Brief research report

Confirmatory factor analysis and psychometric properties of the Spanish version of the Multidimensional Body-Self Relations Questionnaire-Appearance Scales in early adolescents

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ABSTRACT

The main aim of this study was to confirm the factorial structure of the Spanish version of the Multidimensional Body-Self Relations Questionnaire-Appearance Scales in early adolescents from 12 to 14 years. The sample included 355 participants, 189 girls and 166 boys, with ages ranging from 12 to 14 years old. The original MBSRQ-AS 5-factor structure was confirmed, and the model showed a good fit to the data: Appearance Evaluation, Appearance Orientation, Body Areas Satisfaction, Overweight Preoccupation, and Self-Classified Weight. The internal consistency of the test scores was adequate. Girls had higher score s than boys on Appearance Orientation, Overweight Preoccupation, and Self-Classified Weight, and lower scores on Appearance Evaluation and Body Areas Satisfaction. This study confirms the factor structure of the MBSRQ-AS.

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1. Introduction

Early adolescence can be a challenging period for girls and boys, as it is associated with entry into puberty, changes in body shape, and a greater capacity for self-reflection. Studies suggest that a different role is played by body image in early adolescents compared to older adolescents (Paxton, Neumark-Sztainer, Hannan, & Eisenberg, 2006). A large number of pre-pubescent and adolescent girls report being dissatisfied with their weight or shape. In preadolescence, about 40–50% report wanting to be thinner, and in adolescence this percentage increases to 70% (Carey, Donaghue, & Broderick, 2014). In adolescent boys, studies indicate that 57% report being dissatisfied with their bodies. They are specifically concerned about both muscularity and overweight (McCabe & Ricciardelli, 2004), and so they engage in radical body change strategies (e.g., weightlifting, protein supplements, etc.) (Murnen, 2011). Longitudinal studies with adolescents suggest

that body dissatisfaction and negative attitudes about weight and the body predicted future eating disorders over periods of four years (Wertheim, Paxton, & Blaney, 2004). Body image disturbances are some of the most prominent clinical characteristics of eating disorders and overweight (e.g. Watson, Raykos, Street, Fursland, & Nathan, 2011). They are also associated with the chronic use of appearance- and performance-enhancing drugs (Hildebrandt, Alfano, & Langenbucher, 2010), and they are a risk factor for the development of depression or low self-esteem (Mond, Van den Berg, Boutelle, Hannan, & Neumark-Sztainer, 2011).

The MBSRQ-Appearance Scales (MBSRQ-AS; Cash, 2000, 2015) were created to evaluate the different dimensions of body image. The MBSRQ-AS is a 34-item self-report inventory composed of five subscales: Appearance Evaluation (AE), Appearance Orientation (AO), Body Areas Satisfaction Scale (BASS), Overweight Preoccupation (OP), and Self-Classified Weight (SCW). The MBSRQ-AS has been employed in a large number of studies with clinical and nonclinical samples (e.g., Cash, 2015; Vossbeck-Elsebusch et al., 2014). The MBSRQ-AS has been utilized in different languages, but with different procedures and results. In the French version (Untas, Koleck, Rascle, & Borteyrou, 2009) (with participants' ages ranging from 18 to 61 years), only the two main factors of the MBSRQ-AS

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(AE and AO) were used in the exploratory factor analysis, explaining 42.3% of the variance. In the Greek adaptation (Argyrides & Kkeli, 2013) (with participants' ages ranging from 15 to 19 years), an exploratory factor analysis was carried out with only the AE and AO factors, explaining 41.44% of the total variance. In the German adaptation (Vossbeck-Elsebusch et al., 2014) (participants' mean age was 26.42, $SD = 6.65$), a confirmatory factor analysis was conducted, showing goodness of fit for the four-factor model (AE, AO, BASS, and OP). The Spanish version (Roncero, Perpiñá, Marco, & Sanchez-Reales, 2015), using confirmatory factor analysis with participants with ages ranging from 17 to 35 years, showed excellent goodness of fit indices for the original five-factor structure. However, the factor structure of the MBSRQ-AS has not been confirmed for adolescents younger than 15 years old.

The aim of the present study was to confirm the factorial structure of the MBSRQ-AS in early adolescents from 12 to 14 years old and analyze its psychometric properties. Another objective was to analyze gender differences in the MBSRQ-AS subscales in early adolescents.

2. Method

2.1. Participants

Participants included 355 early adolescents, 189 girls and 166 boys from Valencia, Spain. The mean age for the sample was 13.15 years ($SD = 0.84$), ranging from 12 to 14. For the girls, the mean age was 13.19 ($SD = 0.81$), and 13.03 for the boys ($SD = 1.34$). Regarding the grade level for the overall sample, ranging from levels 1 to 3, 39% were in the first year of Compulsory Secondary Education (7th grade), 28% were in the second year (8th grade), and 33% were in the third year (9th grade). BMI standard deviation scores were calculated, adjusted for sex and age. In terms of weight, 2.46% of the participants were categorized as severely underweight (under the 3rd percentile), 83.7% as normal weight (between the 3rd and 85th percentiles), 9.53% as overweight (between the 85th and 95th percentiles), and 4.31% as obese (above the 95th percentile) (Sobradillo et al., 1988). All participants were Caucasian, and all of them understood Spanish.

2.2. Procedure

First, we contacted all the schools in Valencia by telephone to explain the aim of the study, and we asked if they were interested in collaborating in this research. Five schools, 10% of all the schools in Valencia, decided to collaborate in this study. The students provided written agreement, and the parents gave written consent for participation in the study. The students filled out the questionnaires during their normal school day, and their weight and height were measured individually by the psychologists on the research team at the beginning of the school day. One hundred percent of the students from these schools participated in the study. Standardized test administration procedures were followed in the administration of all measures. This study received the ethical approval of the University Ethics Committees.

2.3. Measures

2.3.1. Multidimensional Body-Self Relations Questionnaire-Appearance Scales (MBSRQ-AS; Brown, Cash, & Mikulka, 1990; Cash, 2000, 2015).

The MBSRQ-AS is a 34-item self-report inventory composed of five subscales with good psychometric properties with males and females: (a) AE, assesses evaluative beliefs and feelings of satisfaction or dissatisfaction with one's appearance; (b) AO, assesses the degree of cognitive and behavioral investment in one's appearance; (c) BASS, assesses satisfaction or dissatisfaction with specific body areas, weight, height, and muscle tone; (d) OP, assesses fat anxiety, weight vigilance, dieting, and eating restraint; and (e) SCW, assesses how one perceives his or her weight. The items are rated on a 5-point Likert-type scale and assess agreement from 1 (*strongly disagree*) to 5 (*strongly agree*), frequency from 1 (*never*) to 5 (*quite often*), or satisfaction from 1 (*very dissatisfied*) to 5 (*very satisfied*). Finally, for the items related to weight, the participants use ratings from 1 (*very underweight*) to 5 (*very overweight*). In this study, we used the Spanish version of the MBSRQ-AS (Roncero et al., 2015).

2.3.2. Eating Attitudes Test (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982).

This is a self-report instrument that assesses attitudes and behaviors related to eating disorders on three subscales: Dieting, Bulimia and Food Preoccupation, and Oral Control. Each item is scored on a 6-point Likert scale from 3 (*always*) to 0 (*never*). For this study, we used the Spanish version (Castro, Toro, Salamero, & Guimera, 1991). The scores showed good internal consistency reliability in the present sample (range $\alpha = .78–.89$).

3. Data analysis

The factor structure of the MBSRQ-AS was confirmed following the Bentler and Bonett (1980) criteria for the fit indices: Comparative Fit Index (CFI) and Root Mean-Square Error of Approximation (RMSEA). Hu and Bentler (1999) suggested that a CFI of at least .90 and a RMSEA of less than .06 would together indicate a good fit. Given the nature of the variables (ordered categorical and non-normal), polychoric correlations and maximum likelihood Satorra–Bentler corrected standard errors and test statistics were used as the estimation method in EQS, as recommended in the literature (Finney & DiStefano, 2006). To examine the internal consistency of the scores and factors, Cronbach's alphas were computed with the overall sample and for each gender. Associations between the MBSRQ-AS factors, BMI, and other measures were conducted by computing Pearson's correlations with the subsamples of girls and boys separately. To analyze whether there were gender differences in the MBSRQ-AS scales, we performed t tests for independent samples and computed Cohen's d.

4. Results

4.1. Confirmatory factor analysis

Univariate tests of normality were performed, and we confirmed that the scores were not normally distributed in any of the subscales: AE: $K\text{-}S_{(328)} = .053$; $p = .027$. AO: $K\text{-}S_{(328)} = .054$; $p = .020$. BASS: $K\text{-}S_{(328)} = .073$; $p < .001$. OP: $K\text{-}S_{(328)} = .131$; $p < .001$. SCW: $K\text{-}S_{(328)} = .275$; $p < .001$. Multivariate tests of normality were also performed: Mardia's coefficient = 197.95; Mardia's normalized estimate = 37.69. The original 5-factor structure of the MBSRQ-AS reported by Cash (2000) fit the data well, although the Satorra–Bentler robust chi-square was statistically significant $\chi^2_{(517)} = 964.80$, $p < .001$. The CFI = .96 and RMSEA = .04 (90% CI [.04–.05]) were good, according to all the established guidelines (e.g., Byrne, 1994; Hu & Bentler, 1999). All the items' standardized loadings were higher than the absolute value of .30, with the exception of Item 11 ($\lambda = -.17$) and Item 16 ($\lambda = -.22$) (Table 1). The scores showed good internal consistency in the overall sample, as Cronbach's alphas were adequate: AE $\alpha = .84$; AO $\alpha = .82$; BASS $\alpha = .84$; OP $\alpha = .73$; SCW $\alpha = .77$. In the same way, the scores showed good internal consistency in the boys' and girls' samples, as Cronbach's alphas were adequate. For boys, all the Cronbach's alphas exceeded .68 for every subscale (range $\alpha = .83–.68$), and for girls, Cronbach's alphas exceeded .70 for every subscale (range $\alpha = .86–.72$).