



Facultad de Estudios Superiores
IZTACALA

Mexican validation of the Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ-3) in men undergraduate students

Validación mexicana del Cuestionario de Actitudes Socioculturales hacia la Apariencia (SATAQ-3) en estudiantes universitarios varones

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Received: 22 June 2018

Revised: 21 August 2018

Accepted: 22 January 2019

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Acknowledgements: Postdoctoral Ramon and Cajal Scholarship from the Spanish Ministry of Science and Innovation (RYC-2009-05092)

Conflict of interest: The authors declare no conflict of interest

Abstract

The Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3) is one of the instruments used to measure the influence of mass media on adolescents, and is a useful instrument that has been widely applied in different countries and translated to many languages. The present study is the first validation of the Mexican version of the SATAQ-3 with a male college student sample. A total of 148 students participated in the study ($M = 19.1$, $SD = 2.14$). A principal axis factor analysis was used to evaluate the scale, yielding a poor result, due to the formation of an extra factor with reverse-keyed items. Therefore, reversed key items were removed and a second analysis was conducted. After removing reverse-key items, a four-factor structure was obtained: Pressures, Internalization-general, Internalization-athletic, and Information. The internal consistency obtained

for SATAQ-3 was satisfactory ($\alpha = .81$), however, it was slightly lower than the original. Regarding the concurrent validation, the SATAQ-3 presented significant correlations with body dissatisfaction, social perfectionism and psychological distress. SATAQ-3 is an appropriate instrument to measure the internalization of aesthetic ideals and acceptance, among male college students in Mexico.

Keywords. Sociocultural pressure; Sociocultural influences; Body image; Exploratory factor analysis; Validity.

Resumen Uno de los cuestionarios más utilizados para medir la influencia de los medios de comunicación es el Cuestionario de Actitudes Socioculturales hacia la Apariencia (SATAQ-3), el cual ha sido traducido a varias lenguas y aplicado en distintos países. El presente estudio constituye la primera validación mexicana del SATAQ-3 en varones. Participaron 148 estudiantes universitarios ($M = 19.1$, $DE = 2.14$). Para evaluar la escala se realizó un análisis factorial de ejes principales, obteniendo inicialmente un resultado pobre, dada la formación de un factor extra con los ítems con redacción inversa. Por esta razón dichos ítems fueron removidos y se condujo un segundo análisis que derivó una estructura de cuatro factores: Presión, Interiorización general, Interiorización atlética, e Información. La consistencia interna del SATAQ-3 fue satisfactoria ($\alpha = .81$), sin embargo fue un poco menor a la obtenida de la escala original. Respecto a la validación concurrente, el SATAQ-3 presentó correlaciones significativas con la insatisfacción corporal, el perfeccionismo social y el malestar psicológico. El SATAQ-3 es un instrumento apropiado para medir la interiorización de los ideales estéticos y su aceptación en estudiantes universitarios varones mexicanos.

Palabras clave. Presión sociocultural; Influencias socioculturales; Imagen corporal; Análisis factorial exploratorio; Validez.

Introduction

When dealing with people with weight or eating problems, a crucial aspect to consider is the media influence on young people. The sociocultural model suggests that cultural pressures to achieve a beauty ideal of extreme thinness in women (Escandón-Nagel, Vargas & Herrera, 2019; Heinberg et al., 2008; Levine & Piran, 2004; Striegel, 2019; Thompson & Stice, 2001) or muscularity for men (Cafri & Thompson 2004; Compte, Sepúlveda, de Pellegrin & Blanco, 2015; Griffiths, Murray & Touyz, 2013; Rosenman, Kaplan, Gaunt, Pinho & Guy, 2018), and the internalization of these aesthetic ideals, contribute to the development of body dissatisfaction among women and men. Studies like the one of Harrison and Cantor (1997) or the naturalistic study conducted by Becker, Burwell, Gilman, Herzog and Hamburg (2002) concluded that a greater exposure to media, especially that promotes

thinness, predicted eating disorders (ED) among women and men. The female population is the most affected by these problems, and therefore most of the instruments that evaluate factors related to this pathology are aimed at women (Calado, Lameiras, Sepúlveda, Rodríguez & Carrera, 2011; Dakanalis et al., 2012; McCabe & Ricciardelli, 2004; Sepúlveda, Gandarillas & Carrobes, 2008), however males are not exempt from problems related to weight and figure. Various investigations have shown the role played by the sociocultural influence on male body image, which represents an important risk factor for problems related to ED (Boothroyd et al., 2016; Calado, 2011; Kanayama & Pope, 2011; Neziroglu, 2008), hence the importance of having instruments validated also for males.

One of the instruments used to measure the influence of mass media on adolescents is the Sociocultural Attitudes Towards Appearance Questionnaire-3

(SATAQ-3). The first version of this questionnaire was aimed at measuring the aesthetic ideals and their internalization in women (Thompson, Heinberg & Stormer, 1995). Afterwards, the first revised version of SATAQ appeared (Cusumano & Thompson, 1997), and after following revisions, the SATAQ-3 was published (Thompson, Van den Berg, Roehring, Guarda & Heinberg, 2004). This version integrates Internalization, Pressure, Information and Internalization-athletic factors in relation to mass media. The scale has a Likert-type response format ranging from 1 to 5, the higher scores mean higher levels of media influence. The questionnaire has been translated and adapted to many languages and has been validated in several samples: Greek (Argyrides, Kkeli & Kendeou, 2014), Chinese (Jackson & Chen 2010), French (Rousseau, Valls & Chabrol, 2010), German (Knauss, Paxton & Al-saker, 2009), Malay (Swami, 2009), Arabic (Mandanat, Hawks & Brown, 2006), Italian (Stefanile, Matera, Nerini & Pisani, 2011), Portuguese (Soares, Cordás, Conti & Caputo, 2011) and Spanish, with their validation in samples from Northern Spain (Llorente, Warren, Eulate & Gleaves, 2013), Barcelona (Sánchez-Carracedo et al., 2012), and Buenos Aires (Murawski, Elizathe, Custodio & Rutzstein, 2015).

We found several validations of SATAQ-3, with adequate psychometric properties (Amaral, Jackson & Chen, 2010; Madanat, Hawks & Brown, 2006; Markland & Oliver, 2008; Murawski et al., 2015; Ribeiro, Conti, Ferreira & Ferreira, 2013; Sánchez-Carracedo et al., 2012; Soares, Conti, Caputo & Filgueiras, 2015; Warren, Gleaves & Rakhkovskaya, 2013). Although the SATAQ-3 was initially validated on female samples, and more recently in samples of both sexes (Wilksch & Wade, 2012; Wheeler, Vassar & Hale, 2011), or exclusively men (Jackson & Chen, 2010; Karazsia & Crowther, 2008; Nerini, Matera & Pisani, 2011). Specifically, when it was applied on samples with the presence of males, the items with very specific wording regarding the female aesthetic ideals were modified slightly so that they made sense to the male sample (Jackson & Chen, 2010; Karazsia & Crowther, 2008; Wheeler et al., 2011).

In Mexico was validated the Attitudes Towards Body Figure Questionnaire in a sample of students and a sample of patients with ED, and reliability yielded

a Cronbach's *alpha* of .93 (Unikel, Juárez & Gómez, 2006). Another questionnaire dealing with influences of the aesthetic model is the Questionnaire on Influences on the Body Aesthetic Model (CIMEC, by its initials in Spanish; Toro, Salamero & Martinez, 1994), validated in Mexico by Vázquez, Alvarez and Mancilla (2000), which also yielded appropriate psychometric characteristics. However, it is also necessary to have instruments validated in male population, since they are not exempt from these problems.

This paper presents the first validation of the Mexican version of the SATAQ-3 in a male university students' sample. The specific aims of the present study were: 1. To examine the validity of factor solution of the SATAQ-3, and 2. To estimate internal consistency of each subscale of SATAQ-3, as well as its concurrent validity. Body dissatisfaction is a frequent consequence of the internalization of aesthetic models, so that when body image differs from the internalized model, it is associated with negative feelings and higher depressions levels (Choi & Choi, 2016; Kamody et al., 2018; McCreary & Sasse, 2000; Wichstrøm, & von Soest, 2016) for that reason we decided to evaluate distress, psychopathology distress, and difficulties with emotional regulation. In addition, we evaluate perfectionism, as it is a personality characteristic present in ED (Barnes & Caltabiano, 2017; Unikel, Díaz de León & Rivera-Márquez, 2017), and finally, eating pathology. We expect high associations of the influence of media, measured with the SATAQ-3, with distress, body dissatisfaction, perfectionism, eating pathology, psychopathology distress, and difficulties with emotional regulation.

Method

Participants

The sample consisted of 161 male students from a public university of Zacatecas, Mexico. The participants were students that voluntarily accepted to participate in the study. They were informed about the objective and characteristics of the study and completed an informed consent. The parents of the participants under 18 were contacted and signed informed consent. Eleven participants did not complete the questionnaires

and two others gave them without answering, so they were discarded from study. The age of participants ranged between 17 to 27 years ($M = 19.1$, $SD = 2.14$). Participants attended different campus schools in Zacatecas city: Engineering, Psychology, Health Sciences, Physics Sciences, Educational Sciences and Humanities.

Ethical considerations

This research project has the approval of the Ethic Committee of the Autonomous University of Madrid (UAM-CEI 59-1049). Afterwards the authorization from the coordinators of the degrees at the Autonomous University of Zacatecas was requested. All participants completed an informed consent as well as the parents of the participants under 18.

Procedure

Faculties with the largest population of males and those interested in participating in the project were included in the study. The application of the evaluation battery was carried out during lecture hours.

For this study, the Spanish translation of SATAQ-3 proposed by Sánchez-Carracedo et al. (2012) was considered. However, two psychologists checked the wording to make sure it was fully understandable by Mexican population. Also, as it was applied to a male population, the wording of item 6 was amended as it was considered to be directed towards a female population: "I don't feel pressured by TV or magazines to look prettier" was changed to "I don't feel pressured by TV or magazines to look better".

Instruments

Demographic questionnaire. Student indicated his age, grade, his height and weight, their parent's education level and employment status.

Sociocultural Attitudes Towards Appearance Scale (SATAQ-3; Thompson et al., 2004). The instrument measures the influence and internalization of aesthetic ideals in relation to mass media. The original version by Thompson et al. obtained an excellent internal consistency, for SATAQ total $\alpha = .96$, and its different subscales ($\alpha = .92$ to $.96$).

General Health Questionnaire (GHQ-12; Goldberg & Williams, 1998). This instrument was used to measure

level of psychological distress. The Mexican version has been validated by Caraveo-Andunga, Martínez, Saldivar, López and Saltijeral (1998), with satisfactory internal consistency ($\alpha = .82$). In the current sample was .76

Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994). This instrument was derived from the Eating Disorder Examination interview (EDE; Fairburn & Cooper, 1993). We used the adapted and validated Spanish scale by Peláez, Labrador and Raich (2012). The EDE-Q has obtained adequate internal consistency ($\alpha \geq .80$) in a Mexican sample (Penelo, Negrete, Portell & Raich, 2013). In the current sample was .75

Male Body Attitudes Scale (MBAS; Tylka et al., 2005). This scale assesses men's dissatisfaction with their bodies. The Spanish version (Sepúlveda et al., 2016) shows good internal consistency ($\alpha = .90$ for total scale), as well as the Mexican validation (Castillo, Solano & Sepúlveda, 2018). In the current sample, the internal reliability was .82

Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991), which measures three dimensions of perfectionism. Rodríguez, Rojo, Ortega and Sepúlveda (2009) validated the MPS into Spanish university sample, with good internal consistency ($\alpha = .76-.87$). In Mexico, Franco, Mancilla-Díaz, Alvarez, Vázquez and López (2010) found good psychometric properties of scale, with internal consistency of .87. In the current sample was .78

Symptom Check List-90 (SCL-90-R; Derogatis, 1983). The General Symptom Index (GSI) is one of the most widely used indexes of distress. The Mexican version of the SCL-90-R showed high internal reliability ($\alpha = .96$) for GSI (Cruz, López, Blas, González & Chávez, 2005). In the current sample was .84

Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). This questionnaire measures emotional regulation through a total score and six subscales. The Spanish version showed high internal reliability ($\alpha = .94$) for the total score (Hervás & Jodar, 2008). In Mexico, it was validated by Marín, Robles, González and Andrade (2012) with an adolescent sample, and obtained good high internal reliability ($\alpha = .85$ to $.68$). In the current sample was .89 for the total score.

Data analyses

Data were analyzed with the SPSS version 21.0 program. The descriptive statistics for age, weight, height and type of degree (means, standard deviations and/or percentages) were calculated. In order to obtain the factorial structure of the SATAQ-3, an exploratory factor analysis (EFA) was performed, with the principal axis method and a Promax rotation. We use Bartlett's sphericity test to evaluate the applicability of factor analysis of the variables studied. Based on the size of the sample ($N = 148$), the communalities should be greater than .60. The criterion to determine factors included the *eigen* and *scree plot* values. The criteria for the saturation factor was at least .40, and the consistency was measured using Cronbach's *alpha*. The Kolmogorov-Smirnov test was used for the normality test of the SATAQ-3 scales and the rest of the battery. Following a non-parametric distribution, the Spearman correlation coefficient was used to examine the cross-correlation between the different factors of the SATAQ-3 and the variables considered. According to Cohen (1988), correlations $< .29$ were considered small, $\geq .30$ were considered moderate, and $\geq .50$ were considered large.

Results

There was a total of 148 male participants that agreed to participate in the study. Their ages ranged between 17 and 27 years ($M = 19.10$, $SD = 2.14$). The body mass index (BMI) was calculated using self-reported data on weight and height, obtaining scores ranging between 15.2 Kg/m^2 and 33.1 Kg/m^2 ($M = 23.70$, $SD = 3.19$).

Factorial structure

After performing an EFA with Promax rotation, a five-factor model explaining 61.20% of the variance was obtained. All items (30) yielded a correlational ratio greater than .40 in at least one factor. The first factor generated upon rotation was responsible for 39.40% of the variance and mainly included the items corresponding to the category proposed by the initial model (Thompson et al., 2004), such as the Pressure factor (see M1, Table 1). It should be noted that, contrary to expectations, some items that included the

verb "compare" (4, 8 and 16) in their wording were a part of this factor, instead of the General Interiorization factor theoretically proposed by Thompson et al. The second factor is called Information, its items coincide, and it is responsible for 10.04% of the explained variance. The exception of reversed key items should be noted, which, as can be observed in the table 1 (see M1), have tended to form their own consistent single factor. The third factor is responsible for 5.40% of the variance and groups items related to the internalization of an athletic image. Again, the same phenomenon occurred with reverse-keyed items. The fourth factor does not match any of those proposed by Thompson et al. In this case, all items with a negative wording have grouped together, forming a single factor responsible for 4.00% of the explained variance. Finally, in this first model, the fifth factor groups items designed to assess the internalization of the aesthetic models at overall level. This factor accounts for 3.20% of the variance and differs from that expected according to the initial theoretical model (see M1, Table 1).

With the emergence of a factor that grouped all reverse-keyed items and that had no apparent theoretical or clinical explanation, such items were suppressed from the analysis of a second model (see M2, Table 1). After this variation, four factors were obtained explaining 65.24% of the total variance. In this second model, the generated factors adjust to those obtained by Thompson et al. (2004). Therefore, the configuration was as follows: the first factor called "Pressure" was responsible for 43.0% of the variance; secondly, the factor "Information" explained 9.51%; and finally, the third (7.38%) and fourth factor (5.35%) were "Internalization-athletic" and "Internalization-general", respectively. It is true that, in the latter factor, the migration of the items worded using the verb "compare" has occurred again, saturating in the first factor.

Reliability and intercorrelations

Suitable levels of internal consistency of the scores obtained by applying the SATAQ-3 ($\alpha = .81$) were observed. Results were similar to those obtained in the different subscales: Pressure ($\alpha = .82$), Information ($\alpha = .82$), Internalization-athletic ($\alpha = .82$), and

Table 1. Exploratory factor analysis of the SATAQ-3 with 30 items (N = 148).

	GEN-I	M1 (30 items)				M2 (without reverse key items)				
		INFO	PRESS	I-ATHL	NEG	GEN-I	INFO	PRESS	I-ATHL	
1	TV programs are an important source of information “being attractive”	.09	.73	-.19	-.01	.01	.08	.71	-.20	-.01
2	I've felt pressure from TV or magazines to lose weight	.09	-.02	.69	-.10	-.03	.07	-.02	.73	-.11
3	I wouldn't like my body to look like people who are on TV	.82	.12	-.04	-.01	.01	-	-	-	-
4	I compare my body to the bodies of TV and movie stars	.14	-.01	.77	-.10	-.01	.19	.01	.69	-.08
5	TV commercials are an important source of information about fashion and “being attractive”	.10	.85	-.13	-.06	.01	.12	.87	-.21	-.04
6	I haven't felt pressure from TV or magazines to look better	.11	.07	.63	.01	-.03	-	-	-	-
7	I would like my body to look like the models who appear in magazines	.77	.03	.05	.08	.02	.73	.06	.03	.08
8	I compare my appearance to the appearance of TV and movie stars	.22	.14	.48	.04	-.04	.28	.14	.40	.04
9	Music videos on TV aren't an important source of information about fashion and “being attractive”	.04	.02	.38	-.15	.50	-	-	-	-
10	I've felt pressure from TV and magazines to be lean	.06	.01	.77	-.04	-.01	.20	.01	.66	-.04
11	I would like my body to look like the people who are in the movies	.62	-.02	.18	.10	-.02	.66	.01	.09	.10
12	I don't compare my body to the bodies of the people who appear in the magazines	-.06	.26	-.21	.04	.74	-	-	-	-
13	Magazine articles aren't an important source of information about fashion and “being attractive”	.15	-.05	-.12	.03	.72	-	-	-	-
14	I've felt pressure from TV or magazines to have a perfect body	.06	-.07	.64	.18	-.02	.12	.07	.61	.17
15	I wish I looked like the models in music videos	.53	.02	.39	-.03	.01	.61	.03	.33	-.07
16	I compare my appearance to the appearance of people in magazines	.14	.04	.65	.06	-.02	.22	.03	.62	.02
17	Magazine advertisements are an important source of information about fashion and “being attractive”	.01	.76	.12	-.06	-.01	.03	.82	.04	-.07
18	I've felt pressure from TV or magazines to diet	-.14	-.10	.95	-.07	-.05	-.06	-.12	.95	-.10
19	I don't wish I looked as athletic as the people in magazines	-.18	.10	.10	-.05	.61	-	-	-	-

20	I compare my body to that of people in "good shape"	-.11	-.01	.31	.56	.07	-.16	-.01	.30	.62
21	Pictures in magazines are an important source of information about fashion and "being attractive"	-.05	.69	.21	.09	-.04	-.04	.71	.17	.07
22	I've felt pressure from TV or magazines to diet	-.12	.03	.61	.29	.02	-.08	.04	.53	.33
23	Desearía ser tan atlético/a como las estrellas deportivas. I wish I look as athletic as sports stars	.23	-.03	-.16	.83	-.01	.28	-.03	-.25	.86
24	I compare my body to that of people who are athletic.	-.06	.02	-.01	.99	-.04	-.07	.01	-.03	.95
25	Movies are an important source of information about fashion and "being attractive"	-.10	.68	.29	-.03	.01	-.12	.73	.25	-.03
26	I've felt pressure from TV or magazines to change my appearance	-.16	.01	.77	.11	.09	-.17	.03	.72	.16
27	I don't try to look like the people on TV	-.10	-.04	-.13	.14	.76	-	-	-	-
28	Movies aren't an important source of information about fashion and "being attractive"	.15	-.23	.15	-.09	.80	-	-	-	-
29	Famous people are an important source of information and "being attractive"	.05	.60	.06	.07	.03	-.06	.67	.06	.09
30	I try to look like sports athletes	.08	-.03	.13	.67	.02	.13	-.01	.05	.68

Notes. I-AHTL= Internalization-Athlete, I-GEN = Internalization-General, INFO = Information, NEG = Negative, PRESS = Pressures; Items in bold indicate correspondence to each factor.

Internalization-general ($\alpha = .82$). The results of the correlations between the different factors of SATAQ-3 indicate that all factors were highly interrelated (Table 2), with range varying between .80 and .87. The Pressure factor (Factor 4) and SATAQ-3 obtained the maximum correlation ($r = .87, p < .01$).

Construct validity

As for the concurrent validity, we observed significant and positive associations between the different variables evaluated (see Table 2). We observed a high positive correlation between scores obtained in the overall SATAQ-3 and male body dissatisfaction (total MBAS). It also correlates with the scores obtained on the psychopathological distress, as measured by the GSI. In relation to the obtained subscales, high correlations between SATAQ-3, I-Athletic subscale, and

the MBAS-Musculature subscale were observed. Its moderate association with ED measured by the EDEQ should be highlighted, where the greater the internalization of the ideal, the greater the eating pathology. Finally, the relationship obtained between the Pressure subscale and the scores obtained in the Social perfectionism subscale ($r = .27, p < .01$) is noteworthy. There were not significant differences between subscales of the SATAQ-3 and the age of the students or BMI ($p < .05$).

Discussion

The SATAQ-3 is an instrument used to assess the influence of the media on the formation of the aesthetic ideal of beauty. While the SATAQ-3 is an instrument

Table 2. Mean, standard deviation and correlation among variables (N = 148).

Measures	M (SD)	1	2	3	4	5
1. SATAQ-T	38.83 (15.2)	-				
2. I-GEN	5.45 (2.7)	.82**	-			
3. I-ATHL	8.19 (4.1)	.80**	.65**	-		
4. INFO	11.63 (4.1)	.85**	.57**	.48**	-	
5. PRESS	13.57 (5.7)	.87**	.76**	.68**	.64**	-
6. GHQ-12	16.44 (4.8)	.18*	.16*	.11	.17*	.18*
7. EDEQ total	0.90 (0.8)	.41**	.41**	.44**	.20*	.42**
8. MBAS-M	2.70 (10.5)	.51**	.49**	.50**	.32**	.51**
9. MBAS-F	2.40 (1.0)	.34**	.40**	.32**	.14	.39**
10. MBAS-T	2.53 (0.9)	.51**	.54**	.50**	.28**	.52**
11. P-SOC	53.73 (10.0)	.27**	.26**	.17*	.22**	.29**
12. GSI	1.66 (0.6)	.33**	.35**	.31**	.15	.35**
13. DERS total	58.23 (20.3)	.18**	.22**	.20*	.04	.21**

Notes. DERS = Difficulties in emotion regulation, EDE-Q = Eating Disorder Examination Questionnaire, GHQ-12 = General Health Questionnaire, GSI = General symptom index, I-ATHL = Internalization-Athlete, I-GEN = Internalization-General, INFO: Information, MBAS-F = Male Body Attitudes Scale Low Body Fat, MBAS-M = Male Body Attitudes Scale Muscularity, MBAS-T = Male Body Attitudes Scale Total, PRESS = Pressures, P-SOC = Socially prescribed perfectionism subscale, SATAQ-T = Total score of the Sociocultural Attitudes Towards Appearance Questionnaire-3. * $p < .05$, ** $p < .01$

widely used in various contexts and validated in many languages, there have been several different ways to perform such validations. The aim of this present study was to validate the SATAQ-3 on a Mexican male population. The questionnaire has been validated in different contexts, including reverse-keyed items

(Markland & Oliver, 2008; Sánchez-Carracedo et al., 2012), or excluding reverse-keyed items (Jackson & Chen, 2010; Madanat et al., 2006; Warren et al., 2013). In the validation published by Thompson et al. (2004), performed on female university students, the questionnaire without reverse-keyed items was used. However, the authors recommended the inclusion of some items with this type of wording, so as to detect whether there is a trend in the participants' responses.

For the Mexican validation, the Spanish translation of the SATAQ-3 by Sánchez-Carracedo et al. (2012) was used, including reverse-keyed items. However, initially, the occurrence of an extra factor consisting of these items was observed. Once the reverse-keyed items were removed, the four expected factors were obtained. Furthermore, Sánchez-Carracedo et al. also found clustering of reverse-keyed items after conducting an EFA. For this reason, and to complement their study, they conducted a confirmatory factor analysis to compare their results with those obtained by other studies, without finding the expected results. Finally, they decided to carry out exploratory structural equation, with which they did obtain adequate support for the four factors proposed by Thompson et al. (2004). However, it appears that the clustering of reverse-keyed items on a single factor is a common occurrence. Another study that decided to remove the reverse-keyed items is that of Wheeler et al. (2011), performed on a sample of men and women, with the objective of determining the invariance between sexes. Initially, the scale with 28 items (with two retained items) showed a poor result, and reverse-keyed items formed a unique methodological factor, as in our study, so they were removed. The analysis with 21 items obtained a good result according to the four factors hypothesis for both men and women.

Several studies have replicated the four-factor model through the use of EFA: on Italian women (Nerini et al., 2011), on French female students (Rousseau et al., 2010), on Jordanian women (Madanat et al., 2006), on the main ethnic groups within the United States of America (Warren et al., 2013). However, other studies have needed to use exploratory structural equations to find these four factors in their validations (Argyrides et al., 2014; Karazsia & Crowther, 2008; Sánchez-Carracedo et al., 2012). Only two studies have been

specifically validated on males, one on American male students (Karazsia & Crowther, 2008), and another on Chinese male teenagers (Jackson & Chen, 2010).

In relation to the concurrent validation, as we expected, a strong positive association between total SATAQ-3 and its subscales ($r = .28-.54$) and the total score in MBAS ($r = .51$), in the sense that the greater the internalization of the aesthetic model, presented greater male body dissatisfaction (Doumit, Kharma, Sanchez-Ruiz & Zeeni, 2018; Kanayama & Pope, 2011). Its moderate association with ED measured through EDEQ ($r = .41$) is also noteworthy. In the same vein, in Karazsia and Crowther's (2008) study on men, the SATAQ-3 subscales were significantly associated to instruments related to the obsession with musculature, measured through the Drive for Muscularity Scale ([DMS]; McCreary & Sasse, 2000), as well as with instruments related to psychological distress and behavior such as the Body Change Inventory ([BCI]; Ricciardelli & McCabe, 2002). As for the psychological discomfort, the SATAQ-3 was positively and moderately associated with, and only to a lesser extent associated with the social perfectionism of the MPS, which refers to the perception that others hold perfectionistic standards for them from social pressure.

Regarding the internal consistency, Thompson et al. (2004) obtained a higher consistency for the total SATAQ-3 and its subscales, ranged between .92 and .96. In contrast, in the present study the consistency for the total scale was slightly less than .81, and similar for its four subscales. Other studies have obtained results similar to ours, such as Sánchez-Carracedo et al. (2012), who obtained coefficients between .77 and .85. In Wheeler et al. (2011) study, the internal consistency was between .79 and .94; while Nerini et al. (2011) obtained a high consistency for the subscales of SATAQ-3 (.91-.94), except for the Internalization-athletic subscale (.84). It is important to mention that recently has been presented the latest version of the instrument: SATAQ-4, in which the conceptual limitations of the SATAQ-3 were reviewed. The latest version is different and consists of five factors, such as the Internalization of thinness, the Internalization of the athletic ideal, the Pressure of Family, of the Media and of Friends (Schaefer et al., 2015). However, we consider the SATAQ-3 as a more accurate measure to

evaluate the impact of prevention programs, when the model is media literacy amongst young people.

This study has several limitations which may suggest future research in this area. Firstly, it would be appropriate to extend this validation to men who are not undergraduate students, allowing for a greater generalization of the validation over the Mexican male population. On the other hand, it would be appropriate to revise the wording of certain items to avoid problems such as those caused by negative wording. Moreover, it would be necessary to review wording aspects in items that use the verb "compare". It seems that for Mexican male university students, this verb directly involves an aspect of internalization, with a loss of strength for the remaining contents of the item, and therefore taking part of a factor different from that in the model of Spanish version (Sánchez-Carracedo et al., 2012). Finally, in relation to the data analysis, we consider it necessary to point out the weakness in the quantitative assessment of the validity by the sole use of EFA (Batista-Foguet, Coenders & Alonso, 2004). Alternatively, the treatment of the validation through confirmatory factor analysis models would have been helpful, as it allows us to study and evaluate each item, rather than making global assessments.

Overall, we can conclude that the validation of SATAQ-3 has proven to have a stable factor structure after removing reverse-keyed items, as well as good psychometric indicators to be applied on Mexican male university students. Therefore, we consider this validation as a breakthrough in the measurement of sociocultural pressure and internalization of the ideal of beauty. These aspects constitute the main risk factors for the development of body dissatisfaction, weight concerns and ED. The validation of this tool seems to be a good complement to assess the effectiveness of preventive treatments of these disorders amongst Mexican male university students.

References

- Amaral, A. C. S., Ribeiro, M. S., Conti, M. A., Ferreira, C. S. & Ferreira, M. E. C. (2013). Psychometric evaluation of the Sociocultural Attitudes Towards Appearance Questionnaire-3 among Brazilian young adults. *Spanish*

- Journal of Psychology*, 16, e-94. <http://dx.doi.org/10.1017/sjp.2013.94>
- Argyrides, M., Kkeli, N. & Kendeou, P. (2014). Validation of the factor structure of the Greek adaptation of the Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ-3). *Body Image*, 11(3), 201-205. <http://dx.doi.org/10.1016/j.bodyim.2014.02.003>.
- Barnes, M. & Caltabiano, M. (2017). The interrelationship between orthorexia nervosa, perfectionism, body image and attachment style. *Eating and Weight Disorders*, 22(1), 177-184. <https://doi.org/10.1007/s40519-016-0280-x>
- Batista-Foguet, J., Coenders, G. & Alonso, J. (2004). Análisis factorial confirmatorio: Su utilidad en la validación de cuestionarios relacionados con la salud. *Medicina Clínica*, 122(1), 21-27.
- Becker, A. E., Burwell, A. R., Gilman, S. E., Herzog, D. B. & Hamburg, P. (2002). Eating behaviours and attitudes following prolonged exposure to television among ethnic Fijian adolescent girls. *British Journal of Psychiatry*, 180(6), 509-514. <http://dx.doi.org/10.1192/bjpp.180.6.509>.
- Boothroyd, L., Jucker, J., Thornborrow, T., Jamieson, M., Burt, D. M., Barton, R. et al. (2016). Television exposure predicts body size ideals in rural Nicaragua. *British Journal of Psychology*, 107(4), 752-767. <https://doi.org/10.1111/bjop.12184>
- Cafri, G. & Thompson, J. (2004). Measuring male body image: A review of the current methodology. *Psychology of Men and Masculinity*, 5(1), 18-19. <http://dx.doi.org/10.1037/1524-9220.5.1.18>.
- Caraveo-Anduaga, J., Martínez, N., Saldivar, G., López, J. & Saltijeral, M. (1998). Performance of GHQ-12 in relation to current and Lifetime CIDI Psychiatric diagnosis. *Salud Mental*, 21(4), 1-11.
- Castillo, I., Solano, S. & Sepúlveda, A. R. (2018). Validación mexicana de la Escala de Actitudes Masculinas sobre el Cuerpo en estudiantes universitarios varones. *Revista Iberoamericana de Diagnóstico y Evaluación Psicológica*, 468(1), 51-65. <http://dx.doi.org/10.21865/RIDEP46.1.04>
- Choi, E. & Choi, I. (2016). The associations between body dissatisfaction, body figure, self-esteem, and depressed mood in adolescents in the United States and Korea: A moderated mediation analysis. *Journal of Adolescence*, 53, 249-259. <https://doi.org/10.1016/j.adolescence.2016.10.007>
- Cohen, J. (1988). *Statistical power analysis for the behavioral science*. Hillsdale, NJ: Lawrence Erlbaum Association.
- Compte, E., Sepúlveda, A. R., de Pellegrin, Y. & Blanco, M. (2015). Confirmatory factor analysis of the Drive for Muscularity Scale-S (DMS-S) and Male Body Attitudes Scale-S (MBAS-S) among male university students in Buenos Aires. *Body Image*, 14, 13-19. <http://dx.doi.org/10.1016/j.bodyim.2015.02.005>
- Cruz, C. S., López, L., Blas, C., González, L. & Chávez, R. A. (2005). Datos sobre la validez y la confiabilidad de la Symptom Check List (SCL 90) en una muestra de sujetos mexicanos. *Salud Mental*, 28(1), 72-81.
- Cusumano, D. & Thompson, J. (1997). Body image and body shape ideals in magazines: Exposure, awareness and internalization. *Sex Roles*, 37(9), 701-721. <http://dx.doi.org/10.1007/BF02936336>.
- Derogatis, L. R. (1983). *Administration, scoring and procedures: Manual II for the revised version of the SCL-90-R*. Baltimore: John Hopkins University Press.
- Doumit, R., Kharma, J., Sanchez-Ruiz, M. J. & Zeeni, N. (2018). Predictors of disordered eating in young males. *Community Mental Health Journal*, 54(2), 236-244. <https://doi.org/10.1007/s10597-017-0163-2>.
- Escandón-Nagel, N., Vargas, J. F. & Herrera, A. (2019). Body image based on sex and nutritional status: Association with the construction of self and others. *Revista Mexicana de Trastornos Alimentarios*, 10(1), 32-41. <http://dx.doi.org/10.22201/fesi.20071523e.2019.1.521>
- Fairburn, C. & Beglin, S. J. (1994). Assessment of eating disorders: Interview or self-report questionnaire. *International Journal of Eating Disorders*, 16(4), 363-370. [http://dx.doi.org/10.1002/1090-108X\(199412\)16:4<363::AID-EAT2260160405>3.0.CO;2#](http://dx.doi.org/10.1002/1090-108X(199412)16:4<363::AID-EAT2260160405>3.0.CO;2#).
- Fairburn, C. & Cooper, Z. (1993). The Eating Disorder Examination. *Binge eating: Nature, assessment and treatment* (pp. 317-360). New York: Guilford Press.
- Franco, K., Mancilla-Díaz, J. M., Alvarez, G., Vázquez, R. & López, X. (2010). Estructura factorial y consistencia interna de la Escala Multidimensional de Perfeccionismo. *Revista Mexicana de Psicología*, 27(2), 143-149.
- Goldberg, D. & Williams, P. (1988). *A user's guide to the GHQ*. Windsor: NFER Nelson.
- Gratz, K. & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology & Behavioral Assessment*, 26(1), 41-54. <http://dx.doi.org/10.1023/B:JOBA.0000007455.08539.94>.
- Griffiths, S., Murray, S. B. & Touyz, S. (2013). Disordered eating and the muscular ideal. *Journal of Eating Disorders*, 1(1), 1-15. <http://dx.doi.org/10.1186/2050-2974-1-15>
- Harrison, K. & Cantor, J. (1997). The relationship between media consumption and eating disorders. *Journal of Communication*, 47(1), 40-67. <http://dx.doi.org/10.1111/j.1460-2466.1997.tb02692x>.
- 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(3), 279-290. <http://dx.doi.org/10.1016/j.bodyim.2008.02.001>.
- Hervás, G. & Jódar, R. (2008). Adaptación al castellano de la Escala de Dificultades en la Regulación Emocional. *Clínica y Salud*, 19, 139-156.
- Hewitt, P. & Flett, G. (1991). Perfectionism in the self and social contexts: Conceptualization, assessment, and association with psychopathology. *Journal of Personality and Social Psychology*, 60(6), 456-470. <http://dx.doi.org/10.1037/0022-3514.60.3.456>.
- Jackson, T. & Chen, H. (2010). Factor structure of the Sociocultural Attitudes Towards Appearance Questionnaire 3 among adolescent boys in China. *Body Image*, 7(4), 349-355. <http://dx.doi.org/10.1016/j.bodyim.2010.07.003>.
- Kamody, R. C., Thurston, I. B., Decker, K. M., Kaufman, C. C., Sonnevile, K. R. & Richmond, T. K. (2018). Relating shape/weight based self-esteem, depression, and anxiety with weight and perceived physical health among young adults. *Body Image*, 25, 168-176. <https://doi.org/10.1016/j.bodyim.2018.04.003>
- Kanayama, G. & Pope, H. G. (2011). Gods, men, and muscle dysmorphia. *Harvard Review of Psychiatry*, 19, 95-98. <http://dx.doi.org/10.3109/10673229.2011.565250>
- Karazsia, B. & Crowther, J. (2008). Psychological and behavioral correlates of the SATAQ-3 with males. *Body Image*, 5(1), 109-115. <http://dx.doi.org/10.1016/j.bodyim.2007.08.004>.
- 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(2), 13-120. <http://dx.doi.org/10.1016/j.bodyim.2009.01.002>.
- Levine, M. & Piran, N. (2004). The role of body image in the prevention of eating disorders. *Body Image*, 1(1), 57-70. [http://dx.doi.org/10.1016/S1740-1445\(03\)00006-8](http://dx.doi.org/10.1016/S1740-1445(03)00006-8).
- Llorente, E., Warren, C. S., de Eulate, L. P. & Gleaves, D. H. (2013). A Spanish version of the Sociocultural Attitudes Towards Appearance Questionnaire 3 (SATAQ 3): Translation and psychometric evaluation. *Journal of Clinical Psychology*, 69(3), 240-251. <http://dx.doi.org/10.1002/jclp.21944>
- McCreary, D. R. & Sasse, D. K. (2000). An exploration of the drive for muscularity in adolescent boys and girls. *Journal of American College Health*, 48(6), 297-304. <https://doi.org/10.1080/07448480009596271>
- Madanat, H., 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(4), 421-425. <http://dx.doi.org/10.1016/j.bodyim.2006.09.004>.
- Marín, M., Robles, R., González-Forteza, C. & Andrade, P. (2012). Propiedades psicométricas de la escala Dificultades en la Regulación Emocional en español (DERS-E) para adolescentes mexicanos. *Salud Mental*, 35(6), 521-526. [http://dx.doi.org/10.1016/S0924-9338\(12\)74474-7](http://dx.doi.org/10.1016/S0924-9338(12)74474-7)
- Markland, D. & Oliver, E. (2008). The Sociocultural Attitudes Toward Appearance Questionnaire-3: A confirmatory factor analysis. *Body Image*, 5(1), 116-121. <http://dx.doi.org/10.1016/j.bodyim.2007.10.001>.
- Murawski, B., Elizathe, L., Custodio, J. & Rutzstein, G. (2015). Validación argentina del Sociocultural Attitudes Towards Appearance Questionnaire-3. *Revista Mexicana de Trastornos Alimentarios*, 6(2), 73-90. <http://dx.doi.org/10.1016/j.rmta.2015.09.001>
- Nerini, A., Matera, C. & Pisani, E. (2011). Validation of an Italian version of the Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3) on boys. *Counseling*, 4, 195-208. <http://dx.doi.org/10.1016/j.bodyim.2011.06.001>.
- Peláez-Fernández, M. A., Labrador, J. F. & Raich, R. M. (2012). Validation of Eating Disorder Examination Questionnaire (EDE-Q) –Spanish version– for screening eating disorders. *Spanish Journal of Psychology*, 15(2), 817-82. http://dx.doi.org/10.5209/rev_SJOP.2012.v15.n2.38893.
- Penelo, E., Negrete, A., Portell, M. & Raich, R. M. (2013). Psychometric properties of the Eating Disorder Examination Questionnaire (EDE-Q) and norms of rural and urban adolescent males and females in Mexico. *Plos One*, 8(12), e-83245. <http://dx.doi.org/10.1371/journal.pone.0083245>.
- Rodríguez, M., Rojo, E., Ortega, T. & Sepúlveda, A. R. (2009). Adaptación de la Escala Multidimensional de Perfeccionismo a estudiantes universitarios españoles. *Ansiedad y Estrés*, 15, 13-27.
- Rosenmann, A., Kaplan, D., Gaunt, R., Pinho, M. & Guy, M. (2018). Consumer masculinity ideology: Conceptualization and initial findings on men's emerging body concerns. *Psychology of Men & Masculinity*, 19(2), 257-272. <http://dx.doi.org/10.1037/men0000095>
- Rousseau, A., Valls, M. & Chabrol, H. (2010). Validation of the French version of the Sociocultural Attitudes Towards Appearance Scale 3. *Encephale*, 36(4), 270-276. <http://dx.doi.org/10.1016/j.encep.2008.03.013>.
- Sánchez-Carracedo, D., Barrada, J., López-Guimerá, G., Fauquet, J., Almenara, C. A. & Trepát, E. (2012). Analysis of the factor of the Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ-3) in Spanish secondary-school students through exploratory structural equation modeling. *Body Image*, 9(1), 163-171. <http://dx.doi.org/10.1016/j.bodyim.2011.10.002>.

- Schaefer, L. M., Burke, N., Thompson, J., Dedrick, R., Heinberg, L., Calogero, R. M. et al. (2015). Development and validation of the Sociocultural Attitudes Towards Appearance Questionnaire-4 (SATAQ-4). *Psychological Assessment*, 27(1), 54-67. <http://dx.doi.org/10.1037/a0037917>.
- Sepúlveda, A. R., Anastasiadou, D., de Pellegrín, Y., Blanco, M., García, P. & Bustos, C. (2016). A confirmatory factor analysis of the Male Body Attitudes Scale (MBAS) among Spanish adolescent males. *Men & Masculinities*, 19, 1-19. <http://dx.doi.org/10.1177/1097184X16634798>.
- Soares, A. C., Conti, M. A., Caputo, M. E. & Filgueiras, J. F. (2015). Avaliação Psicométrica do Questionário de Atitudes Socioculturais em Relação à Aparência-3 (SATAQ-3) para adolescentes. *Psicologia: Teoria e Pesquisa*, 31(4), 471-479. <http://dx.doi.org/10.1590/0102-37722015042419471479>
- Soares, A. C., Cordás, T. A., Conti, M. A. & Caputo, M. E. (2011). Equivalência semântica e avaliação da consistência interna da versão em português do Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3). *Cadernos de Saúde Pública*, 27(8), 1487-1497. <http://dx.doi.org/10.1590/S0102-311X2011000800004>.
- 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(4), 432-436. <http://dx.doi.org/10.1016/j.bodyim.2011.06001>.
- Striegel, R. (2019). the role of sociocultural factors in the etiology of eating disorders. *Psychiatric Clinics of North America*. 1(42), 121-144. <https://doi.org/10.1016/j.psc.2018.10.009>
- Swami, V. (2009). An examination of the factor structure of the Sociocultural Attitudes Towards Appearance Questionnaire-3 in Malaysia. *Body Image*, 6(2), 129-132. <http://dx.doi.org/10.1016/j.bodyim.2009.01.003>.
- Thompson, J., Heinberg, L. & Stormer, S. (1995). Development and validation of the Sociocultural Attitudes Towards Appearance Questionnaire. *International Journal of Eating Disorders*, 17(1), 81-89. [http://dx.doi.org/10.1002/1098-108X\(199501\)17:1<81::AID-EAT2260170111>3.0.CO;2-Y](http://dx.doi.org/10.1002/1098-108X(199501)17:1<81::AID-EAT2260170111>3.0.CO;2-Y).
- Thompson, J. & Stice, E. (2001). Thin-ideal internalization: Mounting evidence for a new risk factor for body image disturbance and eating pathology. *Current Directions in Psychological Science*, 10(5), 181-183. <http://dx.doi.org/10.1111/1467-8721.00144>.
- Thompson, J., Van den Berg, P., Roehrig, M., Guarda, A. S. & Heinberg, L. (2004). The Sociocultural Attitudes towards Appearance Scale-3 (SATAQ-3). *International Journal of Eating Disorders*, 35, 293-304. <http://dx.doi.org/10.1002/eat.10257>.
- Tylka, T., Bergeron, D. & Schwartz, J. P. (2005). Development and psychometric evaluation of the Male Body Attitudes Scale (MBAS). *Body Image*, 2(2), 161-175. <http://dx.doi.org/10.1016/j.bodyim.2005.03.001>.
- Unikel, C., Díaz de León, C. & Rivera-Márquez, J. (2017). *conductas alimentarias de riesgo y factores de riesgo asociados: Desarrollo y validación de instrumentos de medición*. México: Universidad Autónoma Metropolitana.
- Unikel, C., Juárez, F. & Gómez, G. (2006). Psychometric properties of the Attitudes Towards Body Figure Questionnaire in Mexican female students and patients with eating disorders. *European Eating Disorders Review*, 14(6), 430-435. <http://dx.doi.org/10.1002/erv.757>
- Vázquez, R., Alvarez, G. & Mancilla, J. M. (2000). Consistencia interna y estructura factorial del Cuestionario de Influencia de los Modelos Estéticos Corporales (CI-MEC), en población mexicana. *Salud Mental*, 23(6), 18-24.
- Warren, C. S., Gleaves, D. H. & Rakhkovskaya, L. M. (2013). Score reliability and factor similarity of the sociocultural Attitudes Towards Appearance Questionnaire 3 (SATAQ-3) among four ethnic groups. *Journal of Eating Disorders*, 1(1), 1-14. <http://dx.doi.org/10.1186/2050-2974-1-14>.
- Wheeler, D., Vassar, M. y Hale, W. (2011). A gender-based measurement invariance study of the Sociocultural Attitudes Toward Appearance Questionnaire-3. *Body Image*, 8(2), 168-172. <http://dx.doi.org/10.1016/j.bodyim.2010.12.004>.
- Wichstrøm, L. & von Soest, T. (2016). Reciprocal relations between body satisfaction and self-esteem: A large 13-year prospective study of adolescents. *Journal of Adolescence*. 47, 16-27. <http://dx.doi.org/10.1016/j.adolescence.2015.12.003>
- Wilksch, S. M. & Wade, T. D. (2012). Examination of the Sociocultural Attitudes Towards Appearance Questionnaire-3 in a mixed-gender young-adolescent sample. *Psychological Assessment*, 24(2), 352-364. <http://dx.doi.org/10.1037/a0025618>