

Psychometric Evaluation of the Sociocultural Attitudes Towards Appearance Questionnaire-3 among Brazilian Young Adults

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Abstract. The objective was evaluating the psychometric properties of the Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3) among Brazilian young adults of both genders. The sample was composed by 506 undergraduate students (295 females and 211 males), aged between 17 and 29 years old. Exploratory and confirmatory factor analyses were used for construct validity ($N = 506$). Correlations between the SATAQ-3 scores and those of the Tripartite Influence Scale (TIS) and Body Shape Questionnaire (BSQ) were used for convergent validity. Reliability was assessed through internal consistency (α) and reproducibility (test-retest) through comparison of the means obtained at two different time points and through intra-class correlation. The scale presented a factor structure composed of five factors, replicated in the confirmatory factor analysis with satisfactory values for the measurements of adjustment to the model. Correlations with the BSQ and TIS scores were $\rho = .52$ and $\rho = -.35$, respectively. Cronbach's alpha coefficients were satisfactory, and their stability was demonstrated. Brazilian SATAQ-3 had good validity and reproducibility, being indicated for use in samples of Brazilian youths.

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Attitudes towards body image (BI) are subject to interpersonal and media-related influences, which has lent importance to the role of sociocultural factors in their genesis (Cafri, Yamamyia, Brannick, & Thompson, 2005; Dittmar, 2009). Dittmar (2005) highlights the sociocultural theory as one of the most widely accepted theories to explain the development of body dissatisfaction and emphasizes that the exposure to unrealistic ideals of beauty makes men and women feel bad about their bodies and seek to modify their bodies.

In relation to these patterns of the ideal body, thinness is the model followed by women, who develop strategies for weight loss that can lead them to the onset of symptoms related to eating disorders (Dittmar, 2005). Worldwide, it is estimated that among women the prevalence rates of anorexia nervosa vary between 0.5% and 0.9% and for bulimia nervosa these values vary between 0.4% and 3.2% (Cotrufo, Barretta, Monteleone, & Maj, 1998; Morandé, Celada, & Casas, 1999; Garfinkel et al., 1995; Nobakht & Dezhkam, 2000; Rojo et al., 2003;). In Brazil, although there are no epidemiological data on the prevalence of these disorders, some studies made in different regions of the country have shown values close to 15% for the occurrence of

symptoms related to eating disorders among young women and adolescents (Alves Vasconcelos, Calvo, & Neves, 2008; Nunes Barros, Olinto, Camey, & Mari, 2003).

Among men, body dissatisfaction seems to be related to muscularity as well as absence of fat. This is related to the use of steroids, excessive exercise and restrictive and high protein diets (Dittmar, 2005). In relation to eating disorders, few studies are focused on investigating the prevalence and etiology in the male population, but it is estimated that it is almost in the proportion of 10 to 1 in relation to women (American Psychiatric Association, 2000).

Validated and reliable scales are necessary to investigate this social influence toward body image. One of these instruments is the Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3) (Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004), a self-applied questionnaire which assesses the media influence on BI, being the most frequently used instrument to investigate this phenomenon (Forbes, Jobe, & Revak, 2006; Markland & Oliver, 2008; Swami, 2009). Túry, Güleç, and Kohls (2010) highlighted the SATAQ-3 as an important instrument for studies on risk factors for eating disorders, as well as for the assessment of prevention and treatment programs. Composed of 30 items, it assesses four main aspects: internalization of socially established body standards, pressure caused by these standards, the media as a source of

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information about the appearance, and internalization of the athletic body ideal.

According to Cafri, Yamamiya, Brannick, and Thompson (2005), internalization represents the deep incorporation or acceptance of a value, up to the point at which the ideal affects the personal attitudes or behaviors of a subject. It is known that internalization, along with the pressure from the media to adopt behaviors in relation to the body, comprises the socio-cultural components that are most strongly related to body dissatisfaction among men and women (Heinberg et al., 2008). In relation to the information construct, the disclosure of standards of beauty in the media is important for the development of eating and image disorders (Stice & Tristan, 2005). This relationship has been proven, which indicates that media has influence on the adoption of food restriction behaviors and dedication to physical activity programs among men and women (Cusumano & Thompson, 1997; Thompson et al., 2004, White & Halliwell, 2010).

The SATAQ-3 was originally developed in 2004, for a sample of North-American female undergraduates, its transcultural adaptation having been made to patients with eating disorders (Calogero, Davis, & Thompson, 2004), Malaysian women (Swami, 2009), British women (Markland & Oliver, 2008), Jordanian women (Madanat, Hawks, & Brown, 2006), French adolescents (Rousseau, Valls, & Chabrol, 2010), German adolescents (Knauss, Paxton, & Alsaker, 2009), Chinese adolescents (Jackson & Chen, 2010) and Italian adolescents (Stefanile, Matera, Nerini, & Pisani, 2011), besides a version for North-American male undergraduates (Karazsia & Crowther, 2008). In most of these studies, the factor structure of SATAQ-3 showed the same factors of the original scale, which were saturated by the same items (Karazsia & Crowther, 2008; Madanat, Hawks, & Brown, 2006; Swami, 2009). In others, however, the factor structure found presented problematic data and different forms of grouping in relation to the original version (Calogero, Davis, & Thompson, 2004; Markland & Oliver, 2008).

An early version of the SATAQ-3 to the Portuguese language (Amaral, Cordás, Conti, & Ferreira, 2011) showed satisfactory verbal comprehension among experts and Brazilian youths and internal consistency over 0.80 for all sub-scales and for the whole instrument. Dunker (2006) made a free translation of the questionnaire, indicating it as an important instrument to assess the factors related to eating disorders; yet, its psychometric qualities were not investigated. In another version, proposed by Swami et al. (2011), exploratory factor analysis among Brazilian adults confirmed the existence of the four factors of the original scale, also with high internal consistency (values over .88).

This study is an evaluation of the psychometric qualities of the SATAQ-3 version proposed by

Amaral et al. (2011), as applied to a sample of Brazilian undergraduates of both genders, similar to the one employed for the development of the original instrument, with the aim to assess its factor structure and reproducibility, and discuss its applicability to the investigation of the influence of sociocultural aspects on the BI of the Brazilian population.

Method

Participants

Five hundred and eighty-seven undergraduates (age range: 17–29 years) from 18 courses of a public higher education institution of the city of Juiz de Fora, MG, southeastern Brazil, took part in this study. After exclusion of those who did not answer all the questions, 506 participants remained, being 295 women (mean age 20.7 years, $SD = 2.02$) and 211 men (mean age 21.1 years, $SD = 2.23$). The mean body mass index (BMI), calculated from self-referred weight and height, was 21.70 kg/m² ($SD = 3.17$ kg/m²) for the women and 23.89 kg/m² ($SD = 3.77$ kg/m²) for the men.

For assessment of reproducibility, 61 undergraduates were selected (33 women and 28 men) from the total sample, with mean ages of 20.7 years ($SD = 2.5$) and 20.6 years ($SD = 1.6$), respectively. According to Thompson (2004), samples of 30–50 participants are sufficient for this evaluation.

Instruments

Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3)

SATAQ-3 is composed of 30 items, with Likert-scale answers ranging from 1 (Definitely disagree) to 5 (Definitely agree), aimed to assess the media influence on the BI. The original version of the instrument was validated for a sample of North-American female undergraduates, aged between 17 and 25 years (Thompson et al., 2004), an adaptation for 18–22-year-old men having been proposed (Karazsia & Crowther, 2008). The final score is calculated by adding the points obtained for each answer, and provides the proportional influence of the sociocultural aspects on the BI. The original items encompass four factors: a) general internalization of socially established standards (questions 3, 4, 7, 8, 11, 12, 15, 16, 27); b) athletic body ideal (questions 19, 20, 23, 24, 30); c) pressure caused by these standards on the BI (questions 2, 6, 10, 14, 18, 22, 26); and d) the media as a source of information on appearance (questions 1, 5, 9, 13, 17, 21, 25, 28, 29).

Tripartite Influence Scale (TIS)

The TIS is a 39-item instrument, with a 5-point Likert scale (1: always; 5: never) composed of three subscales,

each evaluating one out of three factors of sociocultural influence in Body Image: media (10 items), family (18 items) and friends (11 items). The lower the score the greater the influence of the three factors. TIS was originally developed by Kerry, van den Berg and Thompson (2004) and its process of semantic equivalence assessment has been described in samples of Brazilian undergraduates (Conti, Scagliusi, Queiroz, Hearst, & Cordás, 2010). The authors had it translated and back-translated, assessing its verbal comprehension and internal consistency, obtaining satisfactory Cronbach's alpha values ($\alpha > .80$). A previous study proved the factor validity and reproducibility of the TIS among Brazilian undergraduates (Amaral et al., 2013). TIS internal consistency in this study was .91 for the women and .89 for the men.

Body Shape Questionnaire (BSQ)

The BSQ is a 34-item instrument, with a 6-point Likert scale (1: never; 6: always), developed by Cooper, Taylor, Cooper, and Fairburn (1997) to assessing body weight and shape concerns. The Brazilian version was validated by Di Pietro and Silveira (2009) for undergraduates of both sexes, with Cronbach's alpha of .97 for the whole sample and factor structure with four factors, namely: body shape self-perception, BI comparative perception, attitudes towards alterations of the BI and severe alterations of the body perception. For this scale, the higher the score obtained, the higher the body dissatisfaction. The internal consistency in this study was .96 and .95 for women and men, respectively.

Procedures

In the version of SATAQ-3 that was translated into Portuguese (Amaral et al., 2011), some response options were proposed for women and men in a single questionnaire, so that the same questionnaire could be used in mixed samples. A study by Wheeler, Vassar and Hale (2011) showed no sex variance of the SATAQ-3 scores, strengthening the use of the instrument for mixed populations.

Thus, the questionnaires were administered to groups, inside classrooms, by a single investigator, with all participants answering anonymously. The participants were volunteers who signed an informed consent and answered the three questionnaires (SATAQ-3, TIS and BSQ). As has been done in previous studies (Scagliusi et al., 2006; Kawada & Suzuki, 2005), they also reported their weight and height, sex and age.

Two classes of the Physical Education course were selected, within the total sample, for reproducibility analysis, at two time points, with a 2-week interval

between the moments 1 and 2 (Thompson, 2004). These participants answered only SATAQ-3 at moment 2.

The study was approved by the Committee of Research Ethics of the University of Juiz de Fora (document 148/2010), and its execution conforms to the 196/96 Ordinance issued by the Brazilian National Health Council.

Statistical analysis

In order to assess the factor structure, at first, an analysis of categorical main components (CatPCA) was carried out, using as many dimensions as items in order to transform the ordinal data derived from the Likert scale into numeric variables. After the process, the data underwent an exploratory factor analysis (EFA), using the extraction method called Principal Components Analysis. To analyze the rotation matrix, the Varimax rotation was used, which is an orthogonal rotation method that minimizes the number of variables with high loads at each factor, thus simplifying the interpretation of the factors (Lattin, Carroll, & Green, 2011). As a factor selection criterion, an eigenvalue over 1 was used, but according to the item and considering the sample size, values over .35 could be considered relevant loads (Hair, Anderson, Tatham, & Black, 2005).

Per construction, CatPCA produces scores with normal distribution. Therefore, for confirmatory factor analysis (CFA) we used the Maximum Likelihood estimate, with the factors generated by the EFA as latent variables. This analysis was intended to validate the previously obtained factor structure (Hair et al., 2005).

To assess convergent validity, the measurements of the three instruments (SATAQ-3, TIS and BSQ) were standardized through conversion into the z score. As the scores obtained through these instruments represent ordinal variables (Likert scale), we used the *Spearman* correlation test to evaluate the convergent validity and the *Wilcoxon-Mann-Whitney* test to evaluate reproducibility. For this measure, the averages of the scores obtained by the participants in moments 1 and 2 were compared, and the intra-class correlation coefficient was calculated. The internal consistency was also evaluated through *Cronbach's* alpha coefficient.

Furthermore, correlation analysis was made (*Spearman rank*) among the scores obtained in SATAQ-3 and TIS subscales, and among the scores obtained in BSQ and the factors originated by Factor Analysis, according to gender.

For descriptive and inferential analyses and EFA, the SPSS 13.0 software was used. For the CFA, the LISREL v.8.8 software was used.

Results

Factor Structure of the SATAQ-3

Bartlett’s sphericity test was significant ($\chi^2 = 7065.65$, $df = 351$, $p < .001$), and the aiser-Meyer-Olkin measure of sample adequacy (KMO = .93) indicated that the items of this SATAQ-3 version are adequate for factor analysis. At first, the result presented factor structure with six factors, which explained 62.1% of the variance. Because factor 6 was characterized by two items only (9 and 20), and considering, as stated by Kanh (2006), that factors associated with one or two items should

not be kept in the model, a five-factor solution was forced, the latter accounting for 58.6% of the variance.

The factor loadings for each variable are presented in Table 1. The loads in boldface highlight the variables which had significant values ($> .35$) for more than one factor, and the shaded boxes represent the main loads of each item. Although items 10 and 14 presented high loads in two factors, their main load was too distant from the secondary one; hence their permanence in their original factor.

The first factor, composed of 7 items, included 6 of the 9 items of the “General Internalization” original

Table 1. Factor loads with Varimax rotation for a 5-factor solution to the 30-item SATAQ-3 and variance percentage explained by each factor

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
4. I compare my body with those of the people on TV.	.65	.21	.33	.13	.12
7. I would like my body to resemble those of magazine models.	.76	.15	.11	.13	.05
8. I compare my appearance to that of TV and movie stars.	.74	.22	.26	.10	.13
11. I would like my body to resemble those of movie models.	.79	.16	.17	.18	.11
15. I would like to look like video-clip models.	.77	.10	.21	.12	.17
16. I compare my appearance to that of magazine people.	.73	.21	.37	.14	.13
20. I compare my body with that of good-shaped people,	.42	.04	.26	.35	-.02
1. TV programs are an important source of information about fashion and “how to be attractive”.	.90	.76	.10	-.07	.09
5. TV ads are an important source of information about fashion and “how to be attractive”.	.06	.80	.10	.01	-.03
17. Magazine ads are an important source of information about fashion and “how to be attractive”.	.15	.80	.16	.01	.01
21. Magazine photos are an important source of information about fashion and “how to be attractive”.	.20	.80	.17	.05	.04
25. Films are an important source of information about fashion and “how to be attractive”.	.11	.74	.17	.12	.09
29. Famous people are an important source of information about fashion and “how to be attractive”.	.22	.68	.11	.09	.06
2. I have already felt pressed by TV or magazines to lose weight.	.25	.08	.74	-.03	.12
10. I have already felt pressed by TV or magazines to be thin/muscular.	.38	.14	.66	.16	.10
14. I have already felt pressed by TV or magazines to have a perfect body.	.39	.17	.73	.10	.11
18. I have already felt pressed by TV or magazines to go on a diet.	.26	.14	.77	.10	.03
22. I have already felt pressed by TV or magazines to practice exercises.	.01	.16	.67	.20	-.02
26. I have already felt pressed by TV or magazines to change my appearance.	.27	.21	.66	.11	.14
19. I don’t wish to be as athletic as magazine people.	.12	-.03	-.01	.48	.44
23. I would like to look as athletic as sports stars.	.17	.04	.08	.82	.08
24. I compare my body to that of athletic people.	.25	.03	.22	.79	-.03
30. I try to look like the athletes.	.08	.02	.12	.82	.02
3. I don’t mind whether my body looks like those of people on TV.	.37	.03	.20	.04	.43
6. I don’t feel pressed by the TV or magazines to become beautiful/muscular.	.19	-.03	.42	.09	.51
9. Video-clips are not an important source of information about fashion and “how to be attractive”.	-.09	.04	-.04	.02	.56
12. I don’t compare my body to those of magazine people.	.40	-.01	.22	.08	.48
13. Magazine articles are not an important source of information about fashion and “how to be attractive”.	.07	.38	-.01	-.04	.42
27. I don’t try to look like people on TV.	.26	.06	.20	.04	.62
28. Movie stars are not an important source of information about fashion and “how to be attractive”.	.07	.45	-.04	-.04	.52
% variance explained	15.5	14.1	13.1	8.6	7.3

sub-scale (eigenvalue 4.65) and also item 20. Factor 2 presented 6 of the 9 items of the "Information" sub-scale (eigenvalue 4.22); factor 3 included 6 of the 7 original items of the "Pressure" sub-scale (eigenvalue 3.94). Factor 4 represented the "Athletic Internalization" dimension (eigenvalue 2.58). Factor 5 included 7 of the 8 items with a negative meaning (eigenvalue 2.18).

Confirmatory Factor Analysis

For this analysis we considered the five EFA-derived factors (General Internalization, Information, Pressure, Athletic Internalization and Reverse Score Questions) as exogenous constructs. The values obtained for the adjustment measurements were satisfactory (CFI = .97; NFI = .95; NNFI = .96; RMSEA = .064; GFI = .86; AGFI = .84), allowing the inference that the five-factor solution to the SATAQ-3 presented good data adjustment, and that each variable is more strongly explained by a single factor (Lattin, Carroll, & Green, 2011). The correlations between the latent factors are presented in Table 2.

Convergent Validity

There was moderate and significant correlation between the SATAQ-3 scores and the BSQ scores ($\rho = .52$, $p < .01$), indicating that the greater the body dissatisfaction the greater the media influence on the BI. Regarding the correlation between each SATAQ-3 factor and BSQ scores, significant relations were verified among almost all variables (Table 3), and the factor that presented the largest correlation with body dissatisfaction was "Pressure" ($\rho = .60$ and $\rho = .48$, $p < .0001$, for women and men, respectively).

Between the SATAQ-3 and the TIS, there was a low, though significant, negative correlation ($\rho = -.35$, $p < .01$), indicating that the greater the TIS-indicated influence of parents, friends and the media, the higher the SATAQ-3 score. Still concerning the TIS, the correlation between the SATAQ-3 scores and the media sub-scale was also significant ($\rho = -.37$, $p < .01$).

The correlation values for the men's and women's scales can be seen in Table 3.

Internal Consistency

Cronbach's alpha ranged from .65 to .92 for the factors obtained from the factor structure as well as for the sex. The Cronbach's alpha values are presented in Table 3.

Reproducibility

The SATAQ-3 scores for men and women, at both time-points, are presented in Table 3. There was no significant difference between time-points 1 and 2, both for men and women and for the participants as a whole. Furthermore, intra-class correlation between the two time-points was .94 for the whole sample.

Discussion

The SATAQ-3 psychometric properties among Brazilian youths of both sexes were confirmed. The analyses confirmed the existence of the components that make up the original instrument, its ability to correlate with similar measurements (BSQ and TIS), and its reliability and reproducibility.

Exploratory factor analysis revealed the presence of five factors, four of which were the same factors from the original study, the fifth one being characterized by negative meaning items, which were grouped into an independent factor. In a previous personal communication, made to Wheeler et al. (2011), the authors of the original scale had already alerted to this possibility in some samples, probably due to the fact that the version used by Thompson et al. (2004) revealed the presence of only four factors and did not include reverse score items. These items were further made explicit in the SATAQ-3 version made available at the main author's website, a version used in some studies of SATAQ-3 transcultural adaptation (Markland & Oliver, 2008; Wheeler et al., 2011) and recommended by the author in a personal communication (Thompson, personal communication, March 25, 2010).

Table 2. Correlation matrix of the latent variables for Confirmatory Factor Analysis (correlation coefficients and standard errors)

	General Internalization		Information		Pressure		Athletic Internalization		Reverse score questions
	M	SE	M	SE	M	SE	M	SE	
General Internalization	1.00								
Information	0.48	0.04	1.00						
Pressure	0.75	0.02	0.44	0.04	1.00				
Athletic Internalization	0.48	0.04	0.15	0.05	0.42	0.04	1.00		
Reverse score questions	0.71	0.03	0.37	0.05	0.62	0.04	0.34	0.05	1.00

Table 3. Values referring to the Psychometric Evaluation of the Sociocultural Attitudes Towards Appearance Questionnaire - 3 (SATAQ-3)

Analysis	Variable	Parameter	Subjects					
			Men (n = 211)	p	Women (n = 295)	p	Total (n = 506)	p
Convergent Validity	SATAQ-3 – BSQ	<i>rho</i>	.45	< .01	.53	< .01	.52	< .01
	Internalization-General – BSQ		.41	< .001	.51	< .001	.52	< .001
	Information – BSQ		.09	= .104	.16	= .006	.18	< .001
	Pressure – BSQ		.48	< .001	.60	< .001	.58	< .001
	Internalization-Athlete – BSQ		.29	< .001	.22	< .001	.18	< .001
	Reverse score questions – BSQ		.25	< .001	.29	< .001	.29	< .001
	SATAQ-3 – TIS	<i>rho</i>	-.31	< .01	-.37	< .01	-.35	< .01
	SATAQ-3 – parents		-.14	< .05	-.27	< .01	-.22	< .01
	SATAQ-3 – media		-.28	< .01	-.39	< .01	-.37	< .01
	SATAQ-3 – peers		-.29	< .01	-.20	< .01	-.24	< .01
Internal Consistency	The whole scale	<i>Cronbach's alpha</i>	.91	–	.92	–	.91	–
	Internalization-General		.88		.90		.90	
	Information		.89		.87		.88	
	Pressure		.85		.88		.87	
	Internalization-Athlete		.78		.76		.77	
	Reverse score questions		.68		.65		.67	
Reproducibility			n = 28		n = 33		n = 61	
	SATAQ-3 score	T1 means (SD)	75.82 (14.72)	.12	78.61 (19.95)	.22	77.33 (17.66)	.09
		T2 means (SD)	72.93 (16.83)		76.94 (23.08)		75.10 (20.38)	
	T1 vs T2	r _{icc}	.91	< .001	.96	< .001	.94	< .001

Note: The Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3) is from Amaral et al. (2011); the Body Shape Questionnaire (BSQ) is from Di Pietro & Silveira (2009); the Tripartite Influence Scale (TIS) is from Amaral et al. (in press); n – sample size; T1 – time-point 1 ; T2 – time-point 2 (2 weeks after T1)

As for the distribution of the items, those with a negative meaning had relevant loads in more than one factor. Item 20 more strongly loaded the Internalization-General factor than its original Internalization-Athlete factor, possibly indicating a problem inherent to data fluctuation or that the "I compare my body to that of people in good shape" question does not necessarily make Brazilian youths conjure up the image of an athlete's body. Similar results were found in relation to item 20 (Calogero et al., 2004; Markland & Oliver, 2008), which presented a higher factor load in the Internalization-General factor than in its primary factor (Internalization-Athlete) also in other studies. These authors discuss this variation as a result of the content in question, since while the other items of the Internalization-Athlete factor refer to athletes, this item is more general, and refers to the comparison with other items in good shape. It must be highlighted that in spite of the care with which the instrument was translated, there are variations in the repertoire of life and cultural experiences that may account for this fact. Perhaps Brazilian youths see this as ordinary behavior, and not something associated with athletic care.

Concerning this sociocultural influence, some authors emphatically stress the importance of the cultural context in studies of the BI, both in relation to ethnicity and in relation to the individual characteristics (Celio, Zabisnky, & Wifley, 2002), as body concepts evidently vary.

Questions 3, 6, 12, 13, 19 and 28 show loads divided among their original factors and factor five 5, which included the questions of reverse score, indicating that although it shows a significant load in an independent factor, these questions were related to their original dimensions. The behavior of these items can be justified as a result of the fact that they represent negative questions, or that they reflect a difference in relation to the interpretation of these questions by young Brazilians; a fact which can be justified, once again, by the cultural aspects of the population.

Preservation of these items is justified by the fact that the results of the factor analysis should not be assessed in isolation, but rather along with validity and reproducibility evidence (Herdman, Fox-Rushby, & Badia, 1998), the criterion used in this study. Therefore, the results of the CFA allow us to state that the five-factor model was adequately adjusted to the sample, with most of the adjustment indices being satisfactory, and the others being very close to reference values. A relevant result of the CFA was the correlation found between the latent constructs, an aspect that is inherent to the estimation process. According to Pasquali (1996), a test can only be created when considering that a given latent trait may be investigated through the magnitude of its attributes, *i.e.* the behaviors (items) of the

test are representations of the trait to be investigated. This correlation demonstrates that, although grouped in independent factors, all the items of the questionnaire are correlated with one another, assessing a same latent trait.

The SATAQ-3 validation studies which used CFA (Markland & Oliver, 2008; Jackson & Chen, 2010; Karazsia & Crowther, 2008) to demonstrate the validity of the factor structure of the instrument, used the same adjustment indices, with satisfactory results being obtained. The results jointly obtained with EFA and CFA confirm the construct validity of the SATAQ-3 for the Brazilian population, recommending its use in samples similar to ours.

As for the internal consistency of the instrument, the values were adequate ($> .76$) for all the sub-scales, with the exception of the "Reverse Score Items" factor, which had an acceptable ($> .65$) Cronbach's alpha (Maroco & Garcia-Marques, 2006). Some authors have described the negative items as problematic in some samples (Markland & Oliver, 2008; Wheeler et al., 2011), with validity and reliability values that are lower than the remaining items. Preservation of these questions, however, is important to assess the latent traits of the investigated construct, as it allows stereotyped answers (always based on the extremes or on the neutral point) (Pasquali, 1996).

The Brazilian SATAQ-3 had a significant correlation with the TIS and BSQ, indicating good convergent validity. In the study which developed the SATAQ-3 (Thompson et al., 2004), the authors already pointed to the association between the sociocultural influence and body dissatisfaction, a fact demonstrated by our results. In addition, assessment of the SATAQ-3 appraised theoretical construct, through its correlation with the Media sub-scale of the TIS, has shown that the questionnaire is a valid measurement of the media influence on the BI. In addition, the correlation analyses of the SATAQ-3 and its subscales with these instruments allow us to infer that the Pressures subscale was the most strongly related to corporal dissatisfaction, among both men and women. Previous studies had already indicated the relevance of this construct in the development and maintenance of discontent with appearance (Mendez, 2005; Heinberg et al., 2008), which suggests the importance of new studies that seek to investigate the relations among these components of Body Image.

Data analysis confirmed the reproducibility, after a 2-week interval, among both women and men, with high intra-class correlation, without any significant difference between the two time-points. However, the *p*-value for the whole sample reveals a possible marginally significant difference ($p = .09$), which may be accounted for by variation of the phenomenon during the study period and not by the non-reproducibility

of the scale (DeVellis, 2003). It is noteworthy that whereas this psychometric quality was not assessed in any of the transcultural adaptations, Thompson (2004) considers it ideal to perform the test-retest, along with the assessment of internal consistency, in order to confirm its reliability. The proposed version thus has a satisfactory result, confirming another of its psychometric qualities.

One limitation of our study concerns the external validity of the SATAQ-3, as the undergraduate population may not necessarily reflect the characteristics of the Brazilian population as a whole. Notwithstanding, the results obtained suggest that the scale can be used in samples similar to ours. Another limitation was the use of other self-applied questionnaires as measurements of convergent validity, as this may not adequately reflect the investigated constructs. This type of instrument, however, is the most frequently used for the assessment of BI, and both (BSQ and TIS) have already had their validity and reliability for the Brazilian population demonstrated. The need to investigate the score fluctuation observed in the assessment of SATAQ-3 reproducibility among Brazilian youths must be highlighted. Follow-up studies of the variability of the sociocultural influence on the BI, with longer time intervals, are warranted.

We conclude that the Portuguese version of the SATAQ-3 has adequate factor structure, convergent validity, internal consistency and reproducibility, confirming its psychometric qualities for Brazilian undergraduates of both sexes. It is hoped that by making the Brazilian version of the SATAQ-3 available, and after assuring maintenance of quality in other Brazilian population groups, it will be able to be used in the evaluation of groups at risk for the development of eating and image disorders, like adolescents, as well as in the preparation of prevention and treatment programs for these disorders.

References

- Alves E., Vasconcelos F. A. G., Calvo M. C. M., & Neves J. (2008). Prevalência de sintomas de anorexia nervosa e insatisfação com a imagem corporal em adolescentes do sexo feminino do Município de Florianópolis, Santa Catarina, Brasil. [Prevalence of symptoms of anorexia nervosa and dissatisfaction with body image among female adolescents in Florianópolis, Santa Catarina State, Brazil]. *Cadernos de Saúde Pública*, 24, 503–512. <http://dx.doi.org/10.1590/S0102-311X2008000300004>
- Amaral A. C. S., Cordas T. A., Conti M. A., & Ferreira M. E. C. (2011). Equivalência Semântica e avaliação da consistência interna da versão em português do Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3). [Semantic equivalence and internal consistency of the Brazilian Portuguese version of the Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3)]. *Cadernos de Saúde Pública*, 27, 1487–1497. <http://dx.doi.org/10.1590/S0102-311X2011000800004>
- Amaral A. C. S., Ferreira M. E. C., Scagliusi F. B., Costa L. S., Cordas T. A., & Conti M. A. (2013). Avaliação psicométrica da Escala de Influência dos Três Fatores (EITF). [Psychometric evaluation of the Tripartite Influence Scale (EITF)]. *Psicologia: Reflexão e Crítica*, 26, 213–221. <http://dx.doi.org/10.1590/S0102-79722013000200001>
- American Psychiatric Association (2000). Practice guideline for the treatment of patients with eating disorders (Revision). *American Journal of Psychiatry*, 157, 1–39.
- Cafri G., Yamamyia Y., Brannick M., & Thompson J. K. (2005). The influence of sociocultural factors on body image: A meta-analysis. *Clinical Psychology: Science and Practice*, 12, 421–433. <http://dx.doi.org/10.1093/clipsy.bpi053>
- Calogero R. M., Davis W. N., & Thompson J. K. (2004). The Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ-3): Reliability and normative comparisons of eating disordered patients. *Body Image*, 1, 193–198. <http://dx.doi.org/10.1016/j.bodyim.2004.01.004>
- Celio A. A., Zabisnky M. F., & Wifley D. E. (2002). African American body images. In T. F. Cash, & T. Pruzinsky T. (Eds.), *Body Image: A handbook of theory, research and clinical practice* (pp. 234–242). New York, NY: Guilford Press.
- Conti M. A., Scagliusi F., Queiroz G. K. O., Hearst N., & Cordas T. A. (2010). Adaptação transcultural: Tradução e validação de conteúdo para o idioma português do modelo da Tripartite Influence Scale de insatisfação corporal. [Cross-cultural adaptation: Translation and Portuguese language content validation of the Tripartite Influence Scale for body dissatisfaction]. *Cadernos de Saúde Pública*, 26, 503–513. <http://dx.doi.org/10.1590/S0102-311X2010000300008>
- Cooper P. J., Taylor M. J., Cooper M., & Fairburn C. G. (1987). The development and validation of the Body Shape Questionnaire. *International Journal of Eating Disorders* 6, 485–494. [http://dx.doi.org/10.1002/1098-108X\(198707\)6:4<485::AID-EAT2260060405>3.0.CO;2-O](http://dx.doi.org/10.1002/1098-108X(198707)6:4<485::AID-EAT2260060405>3.0.CO;2-O)
- Cotrufo P., Barretta V., Monteleone P., & Maj M. (1998). Full-syndrome, partial-syndrome and subclinical eating disorders: An epidemiological study of female students in Southern Italy. *Acta Psychiatrica Scandinavica*, 98, 112–115. <http://dx.doi.org/10.1111/j.1600-0447.1998.tb10051.x>
- Cusumano D. L., & Thompson J. K. (1997). Body image and body shape ideals in magazines: Exposure, awareness and internalization. *Sex Roles*, 37, 701–721. <http://dx.doi.org/10.1007/BF02936336>
- DeVellis R. F. (2003). *Scale Development: theory and applications*. Thousand Oaks, CA: Sage Publications.
- Di Pietro M., & Silveira D. X. (2009). Internal validity, dimensionality and performance of the Body Shape Questionnaire in a group of Brazilian college students. *Revista Brasileira de Psiquiatria*, 31, 21–24. <http://dx.doi.org/10.1590/S1516-44462008005000017>
- Dittmar H. (2005). Vulnerability factors and processes linking sociocultural pressures and body dissatisfaction. *Journal of Social and Clinical Psychology*, 24, 1081–1087. <http://dx.doi.org/10.1521/jscp.2005.24.8.1081>
- Dittmar H. (2009). How do “body perfect” ideals in the media have a negative impact on body image and

- behaviors? Factors and processes related to self and identity. *Journal of Social and Clinical Psychology*, 28, 1–8. <http://dx.doi.org/10.1521/jscp.2009.28.1.1>
- Dunker K. L. L.** (2006). *Programa de prevenção de comportamentos de risco para transtornos alimentares em adolescentes: Estudo piloto*. [Program to prevent eating disorders risk behaviors in adolescent: A pilot study]. (Unpublished doctoral dissertation). University of São Paulo, São Paulo, Brazil.
- Forbes G. B., Jobe R. L., & Revak J. A.** (2006). Relationships between dissatisfaction with specific body characteristics and the Sociocultural Attitudes Towards Appearance Questionnaire-3 and Objectified Body Consciousness Scale. *Body Image*, 3, 295–300. <http://dx.doi.org/10.1016/j.bodyim.2006.07.003>
- Garfinkel P. E., Lin E., Goering P., Spegg C., Goldbloom D. S., Kennedy S., ... Woodside D. B.** (1995). Bulimia nervosa in a Canadian community sample: Prevalence and comparison of subgroups. *American Journal of Psychiatry*, 152, 1052–1058.
- Hair J. F., Anderson R. E., Tatham R. L., & Black W. C.** (2005). *Análise multivariada de dados*. [Multivariate data analysis]. Porto Alegre, Brazil: Bookman.
- Heinberg L. J., Coughlin J. W., Pinto A. M., Haug N., Brode C., & Guarda A. S.** (2008). Validation and predictive utility of the Sociocultural Attitudes Toward Appearance Questionnaire for Eating Disorders (SATAQ-ED): Internalization of sociocultural ideals predicts weight gain. *Body Image*, 5, 279–290. <http://dx.doi.org/10.1016/j.bodyim.2008.02.001>
- Herdman M., Fox-Rushby J., Badia X.** (1998). A model of equivalence in the cultural adaptation of HRQoL instruments: The universalist approach. *Quality of Life Research*, 7, 323–335. <http://dx.doi.org/10.1023/A:1008846618880>
- Jackson T., & Chen H.** (2010). Factor structure of the Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3) among adolescent boys in China. *Body Image*, 7, 349–355. <http://dx.doi.org/10.1016/j.bodyim.2010.07.003>
- Kahn J. H.** (2006). Factor analysis in counseling psychology research, training and practice: Principles, advances, and applications. *The Counseling Psychologist*, 34, 684–718. <http://dx.doi.org/10.1177/0011000006286347>
- Karazsia B. T., & Crowther J. H.** (2008). Psychological and behavioral correlates of the SATAQ-3 with males. *Body Image*, 5, 109–115. <http://dx.doi.org/10.1016/j.bodyim.2007.08.004>
- Kawada T., & Suzuki S.** (2005). Validation study on self-reported height, weight, and blood pressure. *Perceptual and Motor Skills*, 101, 187–191. <http://dx.doi.org/10.2466/PMS.101.5.187-191>
- Keery H., van den Berg P., & Thompson J. K.** (2004). An evaluation of the Tripartite Influence Model of body dissatisfaction and eating disturbance with adolescent girls. *Body Image*, 1, 237–251. <http://dx.doi.org/10.1016/j.bodyim.2004.03.001>
- Knauss C., Paxton S. J., & Alsaker F. D.** (2009). Validation of the German version of the Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ-G). *Body Image*, 6, 113–120. <http://dx.doi.org/10.1016/j.bodyim.2009.01.002>
- Lattin J., Carroll J. D., & Green P. E.** (2011). *Análise de dados multivariados*. [Analyzing multivariate data]. São Paulo, Brazil: Genecage Learning.
- Madanat H. N., Hawks S. R., & Brown R. B.** (2006). Validation of the Sociocultural Attitudes Towards Appearance Questionnaire-3 among a random sample of Jordanian women. *Body Image*, 3, 421–425. <http://dx.doi.org/10.1016/j.bodyim.2006.09.004>
- Markland D., & Oliver E. J.** (2008). The Sociocultural Attitudes Questionnaire-3: A confirmatory factor analysis. *Body Image*, 5, 116–121. <http://dx.doi.org/10.1016/j.bodyim.2007.10.001>
- Maroco J., & Garcia-Marques T.** (2006). Qual a fiabilidade do alfa de Cronbach? Questões antigas e soluções modernas. [What is the reliability of Cronbach's alpha? Questions ancient and modern solutions]. *Laboratório de Psicologia*, 4, 65–90.
- Mendez J. L.** (2005). Conceptualizing sociocultural factors within clinical and research contexts. *Clinical Psychology: Science and Practice*, 12, 434–437. <http://dx.doi.org/10.1093/clipsy.bpi054>
- Morandé G., Celada J., & Casas J. J.** (1999). Prevalence of eating disorders in a Spanish school-age population. *Journal of Adolescent Health*, 24, 212–219. [http://dx.doi.org/10.1016/S1054-139X\(98\)00025-1](http://dx.doi.org/10.1016/S1054-139X(98)00025-1)
- Nobakht M., & Dezhkam M.** (2000). An epidemiological study of eating disorders in Iran. *International Journal of Eating Disorders*, 28, 265–271. [http://dx.doi.org/10.1002/1098-108X\(200011\)28:3<265::AID-EAT3>3.0.CO;2-L](http://dx.doi.org/10.1002/1098-108X(200011)28:3<265::AID-EAT3>3.0.CO;2-L)
- Nunes M. A., Barros F. C., Olinto M. T. A., Camey S., & Mari J. D.** (2003). Prevalence of abnormal eating behaviors and inappropriate methods of weight control in young women from Brazil: A population-based study. *Eating and Weight Disorders*, 8, 100–106.
- Pasquali L.** (Ed.). (1996). *Teoria e métodos de medida em ciências do comportamento*. [Theory and methods of measurement in the behavioral sciences]. Brasília, Brazil: INEP.
- Rojo L., Livianos L., Conesa L., García A., Domínguez A., Rodrigo G., ... Vila M.** (2003). Epidemiology and risk factors of eating disorders: A two-stage epidemiologic study in a Spanish population aged 12–18 years. *International Journal of Eating Disorders*, 34, 281–291. <http://dx.doi.org/10.1002/eat.10179>
- Rousseau A., Valls M., & Chabrol H.** (2010). The Sociocultural Attitudes Towards Appearance Scale-3 (SATAQ-3): Etude de validation de la version française. *L'Encéphale*, 36, 270–276. <http://dx.doi.org/10.1016/j.encep.2008.03.013>
- Scagliusi F. B., Alvarenga M., Polacowa V. O., Cordás T. A., Queiroz G. K. O., Coelho D., ... Lancha A. H. Jr.** (2006). Concurrent and discriminant validity of the Stunkard's figure rating scale adapted into Portuguese. *Appetite*, 47, 77–82. <http://dx.doi.org/10.1016/j.appet.2006.02.010>
- Stefanile C., Matera C., Nerini A., & Pisani E.** (2011). Validation of an Italian version of the Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3) on adolescent girls. *Body Image*, 8, 432–436. <http://dx.doi.org/10.1016/j.bodyim.2011.06.001>

- Stice E., & Tristan J.** (2005). Sociocultural pressures and Body Image Disturbance: A comment on Cafri, Yamamiya, Brannick, and Thompson. *Clinical Psychology: Science and Practice*, 12, 443–446. <http://dx.doi.org/10.1093/clipsy.bpi056>
- Swami V.** (2009). An examination of the factor structure of the Sociocultural Attitudes Towards Appearance Questionnaire-3 in Malaysia. *Body Image*, 6, 129–132. <http://dx.doi.org/10.1016/j.bodyim.2009.01.003>
- Swami V., Campana A. N. N. B., Ferreira L., Barret S., Harris A. S., & Tavares M. C. G. C. F.** (2011). The acceptance of Cosmetic Surgery Scale: Initial examination of its factor structure and correlates among Brazilian adults. *Body Image*, 8, 179–185. <http://dx.doi.org/10.1016/j.bodyim.2011.01.001>
- Thompson J. K.** (2004). The (mis)measurement of body image: Ten strategies to improve assessment for applied and research purposes. *Body Image*, 1, 7–14. [http://dx.doi.org/10.1016/S1740-1445\(03\)00004-4](http://dx.doi.org/10.1016/S1740-1445(03)00004-4)
- Thompson J. K., van den Berg P., Roehrig M., Guarda A. S., & Heinberg L. J.** (2004). The Sociocultural Attitudes Towards Appearance Scale-3 (SATAQ-3): Development and validation. *International Journal of Eating Disorders*, 35, 293–304. <http://dx.doi.org/10.1002/eat.10257>
- Túry F., Güleç H., & Kohls E.** (2010). Assessment methods for eating disorders and body image disorders. *Journal of Psychosomatic Research*, 69, 601–611. <http://dx.doi.org/10.1016/j.jpsychores.2009.05.012>
- Wheeler D. L., Vassar M., & Hale W. D.** (2011). A gender-based measurement invariance study of the Sociocultural Attitudes Towards Appearance Questionnaire-3. *Body Image*, 8, 168–172. <http://dx.doi.org/10.1016/j.bodyim.2010.12.004>
- White J., & Halliwell E.** (2010). Examination of a sociocultural model of excessive exercise among male and female adolescents. *Body Image*, 7, 227–233. <http://dx.doi.org/10.1016/j.bodyim.2010.02.002>