Self esteem in adolescent females

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Original article

Self-Esteem in Adolescent Females

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Abstract Purpose: Self-esteem is a major “predictor” of satisfaction with life. This longitudinal study examined mean and individual changes in self-esteem, and how self-esteem is affected by race and body mass.

Methods: Girls were recruited at ages 9 and 10 years, and followed to age 22 years. The Harter Self-Perception Profile was administered every other year, analyzing scores from the Global Self-Worth Scale, by age or developmental phase: ages 9–12 (I), 13–16 (II), and 17–22 (III). Regression modeling included main effects and interactions between age/phase, race, and body mass index (BMI).

Results: Self-worth was greater in black than white women, and greater with lower BMI in both races. In the model with age ("traditional model") (with race and BMI), significant variables included BMI (inverse relationship) and the interactions between age and race, race and BMI, and the triple interaction between age, race, and BMI. In the model with phase ("transitional model") (with race and BMI), BMI, and the interactions between BMI and race, and race and phase, were significant. For example, self-worth was generally lower in Phase II (middle adolescence) for white women. Self-esteem tracked significantly (correlation 0.22, \( p < .001 \)). An individual’s self-worth during any given phase of adolescence was correlated significantly with the other two phases.

Conclusions: In this longitudinal analysis of self-esteem in adolescent girls, race and BMI are important predictors of self-esteem. Self-esteem is consistent across the phases of adolescence, and comparable with other personality traits. As noted by others, lower levels of self-esteem may increase the vulnerability of adolescents to risky behaviors. © 2006 Society for Adolescent Medicine. All rights reserved.

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Adolescence is a period of rapid physical, social, and cognitive growth as well as changes in self-esteem. Self-esteem, also called self-worth, is a major predictor of outcomes during adolescence and adulthood. Higher levels are associated with several positive outcomes, such as occupational success, social relationships, well-being, positive perceptions by peers, academic achievement, and improved coping skills (as reviewed by Trzesniewski [1]). Low self-esteem is associated with adverse outcomes, such as depression, substance abuse, and antisocial behavior [2].

Self-esteem has been viewed both as a trait (reflecting stability over a period of time), and a state (reflecting response to situations or life events, or a response to cues from other people, such as a “looking glass” orientation) [3]; other studies have suggested that the development of self-esteem exhibits discontinuities rather than a smooth course [4], especially at times of school transition [4–6]. The
majority of studies of self-esteem in adolescents have examined small samples, typically in cross-sectional analyses. Additionally, the majority of the extant literature has studied mean-value changes. For example, in a recent study, the authors noted that in their review of the literature, only four of 18,000 articles about self-esteem evaluated changes at the individual level, rather than at the population (overall mean) level [7]. Of note, there appears to be differences in self-esteem between black and white women, as reported by an earlier study in this cohort. Self-esteem began to decline at age 11 years in white girls, but appeared to be stable in black girls between 9 and 14 years of age; these differences were attributed to greater satisfaction in physical appearance [8]. A recent meta-analysis noted greater self-esteem in Blacks, as contrasted to Whites, and observed increased differences in effect size with increasing age, as well as with lower socioeconomic status [9].

The goals of this study were to describe mean and individual changes in self-esteem/global self-worth in a group of adolescent females, followed longitudinally from ages 9–10 years through 21–22 years; and to analyze potential explanatory variables, such as body mass index (BMI), that may affect self-worth in this age group, examining not only age, but also “phase” of adolescent development. We hypothesized that global self-worth would decrease among white girls with increasing age, but would remain relatively constant in black girls, and that there would be a significant inverse relationship between global self-worth and BMI, greater among white than black girls.

Methods

Participants

Girls were recruited initially into the National Heart, Lung, and Blood Institute Growth and Health Study (NGHS) [10] at ages 9 and 10 years. The goals and methodology of the parent study has been described previously [10]. The three clinical sites were Cincinnati, Ohio (recruited through selected public and parochial school systems), Richmond, California (all eligible fourth and fifth grade girls in the Richmond Unified School District), and Washington, DC (recruited through health maintenance organization membership, and then supplemented through area Girl Scout Troops). The girls were followed annually for 10 years, and then recruited into “Wave II” for an additional three years, through age 22.

Instruments and procedure

To measure self-esteem, the Harter Self-Perception Profile [11] was administered every other year to the participants. The analyses in this study are based on scores from the Global Self-Worth Scale, widely used in research settings to measure overall self-esteem [3,12]. In the first four years of the study, the Self-Perception Profile for Children (SPPC) [13] was used, and beginning in year five, the Self-Perception Profile for Adolescents (SPPA) was used [14]. Reliability estimates (Cronbach alpha) for the Global Self-Worth Scale in the current study cohort (at ages 9–12 years) ranged from .66 –.75 in black girls and .72–.82 in white girls, with lower estimates among the younger, and greater estimates among the older participants [15]. Other investigators have noted reliability estimates of .68 –.89 for the SPPC [4,13] and .75–.92 for the SPPA [4,14,16]. Additionally, the SPPC and SPPA are comparable in age groups at the upper end of the SPPC and lower end of the SPPA [4,14].

Demographic information was elicited annually from the participants and their parents. Race was defined by the subject’s self-identification (using census categories for race/ethnicity) at baseline, with concordant declaration by a parent. Maximum education of household was categorized into: did not complete high school, high school graduate or equivalent, post high school, college one to three years, college graduate, or graduate school.

Physical examinations were performed annually by trained personnel, as detailed previously [10]. Briefly, a “master trainer” was identified for the overall study, who then trained and (re)certified a local trainer at each center annually. Data for weight and height were used in this study to calculate BMI (weight divided by height squared, kg/M²). Age was defined at the last birthday. Three developmental phases were defined based on age. Phase I was for girls who were ages 9 to 12 years (corresponding to early adolescence), Phase II for ages 13 to 16 years (middle adolescence), and Phase III for ages 17 to 22 years (late adolescence).

The study was approved by each center’s Institutional Review Board.

Statistical methods

All analyses were performed with SAS statistical software, version 8.2 [17]. Age, race, parental and participant’s final education, and clinical center were centered and scaled appropriately. Centering continuous variables allows more meaningful interpretations of models that include interactions, because correlations between the main effects and interactions including those variables will be low, reducing multicolinearity when centering those variables [18]. Developmental changes in global self-worth were analyzed first by constructing two regression models (ProcMixed, SAS). The main independent variables were age, race, and BMI; clinical center and education were included as covariates. In both of these models, intercept was considered a random effect, allowing each girl to begin at her own level of self-worth, and the independent variables were tested as fixed effects. The first model (the “traditional model”) included main effects with two- and three-way interactions of race, age, and BMI. This is a “traditional” model because
age is a continuous variable, as done in most studies. For the second model (the “transitional model”) the variable “Phase” was used rather than age, to examine how developmental phase would affect the model. The three phases represent the developmental phases as described above. In the second model (the “transitional model”), phase was represented by two orthogonal constructs that were used to compare the three phases. The first construct compared early adolescence with the average of the middle and late stages of adolescent development, and the second construct compared the middle with the late phase of adolescent development. Additional analyses then evaluated, within each phase, the interaction between race and BMI, as well as the covariates of clinical center and education; parental education was used for Phases I and II, whereas the participant’s final education level was entered with parental education. These analyses allowed for a further examination of the interaction of race and BMI across the ages within that developmental phase. To plot the triple interaction of race, BMI, and age on global self-worth, race was stratified (black and white), and race-specific BMI distributions were calculated for every age. BMI then was grouped into “med BMI,” reflecting race- and age-specific BMI within one standard deviation of the mean; “low BMI,” race- and age-specific BMI that was greater than one standard deviation below the mean; and “high BMI,” race- and age-specific BMI that was greater than one standard deviation above the mean.

To evaluate how well self-worth tracked, a random effects model was constructed to evaluate longitudinally the correlation of an individual’s self-worth [19]. Pearson Correlation Coefficients were calculated to compare the mean value of self-worth between phases for a given individual. Given the number of analyses performed, the level of significance was set at .01.

**Results**

There were 2379 girls recruited into NGHS, including 1213 black (539 were age 9 at time of recruitment, and 674 were age 10) and 1166 white (616 were age 9 at time of recruitment and 550 were age 10) girls. Sample sizes varied each year, with overall high retention rates; 89% of the original cohort was seen at year 10. Between 1998 and 2001, a second wave of NGHS was conducted (Wave II), which included 2054 of the original cohort (1063 black and 991 white women, representing 86% of the original cohort) [20]. The women were 20–22 years of age during Wave II (mean age 21.5 years). There were no differences in baseline global self-worth scores between those who remained in Wave II and those who were not in Wave II (p = .15, white participants; p = .27, black participants).

At baseline, there was a broad representation of maximum education of household. The maximum level of education attained by the head of household was less than or equal to high school in 32% of black and 20% of white families, and some college in 63% of black and 76% of white families.

As shown in Figure 1, overall, global self-worth was greater in black than white women after age 11; in both groups, global self-worth was greater with lower BMI (not shown). Race was an important explanatory variable for self-worth within each phase of adolescence: in phase I, p < .0008; in phase II, p < .0001; in phase III, p < .0001; within each phase, self-worth was greater in black than white participants.

In the first overall model of developmental changes in global self-worth, the “traditional model,” which included age, race, and BMI, with parental education and clinical site as covariates, significant variables included BMI and interactions between age and race, race and BMI, and the triple interaction between age, race, and BMI (Table 1, Model 1). Figure 2 reflects how global self-worth is affected by the interactions of race, BMI, and age. These results are stratified by race, to simplify the figure. Of note, those with a BMI greater than one standard deviation of the mean typically have the lowest self-worth scores, regardless of age or race. Black participants with BMI values within one standard deviation of the age-specific BMI typically have the greatest self-worth scores, whereas white participants with age-specific BMI values lower than one standard deviation below the mean typically have the greatest self-worth scores.

When phase replaced age in the overall model, the “transitional model,” significant variables included BMI, and the interaction between race and phase, and approached significance for the interaction between race and BMI (Table 1, Model 2). Specifically, in Phase I (ages 9–12 years), regression analysis revealed that global self-worth was related to BMI (p < .0001). In Phase II (ages 13–16 years), global self-worth was related to BMI (p < .0001) and race (p < .001). In Phase III (ages 17–22 years), global self-worth was related to BMI (p < .0001) and race (p < .0001). In a third model, investigating self-esteem by race within each phase...
of adolescence, race was a significant explanatory variable: in phase I (ages 9–12), \( p < .0008 \) (black race > white); in phase II (ages 13–16), \( p < .0001 \) (black race > white); in phase III (ages 17–22), \( p < .0001 \) (black race > white).

The random effects model revealed that the tracking coefficient for self-worth was .224. The correlation for a given individual between Phases I and II was .397 \( (p < .0001) \), between Phases I and III was .238 \( (p < .0001) \), and Phases II and III was .519 \( (p < .0001) \).

**Discussion**

This study followed self-esteem, as measured by the “global self-worth” score on the Harter Self-Perception Profile, in a group of girls from ages 9 and 10 through ages 21 and 22. It examined the impact of race, body mass index, and age, as well as developmental phase, on self-worth. In this longitudinal analysis of self-worth in young women, complex relationships between race, age, and phase were found (Appendix).

As noted in an earlier study in this cohort, self-esteem began to decline at age 11 in white girls [8], corresponding to the transition from elementary to middle school or junior high school as well as the transition into puberty. Self-esteem rose in the mid-teen years. The drop in self-esteem and subsequent recovery in high school has been noted by others [4–7,12,21]. Cole et al [4] found that developmental trajectories such as self-esteem, perceived appearance, and academic competence represent discontinuous rather than smooth functions, with breakpoints occurring during transitions from elementary to middle school, and middle to high school. This first transition, elementary to middle school, occurs approximately at the time of cognitive changes (concrete to formal operational thought), as well as onset of puberty and the accrual of body fat that occurs during early puberty in girls [22–24].

Self-esteem was greater overall in black (as contrasted to white) girls throughout adolescence. Similar findings have been reported by multiple authors, as noted in recent meta-analyses by Gray-Little and Hafdahl [9], and Twenge and Crocker [25]. There are several possible explanations why
self-esteem is preserved in black girls as they go through puberty, as contrasted to white girls. Black girls have greater satisfaction with their physical appearance in early adolescence [8], and may feel more comfortable with a “thicker” body shape [26]. Additionally, white girls may have less resiliency because several changes are occurring nearly simultaneously; that is, white girls are undergoing school transitions at the same time as changes in physical development and body composition. In contrast, pubertal changes in black girls occur before the transition from elementary school [21,27], and the changes in body composition are not perceived as negatively as in white girls. These changes, as well as the change in relative importance of appearance as one progresses through adolescence and young adulthood [28] may account for the interactions noted in these analyses of race, age, and phase. As noted in the Results section, there were interactions between race and BMI on global self-worth in both the traditional (age-based) and transitional (developmental phase-based) models; global self-worth was affected more negatively by increases in BMI in white, when contrasted to black, participants.

Although parental education was used as a covariate, this study did not find an effect of parental education, used as a measure of socioeconomic status (SES), on global self-worth. A recent study noted that youth from higher income families tended to have higher self-esteem [7]; Gray-Little and Haft Dahl noted that the effect size of SES on self-esteem differed by race, with a greater impact at lower SES in white subjects than black subjects [9]. Parental education has been one of several variables used to represent SES; however, other factors that contribute to SES may have a greater impact on self-esteem in adolescent girls.

In addition to changes in mean level of self-esteem, several authors have addressed the issue of consistency of self-esteem within an individual [29], and whether self-esteem represents a dynamic or static concept [1,7,30]. Those adolescents with consistently high self-esteem, as well as those with moderate levels that rise, report healthier outcomes than those with steadily decreasing or consistently low self-esteem [30]. Harter and Whitesell [3] proposed that self-esteem and self-worth do not represent a state or trait during adolescence; for some, self-esteem is stable, whereas for others it is subject to change. Our findings are in agreement with Harter and Whitesell; although we found changes in self-esteem in response to changes in age and BMI, we also found consistency of an individual’s responses, with significant correlations from one phase of adolescence to another. The tracking overall was .224, and the phase-dependent correlation coefficients were .28–.52, somewhat lower than values reported by Block and Robins [29] (.57–.65). This range of values is comparable to the stability of personality traits, as noted by Trzesniewski et al [1], and is consistent with longitudinal correlations by Zimmerman et al (.29–.41), who also noted a decreased consistency in, contracts HC55023-26 and Cooperative Agreements U01-HL-48941-44; and from the National Institute of Mental Health (MH57897) self-esteem with increasing passage of time [31].

Previous studies have noted the impact of self-esteem on the vulnerability of adolescents to risky behaviors. For example, those girls who had lower scores on a self-esteem scale were more likely subsequently to initiate sexual intercourse [32], whereas girls with higher self-esteem reported feeling more efficacious in negotiating condom use, and communicating more effectively with parents and sex partners [33]. In another study examining condom use, college females in a negative mood state were more likely to report their intention to have sex without a condom if they had low self-esteem [34]; the authors noted that teens with low self-esteem were more affected by a negative mood, and were more conciliatory to avoid rejection. In a longitudinal study, those with lower self-esteem were twice as likely to report suicide thoughts and plans, and three times more likely to have a suicide attempt [35]. Additionally, building self-esteem could improve outcomes, as suggested by a community-based study that noted lower rates of violent behaviors in those who underwent self-esteem building [36]. This is corroborated by a meta-analysis of programs designed to improve outcomes; interventions focused on self-esteem were more effective than those focused on behavior or social skills [37].

This study has several limitations. Although the study includes participants from three large urban areas, it does not include other racial or ethnic groups, nor can it be considered nationally representative. This should not limit the generalizability of the findings, given the broad representation from socioeconomic and geographic perspectives. This study examined the relationship between self-worth and race, age (or phase of adolescence), and BMI at a given time. For example, such an analysis cannot conclude that greater BMI causes lower self-esteem, or lower self-esteem causes greater BMI. Additionally, this study did not examine the changes in the domains that contribute to global self-worth, such as academic and athletic competence, physical appearance, or social acceptance. A study that reported on this cohort at younger ages noted a decline in self-esteem of girls 9–14 years old, with a significant correlation between self-worth and physical appearance (R = .47–.68) [8]. Future work could extend the examination of the differential impact of these domains, such as physical appearance, on self-esteem across different phases of adolescence in an ethnically diverse sample, as well as to identify further factors that lead to differences between black and white women.

Acknowledgments

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Appendix

Table a1
Model of global self worth by race, within each developmental phase

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<th>Phase I</th>
<th>Phase II</th>
<th>Phase II</th>
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<td>.074</td>
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<tr>
<td>Race</td>
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<td>&lt;.0001</td>
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<tr>
<td>Age*Race</td>
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<td>.090</td>
<td>&lt;.0001</td>
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References


