

VALIDATION OF THE LITHUANIAN VERSION OF THE SOCIOCULTURAL ATTITUDES TOWARDS APPEARANCE QUESTIONNAIRE-3

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Our aim was to evaluate the factor structure and measure the invariance according to gender of a Lithuanian version of the Sociocultural Attitudes Towards Appearance Questionnaire-3 with a sample of 825 Lithuanian adolescent boys and girls. As a result of exploratory factor analysis we derived 4 factors corresponding to each of the 4 subscales of the original questionnaire, with 2 items (19 and 28) dropped. The Cronbach's alpha of each subscale ranged between .83 and .94. The structural model in the total sample of boys and girls fitted the data well as the majority of indices of fit were acceptable. Invariance across genders was not strong. The results supported the use of the questionnaire with Lithuanian adolescents, but, using the version we used in this study, there are limited possibilities to compare the results according to gender.

Keywords: Sociocultural Attitudes Towards Appearance Questionnaire-3, adolescence, body image, mass media, gender.

Body dissatisfaction (BD) has become a term widely known internationally, partly as a function of the globalized Western mass media. It refers to negative subjective evaluations of one's physical body shape, such as one's figure, stomach, hips, and weight (Stice & Shaw, 2002). *Body image* is defined as a person's subjective concept of his or her physical appearance (Pruzinsky & Cash, 2002). Body image concerns of adolescents living in Western cultures are widespread, and internalization of the sociocultural ideals transmitted by

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the mass media is one of the most important contributors to their body image concerns (Lawler & Nixon, 2010).

After achieving their independence, the Baltic States underwent rapid socioeconomic development, and a consumeristic culture expanded very quickly. In these States, exposure is increasing enormously to commercialized Western mass media, in which an abnormally thin ideal for women and a muscular ideal for men are depicted. The incidence of obesity among Lithuanian adolescents is one of the lowest among Western European countries; however, even so 39% of Lithuanian girls and 21% of boys report that they think they are too fat, according to 2009–2010 data from the international study on health behavior in school-aged children (World Health Organization, 2012).

The mass media might play an abnormally important role in Lithuanian adolescents' identity formation, as findings reported in international studies demonstrate high media exposure among Lithuanian adolescents (World Health Organization, 2012). Understanding and measuring the role of the internalization of beauty ideals in the development of body image concerns among adolescents is critical for designing obesity prevention programs and evaluating the outcomes of body image concerns, and eating disorders.

Adolescent BD is pervasive and associated with emotional distress, lower overall self-esteem, body image concerns, risk for eating disorders, depression, being overweight, obesity, abnormal eating habits, little physical activity, suicide attempts, and suicidal ideation (Hutchinson, Rapee, & Taylor, 2012; Makinen, Puukko-Viertomies, Lindberg, Siimes, & Aalberg, 2012; Roy & Gauvin, 2013). Researchers have concluded that adolescent BD is associated with biological, behavioral, and sociocultural factors (Schneider et al., 2013).

Of these, it is sociocultural factors that have received the most theoretical attention in explaining body image concerns. One of the most thoroughly tested theoretical models explaining BD and eating disorders is the tripartite influence model (van den Berg, Thompson, Obremski-Brandon, & Coovert, 2002). Researchers have reported finding associations between internalized sociocultural appearance ideals and BD in adolescents of both sexes (Calado, Lameiras, Sepulveda, Rodriquez, & Carrera, 2011; Rodgers, McLean & Paxton, 2015). In studies conducted with adolescent girls the findings have shown that perceived pressure to be thin from family, dating partners, or the mass media predicts increases in the girls' BD (Schneider et al., 2013). For adolescent boys, study findings show that messages from the media predict adolescent boys' BD and drive for muscularity (Smolak & Stein, 2010). Findings reported from qualitative studies have also confirmed that BD and dieting might be explained by sociocultural pressure from peers, social comparison, family, and the mass media, as well as by fashion (Holmqvist & Frisén, 2012).

There is lack of studies in Lithuania to demonstrate the associations between beauty ideal internalization, body image, and other important variables of the adolescent lifestyle. Therefore, reliable and valid measures to assess various aspects of sociocultural influence are an important topic to study in this area. Moreover, as a reduction in the internalization of beauty ideals is one of the most important targets of adolescent body image, eating disorder, and obesity prevention programs (Sánchez-Carracedo, Neumark-Sztainer, & López-Guimerà, 2012), it is important to have reliable measures to assess the outcomes of these programs.

The Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ; Heinberg, Thompson, & Stormer, 1995) was initially developed to assess women's recognition and acceptance of societally desirable standards of appearance. The SATAQ-3 represents the third revision of the original scale (Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004). The instrument is comprised of four subscales and is designed to measure multiple aspects of societal influence on the internalization of body ideals.

Calogero, Davis, and Thompson (2004) provided support for the use of the four subscales of the SATAQ-3 in a clinical sample of women exhibiting disordered patterns of eating. Subsequently, Markland and Oliver (2008), using confirmatory factor analysis (CFA), showed that the SATAQ-3 had an acceptable fit to the model according to the conventional criteria in a nonclinical sample of Western women. A four-factor structure has also been established and showed high score reliability in the four largest ethnic groups in the USA (Warren, Gleaves, & Rakhkovskaya, 2013). Further, the findings of Karazsia and Crowther (2008) support the use of the SATAQ-3 with men in the USA.

The SATAQ-3 has become the gold standard to measure multiple aspects of societal influence on the internalization of body ideals. It has been translated into various languages for use with adult and adolescent samples. For use with adult women, the SATAQ-3 has been translated in Arabic (Madanat, Hawks, & Brown, 2006), Malay (Swami, 2009), and Spanish (Llorente, Warren, de Eulate, & Gleaves, 2013).

To date, findings in several studies have validated use of the SATAQ-3 with adolescents. Rousseau, Valls, and Chabrol (2010) examined the factor structure of the SATAQ-3 with a sample of French adolescents of both sexes and Rousseau and Valls (2010) did the same with a sample of French boys. Stefanile, Matera, Nerini, and Pisani (2011) validated the SATAQ-3 with a sample of Italian adolescent girls and Nerini, Matera, Pisani, and Stefanile (2011) carried out a validation study with Italian boys, and in both studies the same four-factor structure was replicated that had been reported as valid with Western samples of adults in other studies. Recently, the SATAQ-3 was translated into the

Greek language for use with a community sample of adolescent girls and boys (Argyrides, Kkeli, & Kendeou, 2014).

Further, when Jackson and Chen (2010) examined the use of the SATAQ-3 among Chinese adolescent boys, the findings revealed that the original factor structure was less applicable to the Asian context than it was to the Western context, and, in fact, was aligned more closely with the structure that Swami (2009) reported in the study with Malaysian women, as the general factors of pressures and internalization loaded together in both studies.

To our knowledge, in only a few studies (Argyrides et al., 2014; Wilksch & Wade, 2012) has the aim been to investigate the psychometric properties of the SATAQ-3 with a community sample of adolescents of both sexes. It should be noted that, in examining the SATAQ-3 for both sexes, Wilksch and Wade (2012) modified some items in the Pressure subscale for the boys. Specifically, the items related to pressure to lose weight, to look pretty, and to be thin, were changed to pressure to gain muscle, to look strong, and to be muscular, respectively. Similarly, in validating the SATAQ-3 with men, researchers have reworded items that focused on thinness or looking pretty. Karazsia and Crowther (2008) changed item 6, "I feel pressure from TV or magazines to look pretty," to "...to look muscular" and item 10, "I've felt pressure from TV or magazines to look thin," to "...to look muscular."

However, some researchers argue that it is important to establish that available internalization measures function in an equivalent manner in both male and female populations and that modification of the item wording might result in the nonequivalence of items across the sexes (Wheeler, Vassar, & Hale, 2011). Therefore, versions of the SATAQ-3 in which item wording has been changed for use with certain groups (e.g., boys) are not considered suitable for direct comparison of scores between the different groups (Sánchez-Carracedo, Barrada, López-Guimerà, Fauquet, Almenara, & Trepát, 2012). Thus, first, researchers should evaluate the measurement invariance of the SATAQ-3 according to gender. The study conducted by Wheeler, Vassar, and Hale (2011) was the first attempt to examine measurement invariance of the SATAQ-3 across genders in an adult mixed-sex sample.

Attempts have also been made to measure gender-based invariance of the SATAQ-3 in an adolescent sample of both boys and girls. In their study of Spanish adolescents of both sexes, Sánchez-Carracedo, Barrada et al. (2012) demonstrated with exploratory structural equation modeling (ESEM) that, with the exclusion of item 20, the four factor solution of the original version was the best fit. The factor structure showed invariance by sex and grade. Again, the authors recommended use of a version excluding item 20 and without reverse-keyed items in future studies (Sánchez-Carracedo, Neumark-Sztainer et al., 2012).

The current study represents the first attempt to explore the factor structure and psychometric properties of a version of the SATAQ-3 designed for use with a Lithuanian population.

To date, three studies have been conducted using adapted versions of the SATAQ-3 with adolescent samples composed of both boys and girls (Argyrides et al., 2014; Rousseau et al., 2010; Wilksch & Wade, 2012), in another study the researchers assessed the gender-based invariance of the SATAQ-3 with a group of adults (Wheeler et al., 2011), and in yet another study the researchers measured gender-based invariance of the SATAQ-3 with adolescents (Sánchez-Carracedo, Barrada et al., 2012). It is important to have a unified instrument for both sexes, as versions modified for use with males or females might result in the nonequivalence of items across genders and the same specific construct may not be measured exactly (Wheeler et al., 2011). Further, only a few studies have been conducted in which the researchers have examined the SATAQ-3 with samples of adolescent boys (Argyrides et al., 2014; Jackson & Chen, 2010; Nerini et al., 2011; Rousseau & Valls, 2010).

In the current study, we used the ESEM technique, which was developed by Asparouhov and Muthén in 2009, for the analysis of the internal structure of a questionnaire. This technique has pronounced advantages over others used for factor structure analysis, such as exploratory factor analysis (EFA) and CFA. First, factor loading matrix rotation can be used in ESEM; in contrast, this is possible in an EFA but restricted in CFA. Thus, models often do not fit the data well in CFA. Second, in ESEM all the usual structural equation modeling (SEM) parameters are incorporated and this allows the researcher to check measurement invariance across groups, as in CFA (Asparouhov & Muthén, 2009).

In the current study we had two main aims. The first aim was to evaluate the factor structure of a Lithuanian version of the SATAQ-3 with a single sample of adolescents of both sexes. The second aim was to examine the measurement invariance of the instrument across genders. Therefore, in line with the recommendations, we kept the same wording for the items for the whole sample, avoiding the use of different versions of the questionnaire for the girls and the boys in the sample (Sánchez-Carracedo, Barrada et al., 2012; Wheeler et al., 2011).

Method

Participants

Participants were two samples ($N = 825$) of Lithuanian adolescent boys and girls who were in the 10th and 11th grades at public high schools when we conducted this study in 2012. The first sample consisted of 416 Lithuanian adolescents, 243 (58.4%) of whom were girls. The participants ranged in age

from 15 to 18 years ($M = 16.41$, $SD = 0.65$). The mean body mass index (BMI) of the students was calculated by dividing the individual's weight by his or her height squared and BMI ranged from 14.66 to 32.32 ($M = 20.68$, $SD = 2.49$) kg/m². The second sample consisted of 409 adolescents. Among them, 242 (59.2%) were girls. Their age ranged from 15 to 18 years ($M = 16.82$, $SD = 0.75$), and their BMI was between 15.62 and 32.55 ($M = 21.00$, $SD = 2.48$) kg/m². The results showed that 9.9% of the boys and 4.9% of the girls were classed as either overweight or obese ($BMI \geq 24.5$ kg/m²).

Instruments

The Sociocultural Attitudes Towards Appearance Questionnaire-3. We used 30 items from the SATAQ-3 (Thompson et al., 2004) in this research. The original SATAQ-3 has four subscales: Internalization—General, Internalization—Athlete, Pressures, and Information. Each of these is composed of items that are rated on a 5-point Likert-type scale, where 1 means *definite disagreement* and 5 means *definite agreement*. The higher the score, the greater is the acceptance or internalization of the prevailing sociocultural standards for appearance. We developed a Lithuanian translation of the SATAQ-3 using double back-translation, which was done by a translation agency in Lithuania. The final translation was reviewed by a scientist whose area of research is the field of body image to determine whether or not the questionnaire covered the concepts it purported to measure. The face validity was rated as good. Further, we performed a test-retest with a separate sample consisting of 40 adolescents of both sexes (20 boys and 20 girls). The interclass correlation coefficient between two measurements that were taken one month apart was 0.81 ($p = .01$).

Body image. We assessed body image (BI) using the question: "How do you perceive your body?" There were five response options ranging from *much too thin* to *much too fat*. This question has been used in the international study on health behavior in school-aged children (World Health Organization, 2012). We classified the respondents into three groups according to their answers: those who responded either that they were much too thin or thin, those who responded that they perceived their bodies as normal, and those responded either that they were a bit too fat or much too fat. Body dissatisfaction (being either too fat or too thin) was greater among the girls (33.9%) than it was among the boys (12.9%), as more girls than boys reported dissatisfaction ($\chi^2 = 56.297$; $df = 2$; $p < .001$).

Procedure

Respondents answered a battery of questions in pen-and-paper format. The Lithuanian Bioethics Committee (N^o BE-2-45) approved the research. The adolescents were allowed to participate only if they signed an informed consent form, and if parental permission were obtained. The sample was

randomly divided into two almost equal groups ($n = 416$ and 409 , respectively), maintaining the proportion in each according to sex. We performed EFA with the data from the first sample, the data from the second sample served for a CFA, and data from both samples were used to examine factor invariance according to gender using ESEM.

We performed the statistical analysis using SPSS 19, AMOS 18, and Mplus 6 software. EFA was carried out using the principal axis factoring method, and the data were transformed through promax oblique rotation. CFA was performed to test the factor structure retained from the EFA. A model with the four-factor structure, based on EFA, was created and this model was submitted for confirmation with the second sample. A range of absolute fit indices was employed. $CMIN/df$ (chi square/degree of freedom ratio) is the minimum discrepancy divided by its degrees of freedom. Researchers recommend using a ratio as low as 2 or as high as 5 to indicate a reasonable fit. Root mean square error of approximation (RMSEA) with a 90% confidence interval (CI) is a population-based fit index that is not sensitive to sample size. The standardized root mean square residual (SRMR) is a direct assessment of how well an a priori model reproduces the sample data. Values for the latter two indexes of $< .05$ indicate a very good fit, and values $< .08$ are interpreted as indicating a good fit. Incremental fit indices compare the chi square value to a baseline model (Hooper, Coughlan, & Mullen, 2008). The comparative fit index (CFI) is an incremental index for which a value $> .90$ indicates a good model fit, and a value $> .95$ reflects a very good model fit (Arbuckle, 2006).

We applied multiple group tests of measurement invariance, which indicate whether or not comparison of scores between the groups is a valid process (Wu, Li, & Zumbo, 2007). We used ESEM, as suggested by Marsh, Nagengast, & Morin (2013) and Sánchez-Carracedo, Barrada et al., (2012) as an integrated approach that includes the best features of EFA and CFA. When a model comparison between groups is the main target, testing measurement invariance constraints is of greater importance than is the absolute level of fit for any one model. A change in CFI and RMSEA between less and more restrictive models should be equal to, or less than, .01 (Cheung & Rensvold, 2002), in which case the more stringent model is reasonably supported (Marsh et al., 2013).

Results

When we performed the EFA analyses we extracted four factors with eigenvalues greater than 1. Based on the pattern matrix, we eliminated two items (items 19 and 28) because the factor loadings for these items did not meet the a priori criteria not to cross-load on other factors with a load greater than .30. We then repeated the EFA procedure. The coefficient of a Kaiser-Meyer-Olkin

measure of sampling adequacy was .96, showing that the data were appropriate for factor analysis. The application of Bartlett's test of sphericity led to the rejection of the null hypothesis ($p < .001$) that the correlation matrix was an identity matrix. Four factors together explained 67.59% of the variance. In Table 1 the final factor structure is presented, represented by 28 items. Each of these items loaded cleanly on their respective factor (Table 1) and corresponded to the four subscales of the original SATAQ-3 (Thompson et al., 2004).

Table 1. *Factor Loadings of the SATAQ-3 Used with a Lithuanian Adolescent Sample*

Items	Factors			
	IG	I	P	IA
7. I would like my body to look like the models who appear in magazines.	.94	-.12		
12. I compare my body to the bodies of people who appear in magazines.	.91			
8. I compare my appearance to the appearance of TV and movie stars.	.89			
16. I compare my appearance to the appearance of people in magazines.	.87			
15. I wish I looked like the models in music videos.	.84			
11. I would like my body to look like the people who are in movies.	.82			
4. I compare my body to the bodies of people who are on TV.	.69			.10
27. I try to look like the people on TV.	.55	.12		.14
3. I care if my body looks like the body of people who are on TV.	.47		.19	.12
17. Magazine advertisements are an important source of information about fashion and being attractive.		.82		
13. Magazine articles are an important source of information about fashion and being attractive.		.78		
1. TV programs are an important source of information about fashion and being attractive.	-.24	.77		
5. TV commercials are an important source of information about fashion and being attractive.	-.12	.76		
9. Music videos on TV are an important source of information about fashion and being attractive.	.12	.73		
25. Movies are an important source of information about fashion and being attractive.	.10	.70		
21. Pictures in magazines are an important source of information about fashion and being attractive.		.68		
29. Famous people are an important source of information about fashion and being attractive.	.30	.50	.12	
18. I've felt pressure from TV or magazines to diet.	-.10		.91	
2. I've felt pressure from TV or magazines to lose weight.	-.18		.85	
10. I've felt pressure from TV and magazines to be in a good shape.	.12		.83	
14. I've felt pressure from TV or magazines to have a perfect body.	.24		.73	
6. I feel pressure from TV or magazines to look pretty.	.17		.65	
22. I've felt pressure from TV or magazines to exercise.			.61	.16
26. I've felt pressure from TV or magazines to change my appearance.	.28		.48	
24. I compare my body to that of people who are athletic.	.12		-.10	.88
30. I try to look like sports athletes.	-.26		.13	.61

Table 1 continued

Items	Factors			
	IG	I	P	IA
23. I wish I looked as athletic as sports stars.	.21			.60
20. I compare my body to that of people in good shape.	.29			.51
Internal consistency (Cronbach's α)	.94	.92	.92	.83

Note. IG = Internalization—General; I = Information; P = Pressures; IA = Internalization—Athlete

The intercorrelations of the extracted factors were moderate to strong (Pearson $r = .37-.81$). The results of the CFA indicated that, with the exception of SRMR, all of the indices of the SATAQ-3 model failed to reach the range for an acceptable fit (Table 2).

Next, ESEM was applied to the whole sample. The results showed that in the total sample of both boys and girls the ESEM model fit the data well (Table 2), and the fit of the ESEM model was better than that of the corresponding CFA model. Although the indices of fit in the total sample, and in the sample of girls, were acceptable, the RMSEA in the sample of boys was above the established threshold.

Further, invariance across the genders was examined. The deltas in CFI and RMSEA showed weak invariance across genders. This means that the constructs manifested in the same way in each group. The baseline model fit indices indicated that the overall fit of the model was acceptable. The results indicated that items loaded on the same factors across groups and each group produced the same number of factors. However, the equal measurement intercepts model was not found to have a good fit and resulted in a slight degradation of the CFI relative to the equal factor loading solution. The results did not support strong invariance across genders. Overall, this indicates that the factor meanings were not equivalent for boys and girls, and this result means that comparison of the latent means between groups is not acceptable.

Further, to test criterion validity, we compared the measures of the SATAQ-3's four subscales among each of the three BI satisfaction groups, making a separate comparison of boys and girls. The results indicated that sociocultural attitudes did not differ across the BI satisfaction groups of boys. However, the Bonferroni post hoc test showed that girls who had responded that they perceived themselves as a bit too fat or much too fat had higher scores than did girls who had perceived that they were either thin, much too thin, or of normal weight on the Internalization—General ($F = 17.328, p < .001$), Internalization—Athlete ($F = 7.400, p = .001$), and Pressure subscales ($F = 14.808, p < .001$); see Table 3.

Table 2. Confirmatory and Exploratory Structural Equation Modeling Factor Analysis of the SATAQ-3

Model	CMIN	df	p	CFI	RMSEA CI 90%	SRMR	ΔCFI	ΔRMSE
CFA Both sexes (n = 409)	1307.34	349	.001	.890	.082 [.077 - .087]	.051		
ESEM								
Both sexes total sample (N = 820)	1318.93	272	.001	.938	.069 [.065 - .072]	.026		
Boys (n = 335)	885.022	272	.001	.917	.082 [.076 - .088]	.029		
Girls (n = 485)	894.406	272	.001	.937	.069 [.064 - .074]	.028		
Same number of factors across groups	2390.727	688	.001	.901	.078 [.074 - .081]	.056		
Same number of factors and factor loadings across groups	2462.279	712	.001	.898	.077 [.074 - .081]	.064	.003	.001
Same number of factors, same factor loadings and same intercepts across groups	2646.193	712	.001	.887	.081 [.078 - .085]	.070	.011	-.004

Note. CMIN - chi square; CMIN/df - chi square/degree of freedom ratio; CFI - comparative fit index; RMSEA CI 90% - root mean square error of approximation and its 90% confidence interval; SRMR - standardized root mean square residual.

Table 3. Means and Standard Deviations for SATAQ-3 Factors by Type of Body Image Perception

BI group	Internalization—General		Internalization—Athlete		Information		Pressure	
	M	SD	M	SD	M	SD	M	SD
Girls								
Too thin (n = 51)	2.25	1.08	2.38	0.99	2.75	1.12	2.08	0.94
Normal (n = 269)	2.43	0.9	2.69	0.91	2.63	0.85	2.30	0.91
Too fat (n = 164)	2.94 ^{1,2}	1.05	2.93 ^{1,2}	0.94	2.81	0.90	2.74 ^{1,2}	0.98
Boys								
Too thin (n = 76)	2.34	0.87	2.72	1.03	2.34	0.85	1.98	0.83
Normal (n = 208)	2.20	0.93	2.81	1.06	2.37	0.86	1.97	0.82
Too fat (n = 42)	2.52	0.98	2.91	1.06	2.53	0.90	2.27	0.82

Note. BI = body image

Discussion

In the current study we had two aims. The first was to evaluate the factor structure of a Lithuanian version of the SATAQ-3 in a mixed-sex sample of adolescents using the same version of the questionnaire for boys and girls. We explored a version without reverse-keyed items, as used in the validation of the original version of the SATAQ-3 (Thompson et al., 2004). For the first sample, a four-factor structure similar to that found by Thompson et al. (2004) emerged from EFA. However, two items (19 and 28) were excluded because of significant cross-loadings on the Internalization—General factor in the EFA. This may have occurred because of semantic similarities between the pairs of items from different factors. The meaning of item 19: “I wish to look as athletic as the people in magazines,” which in the original questionnaire was located in the Internalization—Athlete factor, is similar to that of item 12: “I compare my body to the bodies of people who appear in magazines,” and item 28: “Movie stars are an important source of information about fashion and being attractive,” which was located in the Information factor, is similar in meaning to item 8: “I compare my appearance to the appearance of TV and movie stars,” from the Internalization—General factor.

In our study, the results of CFA analysis indicated that the factor structure model derived during the EFA fitted the data from neither the boys nor the girls. Following the theoretical assumption that CFA is a restricting technique (Asparouhov & Muthén, 2009), we performed ESEM, which yielded a model with a good fit. This supported the results of the SATAQ-3 study involving Spanish adolescents (Sánchez-Carracedo, Barrada et al., 2012) and proved that by use of ESEM the restrictions of CFA can be reduced and more accurate fit indices are provided. Thus, our data support the suitability of the SATAQ-3 for use with Lithuanian adolescents.

Our second purpose in the present study was to explore the measurement invariance of the SATAQ-3 for Lithuanian adolescent boys and girls. The results supported weak invariance by gender. This indicates that an accurate comparison of the means on the subscales could not be made between the groups of boys and girls, as the group differences based on each item were inconsistent. Therefore, it is not feasible to generalize the results, as the factors did not represent the traits in a similar manner. Therefore, our data support the appropriateness of the validated SATAQ-3 for use with Lithuanian girls and, with some caution, boys, in that, for the boys, one out of the three model fit indices was above the cut-off value. However, it is important to emphasize that there are limited possibilities to compare the means of the SATAQ-3 by gender in samples composed of Lithuanian adolescent populations.

This is the third study in which gender invariance in SATAQ-3 factors has been explored and the second such study involving adolescents. It should be noted that in the previous studies, which were conducted with American adults and Spanish adolescents, there was evidence presented that the factors were invariant across gender. However, there are some differences between those two studies and ours. First, in the Spanish study, the authors indicated that there was an important cross-loading of item 20, and in the American study the authors a priori identified two items (6 and 10) as problematic for use with males and deleted them from further analysis, whereas the result of EFA in our study indicated that items 19 and 28 had important cross-loadings. Thus, in our examination of invariance, the number of items in the Internalization—Athlete, Pressures, and Information subscales differed. Second, in the previous studies a form of the SATAQ-3 with eight reverse-keyed items was used, whereas, in our study, we used only positively keyed items.

As the invariance of the Lithuanian version of the SATAQ-3 by gender was not demonstrated, we could explore only the different scores of the SATAQ-3 subscales in the separate groups of boys and girls. Regarding BI, the pattern of results reflected the theoretical expectations, so that, for girls who perceived their bodies as fat, the means for the subscales of Internalization—General, Internalization—Athlete, and Pressures were higher than those of girls who did not perceive their bodies as fat. For boys, no significant difference was found according to their BI. These results differ from those in other studies. For example, in a sample of German boys, the result of analysis indicated weak correlations (r coefficient from .17 to .34) between the SATAQ-G subscales and BD (Knauss, Paxton, & Alsaker, 2009), and with French boys, the correlations ranged from .20 for Internalization—Athlete to .53 for Internalization—General (Rousseau & Valls, 2010).

The findings of the present study are limited to the specific age range of the participants. Further studies might be conducted to explore the psychometric validity of the instrument with a wider age range of adolescents. In the future, researchers might also further test the gender invariance of the instrument across ages. This might enable researchers to assess body ideal internalization during a broader period of the years of adolescence. Another aim in future studies might be to further explore gender invariance in the Lithuanian version of the SATAQ-3, and it will also be important to test the sensitivity and validity of the measure with samples for whom disordered eating behavior has been reported, as well as with populations clinically diagnosed with eating disorders. However, the instrument can also be used as a tool to measure the effectiveness of body image, eating disorder, and obesity prevention programs in pre- and postintervention assessments.

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