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Examination of the Sociocultural Attitudes Towards Appearance Questionnaire-3

in a mixed-gender young-adolescent sample

**Abstract**

Thin-ideal (or media) internalization is an important eating disorder risk factor that has become a central target of many prevention programs. However, evidence for its valid assessment in young, mixed-gender, adolescent samples is limited, and the current study is the first published to explore the psychometric properties of the 30-item Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3: Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004) in a non-adult community sample. Two samples of Grade 8 students (*M* age = 13.68 years, *SD* = .39), totalling 680 girls (*N* =332) and boys (*N* =348) completed the SATAQ-3 and other measures, whereas a smaller sample (*N* = 123) of Grade 10 females (*M* age = 15.01 years, *SD* = .41) served as a comparison group for supplementary analyses. Principal component analyses (PCA) with data from Sample One (*N*=201) revealed four factors with eigenvalues >1.0, similar to the original authors structure but where some cross-loading occurred between the Pressures and Internalization – General scales. Confirmatory factor analyses (CFA) were conducted with data from Sample Two (*N*=479) on the factor solution found in the PCA. The model did not fit well, leading to further revisions based on removal of cross-loading items and CFA modification indices, resulting in a 19-item, 4 factor solution with acceptable fit. Examinations of validity and reliability were generally acceptable. The overall findings suggest an abbreviated version of the SATAQ-3 might be more appropriate than the original version with young-adolescent, mixed gender audiences. Further examinations of the psychometric properties of the SATAQ-3 with this demographic are indicated.

**Introduction**

Over the past two decades considerable effort has been directed towards improving our understanding of eating disorder risk factors (e.g., Stice, 2002) and targeting these in eating disorder prevention programs, a development that has been critical in facilitating improved outcomes of such programs (Austin, 2000; Stice, Shaw, & Marti, 2007). Recent meta-analyses have revealed design features of prevention programs that lead to larger effect sizes and one such feature is the use of validated outcome measures of targeted risk factors rather than programs evaluated without such measures (Stice & Shaw, 2004; Stice et al., 2007). The psychometric properties of measures of disordered eating attitudes and behaviours have often been evaluated in young-adult female populations given this demographic is commonly the target of both prevention (e.g., Celio et al., 2000; Winzelberg et al., 2000) and treatment efforts (e.g., Agras, Walsh, Fairburn, Wilson, & Kraemer, 2000; McIntosh et al., 2005). However, prevention programs delivered to younger and in particular, mixed-gender audiences often have far less psychometric data available on which to select valid and reliable outcome measures.

One risk factor for disordered eating commonly targeted in prevention is thin-ideal (or media) internalization, referring to the extent to which an individual invests in societal ideals of size and appearance (typically thought to be thin-ideal for girls and muscular-ideal for boys), to the point that they become rigid guiding principles (Thompson et al., 2004). Media internalization has been found to be both directly predictive of eating pathology (Field, Camargo, Taylor, Berkey, & Colditz, 1999; Stice, Presnell, & Spangler, 2002; Wichstrom, 2000) and to operate indirectly through increasing other risk factors in the dual-pathway model of bulimic pathology (Stice & Agras, 1998; Stice, Killen, Hayward, & Taylor, 1998), where internalization and sociocultural pressure to be thin leads to body dissatisfaction as an individual becomes discontent with their inability to meet this ideal. Body dissatisfaction is

then thought to lead to dieting and/or negative affect, each of which then increases the risk of bulimic pathology.

Media internalization has commonly been a direct target of eating disorder prevention programs, particularly in the form of media literacy (Stice, Marti, Spoor, Presnell, & Shaw, 2008; Wade, Davidson, & O'Dea, 2003; Wilksch, Durbridge, & Wade, 2008; Wilksch & Wade, 2009), an aproach which shows promise in decreasing risk for disordered eating in young adolescents (Wilksch & Wade, 2009). However, in evaluations of such programs this variable has at times not been assessed with a validated measure (Posavac, Posavac, & Weigel, 2001; Rabak-Wagener, Eickoff-Shemek, & Kelly-Vance, 1998), whereas some studies have not measured the construct (e.g., Wade et al., 2003) or have not provided a description of what was used to measure the construct (Piran, Levine, & Irving, 2000).

Given the importance of using valid measures for outcome variables in the prevention field, the aim of the current study is to evaluate the psychometric properties of the Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3: Thompson et al., 2004), a measure of media internalization, in a mixed-gender, young-adolescent population. To our knowledge of published studies, the SATAQ-3 has been evaluated in adult female community samples (Madanat, Hawks, & Brown, 2006; Markland & Oliver, 2008; Thompson et al., 2004), a clinical, predominantly adult sample (and a minority of adolescents: Calogero, Davis, & Thompson, 2004), and one study has examined its properties with males (a young-adult community sample: Karazsia & Crowther, 2008). The current study is the first published investigation of the psychometric properties of the SATAQ-3 in a community sample of adolescent females and males (younger than 18 years of age), who are most typically the population involved in universal prevention programs.

## Method

### Participants

Baseline data from three of our prevention trials were included in the current study; two samples of Grade 8 (*M* age = 13.68 years, *SD* = .39) girls and boys and one sample of Grade 10 females (*M* age = 15.01 years, *SD* = .41). Sample One consisted of data from 201 Grade 8 girls (*N*=88; 44%) and boys (*N*=113; 56%) from baseline measures in Wilksch, Tiggemann, and Wade (2006) being used for a principal components analysis. Participants in this sample came from three independent private schools. Sample Two consisted of data from 479 Grade 8 girls (*N*=244; 51%) and boys (*N*=235; 49%) from baseline measures from a different study (Wilksch & Wade, 2009) and were used for confirmatory factor analyses and subsequent validity and reliability analyses. Participants in this sample came from two independent schools (*N*=173; 36%), one Catholic school (*N*=162; 34%), and one public school (*N*=144; 30%). It is important to note that in South Australia, the Catholic school system is more comparable with the public school system than private schools, in fee structure and class size.

The third sample included data from 123 Grade 10 females (*M* age = 15.01 years, *SD* = .41), from baseline measures in Wilksch, Durbridge, and Wade (2008) and where these data were included for supplementary analyses involving comparing mean item SATAQ-3 scores with Grade 8 females and males. These participants came from one independent private school (*N*=67; 54.47%) and one public school (*N*=56; 45.53%), with both schools being girls-only. No information regarding participant ethnicity was collected. Approval for this research was received from the Flinders University Social and Behavioural Research Ethics Committee, the South Australian Department of Education and Children's Services, the Director of Catholic Education, and school principals of independent private schools.

**Measure of Media Internalization: Sociocultural Attitudes Towards Appearance Scale-3**

The SATAQ-3 (Thompson et al., 2004) was used to measure levels of internalization of culturally ideal body types presented in the media. This 30-item self-report measure provided 4 sub-scales: Information, 9 items (e.g., *TV programs are an important source of information about fashion and being attractive*); Pressures, 7 items (e.g., *I've felt pressure from TV or magazines to lose weight*); Internalization – General, 9 items (e.g., *I compare my body to the bodies of TV and movie stars*); and, Internalization – Athlete, 5 items (e.g., *I try to look like sports athletes*). In addition, a combined total of these subscales is commonly used (SATAQ – Total, 30 items). Participants rated their responses on 5-point Likert Scales where responses range from 1 (*definitely disagree*) to 5 (*definitely agree*), with higher scores indicating a higher level of internalization. The SATAQ-3 was developed in the USA and the current study was conducted in Australia. It was considered that sociocultural ideals of beauty and appearance are essentially identical across the two countries.

Given that this was the first time the SATAQ-3 had been evaluated with an adolescent male sample, it was decided that three items from the Pressures scale required amendment to be appropriate for boys. Specifically, items relating to pressure "..to lose weight"; "..to look pretty"; and, "..to be thin" were respectively replaced for boys with pressure "..to gain muscle"; "..to look strong"; and, "..to be muscular". This was done to be consistent with the finding that body dissatisfaction in boys more commonly reflects a desire to increase muscle than to lose weight (Ricciardelli & McCabe, 2001) and is a very similar approach to the other evaluation of SATAQ-3 with males (Karazsia & Crowther, 2008) as well as evaluations of earlier versions of the measure with males (Smolak, Levine, & Thompson, 2001). The current study commenced before the Karazsia and Crowther research, explaining why the wording for males is not identical in both studies. All of the SATAQ-3 items can be found in Table 1.

The SATAQ-3 is posited to be a valuable measure as it incorporates advances in understanding regarding the multidimensional nature of media influences (Thompson et al., 2004; Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). This is reflected by the increased number of factors in the current measure (four) compared to earlier versions (two), namely the SATAQ (Heinberg, Thompson, & Stormer, 1995) and SATAQ-Revised (Cusumano & Thompson, 1997). Specifically, a Pressures scale was added to assess perceived pressure to conform to idealized societal stereotypes of beauty (as distinct from an awareness of information presented in the media about such ideals) and an internalization of athletic ideals (Internalization – Athlete) scale to reflect the growing presentation of elite athletes' bodies in the media, as well as an increased proportion of magazine articles devoted to exercise, muscle development and toning (Thompson et al., 1999), with some researchers suggesting this latest version of the SATAQ-3 will be even more useful than earlier versions (Forbes, Jobe, & Revak, 2006). Though a relatively new measure, the SATAQ-3 has been used in recent prevention trials (e.g., Heinicke, Paxton, McLean, & Wertheim, 2007; Roehrig, Thompson, Brannick, & van den Berg, 2006).

To date, the psychometric properties of the SATAQ-3 have been examined in five published studies. The first was with two comparable samples of college women in the USA (Thompson et al., 2004) – sample 1 involved 175 female students aged 17-25 and sample 2 involved 195 female students aged 18-22. The second was with a total of 440 predominantly adult, female disordered-eating inpatients in the USA (Calogero, Davis, & Thompson, 2004), with BN being the most frequently represented diagnosis ($N = 156$), followed by AN-restricting subtype ($N = 120$), AN-binge eating/purging subtype ($N = 66$) and EDNOS ($N = 98$). The third was with 100 non-clinical Jordanian women with a mean age of 33.6 years (Madanat, Hawks, & Brown, 2006). The fourth was with a British community sample of 388 young adult females (Markland & Oliver, 2008). The fifth and only previous published

examination with males, was with 210 college students in the USA (Karazsia & Crowther, 2008).

Thompson et al. (2004) designed the SATAQ-3 with the four-factor solution being confirmed in both of their samples of college-aged women, with an identical factor structure found in the Jordanian sample (Madanat et al., 2006), providing some evidence for the cross-cultural utility of the measure. This solution was largely replicated in the clinical sample (Calogero et al., 2004) with all original items loading highest on the original factor, apart from one Internalization – Athlete item (*I compare my body to that of people in "good shape"*), which loaded higher on the Internalization – General factor.  In their confirmatory factor analyses of the SATAQ-3, Markland and Oliver (2008) found the same item to again be problematic and suggested this item be omitted, however their findings overall also supported the 4-factor solution of the SATAQ-3.  Finally, using adapted wording similar to that of the current study Karazsia and Crowther (2008) found strong support for the 4-factor solution in their sample of young adult males.

The highest of the associations between SATAQ-3 scales in the college sample (Thompson et al.) was shared between the Internalization – General and Information ($r$=.72) scales and Internalization – General and Pressures ($r$=.72) scales, with this second pairing was also the strongest correlation for both the other female, community young adult sample ($r$=.86; Markland & Oliver, 2008) and the clinical sample ($r$=.78; Calegro et al., 2004). Whereas for males, the strongest relationship was between the two Internalization scales (General and Althlete; $r$=.76; Karazsia & Crowther, 2008).

Internal consistency for the four  SATAQ-3 scales have been found to be typically high, where the Internalization – Athlete scale has generally been the scale to have the lower but still acceptable reliability (likely due to the fewer items in this scaled compared to the other scales).  Thompson et al. (2004) found internal reliability scores to range from 0.96

(Internalization – General and Information), to 0.89 (Internalization – Athlete), whereas internal consistencies were slightly lower in the other non-clinical, adult female sample ranging from 0.90 (Internalization – General) to 0.85 (Internalization – Athlete and Pressures). Similar results were found in a disordered eating inpatient sample (Calogero et al., 2004) with only the Internalization – Athlete scale producing Cronbach's α below 0.90, ranging from 0.77 to 0.84 depending on age and diagnosis. Cronbach's α in the Jordanian sample (Madanat et al., 2006) were marginally lower ranging from 0.82 (Internalization – Athlete) to 0.89 (Information), while internal consistency of the scales in the male sample (Karazsia & Crowther, 2008) was high ranging from 0.95 (Information) to 0.85 (Internalization – Athlete).

The convergent validity of the SATAQ-3 has been previously assessed (Calogero et al., 2004; Thompson et al., 2004) using simultaneous multiple regression and correlation analyses with the Eating Disorder Inventory – Body Dissatisfaction scale (EDI-BD; Garner, 1991). Thompson et al. found the overall effect for EDI-BD to be significant ($R^2 = .29$), with the Pressures subscale the only scale to explain unique variance (11%). Calogero et al. also found a significant effect ($R^2 = .05$) for EDI-BD, with a composite Internalization score (i.e., combined Internalization – General and Internalization – Athlete score) accounting for marginally unique variance.

In their two samples, Thompson et al. (2004) found correlations between the SATAQ-3 scales and the Body Dissatisfaction scale as follows: Information ($r = 0.19$; 0.22); Pressures ($r = 0.48$; 0.51); Internalization – General ($r = 0.32$; 0.40); and Internalization – Athlete ($r = 0.17$; 0.31). These associations were not as strong in the clinical sample (Calogero et al., 2004), although the authors cite the restricted range of body dissatisfaction scores (i.e., predominantly high) as having likely attenuated the strength of the relationship. Markland and Oliver (2008) did not report data on other measures, whereas a range of behavioural,

psychological and body image constructs were measured in the males with the vast majority having only a weak association with scales from the SATAQ-3 (Karazsia & Crowther, 2008).

Mean item scores from previous research (Thompson et al., 2004; Calogero et al., 2004) showed that disordered eating adolescents generally had higher mean SATAQ-3 scores than disordered eating adults, most notably on the Internalization – General scale, with this difference reported as significant in the original study (Calogero et al.). By diagnostic categories, participants with bulimia nervosa generally had higher internalization scores than participants with other diagnoses. The clinical sample also had considerably higher scores than the male sample (Karazsia & Crowther, 2008), where interestingly the males scored highest on the Internalization – Athlete scale.

**Measures Included for the Purpose of Convergent Validity**

**Eating Disorder Inventory – Body Dissatisfaction.**

The 9-item Eating Disorder Inventory – Body Dissatisfaction scale (EDI-BD: Garner, Olmstead, & Polivy, 1983) was used to assess the degree of satisfaction with various parts and regions of the body, such as waist, hips and thighs. Responses range from 1 (*never*) to 6 (*always*), with 5 items reversed scored due to being worded in a positive direction (e.g., *I think my stomach is just the right size*). Mean item scores were used (rather than scale total). The continuous scoring system used in the current study was different to that prescribed by the manual which is recommended for use with clinical populations (i.e., the 3 most extreme disordered responses are scored 3, 2 and 1 respectively, with the 3 less extreme responses scored 0). The reason for this different approach in the current study was due to a desire to measure the full variation of body dissatisfaction in a non-clinical, adolescent sample, and this approach has been used in another Australian study (Tilgner, Wertheim, & Paxton, 2004). Garner et al have provided data indicating the high reliability and validity of the EDI-BD with a variety of eating disordered and control samples. Although widely used in eating

disorder and body image research (e.g., Paxton, Wertheim, Pilawski, Durkin, & Holt, 2002), the EDI-BD has also been found to be a reliable and valid measure for 11-18-year-old participants (Shore & Porter, 1990; Thompson, Coovert, Richards, Johnson, & et al., 1995).

An adapted measure of the EDI-BD was used with male participants, based on adaptations made by Hallsworth, Wade and Tiggemann (2005). These changes included reversing the direction of some items (e.g., "too big/large" changed to "too small"), and making body part references male appropriate by adding items relating to chest and bicep size, and omitting items relating to hip size. Six-items worded in a positive direction were reverse scored and mean item scores were used. The measure has been found to be appropriate for use with the Australian young adult male sample with which it was trialed (Hallsworth et al., 2005) where it had acceptable internal reliability, with a Cronbach's $\alpha$ of 0.83. Internal reliability in the present study was also good for both girls and boys with respective Cronbach's $\alpha$ of 0.90, and 0.81.

**Dutch Eating Behavior Questionnaire – Restraint.**

The 10-item Dutch Eating Behavior Questionnaire – Restraint scale (DEBQ-R: Van Strien, Frijters, Bergers, & Defares, 1986) assessed participants' intentions to restrict food intake for weight reasons (e.g., *When you put on weight do you eat less than you usually do*?") where responses range from 1 (*never*) to 5 (*often*), relating to behaviour over the past 28 days. Mean item scores were used where higher scores indicated higher levels of dietary restraint. This questionnaire was used to measure dietary restraint, because it has been found to have superior psychometric properties compared to other measures of dietary restraint (Allison, Kalinsky, & Gorman, 1992).

The internal consistency and test-retest reliability of the DEBQ-R has previously been shown to be acceptable for use with Australian young adolescent girls (Banasiak, Wertheim, Koerner, & Voudouris, 2001) as well as Grade 10 male and females (Paxton, Norris,

Wertheim, Durkin, & Anderson, 2005) and was highly reliable in the current study with

Cronbach's αs for the whole sample, girls and boys of .95, .95, and .93, respectively. The

DEBQ-R has been used in a number of previous prevention evaluations (e.g., Durkin, Paxton,

& Wertheim, 2005; Paxton et al., 2002; Stice, Shaw, Burton, & Wade, 2006), including a

recent Australian study with Grade 7 and 8 girls (Tilgner et al., 2004).

## Results

### Principal Components Analysis

Consistent with the methodology of the development of the SATAQ-3 (Thompson et

al., 2004) and to facilitate meaningful comparisons, a principal component analysis (PCA)

was conducted in version 18 of the Statistical Package for the Social Sciences, and a promax

rotation was used. This rotation method allows for pre-existing associations between factors,

which has been previously found for the SATAQ-3 scales (Calogero et al., 2004; Thompson

et al., 2004). Items where factor loadings were greater than .30 were retained for further

analyses. Initial criteria for the determination of a factor involved an analysis of eigenvalues,

required to be > 1.0.

Data from 201 Grade 8 girls (*N=88; 44%*) and boys (*N=113; 56%*) from baseline

measures in Wilksch et al. (2006) were used for a PCA. No individual SATAQ-3 item had

more than 1% of the sample missing data and analyses revealed no significant systematic

pattern of missing data. The data showed high scores for correlations between items and

were considered appropriate for PCA, Kaiser-Meyer-Olkin (KMO) =.96. The PCA resulted

in four factors with eigenvalues greater than 1.0, collectively accounting for 74.7% of the

variation. The PCA pattern matrix (after rotation), together with eigenvalues and proportion

of variance explained, are presented in Table 1. The pattern matrix is reported as it enables

interpretation of the unique contributions of each factor to the variance in the items

(Tabachnick & Fidell, 2001).  In addition, the scales on to which these items loaded in the original SATAQ-3 study (Thompson et al., 2004) are presented in the first column of this table.

The SATAQ-3 Information scale was an independent factor in the current study (Factor 1).  All of the Pressures items loaded on a single factor (Factor 2), however, four of the Internalization – General items also loaded most highly on Factor 2.  Four of the five Internalization – Athlete items loaded independently on Factor 3.  Four Internalization – General items loaded independently on Factor 4.  Of the remaining items, Item 27, (i.e., *I try to look like people on TV*) originally from the Internalization – General scale, loaded most highly on the Information factor (1), whereas Item 20 (i.e., *I compare my body to that of people in "good shape"*) originally from Internalization – Athlete loaded most strongly on the combined Pressure and Internalization – General factor (2).

A further two PCAs were conducted to assess the gender-specific factor structures for girls (KMO = .92) and boys ( KMO = .92).  The PCA for girls revealed four factors with eigenvalues above 1.0, whereas the PCA with boys revealed five factors with eigenvalues above 1.0.  It was decided to limit the rotated solution to a four-factor model because: (a) the original SATAQ-3 solution produced a four-factor model (Thompson et al., 2004); and, (b) the fifth factor for boys was barely above the eigenvalue of 1.00 (1.08).  The four-factor solution accounted for 77.13% and 72.23% of the variation in girls and boys SATAQ-3 scores, respectively.

The promax rotations for each gender produced factor structures that were generally similar to the whole sample solution (shown in Table 1).  The most noticeable difference however, was the ordering of the factors.  For girls, the ordering was Information (1), Internalization – General (2), Pressures and Internalization – General (3) and Internalization – Athlete (4), while for boys the ordering was Information (1), Pressures and Internalization –

Athlete (2), Internalization – General (3) and Pressures (4).  In all, five items in the girls'

solution and nine items in the boys' solution loaded more strongly on a different factor

compared to the whole sample solution.

Thus the overall findings from the PCA suggested that the Information and

Internalization – Athlete scales were independent factors in this study, whereas cross-loading

was found particularly for items from the Internalization – General and Pressure scales.

**Confirmatory Factor Analysis**

Data from 479 Grade 8 girls ($N=244$; 51%) and boys ($N=235$; 49%) from baseline

measures from a different study (Wilksch & Wade, 2009) to the PCA were used for a

confirmatory factor analysis (CFA).  This was conducted using version 18.0 of Amos, where

results of the PCA for the whole sample informed the model that was tested.  Prior to

analyses, the expectation-maximization method was used to handle missing data (less than

1% for each item).  Maximum likelihood was used for the CFA.  Goodness of fit was

assessed using the root mean square error of approximation (RMSEA), the comparative fit

index (CFI; Bentler, 1990), and the normed fit index (NFI; Bentler & Bonett, 1980).  An

RMSEA equal to zero is suggestive of perfect fit, with values less than 0.05 considered to be

a close fit, and values between 0.05 and 0.08 considered to be a good fit (Dehon, Weems,

Stickle, Costa, & Berman, 2005; Schreiber, Nora, Stage, Barlow, & King, 2006).  The CFI,

NFI and NNFI produce fit coefficients ranging from 0 to 1, with higher values indicating

greater fit.  In general, fit indices of 0.90 or greater indicate that data fit the hypothetical

model well (Feldman, 1993; Marsh, Balla, & McDonald, 1988), where 0.95 or greater is

considered excellent, 0.90-0.95 is considered good, and 0.80-0.90 is considered moderate

(Dehon et al.).

The CFA revealed the model did not fit the data well (RMSEA = .085, CFI = .881,

NFI = .85).  It was decided to omit any items that loaded above 0.3 on more than one factor

for the whole sample (i.e., 4, 8, 12, 16, 19, 20, 22), in order to make the model more

parsimonious.  This 23-item model led to an improved fit (RMSEA = .081, CFI = .912, NFI =

.892).  Modification indices for covariances revealed high scores relating to items 1, 2, 27,

29.  Taken together with the results of the PCA where these items cross-loaded with other

factors for girls (i.e., 1, 2, 27, 29) or boys (i.e., 27), it was decided to omit these items and

conduct another CFA.  This 19-item model revealed a better fit than the earlier trials

(RMSEA = .068, CFI = .951, NFI = .931) and the factor structure can be found in Figure 1.

To avoid the risk of capitalization on chance (MacCallum, Roznowski, & Necowitz, 1992)

and given this was the first published CFA on the SATAQ-3 with a mixed-gender, young-

adolescent audience, it was decided to not further modify the model.  The 19-item model was

then evaluated separately by gender to test fit with girls and boys, respectively.  For both girls

(RMSEA = .072, CFI = .936, NFI = .891) and boys (RMSEA = .069, CFI = .949, NFI = .909)

the model fit was acceptable (Schreiber et al., 2006).

Equivalence of the four factors was then tested across males and females, using the

Tucker congruency coefficient (Tucker, 1951), with the results assessed against Lorenzo-

Seva and ten Burge's (2006) thresholds for meaningful similarity, where "Fair" = .85-.94 and

"Good" = >.95.  Results were as follows: Information =.930; Pressures =.928; Internalization

– Athlete =.947; and, Internalization – General =.942.  These results indicated that the level

of similarity between girls and boys on the scales in the current study were generally in the

upper end of the "Fair" range (.85-.94), with Internalization – Athlete on the threshold of a

"Good" level of similarity.

**Intercorrelations Between the SATAQ-3 Scales**

Pearson correlations between the four SATAQ-3 factors found in the 19-item solution

from the CFA for the whole sample can be seen in Figure 1, whereas those correlations for

girls and boys can be found in Table 2 (again based on CFA).  For the whole sample ($r$=.78;

confidence interval [CI] = .65-.91) and girls only (*r*=.73, CI = .57-.89), the strongest

association was found between the Pressures (Factor 2) and Internalization – General (Factor

4) scales, while for the boys (*r*=.79, CI = .64-.94), the strongest correlation was found

between the Pressures and Internalization – Athlete scale.  Although these confidence

intervals do not cross 1.0, which can be taken as some evidence of discriminant validity, the

magnitude of these strongest associations suggest some caution is required when interpreting

analyses involving all SATAQ-3 scales, as opposed to just using the total scale score.

**Reliability and Validity**

Reliability (internal consistency) was computed using Cronbach's alpha, and test-

retest reliability for one- and six-month intervals in the younger adolescent population (Grade

8s).  The number of participants eligible for the test-retest reliability analyses in the current

study was limited to control participants from our 2.5-year controlled trial (*N*=258; Wilksch

& Wade, 2009).  This is because all other participants in this study had received the 8-lesson

media literacy program in the controlled trial (*N*=221), which could be expected to influence

subsequent SATAQ-3 scores.

The internal consistencies (Cronbach's alphas) for the whole sample, girls and boys

are presented in Table 3, with most scales displaying very good consistency.  One- and six-

month test-retest reliability for the original SATAQ-3 scales, are also presented in Table 3.

One-month reliability coefficients were generally in the marginal to acceptable range,

whereas the six-month coefficients were generally in the poor to marginal range (Barker,

Pistrang, & Elliot, 1994) and below the *r*>0.6 criterion used to judge risk factor stability by

some researchers (e.g., McKnight Investigators, 2003).

Consistent with previous research (Calogero et al., 2004; Thompson et al., 2004), the

convergent validity of the SATAQ-3 was again assessed through simultaneous multiple

regression and correlation analyses with the EDI-BD.  By simultaneously entering all four

SATAQ scales as independent variables in the regression analysis, it can be evaluated if each scale accounted for unique variance in the dependent variable (i.e., body dissatisfaction), as well as if each scale was significantly associated with a conceptually related construct. As dieting was the most proximal eating disorder risk factor measured in the current study, the predictive ability of the SATAQ-3 was also examined with the DEBQ-R.

Results for the simultaneous regressions can be found in Table 4. For the whole sample, the overall contribution to the EDI-BD was significant, $F(4, 455) = 51.88$, $p<.0001$, and a total $R^2$ of .32 was obtained (adjusted $R^2 = .31$). The overall association with the DEBQ-R was also significant, $F(4, 454) = 43.76$, $p<.0001$, and a total $R^2$ of .28 was obtained (adjusted $R^2 = .2836$). In both cases, Pressures and Internalization – General contributed to unique predictive variance for both scales while Information also contributed unique variance to the EDI-BD, thus provided some evidence for measuring separate constructs.

Correlation analyses were conducted to assess convergent validity of the SATAQ-3 scales and the results can be found in Table 2. For the whole sample, the Pressures and Internalization – General scales were the SATAQ-3 scales most strongly related with EDI-BD and DEBQ-R. This pattern of findings was generally the same for the girls. For the boys, Internalization – Athlete and Pressures was most strongly related with dieting. The correlations were in the moderate to large range, indicating that the constructs measured were associated as would be theoretically expected, however the strength of the relationship was low enough to suggest they were measuring distinct constructs (Cohen, 1988). Significant differences were found in the strength of the correlations between the three scales for males and females. With the exception of the Internalization – Athlete scale, females had significantly higher correlations between the SATAQ-3 scales and both the EDI-BD and dieting, whereas males had significantly higher correlations between the Internalization – Athlete scale and other SATAQ-3 scales.

**Descriptive Statistics**

Mean item scores for each SATAQ-3 scale found in the 19-item CFA solution are presented in Table 5 for the Grade 8 boys and Grade 8 girls.  In addition, comparison data from 123 Grade 10 girls from baseline scores in a female-only prevention trial (Wilksch et al., 2008) are also presented.  The original 30-item SATAQ-3 scales were used for the Grade 10 girls as it was unknown if the fit found in the CFA for Grade 8 students would be appropriate for older-adolescent females.  Mean scores for the respective SATAQ-3 scales for Grade 8 females, Grade 8 males and Grade 10 females were compared using one-way analysis of variance (ANOVAs), where Bonferroni-adjusted post-hoc analyses were conducted when a main effect for group was found. Grade 8 boys scored significantly lower than Grade 10 girls for all scales and significantly lower than Grade 8 girls on all but the Internalization − Athlete scale.  Although Grade 10 girls scored slightly higher than Grade 8 girls on each of the SATAQ-3 scales, only the difference for the Internalization − Athlete scale was significant.

Available SATAQ-3 mean item scores were also presented from previous studies (Calogero et al., 2004; Karazsia & Crowther, 2008; Madanat et al., 2006; Thompson et al., 2004) for visual comparison with data from the current study.  One-sample t-test comparisons were conducted between female groups from the current study (Grade 8 and Grade 10) and college-aged females (Thompson et al., 2004) and between Grade 8 males from the current study and college-aged males (Karazsia & Crowther, 2008).  Grade 8 girls scored significantly lower than the female college comparison group (Thompson et al., 2004) on each SATAQ-3 scale apart from Internalization − General.  The same finding emerged between the Grade 10 girls and female college comparison group on all but the Internalization − General scale ($t$[122]=.99, $p$=.323), and scores on this scale for Grade 8 females and college women were also not significantly different ($t$[243]= 1.27, $p$=.206).  The

college males (Karazsia & Crowther, 2008) had significantly higher scores than the Grade 8

males for each scale and it was of interest that for both male samples, the highest score was

for the Internalization – Athlete scale.

## Discussion

The aim of this study was to assess the psychometric properties of the SATAQ-3

(Thompson et al., 2004) in a Grade 8 mixed-gender, young-adolescent population.  This was

important for three reasons.  First, the factor structure and psychometric properties of the

SATAQ-3 had not previously been examined in this age group.  Second, the SATAQ-3 had

not previously been examined in a non-adult male population and indeed had only been

examined in one previous published study with college age men (Karazsia & Crowther,

2008).  Third, the SATAQ-3, a measure of media internalization, has been one of the primary

outcome measures in recent evaluations of media literacy approaches (Wilksch et al., 2008;

Wilksch et al., 2006; Wilksch & Wade, 2009) and thus appropriateness for its use with the

population studied needed to be confirmed.

For the whole sample, a four-factor structure generally similar to the four-factor

model outlined by Thompson et al. (2004) emerged from the PCA.  However, the most

notable difference was the partial "merging" of some Pressures items with half of the

Internalization – General items, on a single factor.  This finding was consistent with that

expected by the author of the SATAQ-3 (J.K. Thompson, personal communication, August 8,

2006) who suggested that for developmental reasons, these two constructs may not be as

clearly differentiated in younger populations, compared to adults.  There was also some

cross-loading of Internalization – General and Information items.  Similar findings have

emerged in other areas where for example, depression and anxiety have been found to be

more unique constructs and better differentiated in adolescents compared to pre-adolescents and children (Ollendick, Seligman, Goza, Byrd, & Singh, 2003).

The CFA conducted on the findings from the PCA (separate data set), suggested that 30-item solution did not fit the data well. Eleven items were removed based upon cross-loadings on the PCA and high modification indices. The resulting 19-item, 4-factor solution had an acceptable fit. Of interest, the 19-items retained each loaded on the same factor as in the published development of the scale (Thompson et al., 2004). The Tucker congruency coefficients provided evidence that this factor structures stability across both genders was fair (Lorenzo-Seva & ten Berge, 2006). However, it should be noted that the overall fit of the model was in the moderate range (Feldman, 1993) and this fit was not significantly improved by omitting items that cross-loaded across two factors. Taken collectively, these findings provide some support for the use of a four-factor but shortened version of the SATAQ-3 with a sample with which the measure had not been previously validated.

The strongest SATAQ-3 inter-scale correlations in the current study were between the Pressures and Internalization – General scales for both the whole sample ($r$=.78) and girls only ($r$=.73). The strength of this relationship was of a similar magnitude to those found in previous studies with female college samples (Thompson et al., 2004: $r$=.72; Forbes et al., 2006: $r$=.81). For the boys in the current study, these two scales were also strongly related, but the strongest association was found between the Pressures and Internalization – Athlete scales ($r$=.79). This is consistent with the suggestion that internalization of athletic body types presented in the media was of greater relative importance to males than females in the current study and follows previous findings regarding boys' body satisfaction (Ricciardelli & McCabe, 2001) where males more commonly feel pressure to have a body of strong, athletic appearance rather than the thin ideal to which many females aspire , although some males do also experience a desire to lose weight (Cohane & Pope, 2001). Girls' scores on the SATAQ-

3 scales (with the exception of Internalization – Athlete) were significantly more strongly correlated with their scores on the EDI-BD and DEBQ-R scales than for boys.  This finding was not surprising given that the relationships between media internalization, body dissatisfaction and dieting have been much more thoroughly examined with female samples rather than males and in particular through multivariate, longitudinal evaluations of the dual pathway model (Stice & Agras, 1998).

The internal consistency of the SATAQ-3 scales was generally high, with the Internalization –Athlete the only scale with Cronbach's alphas below 0.90.  This finding was consistent with previous studies (Calogero et al., 2004; Karazsia & Crowther, 2008; Madanat et al., 2006; Markland & Oliver, 2008; Thompson et al., 2004), where the Internalization – Athlete scale also had the lowest internal reliability of the SATAQ-3 scales, likely due to its comparatively low number of items, particularly in the current study where it was represented by just 3 items following the 19-item CFA solution.  Test-retest reliability coefficients were lower than desirable (Barker et al., 1994) and this was the first time this form of reliability had been examined for the SATAQ-3 with any population.  It may indicate that internalization is not a stable construct, or at least might not be a stable construct in a young adolescent population (McKnight Investigators, 2003).  Measure stability is generally lower over time in younger populations than would be expected with adults (Bryant-Waugh, Cooper, Taylor, & Lask, 1996).  Another possible explanation is that test-retest reliability data were gathered from control classes in our controlled trial (Wilksch & Wade, 2009), where each school had both control and intervention classes raising the possibility that some 'contamination' effects may have occurred between the two conditions (Wilksch & Wade, 2009).  Regardless, the findings from the current study highlight that the test-retest reliability of the SATAQ-3 scales require further investigation.  Given that relatively low test-retest reliability sets an upper limit on the validity of outcome measures and in the current absence

of any comparison test-rest reliability scores for the SATAQ-3 from other studies, caution is

required when using such a measure with young adolescents in eating disorder prevention

research.

Validity analyses revealed findings of a comparable nature with that of Thompson et

al. (2004). In the current study, the Pressures and Internalization – General scales were the

strongest predictors of variance in EDI-BD and dieting scores for the whole sample and

females only. For boys, the Pressures scale was also the strongest predictor of variance in

dieting, whereas Internalization – General was the only significant predictor of body

dissatisfaction. This was an important finding given that this was the first time the

psychometric properties of the SATAQ-3 had been evaluated in non-adult males and suggests

that adolescent males can also suffer adverse effects (in the form of increased body

dissatisfaction and dieting) from internalizing pressure to maintain a certain appearance. The

findings were consistent with those of a recent correlational study of Swiss adolescent

females and males, where the SATAQ-3 Pressures scale was the strongest predictor of body

dissatisfaction in males, whereas an amended version of the SATAQ - Intenalization subscale

(Heinberg et al., 1995; Smolak et al., 2001) was the strongest predictor of body

dissatisfaction in females (Knauss, Paxton, & Alsaker, 2009).

As would be expected, mean item SATAQ-3 scores were significantly higher for

Grade 8 girls than boys on all but the Internalization – Athlete scale (Groesz, Levine, &

Murnen, 2002). In addition, cross-sectional comparisons revealed Grade 10 girls had

significantly higher scores on all but the Internalization – General scale. Interestingly,

college women (Thompson et al., 2004) did not score significantly differently on this scale

compared to either Grade 8 girls or Grade 10 girls from the current study. Although the

current study is not of a longitudinal nature, these comparisons suggest it is possible that

internalization is a risk factor that emerges in early adolescent (or younger) years and perhaps

remains somewhat stable over the subsequent adolescent years.  This suggestion is indirectly

supported by our media literacy prevention research, where an 8-lesson program targeting

media internalization has been found to be more beneficial with Grade 8 students (Wilksch &

Wade, 2009), compared to Grade 10 students (Wilksch et al., 2008), where levels of media

internalization might already be more entrenched.  Males in both the current and previous

study (Karazsia & Crowther, 2008) had highest scores for the Internalization –Athlete scale.

This is of interest and indicates a subtle difference from female samples.  It also suggests that

media literacy prevention programs targeting males (or mixed-gender samples) might benefit

from the explicit discussion of media messages presented regarding athletes.

In summary, the results of this study suggest that the 30-item SATAQ-3 might not be

well suited for use in its original form (Thompson et al., 2004), with young-adolescent

females and males.  The CFA suggests that a 19-item, 4 factor solution led to an improved fit

of the data.  Although reduced in the number of items, each retained item did load on the

same factor as in the development of the SATAQ-3 (Thompson et al., 2004).  Subsequent

analyses of the psychometric properties revealed this shortened measure to generally have

acceptable levels of validity and reliability, although test-retest reliability emerged as an area

requiring further investigation, particularly as it has yet to be assessed in any previous

examinations of the SATAQ-3.  Given that media internalization has been identified as a risk

factor for disordered eating (e.g., Field et al., 1999; Stice et al., 2002), having a valid measure

of this variable is important, and it would be of value to conduct further examinations of the

psychometric properties of the SATAQ-3 with a larger sample of mixed-gender, young-

adolescents with a view to further improving the validity of this measure.  In future research

it would be useful to examine relationships between specific scales of the SATAQ-3 and their

prospective relationships with increases in disordered eating behaviours and risk.  A

particular area of interest would be to examine if internalization of athlete body ideals is a

specific eating disorder risk factor for males, along with further examinations of construct

validity of the SATAQ-3 with males (e.g, using a muscle-building scale as a criterion

variable).

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Table 1

*Items and factor loadings (≥.30) on the 4-factor solution for the SATAQ-3 for the whole sample (W), girls (g)
and boys (b)*

| | Factor | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Item<br>(*Original factor loading in<br>Thompson et al. 2004*) | **Information** | **Pressure &<br>Internalization -<br>General** | **Internalization<br>-Athlete** | **Internalization -<br>General** |
| 13. Magazine articles are an important source of information about fashion and "being attractive" *(Info)* | **.92**(W)**.83**(g)**.97**(b) | | | |
| 21. Pictures in magazines are an important source of information about fashion and "being attractive" *(Info)* | **.89**(W)**.78**(g)**.87**(b) | | | |
| 28. Movie stars are an important source of information about fashion and "being attractive" *(Info)* | **.89**(W)**.85**(g)**.82**(b) | | | |
| 17. Magazine advertisements are an important source of information about fashion and "being attractive" *(Info)* | **.88**(W)**.78**(g)**.88**(b) | | | |
| 5. TV commercials are an important source of information about fashion and "being attractive" *(Info)* | **.87**(W)**.67**(g)**.89**(b) | | -.33(b) | |
| 25. Movies are an important source of information about fashion and "being attractive" *(Info)* | **.85**(W)**.78**(g)**.77**(b) | | | |
| 29. Famous people are an important source of information about fashion and "being attractive" *(Info)* | **.79**(W)**.74**(g)**.77**(b) | .48(g) | | |
| 9. Music videos on TV are an important source of information about fashion and "being attractive" *(Info)* | **.76**(W)**.58**(g)**.83**(b) | | -.37(b) | .55(g) |
| 1. TV programs are an important source of information about fashion and "being attractive" *(Info)* | **.74**(W)**.70**(g)**.65**(b) | | | .44(g) |

EXAMINATION OF THE SATAQ-3

| Item | Factor 1 | Factor 2 | Factor 3 | Factor 4 |
|---|---|---|---|---|
| 27. I try to look like the people on TV *(Int-Gen)* | **.47**(W)**.45**(g)**.42**(b) | | .36(g)**.42**(b) | |
| 2. I've felt pressure from TV or magazines to lose weight[a] *(Pr)* | | **1.0**(W)**.95**(b).55(g) | | **.59**(g) |
| 10. I've felt pressure from TV and magazines to be thin[a] *(Pr)* | | **.94**(W).36(g)**.80**(b) | | **.58**(g) |
| 6. I've felt pressure from TV or magazines to look pretty[a] *(Pr)* | | **.91**(W)**.80**(b) | | **.66**(g) |
| 18. I've felt pressure from TV or magazines to diet *(Pr)* | | **.87**(W)**.66**(g).44(b) | **.56**(b) | .36(g) |
| 14. I've felt pressure from TV or magazines to have a perfect body *(Pr)* | | **.80**(W)**.61**(g).45(b) | **.48**(b) | .40(g) |
| 22. I've felt pressure from TV or magazines to exercise *(Pr)* | | **.75**(W)**.91**(g) | **.88(b)** .42(W) | |
| 26. I've felt pressure from TV or magazines to change my appearance *(Pr)* | | **.66**(W)**.59**(g).35(b) | **.47**(b) | |
| 16. I compare my appearance to the appearance of people in magazines *(Int-Gen)* | .35(W)**.50**(b) | **.61**(W)**.63**(g) | .42(b) | |
| 8. I compare my appearance to the appearance of TV and movie stars *(Int-Gen)* | .31(W)**.43**(b) | **.52**(W).43(g) | .36(b) | **.44**(g) |
| 12. I compare my body to the bodies of people who appear in magazines *(Int-Gen)* | .39(W)**.52**(b) | **.52**(W).38(g) | | **.40**(g) |
| 4. I compare my body to the bodies of TV and movie stars *(Int-Gen)* | .38(W).39(g)**.40**(b) | **.52**(W)**.49**(g) | | |
| 20. I compare my body to that of people in "good shape" *(Int-Ath)* | | .46(W)**.89**(g) | .43(W)**.76**(b) | |
| 23. I wish I looked as athletic as sport stars *(Int-Ath)* | | | **.92**(W)**.92**(g)**.73**(b) | .38(b) |
| 30. I try to look like sports athletes *(Int-Ath)* | | | **.88**(W)**.98**(g)**.88**(b) | |
| 19. I wish I looked as athletic as the people in magazines *(Int-Ath)* | | | **.73**(W)**.65**(g)**.69**(b) | .33(W).43(b) |
| 24. I compare my body to that of people who are athletic *(Int-Ath)* | | | **.68**(W) **.71**(g)**.84**(b) | |

| | | | | |
|---|---|---|---|---|
| 3. I would like my body to look like the people who are on TV *(Int-Gen)* | | | | **.86**(W)**.83**(g)**.94**(b) |
| 15. I wish I looked like the models in music videos *(Int-Gen)* | | | | **.78**(W)**.83**(g)**.79**(b) |
| 7. I would like my body to look like the models who appear in magazines *(Int-Gen)* | | | | **.75**(W)**.80**(g)**.86**(b) |
| 11. I would like my body to look like the people who are in the movies *(Int-Gen)* | | | | **.75**(W)**.56**(g)**.86**(b) |
| Eigen Values | 17.38(W) 18.45(g)/15.62(b) | 2.15(W) 1.67(g)/1.38(b) | 1.54(W) 1.15(g)/2.82(b) | 1.34(W) 1.88(g)/1.85(b) |
| % of Variance | 57.92(W) 61.49(g)/52.07(b) | 7.18(W) 5.55(g)/4.59(b) | 5.14(W) 3.84(g)/9.41(b) | 4.45(W) 6.26(g)/6.17(b) |

*Note*. Italicised brackets in left column indicate factor loading for that item in the original SATAQ-3 (Thompson et al., 2004). *Info* = Information; *Pr* = Pressures; *Int-Gen* = Internalization – General; *Int-Ath* = Internalization – Athlete

Bolded numbers indicates which factor the item loaded most strongly on in the current study.

[a] Items 2, 6 and 10 were changed to be appropriate for boys. Specifically, 2. I've felt pressure from TV or magazines to gain muscle; 6. I've felt pressure from TV or magazines to look strong; 10. I've felt pressure from TV and magazines to be muscular

Table 2

*Correlations between the SATAQ-3, EDI-BD and DEBQ-R scales*

| Measures | SATAQ-3 | | | | | EDI - BD | DEBQ- R |
| --- | --- | --- | --- | --- | --- | --- | --- |
| | Info | Press | Int – Athlete | Int – General | Total | | |
| *Girls* | | | | | | | |
| Information | - | .53* | .40*^ | .62* | .85* | .27* | .23* |
| Pressures | | - | .43*^ | .66* | .84* | .50*^ | .49*^ |
| Internalization – Athlete | | | - | .43*^ | .63*^ | .25* | .25* |
| Internalization – General | | | | - | .85* | .51*^ | .47*^ |
| SATAQ-3 – Total | | | | | - | .49*^ | .43*^ |
| Body Dissatisfaction | | | | | | - | .60*^ |
| Dieting | | | | | | | - |
| *Boys* | | | | | | | |
| Information | - | .65* | .57* | .56* | .89* | .19* | .19* |
| Pressures | | - | .67* | .64* | .86* | .31* | .29* |
| Internalization – Athlete | | | - | .59* | .80* | .27* | .24* |
| Internalization – General | | | | - | .81* | .32* | .19* |
| SATAQ-3 – Total | | | | | - | .29* | .27* |
| Body Dissatisfaction | | | | | | - | .37* |
| Dieting | | | | | | | - |
| *Whole Sample[#]* | | | | | | | |
| SATAQ-3 – Total | .88* | .87* | .69* | .86* | - | .49* | .46* |
| Body Dissatisfaction | .32* | .51* | .27* | .51* | - | - | .57* |
| Dieting | .30* | .51* | .26* | .45* | - | - | - |

*Note*. SATAQ-3 = Sociocultural Attitudes Towards Appearance Scale-3; Info = Information; Press = Pressures; EDI-BD = Eating Disorder Inventory - Body Dissatisfaction; DEBQ-R = Dutch Eating Behavior Questionnaire – Restraint; Int – General = Internalization – General; Int –Athlete = Internalization – Athlete; Total = SATAQ-3 – Total. *= correlation $p<.001$; ^ = significant difference ($p<.05$.) between female and male correlation analyses for the same variable pair; [#] = Whole-sample inter-SATAQ-3 scale correlations can be found in Figure 1

Table 3

*Internal consistency (Cronbach's alpha) and one- and six-month test-retest reliability for the SATAQ-3 scales*

| Measures | Internal Consistency | | | 1-month Test-Retest | | | 6-month Test-Retest | | |
|---|---|---|---|---|---|---|---|---|---|
| | Girls | Boys | Whole Sample | Girls | Boys | Whole Sample | Girls | Boys | Whole Sample |
| | $\alpha$ | $\alpha$ | $\alpha$ | $r$ (N=89) | $r$ (N=85) | $r$ (N=174) | $r$ (N=98) | $r$ (N=108) | $r$ (N=206) |
| *SATAQ-3* | | | | | | | | | |
| Information (7 items) | .90 | .94 | .93 | .56* | .63* | .65* | .43* | .40* | .45* |
| Pressures (5 items) | .86 | .88 | .89 | .70* | .62* | .72* | .50* | .44* | .52* |
| Internalization – Athlete (3 items) | .85 | .83 | .84 | .49* | .60* | .54* | .50* | .54* | .52* |
| Internalization – General (4 items) | .90 | .88 | .91 | .71* | .59* | .70* | .49* | .49* | .53* |
| SATAQ-3 – Total (19 items) | .93 | .95 | .95 | .71* | .67* | .73* | .50* | .52* | .55* |

*Note*. SATAQ-3 = Sociocultural Attitudes Towards Appearance Scale-3; * $p<.01$

Table 4

*Regression analyses examining the unique predictive ability of the SATAQ-3 scales to account for variance in body dissatisfaction and dieting*

| | Body Dissatisfaction | | | Dieting | | |
|---|---|---|---|---|---|---|
| | Girls | Boys | Whole Sample | Girls | Boys | Whole Sample |
| SATAQ-3 | β | β | B | β | β | β |
| Information (9 items) | -.15* | -.09 | -.11* | -.18* | -.02 | -.10 |
| Pressure (7 items) | .32*** | .19 | .36*** | .35*** | .25* | .42*** |
| Internalization – Athlete (5 items) | .01 | .07 | -.03 | .03 | .01 | -.02 |
| Internalization – General (9 items) | .38*** | .21* | .34*** | .34*** | .08 | .23*** |

*Note*. SATAQ-3 = Sociocultural Attitudes Towards Appearance Scale-3; *** $p<.001$, **$p<.01$, * $p<.05$

Table 5

*Mean (and standard deviation) scores for Grade 8 boys and girls, Grade 10 girls and data from other studies on the SATAQ-3 scales*

| SATAQ-3 | Current Research Program | | | | Previous Studies | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Grade 8 Boys ($N = 235$) M (SD) | Grade 8 Girls ($N = 244$) M (SD) | Grade 10 Girls[a] ($N = 123$) M (SD) | Main Effect $F (2, 601)$ | College Women[b] ($N = 370$) M (SD) | College Males[c] ($N = 210$) M (SD) | ED Adolescents[d] ($N = 110$) M (SD) | ED Adults[d] ($N = 326$) M (SD) | Jordanian Women[e] ($N = 100$) M (SD) |
| Information | 2.14 (.94)[1] | 2.77 (.91)[2] | 2.79 (.94)[2] | 33.15* | 3.46 (1.12)^ | 2.48[#] | 3.38 (1.08) | 3.32 (1.08) | 2.88 (.81) |
| Pressure | 1.85 (.82)[1] | 2.74 (1.02)[2] | 2.89 (1.09)[2] | 69.22* | 3.22 (1.19)^ | 2.37[#] | 3.85 (1.05) | 3.77 (1.10) | 2.49 (.68) |
| Internalization – General | 2.24 (.97)[1] | 3.10 (1.10)[2] | 3.09 (1.07)[2] | 47.82* | 3.19 (1.09)^ | 2.75[#] | 4.09 (.92) | 3.85 (1.02) | 2.45 (.66) |
| Internalization – Athlete | 2.34 (1.04)[1] | 2.52 (1.03)[1] | 2.84 (.86)[2] | 9.45* | 3.24 (.98)^ | 3.02[#] | 3.58 (.84) | 3.62 (.90) | 2.61 (.80) |
| SATAQ-3 – Total | 2.11 (.79)[1] | 2.78 (.81)[2] | 2.91 (.90)[2] | 55.23* | | | | | |

*Note*. SATAQ-3 = Sociocultural Attitudes Towards Appearance Scale-3; ED = eating disorder; M = mean; SD = standard deviation.

[a] Grade 10 girls from current research program; [b] Thompson et al. (2004); [c] Karazsia & Crowther (2008); [d] Calogero et al. (2004); [e] Madanat et al. (2006.

[1,2] Differences in superscript numbers indicate significant differences between groups in the current research program using Bonferroni adjustment, * $p<.001$

^ One-sample t-test comparisons between Grade 8 girls and college women (Thompson et al., 2004), and Grade 10 girls and college women indicated college women scored significantly higher than comparison groups in the current study ($p<.001$) on all but the Internalization – General scale

[#] One-sample t-test comparisons between Grade 8 boys and College males (Calogero et al., 2004) indicated college males scored significantly higher than Grade 8 boys on each SATAQ-3 scale, $p<.001$.
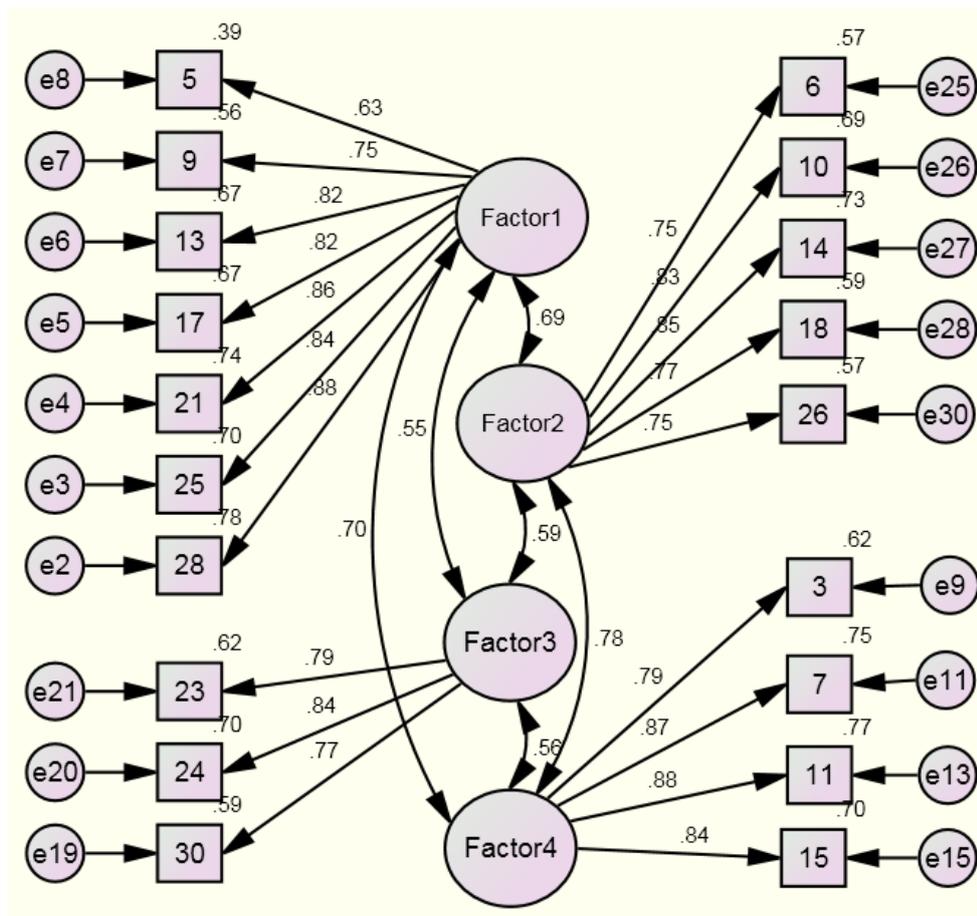
*Figure 1.* Four factor, 19-item CFA solution for SATAQ-3 for Grade 8 girls and boys

Notes. Factor 1 = Information; Factor 2 = Pressures; Factor 3: Internalization – Athlete; Factor 4 =

Internalization – General.