Biber (1992) found that among a sample of college women, observed from their sophomore to their senior year, eating disorders were significantly more prevalent initially and decreased by senior year. Furthermore, Rosen and Ramirez (1998) found that people with eating disorders find it difficult to accept their bodies. Thus, they are very distressed and have low self-esteem. In one study, women with eating disorders scored much lower on both self-esteem and body-esteem measures than healthy women (Mendelson, McLaren, Gauvin & Steiger, 2002). As such, there may be a connection between the predominantly sophomore sample of this study and eating disorders acting as an extraneous variable. Future research should investigate the relationship between self-esteem, body esteem, and BMI, while accounting for the potential influence of eating disorder symptomology in a college population, especially among female sophomore college students.

There are some limitations in the design. The use of heterogeneous groups could have either increased or decreased our ability to detect differences. Another limitation is the use of the cluster and the convenience samples. Lastly, the cross-sectional nature of the study is another limitation. Because of the cross-sectional design, we are not able to determine directionality of the relationship of self-esteem, body esteem and BMI.

The strengths of the study appear to outweigh some of the potential limitations. For example, the use of both the Rosenberg Self-Esteem Scale and the Body-Esteem Scale for Adolescents and Adults, which have been frequently used in the literature and have high validity and good test-retest reliability (Mendelson, White, & Mendelson, 1997), may have reduced the amount of random error. There were also no differences found between the two clusters. The lack of statistically significant differences between the convenience sample and the cluster sample showed that any potential extraneous variables did not affect the data or skew the results. Finally, the experimenter ensured that the participants were aware of the anonymity of the measures. Emphasis on this aspect decreased self-promotion effects and may have fostered unbiased data.

Future research could consider ethnic differences. Some researchers have highlighted potential differences in ethnic values regarding physical appearance (Croll, et al., 2002). A more diverse sample should be examined in the future, both in a college and a community sample. Given the different values regarding physical characteristics, it is likely that there may be different pressures on different ethnic groups regard-

ing BMI. As in the current study, these varying perceptions are also likely to influence self-esteem and body esteem.

The present study investigated the differences between men and women in their attitudes about their appearance and found that men generally have higher self-esteem and body esteem. It also showed that the lower a person's BMI is, the higher self-esteem and body esteem one is expected to have. Such findings suggest that there may be a problem in our society and that sociocultural factors play a role in people's perceptions (Smolak, Levine, & Thompson, 2001). Indeed, Mendelson, Mendelson, and Andrews' (2000) findings suggest that if people do not base their self-esteem and feelings of self-worth on weight, they come to have higher self-esteem. All evidence suggests that society must strive to allow individuals to evaluate themselves based on more meaningful and less superficial criteria.

References

- Coopersmith, S. (1967). *The antecedents of self-esteem*. San Francisco, CA: Freeman.
- Crocker, J., Luhtanen, R. K., Cooper, L. M., & Bouvrette, A. (2003). Contingencies of self-worth in college students: Theory and measurement. *Journal of Personality and Social Psychology*, 85, 894-908.
- Croll, J. K., Neumark-Sztainer, D., Story, M., Wall, M., Perry, C., & Harnack, L. (2002). Adolescents involved in weighty-related and power team sports have better eating patterns and nutrient intakes than non-sport-involved adolescents. *Journal of the American Dietetic Association*, 106, 709-171.
- Erikson, E. H. (1963). *Childhood and society*, (2nd ed.). New York: Norton.
- Felker, D. W. (1968). Relationship between the self-concept, body build, and perception of father's interest in sport in boys. *Research Quarterly*, 39, 513-517.
- Feingold, A., & Mazzella, R. (1998). Gender differences in body image are increasing. *Psychological Science*, 9, 190-195.
- Garner, D. M., Garfinkel, P. E., Schwartz, D., & Thompson, M. (1980). Cultural expectations of thinness in women. *Psychological Reports*, 47, 483-491.
- Gray, H. (1977). Social aspects of body image: Perception of normalcy of weight and affect of college undergraduates. *Perceptual and Motor Skills*, 45, 1035-1040.
- Greene, A. L., & Wheatley, S. M. (1992). "I've got a lot to do and I don't think I'll have the time": Gender differences in late adolescents' narratives of the future. *Journal of Youth and Adolescence*, 21, 667-686.
- Hendry, L. B., & Gillies, P. (1978). Body type, body esteem, school and leisure: A study of overweight average and underweight adolescents. *Journal of Youth and Adolescence*, 7, 181-195.
- Hesse-Biber, S. (1992). Women's eating patterns and disorders: Noncontinuum versus continuum measures. *Health Care for Women International*, 13, 375-391.
- Hewitt, P. L., Flett, G. L., & Ediger, E. (1995). Perfectionism traits and perfectionistic self-presentation in eating disorder attitudes, characteristics, and symptoms. *International Journal of Eating Disorders*, 18, 317-327.
- Hyde, J. S. (2005). The gender similarities hypothesis. *American Psychologist*, 60, 581-592.
- Lyxell, B., & Adamson, L. (1996). Self-concept and questions of life: Identity development during late adolescence. *Journal of Adolescence*, 19, 569-582.
- Mendelson, B. K., McLaren, L., Gauvin, L., & Steiger, H. (2002). The relationship of self-esteem and body esteem in women with

- and without eating disorders. *International Journal of Eating Disorders*, 31, 318-323.
- Mendelson, B. K., Mendelson, M. J., & White, D. R. (2001). Body-esteem scale for adolescents and adult. *Journal of Personality Assessment*, 76, 90-107.
- Mendelson, B. K., & White, D. R. (1985). Development of self-body-esteem in overweight youngsters. *Developmental Psychology*, 21, 90-96.
- Mendelson, B. K., White, D. R., & Mendelson, M. J. (1996). Self-esteem and body esteem: Effects of gender, age, and weight. *Journal of Applied Developmental Psychology*, 17, 321-346.
- Mendelson, B. K., White, D. R., & Mendelson, M. J. (1997). *Manual for body-esteem scale for adolescents and adults*. Montreal: Concordia University.
- Mendelson, M. J., Mendelson, B.K., & Andrews, J. (2000). Self-esteem, body esteem, and body-mass in late adolescence: Is a competence importance model needed. *Journal of Applied Developmental Psychology*, 21, 249-266.
- Morrison, T. G., Morrison, M. A., Hopkins, C., & Rowan, E. T. (2004). Muscle mania: Development of a new scale examining the drive for muscularity in Canadian males. *Psychology of Men and Masculinity*, 5, 30-39.
- Olivardia, R., Pope, H. G., Borowiecki, J. J., & Cohane, G. H. (2004). Biceps and body image: The relationship between muscularity and self-esteem, depression, and eating disorder symptoms. *Psychology of Men and Masculinity*, 5, 112-120.
- Piers, E. V., & Harris, D. B. (1969). *Manual for the Piers-Harris children's self-concept scale*. Los Angeles: Western Psychological Services.
- Rosen, J. C., & Ramirez, E. (1998). A comparison of eating disorders and body dysmorphic disorder on body image and psychological adjustment. *Journal of Psychosomatic Research*, 44, 441-449.
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, N.J.: Princeton University Press.
- Rosenberg, M. (1979). *Conceiving the self*. New York: Basic Books.
- Smolak, L., Levine, M. P., & Thompson, J. K. (2001). The use of the sociocultural attitudes towards appearance questionnaire with middle school boys and girls. *International Journal of Eating Disorders*, 29, 216-223.
- Wade, T. J., Shanley, A., & Imm, M. (2004). Second to fourth digit ratios and individual differences in women's self-perceived attractiveness, self-esteem, and body-esteem. *Personality and Individual Differences*, 37, 799-804.