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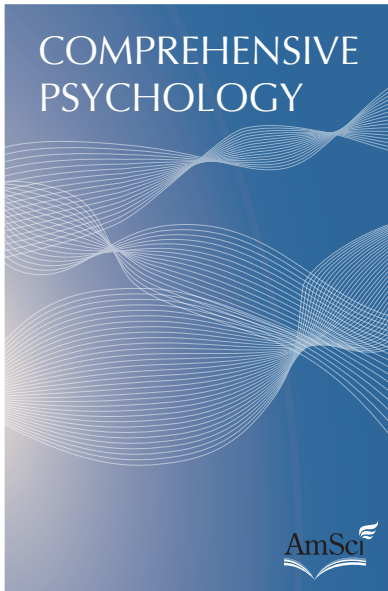
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Social physique anxiety in early adolescent Black females¹

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Abstract

An adapted version of the 9-item Social Physique Anxiety Scale (SPAS) was administered to Black females ($N=179$) ages 11 to 14 years. Comparison between body composition (BMI) and social physique anxiety (SPA) indicated greatest SPA in overweight/obese participants. No change over age was observed. In comparison to previous data for a White sample, these Black early adolescent females evidenced somewhat lower social physique anxiety than the White females. The lower SPA supports the hypothesis that Black females are more accepting of a larger physique in early adolescence. Factor analysis supported a substantive/non-substantive two-factor model for the SPAS-C.

Over the past 20 years, numerous research investigations have focused upon anxiety experienced relative to one's physical characteristics, especially with reference to when others observe their body composition or physique (Sands, 2000; Thompson & Chad, 2000, 2002; Hausenblas, Symons Down, Fleming, & Connaughton, 2002; Davison & McCabe, 2006). The development of the Social Physique Anxiety Scale (the SPAS), by Hart, Leary, and Rejeski (1989), allowed the quantitative assessment of this anxiety type in adults. Over this same time period, a public outcry and growing concern about obesity in youngsters has been evidenced (e.g., Bell, Rogers, Dietz, Ogden, Schuler, & Popovic, 2011). It is clear that accompanying the obesity epidemic in youth is the potential for the development of social physique anxiety in children.² High anxiety could be debilitating and even harmful to the child. However, as noted by Hagger and Stevenson (2010, p. 90), "comparatively little research has examined the developmental trends in the construct (of SPA) across age groups." The majority of study of SPA has employed college-age males and females; relatively few studies assess youngsters. Yet, this is the developmental period where social comparison and potential concern for body image and self-presentation could be heightened due to maturation and normal but dramatic physical change.

While some early attention to adolescents occurred (e.g., McAuley & Burman, 1993), until quite recently there have been few studies to examine social physique anxiety in children and early adolescents. These recent efforts to examine SPA in pre-adolescent and adolescent boys and girls have primarily assessed European samples. Niven, Fawcner, Knowles, Henretty, and Stephenson (2009) assessed SPA in early adolescent White British girls (M age = 11.8 yr., $SD=0.3$). As might be predicted, girls in earlier stages of maturation demonstrated lower SPA than females at the middle or later maturation stages. Maïano, Morin, Eklund, Monthuy-Blanc, Garbarino, and Stephan (2010) examined the construct validity of the SPAS with French early adolescent and adolescent samples. A younger group (M age = 10.8 yr., $SD=1.6$) was employed to develop an easily understandable questionnaire. Additional validation studies assessed older children (M age varied from 14.6 to 16.6 yr.). SPAs over age groups were not reported.

Hagger and Stevenson (2010) studied age and sex differences in SPA and physical self-esteem with UK secondary school students (age range = 11 to 18 years) and university students (18 to 24 years). In the 11- to 12-year-old age group, girls had consistently higher SPA than boys. The 21+ age group evidenced higher SPA than either of

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²In the current study, the ages of the participants overlap later childhood, pre-adolescence and early adolescence and thus all three terms may appear in the text.

the two younger age groups (11–12 and 13–14 years). A follow-up study (Hagger, Stevenson, Chatzisarantis, Gaspar, Ferreira, & Rave, 2010) with Spanish and Portuguese samples found similar results. Thus, a better understanding of SPA among European youngsters has emerged, especially with respect to girls demonstrating greater SPA than boys and SPA increasing over age. However, cultural and ethnic differences may mediate this understanding of SPA.

Culture/ethnicity

Motl and Conroy (2000) identified a number of variables related to SPA in need of study, including fitness, age, and culture. Smith (2004) took these recommendations concerning further study and assessed the factorial validity of various SPA models with U.S. Grade 9 and 10 students. Whereas all other studies have assessed White (and mostly European) respondents, Smith's sample had greater diversity, with 45.5% being minorities. However, comparisons between different cultural/racial groups were not reported by Smith and little attention or concern by other researchers has been focused upon minority youth. Given that non-Hispanic Black females are "disproportionately affected by obesity" (Bell, et al., 2011, p. 42) and that, in 2007–2008, U.S. Black, non-Hispanic females evidenced the highest incidence (almost 30%) of obesity (Ogden, Carroll, Curtin, Lamb, & Flegal, 2010), attention to this population seems most relevant.

Overall, females are at higher risk to develop anxiety disorders (U.S. Department of Health and Human Services, 2006). Research suggests that being female seems to be a risk factor in Black children in the development of anxiety. Douglass and Rice (1979) studied U.S. Grade 5 and 6 students using standardized self-report measures and found that girls had higher general anxiety scores than boys. Similarly, a study by Kingery, Ginsburg, and Alfano (2007) of somatic symptoms and anxiety in Black adolescents found that girls reported significantly more somatic symptoms than boys. Given the evidence for greater risk of higher general and somatic anxiety apparent for Black girls, the present study sought to assess whether there was evidence for higher anxiety of a more specific type, namely SPA, in this under-examined population.

The present study focused upon Black, non-Hispanic girls of later elementary and middle school age (i.e., 11 to 14 years old). The focus upon this specific population was partially motivated by literature that suggests the Black culture might view a larger body size as more acceptable than their White counterparts. For example, Neumark-Sztainer, Croll, Story, Hannan, French, and Perry (2002) reported that, compared to White females, Black females reported fewer concerns about weight-related issues. A secondary interest for this study related to whether there seems to be a systematic increase in SPA over age in early adolescent girls.

Hypothesis 1. Black early adolescent girls will evidence a positive linear relationship between age and SPA and will have SPA lower than what White early adolescent girls evidenced in the earlier Fender-Scarr, MacCracken, Stadulis, Caine, Gan-dee, Maddox, et al. (2003) investigation.

Measuring Social Physique Anxiety

While not meant to be the major focus of the current research, the multiple available instruments that have been used to measure SPA warranted some concern for which instrument to select to use in this study. Researchers have employed four different forms to assess SPA, with 12, 9, 8, or 7 items derived from the original 12-item SPAS (Hart, et al., 1989). When administered to a younger sample, often the item language is modified to be age appropriate but frequently these modifications are not reported. Thompson and Chad (2002), assessing 7- to 16-year-olds, used a 12-item modified SPAS to study the relationship between body image and risk for developing an eating disorder. However, the psychometric qualities of this adaptation were not reported. Smith (2004) found both the 7- and 9-item models had acceptable fits to the data, but the 7-item model comprised different items than Motl and Conroy's earlier version (2000). Smith recommended that the 9-item SPAS be used with adolescent samples. Smith also demonstrated factorial invariance between adolescent boys and girls on the SPAS. He found that girls evidenced higher social physique anxiety than boys.

More recent studies have focused upon the SPA of early adolescents and adolescents. Interestingly, these recent efforts have not always heeded Smith's (2004) conclusions, and different forms of the SPAS continue to be employed. Niven, et al. (2009) followed Smith's recommendation, using a 9-item SPAS. However, after starting with a 12-item SPAS, Maïano, et al. (2010) revised the scale to 7 items based upon their data in the earlier phases of their six-study effort. Similarly, Hagger and Stevenson (2010) found that an 8-item SPAS, derived after analyzing data from a 12-item version, demonstrated the best psychometric properties. The most appropriate instrument to use seems still uncertain.

Thus, given the variety of SPAS forms used in the efforts to study SPA in early adolescents, the issue is whether the SPAS used (as often adapted and modified) is appropriate to assess social physique anxiety in youngsters in later childhood and early adolescence. Martin, Rejeski, Leary, McAuley, and Bane (1997), using a U.S. sample of females ages 13 to 35 years, found that the 9-item SPAS was more conceptually clear and recommended that the 9-item, unidimensional version of the SPAS be utilized. Motl and Conroy's (2000) confirmatory factor analyses, with a college student sample, supported both 9- and 7-item versions of the unidimensional SPAS, with

factorial validity, factorial invariance, and construct validity evidenced as well as similar goodness of fit. Similarity in factor structure and pattern loadings between males and females also was demonstrated, although the 7-item SPAS seemed to provide stronger invariance. Motl and Conroy (2000) also suggested that a possible two-factor solution found in some studies was only reflecting the directionality of items' wording. Their two-factor solution consisted of the positively worded items and the negatively worded items as apparent different factors, but that the best model from the factor analytic results was still unidimensional.

With respect to an appropriate instrument to employ with children and early adolescents, Fender-Scarr, et al. (2003) modified Martin, et al.'s (1997) 9-item scale. Called the SPAS-C (Social Physique Anxiety Scale for Children), Fender-Scarr, et al.'s (2003) instrument appears to be the only measure specific to the age group of interest with demonstrated reliability and validity. Thus, the SPAS-C was selected for use in the present study. Fender-Scarr, et al.'s (2003) sample was predominantly female, White, and attending middle school, prompting a focus in the present study upon middle-school aged Black girls so that potential race differences in SPA between the present sample and Fender-Scarr, et al.'s sample could be examined.

Hypothesis 2. The SPAS-C will demonstrate acceptable psychometrics for use with the sample of early adolescent Black girls.

In addition to determining the SPA characteristics in a sample of early adolescent Black girls, the relationship of SPA to body composition needs to be considered. Logically, it is expected that overweight/obese children would have higher SPA. Monsma, Pfeiffer, and Molina (2008) investigated the relationship between SPA and physical size characteristics; weight, percent body fat, and BMI demonstrated the strongest correlations with SPA. The present investigation used Body Mass Index (BMI) equations recommended by the Centers for Disease Control (CDC, 2012) to assess body composition. Fender-Scarr, et al. (2003) found that the BMI measure was as effective, and more efficient, than skinfold and/or bio-impedance measurement of body composition in middle school children. Of concern also is whether the SPAS-C would demonstrate the same construct validity in a sample of early adolescent Black girls as in the earlier White sample (Fender-Scarr, et al., 2003).

Hypothesis 3. There will be a positive relationship between body composition as measured by BMI and SPA, i.e., the greater the BMI the greater the anxiety. Girls of average body composition (e.g., BMI) will have less social physique anxiety than those with higher BMI.

Method

Sample

The present study's participants were predominantly lower and lower-middle class (based upon the participants' family income data), Black girls ($N=179$) who attended a community-based program focusing on physical activity, nutrition, and self-esteem. Only the participants with complete data are included in the analyses reported here. Their data represent two consecutive program years, with children assessed when they first entered the program. The ages within the program ranged from 8 to 15 years, but only girls of ages 11 ($n=60$), 12 ($n=46$), 13 ($n=53$), and 14 ($n=20$) years from the overall sample were examined here. These four ages enabled direct comparison to the Fender-Scarr, et al.'s (2003) data; the Fender-Scarr (White) sample had comparable BMIs but did differ socio-economically as they were somewhat more middle class overall. Race for both samples were the result of completion of a demographic intake survey as well as via observation. Subsets of the ethnicity category "Black" were not assessed (e.g., were the participants African American, Caribbean, etc.). Participant and parental/guardian consent (and assent from the younger children) and institutional review board approval was obtained.

Procedures

The girls were involved in an assessment session when they entered the program. Testing included completing the SPAS-C as well as measures of height and weight to determine body mass index (BMI), percent body fat (skinfolds and bioelectrical impedance), fitness (cardio-respiratory, muscular strength and endurance, flexibility), and a variety of other psychological measures (intrinsic motivation, racial identity, general anxiety, and self-concept). This current article will focus upon only the SPAS-C and BMI measures.

The SPAS-C (Appendix) consisted of nine self-presentation statements about being worried, bothered, nervous, uncomfortable (or comfortable), or relaxed relative to one's body (and weight) with others present (Fender-Scarr, et al., 2003). Participants read each statement and responded on a five-point scale with anchors 1: NO! and 5: YES! An example item is, "When in a bathing suit, I often feel nervous about my body." Two items were reverse scored (Items 5 and 8).

Height (in inches) was measured via a stadiometer and weight (in pounds) via a bar scale. Given that Fender-Scarr, et al. (2003) found that BMI, skinfold, and bio-impedance all indicated similar body composition when applied to the same participants, and because assessment of BMI is more efficient and practical, BMI was used in the current analyses as the body composition measure. BMI was calculated using the child and teen version published by the Centers for Disease Con-

trol (CDC, 2012). The CDC version also provides a percentile score that accounts for the child's sex and age.

Analyses

Internal consistency reliability of the SPAS-C was assessed as Cronbach's α . Concerning the structure of the SPA scale, prior research has reported mixed results, with both unidimensional (Eklund, Kelley, & Wilson, 1997; Martin, et al., 1997; Eklund, 1998) and two-dimensional structures (Eklund, Mack, & Hart, 1996; Motl & Conroy, 2000; Smith, 2004) emerging, dependent upon the particular sample. Principal components factor analysis with Varimax rotation was applied to the current sample of urban, Black early adolescent girls to assess if a uni- or multi-dimensional factor structure fit the data best. Fender-Scarr, et al. (2003) reported a two-factor structure, with one factor representing the positively worded SPAS-C items and the second the negatively worded items. Of interest in the current study was whether the factor structure for the Black sample would be similar or different from Fender-Scarr, et al.'s (2003) mostly White sample. A confirmatory factor analysis (CFA) was also applied although an exploratory factor analytic (EFA) approach has been used in the majority of previous studies and by Fender-Scarr, et al.

To assess the relationship between body composition and social physique anxiety, three body composition groups were established based upon BMI. The sample was split into three equal-sized groups (highest 1/3 BMIs=Overweight/obese group, middle 1/3=Average group, low 1/3=Lean group). Analysis of variance (ANOVA, random groups design) was used to compare the three body composition groups for differences in SPA. The earlier Fender-Scarr, et al. (2003) study found that as BMI increased, so did SPA. The goal of the analysis in the current study was to assess whether a similar relationship would be observed in the Black sample or not. Linear regression analysis was applied to assess the BMI-SPA relationship as well.

Fender-Scarr, et al. (2003) did not report a pattern of change in SPA over the age range studied. In the current study, multivariate analysis of variance (MANOVA) was employed to determine if reported SPA and/or BMI changed for the groups of girls ages 11 to 14 years. The relationship between age and SPA and BMI was assessed via regression as well.

Results

Before addressing the primary hypotheses of the study concerning race, age, and the relationship between body composition and social physique anxiety, the assessment of the psychometric properties of the SPAS-C will be presented.

Reliability

Cronbach's α reliability was .82 ($N=179$). Test-retest external reliability was not assessed.

Factor Analytic Validity

Ideally, a factor analysis of the 9-item SPAS-C should yield one factor with an eigenvalue>1.0, with all 9 SPAS-C items loading on that one factor (loadings above .50). However, three factors emerged (Table 1) in the current study with eigenvalues>1.0. The first factor represented the seven positively worded items. Negative and positive here refer to the relationship to anxiety, from low to high, where a positively worded item depicts higher anxiety wording (e.g., worried, bothered) and negatively worded depicts lower anxiety wording (e.g., comfortable, relaxed). The remaining two factors, based upon the factor loadings, represented the two negatively worded items (5 and 8). Item 7 ("When it comes to showing my body to others, I am a shy person") loaded (>.50) on both Factors 1 and 3.

The three-factor result (one factor representing the positively worded items and the other two representing each of the negatively worded items primarily) conforms to the more current assessment of the attributes

TABLE 1
Factor Analysis of Girls' ($N=179$) Responses to SPAS-C Items

SPAS-C Item	M	SD	Loadings ¹			h ²
			Factor 1	Factor 2	Factor 3	
SPAS-C 1	2.7	1.3	.75	-.02	-.11	0.57
SPAS-C 2	2.4	1.4	.79	-.17	.07	0.66
SPAS-C 3	2.0	1.2	.82	-.03	.13	0.69
SPAS-C 4	2.2	1.3	.75	-.25	.22	0.67
SPAS-C 5	2.6	1.4	.27	.56	.66	0.82
SPAS-C 6	3.2	1.5	.58	-.14	.41	0.52
SPAS-C 7	3.5	1.3	.59	.22	-.50	0.65
SPAS-C 8	3.4	1.3	.30	.80	-.30	0.83
SPAS-C 9	2.5	1.5	.80	-.10	.05	0.66
Eigenvalue			3.90	1.14	1.02	
% Variance			43.3	13.6	11.4	

TABLE 2
Confirmatory Factor Analysis For One- and Two-factor SPAS Models

Model	GFI FIT	AGFI FIT	RMS	χ^2	df	p
One-Factor	0.952	0.919	0.051	80.28	27	<.0001
Two-Factor	0.954	0.920	0.047	73.19	26	<.0001

of the SPAS. To further assess the model, CFA (via EQS) was undertaken to compare the one factor and two factor models (see Table 2). Both analyses yielded similar results, with the two-factor model seemingly having slightly better fit indexes.

SPA and Body Composition

BMI was employed to assess the body composition of the sample. A significant positive correlation between BMI and SPA emerged ($r_{179} = .34, p < .0005$). Regression analysis yielded a linear positive, statistically significant relationship for this group of girls ($R^2 = .12, F_{1,177} = 23.01, p < .0005, 95\%CI = .27, .64$).

The sample was split into three almost equal sized body composition groups: Leaner, BMI ≤ 21.8 ($n = 60$); Average, $21.9 > BMI < 27.2$ ($n = 58$); and Overweight/obese, BMI ≥ 27.3 ($n = 61$). As Fig. 1 shows, the lowest mean SPA occurred for the Leaner subgroup and the highest SPA for the Overweight/obese subgroup. ANOVA yielded a significant difference between the subgroups ($F_{2,176} = 10.73, p < .0005, \eta^2 = 0.11$). As presented in Fig. 1, the differences between the Overweight/obese group and the two other groups were significant ($p < .05$) in *post hoc* comparisons (Bonferroni correction).

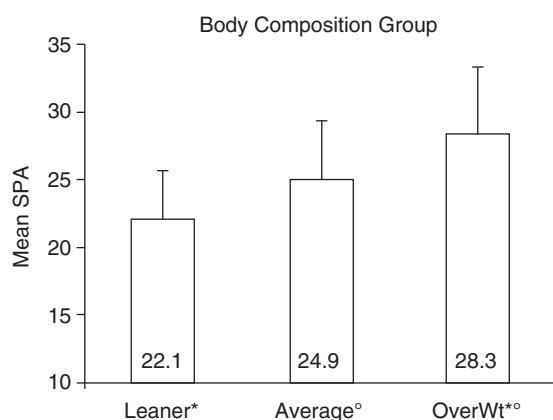


Fig. 1. Mean SPA for three body composition/BMI groups: lean, average, and overweight/obese. Means with different symbols (*, °) differ at $p < .05$.

Age Differences

A descriptive statistical summary for SPA and BMI by age is presented in Table 3. BMI seemed to increase over the four-year age range with regression analysis resulting in a small but positive relationship ($r_{179} = .24; p = .001$). Neither regression nor ANOVA indicated systematic variance over age for SPA ($p > .05$).

Race Differences

Descriptively, this sample of Black early adolescent girls' social physique anxiety distribution ($M = 24.2, SD = 7.5$) was similar to that of the White females ($M = 25.1, SD = 7.7$) in Fender-Scarr, et al. (2003). While lower SPA for the Black pre-adolescents was in the hypothesized direction, the difference was not large enough to be significant ($p > .05$). Both groups reported moderate SPA (the mid-point for the SPAS-C scale = 27).

Discussion

Relative to the main question concerning developmental aspects of social physique anxiety, the findings support the contention that early adolescent girls manifest some moderate anxiety about their body composition by the age of 10 years. Davison, Markey, and Birch (2000) reported that females (non-Hispanic Whites) as young as 5 years have concerns about their body image that parallel those reported among adults. Greater body dissatisfaction in girls than boys appears to be already present in pre-adolescence (Davison & McCabe, 2006). A popular perception has been that concern and anxiety for their bodies should increase as girls move through adolescence. Studies of European samples (e.g., Hagger & Stevenson, 2010) evidenced increases in SPA from early adolescence to young adulthood. The current findings do not support that contention as no systematic increase in social physique anxiety with age in early adolescence was observed. However, given that the current research design was cross-sectional, conclusions concerning change over the ages 10 to 14 years are limited. Longitudinal study is required to document whether individual girls experience systematic changes in social physique

TABLE 3
Descriptive Statistics for SPA and BMI Across Age

Measure	Age, yr.							
	11 ($n = 60$)		12 ($n = 46$)		13 ($n = 53$)		14 ($n = 20$)	
	M	SD	M	SD	M	SD	M	SD
SPA	26.0	7.7	24.2	7.8	24.8	7.4	25.4	8.7
BMI	23.9	5.2	24.9	5.4	26.0	5.6	28.5	7.4

anxiety. While the current investigation demonstrated that early adolescents with higher BMIs had higher social physique anxiety, the cross-sectional design does not permit assessment of changes in SPA that might accompany changes in body composition. It is hypothesized that increased BMI, especially in girls, would result in greater anxiety about physique. Similarly, a downward change in BMI ought to be accompanied by lower anxiety. Longitudinal and/or epidemiological methods are needed to better address the change relationship between body composition and SPA.

The distributions of social physique anxiety for the pre-adolescent Black and White girls were similar. Few studies address ethnicity and cultural differences with respect to social physique anxiety. With respect to the Black population, and especially females, Neumark-Sztainer, et al. (2002) reported that Black females, compared to White females, reported fewer concerns about weight-related issues. This finding could be interpreted that Black females might have less anxiety about their body composition. The current findings suggest that the social physique anxieties of early adolescent girls of the two ethnicities are similar. However, while the SPA of the girls remained fairly similar over the ages studied, their BMIs increased (although not statistically significantly). This could be an indication that Black girls are less concerned and anxious than their White counterparts as body fat increases with adolescence. As noted previously, Neumark-Sztainer, et al. (2002) reported that, compared to White females, Black females experience fewer concerns about weight-related issues. In fact, it may be that being too thin is an issue for the Black female population. As noted by Terry McMillan in *Waiting to Exhale* (1992), she became tired of apologizing for being a size 6 instead of a size 10. Within Black culture, being skinny may not be as valued as in the White population. Investigating the relationship in later adolescence and early adulthood might yield clearer evidence of SPA differences between Black and White females with similar BMIs. One of the limitations in the current study is the relatively small sample of the oldest girls (i.e., age 14 years); that may have lessened observing possible age changes.

While not a central focus of the current study, assessing the psychometric qualities of the SPAS-C was required given the great diversity of scales used in previous research. The various analyses of the current data of these early adolescent Black girls supported the use of the SPAS-C as a reasonably valid and reliable assessment tool for social physique anxiety in this population. The displayed relationship supports the validity of the SPAS-C in that the larger a female's size, as indicated by BMI, the greater the social physique anxiety. The results only partially supported the two-factor structure reported by Motl and Conroy (2000). All seven positively worded items on the SPAS-C (higher score = higher

anxiety) loaded together on one factor, whereas the two negatively worded items loaded as separate factors. As previously suggested (Motl & Conroy, 2000, p. 327), "a single substantive factor" (the positively worded items) "and a non-substantive method effect" (the negatively worded items) appeared to be the best explanation of the factor analytic results.

Some might suggest that using a seven item SPAS consisting of only the positively worded items is the best choice. We would argue for retaining all nine items. While not significant, the two-factor CFA solution was a bit better than the one-factor model. Certainly further assessment is necessary to resolve the issue. Further, we have found that the two negatively worded items provide a reliability check when the SPAS-C is being completed. If the responses on the seven positive items are consistently high or low, and the responses to Items 5 and 8 are also high or low, then the likelihood is that the respondent is not reading the items carefully. When we asked a respondent to reconsider the responses to Items 5 and/or 8 if the responses seemed opposite to what would be expected from the responses to the other seven items, invariably the respondent acknowledged the misinterpretation of the item and changed to a choice more consistent with the other responses.

Conclusions

The current investigation aimed to assess the social physique anxiety of early adolescent Black females. The findings suggest that social physique anxiety of Black girls does not systematically increase from ages 11 to 14 years. Although it is a low, moderate effect, as body composition enlarges, social physique anxiety increases. Black girls 11 to 14 years old have social physique anxiety similar to White females of the same age. The SPAS-C is a reasonably valid and reliable instrument for 11- to 14-year-old Black girls; the two-factor model of the SPAS (Motl & Conroy, 2000) was partially supported as the SPAS-C generated one substantive factor representing the positively worded items. The two negatively worded items represented a non-substantive method effect but not together as a single factor.

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