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THE ADOLESCENT BODY IMAGE SATISFACTION SCALE FOR MALES: EXPLORATORY FACTOR ANALYSIS AND IMPLICATIONS FOR STRENGTH AND CONDITIONING PROFESSIONALS

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¹Department of Movement Arts, Health Promotion, and Leisure Studies, Bridgewater State University, Bridgewater, Massachusetts; ²Department of Physical Education and Health Education, Springfield College, Springfield, Massachusetts; ³Department of Movement Arts, Health Promotion, and Leisure Studies, Bridgewater State University, Bridgewater, Massachusetts; and ⁴Department of Health Professions, University of Central Florida, Orlando, Florida

ABSTRACT

Leone, JE, Mullin, EM, Maurer-Starks, SS, and Rovito, MJ. The adolescent body image satisfaction scale for males: Exploratory factor analysis and implications for strength and conditioning professionals. *J Strength Cond Res* 28(9): 2657–2668, 2014—The purpose of this study was to determine whether there is evidence of reliability and validity for the Adolescent Body Image Satisfaction Scale (ABISS), an instrument previously developed to measure adolescent body image. A sample ($N = 330$) of adolescent males, aged 14–19 years, completed the ABISS to determine current body image satisfaction. Data were analyzed for measures of instrument composite reliability and initial content and construct validity. Exploratory factor analysis supported a 3-factor solution (16 total items), which explained 42.7% of variance in the model. Composite reliability for the subscales, body competence, body inadequacy, and internal conflict ranged from 0.64 to 0.82. Exploratory factor analysis of the ABISS provides initial psychometric support for a valid and reliable measure for assessing adolescent male body image, which also can be used as a needs assessment tool. Strength and conditioning professionals should be aware of their athlete and client psychological attributes, many of whom are adolescents. Understanding how adolescents view their bodies and their body image will assist professionals in designing appropriate, health-promotive strength programs, while at the same time monitoring for signs of body image dissatisfaction. Assessing body image can help heighten awareness and possibly encourage preventative programming to help avert negative health practices (e.g., performance-enhancing drug use, exercise addictions, disor-

dered eating). The ABISS seems to have preliminary psychometric support to be a valid and reliable instrument that helps gauge at-risk populations.

KEY WORDS instrument, reliability, gender, scale, muscle dysmorphia

INTRODUCTION

Strength and conditioning professionals work with diverse populations many of whom are adolescents (3). Not only do strength and conditioning professionals attend to the physical conditioning of athletes but also to the psychological and emotional health and well-being (20). One critical emotional component for athletes, particularly males, as it relates to healthy physical and emotional development is body image (9). Body image describes a complex construct consisting of attitudes and perceptions about one's body (12,16). Body image research has had a long history in the social and psychological sciences (38) with most research conducted with adults and clinical samples, such as people with eating disorders (EDs) (32). Additionally, studies of body image concern and pathology have greatly lagged in the scientific literature for men as compared with women (37,39,41). All people have a body image, therefore, it is important to critically analyze factors that influence it, especially in populations where research is less well defined.

Although social norms often lead people to believe male and female body images are simply opposites, research supports male body image as a unique, varied, and complex construct (5,8,9,14,16,27,39,41,45). There are several social influences that impact how people conform to standards of physical attractiveness (16). For example, Western social ideals for women's physiques include a lean body with larger buttocks and breasts, whereas males typically are more heavily muscled with lean body mass (5,21). Postulates concerning male body image development and perception of

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ideal physiques have been proposed with much research limited to cross-sectional study designs. For example, Pope et al. (45) and Baghurst et al. (5) have proposed boys' exposure to larger physiques in toys (e.g., action figures) that they tend to play with, may negatively impact body image. Delayed puberty (i.e., slower than median values for boys [approximately 12 years old]) and development in boys also has been proposed as a cause for body critique and dissatisfaction (54). Social media also has played a role in body image. Pope et al. (44) conducted a content analysis of popular women's magazines from 1958 to 1998 and found, "the proportion of undressed men has increased dramatically, especially since the early 1980s" (pp. 189). An analysis of *Playgirl* centerfold models found "models became increasingly 'dense' and more muscular over time..." (pp. 91), again suggesting media may play a substantive role in negatively impacting male body image (25). Understanding the theoretical context, underpinning the sociocultural shift in male body image is important to study, particularly when considering instrument development.

Approach to Theoretical Background

Media exposure and consumption patterns have been implicated in male body image dissatisfaction. Leit et al. (24) found that even brief exposure to media with hypermasculine images enhanced the discrepancy between one's perceived muscularity to what is ideally desired. Hargreaves and Tiggeman (19) found that exposure to multiple images and cumulative time of exposure decreased muscular satisfaction in males. Several studies have suggested an overall cultural shift (mostly in westernized societies) in male body perception, the "ideal" male body, and the internalization of these ideals and standards (10,14,16,26,46). Figure 1 details how this process may occur in some males.

Considering the social factors influencing male body image, the theoretical underpinnings of our research are based on social learning (cognitive) theory (SLT) (6,7). Social learning theory focuses on the social context in which people learn and express behaviors based on processing cognitions. A major concept of SLT relates to role modeling and locus of control (7). In the present study, it is a salient point to research how younger males develop and view their body image based on the social context and interactions (intrapersonal and interpersonal) with others. Instruments based on solid theoretical foundations are more likely to provide valid measures of any particular phenomenon including body image (15). For example, in younger males, physical development and changes to one's physique can form a certain level of body competence (BC), often expressed through sport and physical activity (9,10,16,17). Adolescents intrinsically process how their body feels during an activity but also by how others' perceived them (e.g., compliments, criticism). The latter can form a certain level of BC or as Bandura noted in SLT, a stronger locus of control (7). In a similar vein, feelings of body inadequacy (BI) also may result from failed attempts or various forms of criticism from the self, parents, peers, and people in general with respect to how one uses their body (16). These complex interpersonal and social contexts of understanding one's body through competence and inadequacy may lead to internal conflict (IC) if a substantial discrepancy exists. Thus, body image satisfaction in adolescent males likely includes constructs of SLT, which is important to consider in body image measures.

Practical Importance of Identifying Body Image Disorders in Males

Literature concerning body image dissatisfaction and resulting disorders in men has steadily increased over the past

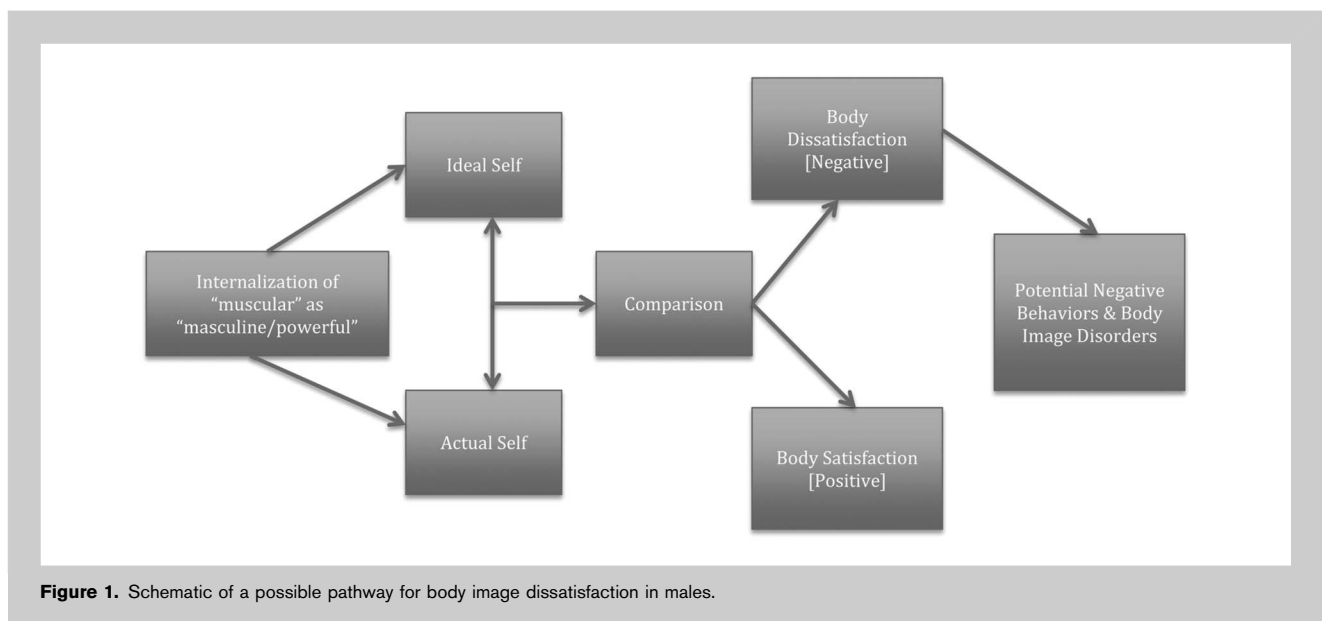


Figure 1. Schematic of a possible pathway for body image dissatisfaction in males.

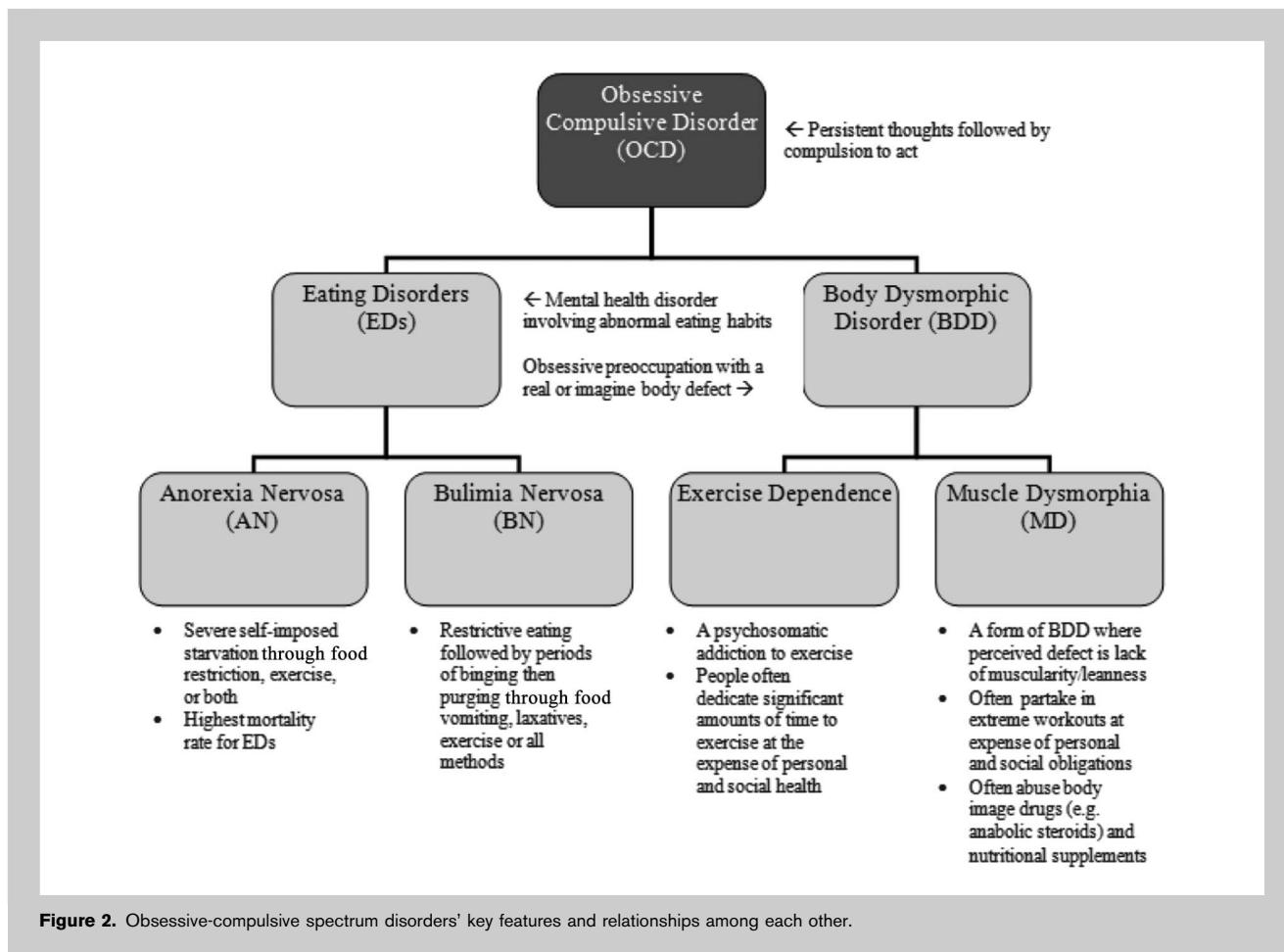
decade (9,14,35,45,50), but much is still unknown. For example, etiology of EDs in males is less well studied and documented (39). Although predictors of male body image dissatisfaction also have received more attention in the literature (16,27), a salient model has yet to be identified. Furthermore, the epidemiology of body image dissatisfaction and resulting pathologies, such as EDs, body dysmorphic disorder (BDD), and muscle dysmorphia (MD) is virtually nonexistent. Lacking understanding concerning the etiology of body image dissatisfaction and associated pathologies could be due to males being much less likely to express concern for body image than females (37). Eating disorders, such as anorexia nervosa (AN) and bulimia nervosa (BN) are reportedly higher in females (23) with rates in males grossly under-reported and under-documented being that males are less likely to report issues to medical professionals (37,48). The latter point captures the importance for strength and conditioning professionals to have a working knowledge and accurate tools to assess male clients. Although signs and symptoms of AN and BN are similar in males and females, specific rates and subgroupings of males who are affected at higher rates also are important to study. Carlat et al. (11) found that younger nonheterosexual males (i.e., homosexual or bisexual) had higher rates of EDs than the general population of males. Moreover, specific body image disorders, such as BDD and MD may be higher in subgroups of males and males in general because of changing societal ideals of the male body. Strength and conditioning professionals are likely to witness and field complex questions concerning these changing ideals in their everyday practice, and therefore, need awareness and skills to enable them to identify clients who struggle with body image.

In particular, strength and conditioning professionals need to have acute skills for identifying negative emotions and unhealthy exercise patterns in athletes/clients. It is important to understand how adolescent males may present (in terms of maladaptive practices and disorders) in the course of physical training in strength and conditioning. Among some of the many psycho-emotional disorders professionals may see are BDD, obsessive-compulsive disorder (as with exercise dependence), and MD. Body dysmorphic disorder is an obsessive preoccupation with a real or imagined defect in appearance despite how trivial the flaw. The disorder causes clinically significant distress and impairment in social, occupational, and other important areas of life and is thought to be a subcategory of obsessive-compulsive disorder (38,40). One particular form of BDD known as MD, almost exclusively affects younger males. Originally described by Pope et al. (42), MD has an average age of onset of 19.4 years and often causes significant physical and emotional distress (36). People with MD often workout to build muscle to the point of physical damage, sacrifice social obligations in favor of exercise, and eat highly specialized foods (36). For an illustration of the relationship among these disorders, see Figure 2. Body esteem, a pivotal

construct of body image, is a key measure and component of MD (37,48). Unlike other disorders, such as AN and BN, identification, diagnosis, and treatment of MD present a challenge as exercise may be viewed as “healthy” in this context, making assessment of one’s body image imperative (29). Researchers have shown when males feel body image insecurity (i.e., demasculinized), they often subscribe to a reactive approach, including exercise dependence and use of body-enhancing substances, such as androgenic-anabolic steroids (AAS) (16,26,37,48).

Strength and conditioning professionals may be confronted with athletes and clients who are curious or actively use performance-enhancing supplements and drugs; therefore, it is important to understand and assess what prompts these curiosities and behaviors in younger males so as to prevent maladaptive behaviors and misuse. The use of “body image” drugs often results from experiencing 1 or more of the aforementioned body image concerns (22). Body image drugs, such as growth hormone, insulin-like growth factor 1, thyroid hormones, stimulants, insulin, and AASs are commonly thought to be used by athletes to improve performance; surprisingly, however, more people may take them to improve appearance, physical status, and overall body image (22,26). With unmonitored nonmedical use of these drugs, comes the potential for serious physical and psychiatric consequences. Pope et al. (43) studied physical and psychological effects of persistent supraphysiological doses of AAS and noted clear evidence for mental health issues (i.e., mania and depression). Other studies have examined altered blood lipid profiles and risk factors for cardiovascular consequences from AAS use (4,51). Although the Adolescent Body Image Satisfaction Scale (ABISS) does not attempt to measure drug use/abuse, it does allow the strength and conditioning professional opportunity to use an assessment to assist in identifying psycho-emotional risk factors in adolescents. Strength and conditioning professionals need to be able to accurately identify unhealthy profiles so as to prevent/address reactive behaviors, especially in adolescent males.

Males may strive to emulate a hypermasculine “super-male” image, however, attaining this ideal is unlikely and can lead to negative consequences (10,14,16,24,37). Ultimately, the goal is to prevent, limit, and lessen the impact of negative body image that may precipitate unhealthy outcomes (e.g., psychiatric illness, physical damage, cardiovascular problems). In doing so, there is a need for more gender-appropriate, specific measures of body image that can be used with younger males. Cafri et al. (10) noted, “...few studies have evaluated the associations among multiple sociocultural influences and body dissatisfaction, [and] little work has examined the role of sociocultural factors in driving young boys to engage in the muscle enhancement strategies of steroid use and dieting to gain weight, and no study has evaluated the role of sociocultural influences on muscle dysmorphia symptoms” (pp. 284). Some work has advanced knowledge in this area (49,50) such as in non-U.S.



samples (47), but a general understanding as to the etiology of body image concerns in adolescent males in the United States is lacking. Moreover, research has been conducted with both clinical and nonclinical samples; however, it may be more salient to use measures in nonclinical samples, as many males may not express body image dissatisfaction for fear of breaching masculine norms (1).

Need for New Body Image Instruments for Adolescents

Being that body image is a continuous developmental process, it is important to develop measures that are valid and reliably capture this process. Assessing body image development in adolescent males is vitally important so as to help them chart a healthy course, especially as it relates to physical and emotional development, sports, exercise, and other lifelong behaviors. Instruments that help to identify and measure adolescent self-esteem and other factors related to body image may assist in accounting for maladaptive behaviors. For example, understanding how athletes view their body esteem through competence in sport may help predict behavioral outcomes (9,10,12). This sensitive period of time in an adolescent male's life needs an instrument that is specifically tailored to meet these concerns and needs.

Several assessments exist that identify specific aspects of pathological male body image (see Somatomorphic Matrix (18), Muscle Appearance Satisfaction Scale (33), Drive for Muscularity Scale (34)), but few if any are specific to constructs consistent with the *adolescent* male body image perspective (9). Cafri and Thompson (9) found that the 3 most salient measures were the Drive for Muscularity Scale, Somatomorphic Matrix, and a modified version of the Somatomorphic Matrix, but again, these measures are not age-specific to adolescent males. Moreover, a review of literature has shown that several measures have been developed from previously validated instruments for use with females or modified from adult measures (9). A better approach would be a holistic measure that has the ability to link the varied intrapersonal, interpersonal, and social factors associated with age-appropriate *adolescent* male body image constructs. This type of measure, however is lacking in clinical practice and the 3 subscales of the ABISS help measure these factors as noted in an initial pilot study (26). The questions are phrased in such a way to accurately capture adolescent male body image. Further validation of the ABISS for use in other populations, however is warranted. In light of the previous research and available instruments

TABLE 1. Summary statistics for the factor structure of the ABISS.*

Factor	No. items	Eigenvalue	% of variance	Cumulative variance	Weighted omega
Body competence	6	2.77	17.31	17.31	0.82
Body inadequacy	6	2.75	17.21	34.52	0.79
Internal conflict	4	1.30	8.14	42.66	0.63

*ABISS = Adolescent Body Image Satisfaction Scale.

concerning adolescent males, a clear need exists for the development of an instrument specifically to address this population. Using social learning theory as a theoretical framework for the development of such an instrument, allows for greater salience of the proposed measure and subsequent development of a holistic model of factors contributing to adolescent male body image.

Purpose

Based on the apparent need for a more sensitive, gender- and age-specific measure for assessing adolescent male body image, the purpose of this research was to present the development of the ABISS, detail initial evidence of reliability and validity, and discuss clinical and practical implications for use by strength and conditioning professionals. Our hypothesis is that the underlying factor structure of the ABISS will be congruent with the proposed theoretical structure of examining body image, providing evidence of construct validity for the ABISS as a measure of adolescent male body image. In addition, we hypothesized that the

ABISS will demonstrate acceptable levels of internal consistency.

METHODS

Experimental Approach to the Problem

To evaluate the reliability and validity of the ABISS, a non-experimental, descriptive, cross-sectional, correlational study design was used. Data from a previous study (27) were used to statistically analyze the instrument’s utility in adolescent males; therefore IRB approval was exempt because of the use of secondary data. Conclusions were drawn from the statistical and theoretical evidence of preliminary reliability and validity of the ABISS with respect to the accuracy, ease of use, and practical use for strength and conditioning professionals.

Subjects

We used secondary data from a previous study (27) to conduct analyses for the present study. We present how subjects were selected and data were gathered in this previous research.

TABLE 2. Summary of factor loadings for each item of the ABISS.*

#	Item	Body competence	Body inadequacy	Internal conflict
9	I am in control of my body	0.78		
16	I respect my body (eat healthy, exercise, etc.)	0.66		
40	I am comfortable with my body	0.67		
1	I am satisfied with my body	0.62		
25	I feel connected with my body	0.60		
17	My body makes me feel confident	0.52		
42	My body makes me feel insecure		0.64	
27	I am unattractive		0.73	
30	My body is weak		0.52	
36	People find me physically unattractive		0.64	
35	I am physically intimidated by others		0.56	
7	I feel people ignore me because of my looks		0.54	
20	I want the “perfect” body			0.62
15	I am critical of my body			0.46
45	There is no “perfect” body			0.60
8	I feel good when others reassure that I look alright			0.48

*ABISS = Adolescent Body Image Satisfaction Scale.

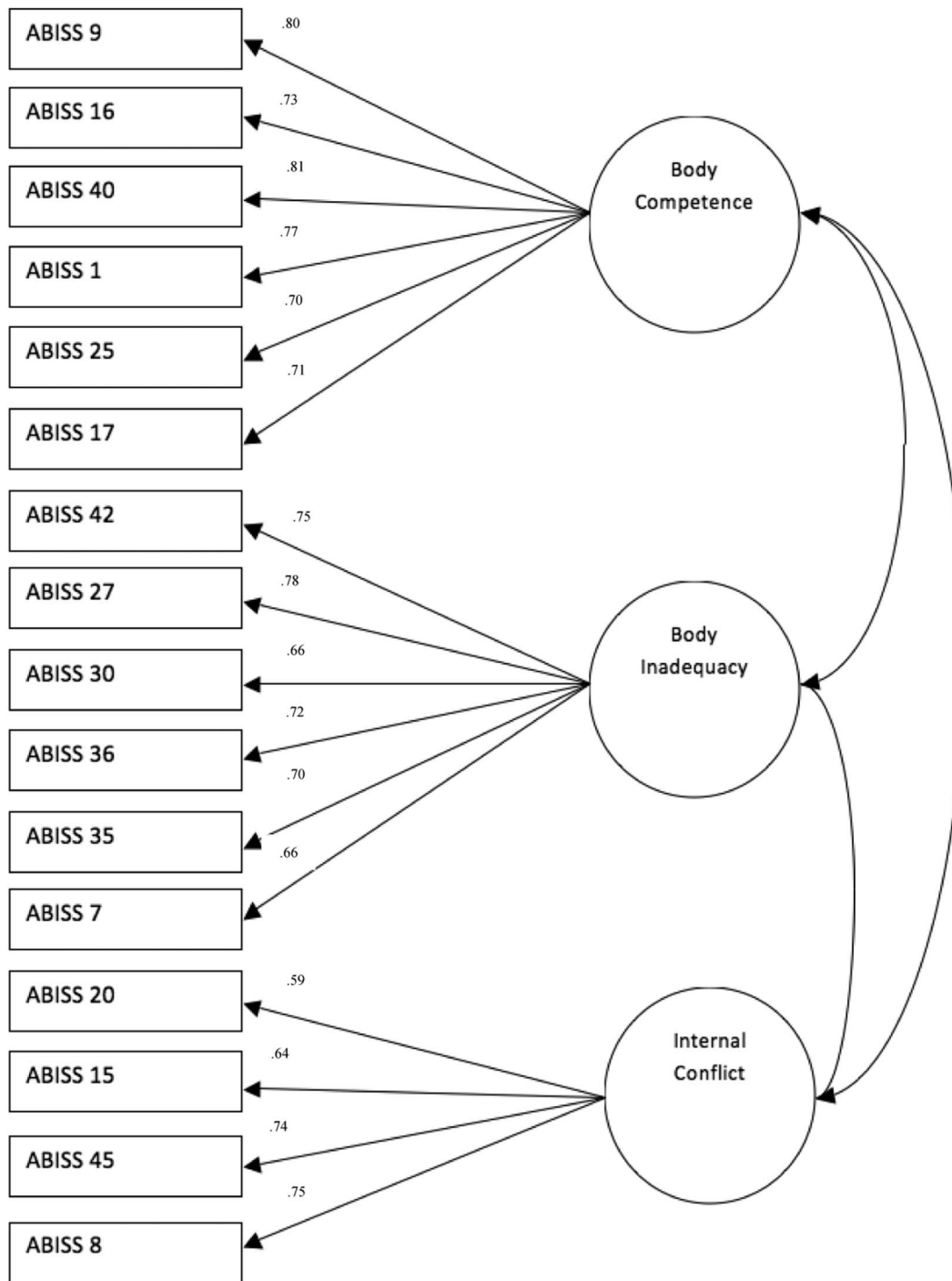


Figure 3. Three-factor model solution for the 16-item ABISS with item-to-scale correlations. ABISS = Adolescent Body Image Satisfaction Scale. All item-to-scale correlations are significant at the $p \leq 0.05$ level.

Before participation, all participants, younger than 18 years, had to obtain parental consent in addition to affirming minor assent by signatures through appropriate informed consent forms. Participants, aged 18 years and older only,

were required to provide written informed consent. The original study (27) obtained institutional review board approval for all measures, methods, and procedures for the use of human subjects. Participants included 330 adolescent

males, aged 14–19 years ($M = 16.36$, $SD = 2.97$) from the Northeast region of the United States. Participants who did not fully complete the ABISS ($n = 7$) were removed from the Exploratory Factor Analysis. Consequently, 323 questionnaires were analyzed. The majority of the sample was white/Caucasian (70.3%), followed by black/African American (10%), Asian/Pacific Islander (7.3%), and Hispanic (4.8%) with the remainder as “Other” (7.6%). Self-reported height ranged from 154.94 to 198.12 cm ($M = 177.29$, $SD = 27.37$) self-reported weight ranged from 47.63 to 137.44 kg ($M = 75.57$, $SD = 14.61$); therefore, we were able to calculate body mass index ($M = 24.0$, $SD = 3.95$). Although not formally assessed in this study, there was a wide range of athletes and nonathletes and training statuses in the sample. Of the 323 responding participants, 277 (85.7%) indicated that they were currently involved in a sport. Nineteen different sports are represented by the sample in this study. Many participants ($n = 158$) indicated that they played more than 1 sport, and 4 participants indicated involvement in 5 sports.

Development of the Adolescent Body Image

Satisfaction Scale

The ABISS was developed from a content analysis of extant body image literature ($N = 293$ articles) pertaining to younger males (27) in addition to an analysis of current measures of body image and behaviors (e.g., Eating Disorders Inventory, Body Image Satisfaction Scale, Eating Attitudes Test, Rosenberg Self-Esteem Scale, and Body Esteem Scale). Using these articles and measures and the Social Learning Theory framework (6,7), 25 items were developed using the frequency of identified themes (e.g., using “self-esteem,” a question was phrased, “I feel proud of my body”). The 25 items were written as concepts that best capture body image issues as validated by the extant literature and other measures. Items were developed with adolescent males in mind; the measure may potentially be used with females and older populations, however, future validation of the ABISS in other populations would be necessary. After all, items were written, an initial review by a panel of 5 experts in health, psychology, and education determined 6 items were redundant and 3 were less relevant to male body image, therefore, they were eliminated from the scale leaving 16 items. Each item had an oppositely worded parallel item (e.g., “My body makes me feel proud” was oppositely worded as “I am ashamed of my body”) to help ensure consistency in noting answer patterns. Final review of the 16 items and 16 oppositely worded questions by the expert panel resulted in rewording, but all were retained ($n = 32$).

Pilot Study

A pilot study was undertaken to further refine the scale in previous research (27). A sample of randomly selected male high school students ($N = 27$) in grades 9 through 12 from 1 high school participated using the same procedures previously described. After the completion of the survey, students

were asked to provide feedback in a brief 10 minutes discussion group with the researcher, of which 17 students agreed. Comments, such as awkwardly worded questions and using more common/understandable terms, were presented, discussed, and recorded for adjustments to be made at a later time. Written comments also were used to make adjustments to the final version of the scale. Two-week test-retest reliability was acceptable in this pilot sample ($r = 0.72$).

Second Version of the Adolescent Body Image

Satisfaction Scale

The 32-item ABISS is scored using a Likert scale to determine body image satisfaction. The maximum value of each question is “4,” with minimum values of “1,” and scores are summed for a total score. Statements were positively and negatively worded, for example “I am satisfied with my body” would be scored on a 4-point Likert scale (Strongly Disagree = 4, Disagree = 3, Agree = 2, Strongly Agree = 1). The oppositely scored parallel item would be “I am critical of my body” and would be scored using a reverse coding sequence (Strongly Disagree = 1, Disagree = 2, Agree = 3, Strongly Agree = 4). Higher scores equate to a stronger level of body image dissatisfaction. Recommended scoring of the ABISS is to reverse score 7 of the 16 items and then take the mean score for each of the 3 subscales as this information yields more meaningful data concerning the 3 factors (intrapersonal, interpersonal, and social) that contribute adolescent male body image.

Procedures

The ABISS was administered over a 3-month period (March through May). Pencil and paper versions of the 32-item ABISS were administered and measured adolescent male body image and 7 demographic questions.

Statistical Analyses

Exploratory Factor Analysis. All levels of statistical significance were set a priori $p \leq 0.05$. Data were coded and entered into the Statistical Package for the Social Sciences software (SPSS, Inc., 18.0, Chicago, IL, USA). An exploratory factor analysis using a principle-axis factor extraction method with a varimax rotation was conducted (51). Examinations of eigenvalues, percentage of explained variance, and a scree plot were made to determine the number of underlying factors. Factors with eigenvalues greater than 1.0 were considered acceptable. Individual item factor loadings also were reviewed. Items that had a factor loading greater than 0.40 and did not load on other factors were retained (52). Weighted omega (2) composite reliability was calculated for each subscale. Independent group t -tests were conducted to determine whether significant mean differences existed between athlete and nonathlete participants to determine equivalency of subgroupings.

RESULTS

A review of the basic assumptions for EFA was conducted. Kaismer-Meyer-Olkin measure of sampling adequacy was

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1. I am satisfied with my body (BC; item 1)*
 2. I feel people ignore me because of my looks (BI; item 7)
 3. I feel good when others reassure that I look all right (IC; item 8)
 4. I am in control of my body (BC; item 9)*
 5. I am critical of my body (IC; item 15)
 6. I respect my body (eat healthy, exercise, etc.) (BC; item 16)*
 7. My body makes me feel confident (BC; item 17)*
 8. I want the “perfect” body (IC; item 20)
 9. I feel connected with my body (BC; item 25)*
 10. I am unattractive (BI; item 27)
 11. My body is weak (BI; item 30)
 12. I am physically intimidated by others (BI; item 35)
 13. People find me physically unattractive (BI; item 36)
 14. I am comfortable with my body (BC; item 40)*
 15. My body makes me feel insecure (BI; item 42)
 16. There is no perfect body (IC; item 45)*
-

BC = Body Competence; BI = Body Inadequacy; IC = Internal Conflict

Item number in parentheses refers to item numbers used when conducting the Exploratory Factor Analysis.

*Item is recoded

Figure 4. The 16-item adolescent body image satisfaction scale.

appropriately close to 1.0 (0.86), and Bartlett’s test of sphericity was statistically significant ($\chi^2 (120) = 1666.31, p \leq 0.05$), both indicated that the items could reliably yield a multidimensional factor structure. Items were univariately normal, and thus appropriate for an EFA. A 3-factor solution with 18 items emerged from the EFA, explaining 42.7% of unique variance in adolescent male body image after items with unacceptably low factor loadings were removed from the model. A summary of the factor structure is available in Table 1. Factor loadings for each item are provided in Table 2. The first factor consisted of 6 items regarding BC of body image. The factor had an eigenvalue 2.77 and explained 17.3% of model variance.

The second factor consisted of 6 items regarding BI of body image. The factor had an eigenvalue of 2.75 and explained 17.2% of model variance. The third factor consisted of 4 items related to IC. This factor had an eigenvalue of 1.30 and explained 8.1% of the variance in the model. A fourth factor related to external influences emerged with an eigenvalue over 1.0 in the initial EFA, however, only 2 items loaded onto this factor, therefore, it was eliminated from the model. The 3-factor solution with item-to-scale correlations for each item is provided in Figure 3. The 16-item scale is provided in Figure 4. Weighted omega composite reliability (2) was

calculated for each of the 3 subscales. Weighted omegas for the 3 scales were BC = 0.82, BI = 0.79, and IC = 0.64.

In an effort to determine equivalency of subgroups in the data set, independent groups *t*-tests were conducted to determine whether significant differences existed between athletes and nonathletes participating in the study. Of the 16 retained items, there was no significant mean difference between athletes and nonathletes for 14 of the items. For the following 2 items, nonathletes scored significantly higher than athletes: (a) people find me physically unattractive (item 36; $t = -2.88, p < 0.01$) and (b) I feel people ignore me because of my looks (item 7; $t = -2.75, p < 0.01$).

DISCUSSION

This study detailed the development of the ABISS, a 16-item, gender-sensitive and age-appropriate measure that demonstrates initial validity and reliability for assessment of male body image. This is the first study to specifically explore the factor structure of the ABISS in a robust sample. Applications of the ABISS for the strength and conditioning professional are discussed.

Our hypothesis was that the underlying factor structure of the ABISS would be consistent with the theoretical structure of adolescent male body image using social learning theory

(6,7). A 16-item 3-factor solution emerged as a result of the EFA (Figure 3). The factors consisted of BC, BI, and IC subscales. Overall, the model describes a substantial amount of variance (42.7%) in the underlying construct of body image in this sample of adolescent males and yielded adequate to good reliability ($\Omega = 0.64\text{--}0.82$). In support of our hypothesis, we have demonstrated initial evidence that the ABISS is valid and reliable for measuring adolescent body image in a sample of males.

Social learning theory (7) posits that humans learn by interacting with their environment through experiences. Essentially, the environment causes people to behave in certain ways. A combination of intrapersonal (psychological) factors along with environmental (social) variables, thus influence behavior. Learning and modeling attitudes and behaviors depend on attention, retention, reproduction of a concept or behavior, and motivation to adopt an attitude or behavior (6). Using SLT to guide the development of the ABISS, the 3-factor solution from the EFA provides greater insight as to how adolescent males develop, internalize, and express their body image. Knowledge of the former is important for strength and conditioning professionals to design programs targeting younger males to promote optimal health and avoid maladaptive behaviors such as androgenic-anabolic steroid use. For example, knowing if an adolescent feels insecure with his body competence may allow the strength and conditioning professional to not only design a strength program but also incorporate activities that can help build confidence (such as games, personal goals, and benchmarks).

Being that body image results from a confluence of factors (9,12,27,38), the ABISS helps to partially identify 3 subscales that attend to how this sample of adolescent males perceive their body image. The first subscale, BC, helps explain how people may place value in the development of their body from a positive perspective. Intrapersonal factors such as control, comfort, and respect for one's body often are predictive of feeling in control physically, and thus, healthier behaviors often result (8). Feeling competent with one's body has consistently been validated as a predictor of positive body image, especially in males (13,17). For example, Grossbard et al. (17) found physical prowess in male athletes to be notably higher than nonathletes, which seems to have held true in our study considering 85.7% identified participation in athletics. However, feeling competent with one's body is not something that forms without social influences. Connecting with SLT, comparing one's present level of muscularity and leanness with a social ideal has been elaborated in several studies (e.g., 5,10,21,24,35,44,45). Grammas and Schwartz (16) detailed how males internalize social influences and media messages when evaluating their body and body image and were able to note predictors for body image satisfaction. Although the former study is informative, the sample largely was comprised adult males, whereas the present study examined an adolescent sample with hopes of understanding how to capitalize on early prevention and

intervention strategies for at-risk males. Overall, body competence in adolescent males helps to explain body image satisfaction.

Closely related to body competence, BI emerged as the second subscale. Within this subscale, internalization of interpersonal and social variables affects one's conceptualization of their body image. For example, feeling ignored, intimidated, and unattractive by other people demonstrates how an adolescent may develop a negative body image. Other factors, such as feeling insecure and weak, also relate to feeling inadequate relative to a social standard of comparison. These results nicely align with Bandura's (6,7) SLT in that social interactions and perceptions are internalized and when recalled, present as body competence or inadequacy. Adolescents in general are quite impressionable in terms of social and peer group interactions, however, males often are less likely to express concern (as compared with acting on it) (27). The value one places on the body often is predicated on an ideal standard of attractiveness or beauty. For example, Pope et al. (46) present and discuss the "Adonis Complex" in their book, demonstrating the complex interaction of the individual with environmental enablers (e.g., supplements, gymnasiums, athletics) and social pressures to conform to an ideal standard of beauty. Feeling inadequate in terms of one's body provokes some people, particularly males, to seek means to rectify this discrepancy by excessive exercise (25,29,35,48), using "body image" supplements (22), and even AAS (14,26). The ABISS is useful in that it effectively assesses positive body image (i.e., BC subscale) and negative body image (i.e., BI subscale). The ability of the ABISS to evaluate and discriminate between positive and negative body image in adolescents is similar to other valid and reliable body image assessments such as the Body Image Questionnaire (13) but allows for a better understanding of concerns and attributes specific to adolescent males vs. instruments created with females or the general population in mind.

Internal conflict was a third subscale that emerged and included 4 items that capture the balance between an adolescent's positive and negative perceptions of body image, such as overinvestment or underinvestment. Factor loadings included conceptualizing the "perfect" body, being critical of one's body, and seeking reassurance from others concerning appearance. Social comparison is ubiquitous in humans, but it is an especially active process during adolescence (10,14,27). Comparing requires attention or acknowledgment of something, retaining the experience, and evaluating one's own beliefs and attitudes based on the past interactions (6,7). Several studies have noted changing societal standards of the male body toward a hypermuscular ideal (5,24,25,32,35,42,45,50). This shift in body image for males has led many to attempt to resolve this IC through unhealthy means (e.g., supplement use, excessive exercise routines, over-specialized diets, and even androgenic-anabolic steroid use) described in the previous section.

Interestingly, participants demonstrated different patterns of answering questions that referenced both positive and negative beliefs regarding their body image. Understanding IC in adolescent males may be a critical factor in terms of understanding what prompts a positive or negative body image and how this may predict positive or negative health attitudes and behaviors. Strength and conditioning professionals can use IC data as a baseline or needs assessment with athletes and clients so as to help account for pathological behaviors in sports and conditioning. For example, daily experiences of noting what a client *does* vs. *says* can help a professional identify potential issues in this population.

A fourth factor emerged in the initial EFA with an eigenvalue greater than 1.0; only 2 items significantly loaded onto the factor, which described the role of external sources on how one understands body image. As the literature highlights the importance of external sources (10,16,21), this factor may explain an important segment of variance in adolescent body image. Consequently, future examinations may examine whether additional external source items with evidence of construct validity can be added to the ABISS to measure this important component of body image.

The 3-factor solution of ABISS accurately and uniquely assesses adolescent body image. In contrast to similar instruments, such as the Somatomorphic Matrix (18), Muscle Appearance Satisfaction Scale (33), and the Drive for Muscularity Scale (34), the ABISS is a gender appropriate, specific measure of the construct of adolescent body image. It provides practitioners with a tool to capture the body image profile of adolescents potentially susceptible to engaging in unhealthy behaviors. As research suggests males may be less likely to express emotions and feelings of insecurity with their body (48), having a measure that provides meaningful, valid, and reliable data is an important tool for strength and conditioning professionals. With primary and secondary prevention as an ultimate utilitarian use of the ABISS, we encourage further study through prospective longitudinal studies and confirmatory factor analyses.

In summary, initial evidence of content validity and initial construct validity for the ABISS was reported in the present study. In the future, a confirmatory factor analysis testing the 3-factor solution of the ABISS among high school aged adolescents is necessary. Instrument development is an ongoing process (30), where researchers must continually examine whether the measure accurately assesses the underlying construct(s). Being that body image is dynamic (12) but also internalized based on social learning and interactions (7), additional study as to how external influences can be measured by the ABISS is needed. Researchers also may be interested in examining whether the ABISS would have evidence of convergent validity and test-retest reliability in a larger sample.

We must account for limitations that may affect the generalizability of these results. First, regarding the sample, we attempted to gauge body image satisfaction across the

high school experience (grades 9–12). Although it may be viewed as a methodological strength to determine which grade level and age experienced the strongest body image concerns, the wide range of ages (14–19) also may have affected findings. For example, the body image of a 14-year-old may be quite different than that of a 19-year-old. However, given the wide range of ages in this study, 60% were aged between 16 and 17 years, which is when body image in boys most likely exerts both positive and negative effects (i.e., psycho-emotional issues, “body image drug” use, pathological exercise patterns) (10,14,27,47,49). Future work may want to look at how (if) stratifying by age influences body image satisfaction outcomes. Response bias may have been present in that only participants present on the day of the survey were given the opportunity to complete the ABISS (i.e., nonresponse bias). Additionally, only males who felt comfortable answering statements also may have limited our findings. Socially desirable answer patterns also may have affected our data, for example, research has shown males are less likely to divulge sexual orientation other than “heterosexual” (53). Attempts were made to recruit a diverse and robust sample and although random sampling methods were used (listings of students at each school were provided and random numbers were assigned to attain a sample and recruiting through random-digit dialing from a Northeast market research database), our results should be interpreted bearing in mind that our sample came from 1 region of the country. Research needs to be conducted with various subgroupings of adolescent males such as racial and sexual minority populations. Perhaps, even further is to identify the relevance the ABISS may have regarding race, culture, and ethnicity as these factors may provide key insight as to how adolescent males, globally, perceive body image. The addition of questions pertaining to perceived masculinity also may be useful to differentiate responses in male populations and enhance the explained variance of the model. The 3-month variation in data collection also may have limited our findings in that data collection began when the spring season was underway and the weather was shifting from cooler to warmer temperatures. This point may have influenced our data due to the fact that people tend to wear less clothing and thus, expose more of their bodies (35,38). Boys’ perceptions of their body image may have been affected by these seasonal changes; therefore, future research should account for and study these possible variances. Finally, although the ABISS seems to be a valid and reliable measure of adolescent body image, further studies should be conducted to confirm our findings. Additional examination of the IC subscale may be warranted, as the internal reliability was below 0.70.

PRACTICAL APPLICATIONS

Strength and conditioning professionals should be aware of the psychological attributes of their athletes and clients. Research has confirmed that males with lower-body image

satisfaction often partake in riskier behaviors and experience greater negative health consequences (17,27,28,31). Understanding how adolescents view their body image will assist professionals in designing appropriate, health-promotive strength programs, while at the same time monitoring for signs of body image dissatisfaction. Assessing body image may help avert negative health practices (e.g., performance-enhancing drug use, exercise addictions, disordered eating).

Measures that capture the unique aspects of gender-appropriate adolescent body image are scarce in the scientific literature with many existing as modified versions of adult scales or adapted scales meant for use with females. This study presents a measure that is not only gender appropriate but also age-specific. Exploratory factor analysis demonstrates that the ABISS has initial evidence of construct validity and internal consistency to assess adolescent body image, especially in males. The ease of use, scoring, and interpretation of this instrument is useful for strength and conditioning professionals working in diverse settings. The flexibility of the ABISS allows practitioners to gauge overall body image satisfaction, use the subscales to assess particular areas of concern, or practitioners may choose to analyze each item so as to pick up on underlying concerns that may go unnoticed in the overall ABISS scores. Finally, the ABISS also may be used to help identify needs in younger male populations. The ABISS seems to have initial evidence and statistical support as a valid and reliable instrument that helps to gauge at-risk populations. With future confirmatory factor analyses, a full appreciation of the robustness of this measure will be possible.

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