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School Anxiety Inventory–Short Version: Factorial Invariance and Latent Mean Differences Across Gender and Age in Spanish Adolescents

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Abstract

This study examined the factorial invariance and latent mean differences of the School Anxiety Inventory–Short Version across gender and age groups for 2,367 Spanish students, ranging in age from 12 to 18 years. Configural and measurement invariance were found across gender and age samples for all dimensions of the School Anxiety Inventory–Short Version.

Keywords

adolescence, factorial invariance, inventory, measurement invariance, school anxiety

Introduction

School anxiety is considered to be a subset of symptoms of general school refusal behavior, which is defined as a general difficulty attending or remaining in school for an entire day and is observed in youths aged 5 to 17 years (Kearney, Cook, & Chapman, 2007). These authors argued that the top two reasons why youths refuse school are closely related to the concept of school anxiety or stress. These reasons are as follows: (a) to avoid school-related objects and situations that provoke a general sense of negative affect (i.e., anxiety) and (b) to escape aversive social and/or evaluative situations at school. According to Kearney and Spear (2012), these functions refer to youth who refuse school due to negative reinforcement or to avoid unpleasant school-related circumstances.

School stress or anxiety is defined as unpleasant physical and cognitive symptoms in response to global and specific school-related stressors (Kearney et al., 2007). Thus, school anxiety can be defined as a response pattern elicited by stressful school situations that the student perceives as threatening and/or dangerous. This response pattern includes cognitive symptoms (unpleasant thoughts and apprehension), physiological symptoms (high level of arousal), and behavioral symptoms (avoidance and/or escape behavior; García-Fernández, Inglés, Martínez-Monteagudo, & Redondo, 2008).

Self-report measures are a common method for assessing school refusal behavior (Kearney & Spear, 2012) and school anxiety (see Martínez-Monteagudo, Inglés, &

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García-Fernández, 2013, for a review). The self-report method is especially important given the subjective and internalized nature of anxiety (Mash & Barkley, 2007; Silverman & Ollendick, 2005). Thus, Miller and Jome (2008) observed that self-report scales are commonly used instruments for the assessment of childhood internalizing disorders (e.g., school phobia/refusal) and are the most valued by school psychologists. Early recognition and intervention is necessary for adolescents with school anxiety to improve their school and social functioning and prevent the development of other psychological disorders (Miller & Jome, 2010). Along these lines, the School Anxiety Inventory–Short Version (SAI-SV; García-Fernández, Inglés, Marzo, & Martínez-Monteagudo, 2014) is a self-report measure that assesses the frequency of cognitive anxiety responses, physiological anxiety responses, and behavioral anxiety responses to school situations that generate anxiety.

The overall goals of the present study were to extend the existing evidence base for the SAI-SV testing for internal consistencies, configural, measurement invariance, and latent mean differences of scores on the SAI-SV across gender and age groups in a sample of Spanish middle and high school students.

Previous Evidence of the Reliability and Validity of SAI-SV Scores

The short version of the SAI (the SAI-SV) was recently developed by García-Fernández et al. (2014) from the long version of the SAI (the SAI-LV; García-Fernández, Inglés, Martínez-Monteagudo, Marzo, & Estévez, 2011). The conceptual basis of the SAI originated with the integration of Lang's three-dimensional theory (Lang, 1968; see Martínez-Monteagudo, Inglés, Cano-Vindel, & García-Fernández, 2012, for a review) and the person–situation interaction model of anxiety proposed by Endler (1975).

The SAI-LV included 23 school situations and 19 anxiety responses (nine cognitive, five physiological, and five behavioral). In this case, the situations × responses interaction results in 200 items. However, due to the SAI-LV's administration time, it may not be useful in certain situations. Furthermore, researchers and students often perceived the length of the SAI-LV to be excessive, especially when administered in combination with other instruments.

To address this concern, García-Fernández et al. (2014) developed the SAI-SV. The SAI-SV is composed of 15 items related to school situations and 15 items related to three response systems of anxiety (five cognitive, five physiological, and five behavioral responses). Hence, the student must respond to 225 blank cells (15 × 15). A panel of experts reviewed the SAI-SV to reduce the number of items while maintaining the relevant information for assessment. Thus, the SAI-SV was delivered to 10 expert judges who had an average of 12.5 years of experience in research and professional practice in school and clinical psychology. Specifically, six judges were researchers who specialized in anxiety disorders in childhood and adolescence, and four judges were school psychologists from four public high schools. All judges rated the degree of relevance of each item of the SAI via a 5-point Likert-type scale (0 = *not relevant*, 4 = *fairly or very relevant*). An item was retained when at least eight judges (agreement rate = 80%) rated the item as quite or very relevant (blank cells). As a result, 109 cells were eliminated (black cells), so the student must respond to 116 blank cells (García-Fernández et al., 2014).

The SAI-SV was administered to a sample of 2,367 Spanish secondary school students ranging from 12 to 18 years of age (García-Fernández et al., 2014). The purposes of this study were (a) to examine the validity evidence based on the internal structure drawn from the scores on the SAI-SV by cross-validation using principal axis factoring (PAF) and confirmatory factor analysis (CFA); (b) to estimate the internal consistency (Cronbach's alpha coefficients) of scores on the SAI-SV; and (c) to estimate the 2-week test–retest reliability coefficients for SAI-SV scores.

One PAF for school situations was performed with promax rotation because of the

assumption of correlated factors. Three PAFs were performed for the triple response system of anxiety as assessed by the SAI-SV. Next, CFAs were conducted with all samples to test the models obtained in the PAFs.

The PAF applied to school situations in the SAI-SV identified three factors: anxiety about aggression (AA) included five items (e.g., "If I am insulted or threatened"), anxiety about social evaluation (ASE) included five items (e.g., "If I ask the teacher in class"), and anxiety about academic failure (AAF) included five items (e.g., "If I get bad marks"). The correlations between the factors presented a large magnitude ($r > .50$; Cohen, 1988), ranging from .52 (ASE-AAF) to .59 (AA-AAF).

The PAF applied to each response system in the SAI-SV identified the following three factors: (a) physiological anxiety (PA) included five items (e.g., "My heart beats quickly"), (b) cognitive anxiety (CA) included five items (e.g., "It frightens me and it makes me nervous"), and (c) behavioral anxiety (BA) included five items (e.g., "My voice trembles").

CFA supported the correlated three-factor model (i.e., AA, ASE, and AAF) of the SAI-SV that was identified by the PAF. Furthermore, CFA also supported the factor model for the PA, CA, and BA scales of the SAI-SV.

García-Fernández et al. (2014) found internal satisfactory consistency coefficients (Cronbach's alpha) for all scores of the SAI-SV, ranging from .77 (BA) to .94 (AA). Furthermore, the 2-week test–retest reliability ranged from .74 (AC) to .87 (AA).

Utility of the SAI-SV for Counseling and Development Researchers and Practitioners

School phobia/refusal (labeling as used by Miller & Jome, 2008) is one of the nine internalizing disorders widely considered to be among the most prevalent and the problem of which school psychologists should be more aware (Miller & Jome, 2008). Miller and Jome (2010) examined the perceived knowledge, role preferences, and training needs in a sample of school psychologists in the United States regarding school-based prevention and treatment of some of the most common internalizing disorders and problems (e.g., school phobia/refusal) experienced by children and adolescents. The results revealed a strong consensus in the sample that school psychologists should play a major role both in preventing (88.6%) and treating (90.1%) school phobia/refusal in the school setting. Assessing this problem was viewed as an appropriate role by 92.9% of the school psychologists in the country. Furthermore, participants indicated that they required some additional training with regard to school phobia/refusal: 51% (prevention) and 47.5% (treatment). Participants also largely believed that it was important for school psychologists to have adequate knowledge of preventing and treating all internalizing disorders analyzed, with school phobia/refusal being perceived as the most prominent problem. In this line, Miller and Jome (2008) indicated that self-report scales are frequently used and are very positively valued by school psychologists.

A primary role and function of school psychologists is to provide assessments of children and youth suspected of having emotional problems (Merrell, Ervin, & Gimpel, 2006). However, internalizing disorders in children and adolescents are frequently misunderstood and overlooked by school personnel (Gosch, Flannery-Schroeder, & Brecher, 2012; Merrell & Gueldner, 2010). Because they are frequently difficult to observe, internalizing disorders are often underreported at school, and as a result, they have been described as a secret illness (Miller & Jome, 2010). In this line, Herzig-Anderson, Colognori, Fox, Stewart, and Masia-Warner (2012) indicated that there is some evidence suggesting that youth are more likely to contact services than parents or other adults when school personnel (e.g., teachers, school counselors) explicitly show awareness of their anxiety.

Bearing in mind these considerations, the SAI is a promising assessment tool that enables detecting different school situations that elicit anxiety. Another feature of the SAI is that it separately assesses cognitive, physiological, and behavioral symptoms of school

anxiety. Obtaining these three scores is essential, as some studies revealed that anxiety is not a unitary construct, but that the responses of the three systems may vary in different ways (Lang, 1968; see Martínez-Monteagudo et al., 2012, for a review). This issue has gained particular strength from studies of dyssynchrony or fractionation response (e.g., Haynes & Wilson, 1979).

The SAI is an accurate tool to assess cognitive responses to school anxiety. It is also a detector of physiological and motor responses to anxiogenic situations. However, thorough assessment should confirm the results obtained by the SAI using physiological recording techniques and direct observation, respectively. In addition, school situations and anxiety responses are described in the SAI in concrete terms (not just abstractions), which allows easily validating the information obtained by the SAI if, as recommended by Riccio and Rodriguez (2007), it is used along with other methods of psychological and educational assessment, such as interviews, rating scales, observations, and curriculum-based measurement to define important target areas in educational training programs.

In the educational context, the SAI-SV allows a more rigorous study of the relations between academic achievement and school anxiety, school problems, and so on. In research, the SAI-SV facilitates the development and testing of new hypotheses in conducting and/or replicating different works, both from a behavioral approach as well as from an interactive approach. It also greatly simplifies the task of selecting samples based on the degree of subjects' cognitive, physiological, or motor reactivity.

Furthermore, in educational and clinical settings, the SAI-SV provides the greatest benefits both in assessment and treatment. Regarding assessment, the SAI-SV provides more detailed and complete information to assess school situations, responses, the interaction between situations and responses, and the three response systems separately. Additionally, it greatly facilitates functional analysis of behavior when conducting systematic explorations, with a considerable saving of time. Regarding treatment, the SAI allows conducting a prescan to provide guidelines on school situations that are problematic for the individual, as well as on responses to be modified and more personalized treatments. Thus, the SAI-SV provides guidance on the treatment technique to be employed and can function as a predictor of the success of various treatment techniques. This allows a more individualized and effective use of anxiety-reducing techniques, using specific strategies depending on the prevailing component (e.g., Lang, Melamed, & Hart, 1970; Ost, Johansson, & Jerremalm, 1982; Wolpe, 1977): cognitive (i.e., self-instructions, cognitive restructuring, stress inoculation, fading), physiological (i.e., relaxation training, systematic desensitization, biofeedback), or behavioral (i.e., social skills training and reinforced practice).

The SAI-SV provides important information for adolescents, educational and clinical psychologists, and researchers. This instrument can be used as a screening measure to identify school situations that elicit anxiety and anxiety responses (cognitive, physiological, and behavioral) that adolescents find troublesome, which may serve as important target areas in training programs. Thus, the SAI-SV can be used as a counseling tool for adolescents, for school anxiety remediation, or in prevention programs in a variety of clinical, educational, and research settings, such as schools, counseling and mental health centers, social service agencies, research centers, and so on.

The Present Study

Although prior research has supported the factorial structure of scores on the SAI-SV in samples of Spanish secondary education students (García-Fernández et al., 2014), current studies have not examined whether the factor structure of the SAI-SV is invariant across gender and age groups of adolescents. Rather, previous research that focused on multigroup comparison (e.g., gender and age differences) of SAI-SV scores has typically assumed that this instrument operates in exactly the same

way across groups (e.g., boys and girls) and the underlying construct (i.e., school anxiety or its dimensions) has the same theoretical structure and psychological meaning across groups (e.g., García-Fernández, Martínez-Monteagudo, & Inglés, 2011).

Thus, to date, there is a lack of information regarding whether the SAI-SV measures the same components of school anxiety with equal validity for boys and girls and for adolescents from different age groups. Some researchers have argued that establishing measurement invariance is necessary for a between-group difference to be unambiguously interpreted, as between-group differences could reflect either a "true" difference in the construct of interest or different psychometric properties of the scale items. Furthermore, the role of testing for measurement invariance as a procedure to collect evidence of the generalizability of validity (under the unified construct-based model of validity; e.g., Messick, 1995) is another important aspect. In this sense, several researchers (Bentler, 2005; Brown, 2006; Byrne, 2006; Dimitrov, 2010) state that unless there is reasonable support for the measurement invariance of the factor structure of the SAI-SV across gender and age groups, comparing responses of boys and girls or of adolescents from different age groups may not be justified.

Such concerns about factor structure invariance are most appropriately analyzed using multigroup confirmatory factor analysis (MGCFA). MGCFA is an extension of single CFA and can determine whether (and how) the factor structure of the SAI-SV varies according to gender and age group (Brown, 2006; Byrne, 2006; Dimitrov, 2010). Therefore, the present study used MGCFA to examine whether the components of the SAI-SV are operating equivalently across age and gender groups and to analyze the latent mean differences in SAI-SV scores across gender and age groups.

In summary, the key goals of this study were (a) to examine the internal consistencies of scores on the SAI-SV across gender and age groups, (b) to examine the normality or distribution of the SAI-SV items by gender and adolescent age groups, (c) to extend the evidence of the validity of scores on the SAI-SV by analyzing configural invariance and measurement invariance, and (d) to examine the invariance of latent mean structures on the SAI-SV across gender and adolescent age groups using MGCFA in a sample of Spanish middle and high school students.

Based on the above study aims, the following hypotheses were advanced.

Hypothesis 1: The scores on the SAI-SV will demonstrate adequate internal consistency (i.e., Cronbach's alpha above .70).
Hypothesis 2: The correlated three-factor structure related to school situations (AA, ASE, and AAF) and the factor structure related to three system response systems of anxiety (FA, CA, and BA) will be equivalent across gender and adolescent age groups.
Hypothesis 3: There will be latent mean differences in the scores of the SAI-SV across gender and age groups. However, the exact pattern of the latent mean differences is an open research question because previous studies (e.g., García-Fernández, Martínez-Monteagudo, et al., 2011) have examined gender and age or grade differences based on observed mean scores for the SAI but not based on latent mean scores.

Method

Participants

The research study took place in two provinces in southeast Spain during the 2011–2012 academic year. The province of Alicante served 71,565 students in 241 schools, and the province of Murcia served 65,264 students in 224 schools (Spanish Ministry of Education and Science, 2013).

Cluster random sampling was performed throughout the five geographical areas of the provinces of Alicante and Murcia, Spain: center, north, south, east, and west. Seventeen high schools from rural and urban areas, 14

public and 3 private, were randomly selected to represent all geographical areas. Each geographical area was represented by an average of one school. Once the schools were selected, six classrooms were randomly chosen from each school, with approximately 140 students per school.

The initial sample consisted of 2,415 high school students from Grades 7 to 12. To avoid missing data, 48 (2.03%) students were excluded from the study because their answers were incomplete or their parents did not provide informed written consent. All the students participated voluntarily, and no students declined to participate. The final sample was composed of 2,367 students (1,134 boys and 1,233 girls). Their ages ranged from 12 to 18 years ($M = 14.80$; $SD = 1.92$). The distribution of the sample according to age groups and gender was as follows: 745 (349 boys and 396 girls) 12 to 13 year olds, 714 (351 boys and 363 girls) 14 to 15 year olds, and 908 (434 boys and 474 girls) 16 to 18 year olds.

A chi-square test was used to evaluate gender and age differences in the distribution of adolescents, finding no significant differences for the six Age × Gender groups ($\chi^2 = .79$; $p = .67$). The effect size was small ($d < .30$; Cohen, 1988), supporting the absence of gender or age differences in the distribution of the sample ($Phi = .02$).

Measure

School Anxiety Inventory–Short Version. The SAI-SV (García-Fernández et al., 2014) can be administered to students who range in age from 12 to 18 years. This instrument assesses the frequency of five cognitive anxiety responses, five physiological anxiety responses, and five behavioral anxiety responses to 15 school situations.

The SAI-SV has a situation-response format. Students are asked to assess the frequency with which they experience cognitive, physiological, and behavioral anxiety responses in 15 school situations using a 5-point Likert-type scale (0 = *never*; 1 = *a few times*; 2 = *sometimes yes, sometimes no*; 3 = *lots of times*; and 4 = *always*). The three anxiety responses and the 15 school situations that comprise the SAI-SV have a two-way table format. The cognitive anxiety, physiological anxiety, and behavioral anxiety scales are each displayed on a separate table (on the vertical axis), and the 15 school situations are displayed on the horizontal axis of each of the tables. Only the blank cells in each table must be completed. Therefore, a student must read a school situation on the horizontal axis of the table and the corresponding responses (either cognitive, physiological, or behavioral) on the vertical axis only when the intersection of the two is blank rather than black.

Procedure

Adolescents provided consent prior to participation, and their parents had to provide active informed consent. The SAI-SV was administered in each participating classroom. Research assistants informed the adolescents that their participation was strictly voluntary. The questionnaire was distributed with instructions and answer sheets. The instructions were read aloud. Research assistants supervised each administration, answered questions, and verified that the participants completed the test independently. The average administration time was 20 minutes.

Statistical Analyses

The data analysis plan was as follows. First, we computed the internal consistencies for the scores on the SAI-SV, estimated separately by gender and age group using McDonald's coefficient omega (McDonald, 1999) for the SAI-SV scores with the MBESS Package (method: Bias-Corrected and accelerated [BCa]; 95% confidence interval). Second, we examined the normality or distribution of the SAI-SV items by obtaining univariate skewness, univariate kurtosis, and multivariate kurtosis values following the procedures outlined by Finney and DiStefano (2006). Third, we conducted MGCFA in the framework of structural equation modeling to investigate the factorial invariance or equivalence (i.e., the configural and measurement invariance) and the invariance

of the mean structures on the SAI-SV scores across gender and age groups. Specifically, following the procedure outlined by Dimitrov (2010), we analyzed the configural invariance; the measurement invariance, which includes the metric invariance (i.e., equal factor loadings across groups) and the scalar invariance (i.e., equal item intercepts across groups); and the structural invariance (i.e., the invariance of factor variances and covariances). We do not provide testing for invariance of item uniqueness (equal error variances). This was not done because (a) the test for invariant error variances is too stringent and (b) it is not necessary for the test of group latent mean differences (Dimitrov, 2010), which is the goal in this study. The confirmation of the invariance of the intercepts (i.e., strong or scalar invariance) permits comparison of the latent means across groups. Differences in various parameters were assessed based on the results of the Lagrange multipliers method, which suggests which cross-group equality constraints could be released to improve the model fit (Byrne, 2006).

The analyzed models can be considered nested models to which constraints are progressively added. To compare the nested models, we computed the chi-square differences using the Satorra–Bentler chi-square ($SB\chi^2$) scaling method (Satorra & Bentler, 1994). The $SB\chi^2$ method has been found to perform well across small, moderate, and large sample sizes, and researchers have recommended its use for nonnormal multivariate data (Curran, West, & Finch, 1996). However, it is important to take into account that the chi-square difference ($\Delta\chi^2$) is sensitive to sample size, both the regular (ML-based) $\Delta\chi^2$ and the Satorra–Bentler scaled chi-square difference ($\Delta SB\chi^2$). Furthermore, it is important to take account that the difference in the two $SB\chi^2$ statistics ($SBS\Delta\chi^2$) is not distributed as chi-square. Instead, an additional scaling of $SB\chi^2$, referred to as the Satorra–Bentler scaled chi-square difference ($SBS\Delta\chi^2$), follows the chi-square distribution (Satorra & Bentler, 2001).

We lastly analyzed the latent mean differences on the SAI-SV across gender and age groups using structured means modeling. Statistical analyses were conducted using the EQS software program, version 6.1 (Bentler, 2005).

Results

Internal Consistency Reliability

McDonald's omega coefficients for the SAI-SV scores were estimated by gender and age group. These coefficients ranged from .77 (.74–.80) (BA) to .93 (.92–.94) (AA) for boys, and from .73 (.74–.77) (BA) to .94 (.93–.95) (AA) for girls. The range of coefficients by age group was as follows: .76 (.73–.79) (BA) to .93 (.92–.94) (AA) for 12 to 13 year olds; .77 (.74–.81) (BA) to .93 (.92–.94) (AA) for 14 to 15 year olds; and .80 (.77–.82) (BA) to .95 (.94–.95) (AA) for 16 to 18 year olds.

Testing for Configural Invariance of the SAI-SV Across Gender and Age Groups

We examined the data concerning the univariate and multivariate normality assumptions by obtaining the univariate skewness and univariate kurtosis values and the Mardia's normalized multivariate kurtosis coefficient by gender and age group. We found that the univariate skewness and univariate kurtosis values for all items of the SAI-SV were within the expected range for normality. However, we found evidence of multivariate nonnormality by sex and age group; the values of Mardia's normalized multivariate kurtosis for the all items of the SAI-SV were greater than 55.54. Therefore, based on recommendations of Finney and DiStefano (2006), we used the Satorra–Bentler chi-square ($SB\chi^2$) scaling method. Robust comparative fit indexes were also applied (i.e., robust comparative fit index [R-CFI] and robust root mean square error of approximation [R-RMSEA]). A good fit is indicated by R-CFI $\geq .95$, a standardized root mean square residual (SRMR) $\leq .08$, and a robust root mean square error of approximation (R-RMSEA) $\leq .06$ (Hu & Bentler, 1999). Other authors suggested that less stringent

criteria for a reasonable data fit (R-RMSEA ≤ .08 and CFI ≥ .90) can also be useful in some practical applications (e.g., Marsh, Hau, & Wen, 2004).

We tested the adequacy of these baseline models separately for the subsamples of adolescents based on gender and age. The factor loadings for latent variables of the SAI-SV across gender and age groups are provided in Table 1. All items had a factor loading of at least .40. In the CFA, regarding school situation, correlations between the three latent dimensions of the SAI-SV were similar across gender and age groups. For boys: .60 (AA-ASE), .61 (AA-AAF), and .51 (ASE-AAF). For girls: .57 (AA-ASE), .64 (AA-AAF), and .52 (ASE-AAF). For 12 to 13 year olds: .54 (ASE-AAF), .56 (ASE-AA), and .62 (AAF-AA). For 14 to 15 year olds: .51 (ASE-AAF), .58 (ASE-AA), and .69 (AAF-AA). For 16 to 18 year olds: .56 (ASE-AAF), .63 (ASE-AA), and .62 (AAF-AA). Intercorrelations among the factors of the SAI-SV across gender and age groups were of a high magnitude ($r > .50$; Cohen, 1988).

Overall, the fit of the baseline model of the SAI-SV for girls, boys, and age groups was reasonable, with appropriate values for the R-CFI, R-RMSEA, and SRMR (see Table 2). Based on these results, we can conclude that there is configural invariance of the CFA models across gender and age groups.

Testing for Measurement Invariance of the SAI-SV Across Gender

To evaluate factorial invariance (i.e., configural invariance, measurement invariance, and structural invariance) on the SAI-SV scores across gender, we employed MGCFA with robust ML estimation using EQS 6.1.

First, factorial invariance across gender for situational dimensions of the SAI-SV (AA, ASE, AAF) was tested to determine whether the factor structure of the SAI-SV was the same for boys and girls (see Table 3). We initially tested a baseline model (M0) with no equality constraints across gender, revealing that this model provided an adequate fit to the data, with an R-CFI value greater than .90, an R-RMSEA value less than .06, and an SRMR value less than .08. Next, all free factor loadings were constrained to be equal across gender groups (M1). The fit of this model was also reasonable. Chi-square differences were adjusted with Satorra and Bentler's (2001) correction, referred to as the Satorra–Bentler scaled chi-square difference ($SBS\Delta\chi^2$). The $SBS\Delta\chi^2$ test between the constrained model (M1) and the unconstrained baseline model (M0) indicated that the factor loadings were equivalent across gender ($p = .25$); thus, there is complete invariance of factor loadings (i.e., metric invariance) across boys and girls. The next step was to fix the equality of intercepts (M2). Once again, the $SBS\Delta\chi^2$ between Models M2 and M1 indicated that the item intercepts were equivalent across gender ($p = .11$), supporting scalar invariance. Lastly, the factor variances and covariances were constrained to be equal across gender groups ($M3^1$). The $SBS\Delta\chi^2$ showed no statistically significant differences ($p = .06$). Therefore, this model is also equivalent (i.e., structural invariance was found). Taken together, these results suggest that acceptable measurement invariance (i.e., metric and scalar invariance) and acceptable structural invariance exist across gender groups for the situational dimensions of the SAI-SV (AA, ASE, AAF).

Factorial invariance across gender for physiological anxiety, cognitive anxiety, and behavioral anxiety dimensions of the SAI-SV was tested to determine whether the factor structure of the SAI-SV was the same for boys and girls. Similar results were found (see Table 3). Taken together, these results also suggest that acceptable measurement invariance (i.e., metric and scalar invariance) and acceptable structural invariance exist across gender groups for these three dimensions of the SAI-SV.

Testing for Measurement Invariance of the SAS-A Across Age Groups

First, factorial invariance across age groups (i.e., 12–13 year olds, 14–15 year olds, and

Table 1. Factor Loadings in the Confirmatory Factor Analysis for Latent Variables of the School Anxiety Inventory–Short Version in All Samples.

	Gender						Age								
	Boys			Girls			12–13 Years			14–15 Years			16–18 Years		
Items	L	E	R^2	L	E	R^2	L	E	R^2	L	E	R^2	L	E	R^2
Anxiety about Aggressiveness															
S1	.90	.43	.82	.92	.39	.85	.85	.52	.73	.89	.46	.79	.91	.42	.82
S2	.93	.36	.87	.95	.32	.90	.93	.37	.86	.95	.32	.90	.96	.27	.92
S3	.81	.59	.65	.84	.54	.71	.91	.41	.83	.91	.41	.83	.92	.39	.84
S4	.87	.49	.76	.88	.47	.78	.84	.51	.71	.80	.60	.64	.83	.55	.70
S5	.77	.63	.60	.80	.60	.64	.80	.60	.64	.77	.63	.60	.81	.59	.65
Anxiety about Social Evaluation															
S6	.84	.54	.71	.86	.50	.75	.84	.54	.71	.85	.53	.72	.88	.47	.78
S7	.74	.67	.55	.78	.62	.61	.74	.67	.55	.75	.66	.56	.81	.58	.66
S8	.88	.47	.78	.90	.43	.81	.82	.56	.68	.81	.59	.65	.86	.52	.73
S9	.81	.58	.66	.85	.53	.72	.75	.66	.56	.71	.70	.51	.71	.71	.50
S10	.74	.67	.55	.71	.70	.51	.89	.46	.79	.90	.45	.80	.91	.42	.83
Anxiety about Academic Failure															
S11	.90	.43	.81	.91	.42	.82	.65	.76	.42	.66	.75	.44	.73	.68	.54
S12	.87	.49	.76	.89	.45	.79	.87	.50	.75	.86	.51	.73	.91	.41	.83
S13	.81	.59	.65	.79	.61	.63	.91	.42	.82	.89	.45	.79	.92	.40	.84
S14	.73	.68	.53	.72	.70	.51	.86	.51	.74	.81	.58	.66	.75	.66	.56
S15	.64	.77	.40	.66	.75	.44	.71	.71	.50	.73	.68	.54	.75	.67	.56
Physiological Anxiety															
P1	.93	.38	.86	.89	.45	.80	.70	.71	.49	.70	.71	.49	.71	.71	.50
P2	.86	.51	.73	.89	.46	.79	.73	.68	.54	.73	.69	.53	.74	.68	.54
P3	.68	.73	.46	.70	.71	.50	.45	.89	.21	.52	.85	.27	.47	.88	.22
P4	.73	.68	.53	.72	.69	.52	.89	.44	.80	.88	.46	.79	.91	.41	.84
P5	.51	.86	.26	.45	.89	.20	.89	.45	.79	.85	.52	.72	.89	.45	.80
Cognitive Anxiety															
C1	.83	.56	.69	.91	.41	.83	.85	.53	.72	.83	.55	.70	.79	.61	.63
C2	.85	.52	.73	.78	.63	.61	.59	.81	.34	.50	.86	.25	.91	.41	.83
C3	.85	.52	.72	.92	.39	.85	.69	.72	.48	.70	.71	.49	.51	.86	.26
C4	.69	.72	.47	.71	.71	.50	.82	.58	.67	.84	.53	.71	.50	.95	.09
C5	.47	.88	.23	.49	.87	.24	.85	.53	.72	.84	.53	.71	.85	.52	.73
Behavioral Anxiety															
B1	.80	.60	.64	.95	.31	.90	.75	.66	.56	.81	.49	.65	.79	.61	.63
B2	.84	.54	.71	.79	.62	.62	.79	.61	.62	.90	.44	.80	.91	.41	.83
B3	.75	.66	.56	.72	.70	.52	.42	.92	.16	.47	.93	.14	.51	.86	.26
B4	.44	.93	.14	.42	.91	.18	.43	.93	.13	.45	.94	.12	.40	.95	.10
B5	.41	.92	.16	.40	.95	.09	.83	.55	.70	.79	.61	.63	.85	.52	.73

Note. CFA = L = factor loadings; E = error; R^2 = proportion of explained variance.

16–18 year olds) for situational dimensions of the SAI-SV (AA, ASE, AAF) was tested to determine whether the factor structure of the SAI-SV was the same for these age groups. We examined a baseline model (M0) with no equality constraints across age groups, which had a good fit to data, with an R-CFI value greater than .95, an SRMR value less than .06,

Table 2. Goodness-of-Fit Indices in the Confirmatory Factor Analyses (Situations and Responses) of the School Anxiety Inventory–Short Version by Gender and Age Group.

	SBχ^2	gl	*p*	RCFI	RMSEA (90% CI)	SRMR
School Situational Dimensions (AA, ASE, AAF)						
Gender						
Boys	365.83	87	.000	.965	.053 (.048–.059)	.055
Girls	509.63	87	.000	.996	.063 (.058–.068)	.050
Age						
12–13	261.82	84	.000	.979	.052 (.045–.059)	.064
14–15	269.23	84	.000	.977	.056 (.048–.063)	.052
16–18	321.14	84	.000	.978	.056 (.049–.062)	.041
Physiological Anxiety						
Gender						
Boys	16.62	4	.002	.992	.053 (.028–.080)	.018
Girls	31.95	4	.000	.988	.075 (.052–.100)	.019
Age						
12–13	12.77	4	.010	.999	.054 (.023–.089)	.016
14–15	12.06	4	.010	.998	.053 (.020–.089)	.017
16–18	31.54	4	.000	.988	.087 (.060–.116)	.021
Cognitive Anxiety						
Gender						
Boys	12.63	3	.005	.996	.053 (.025–.085)	.014
Girls	11.48	3	.009	.997	.048 (.021–.079)	.014
Age						
12–13	7.04	3	.070	.998	.043 (.000–.084)	.011
14–15	10.72	3	.010	.992	.060 (.024–.101)	.019
16–18	7.28	4	.120	.994	.030 (.000–.064)	.020
Behavioral Anxiety						
Gender						
Boys	24.92	4	.000	.976	.068 (.044–.095)	.015
Girls	34.75	4	.000	.980	.079 (.056–.104)	.037
Age						
12–13	11.23	4	.000	.986	.049 (.016–.084)	.021
14–15	18.42	4	.000	.987	.071 (.040–.105)	.024
16–18	7.28	4	.120	.995	.030 (.000–.064)	.020

Note. SBχ^2 = Satorra–Bentler scaled chi-square; RCFI = robust comparative fit index; RMSEA = root mean square error of approximation; CI = confidence interval; SRMR = standardized root mean square residual; AA = anxiety about aggressiveness; ASE = anxiety about social evaluation; AAF = anxiety about academic failure.

and an R-RMSEA value near.06 (see Table 4). Next, all free factor loadings were constrained to be equal across age groups (M1). The fit of this model was also reasonable. The SBS$\Delta\chi^2$ test between the constrained model (M1) and the unconstrained baseline model (M0) indicated that the factor loadings were equivalent across age groups (p = .07). Thus, there is complete invariance of factor loadings (i.e., metric invariance) across all age groups. The next step was to fix the equality of the intercepts (M2). Once again, the SBS$\Delta\chi^2$ between Models M2 and M1 indicated that the item intercepts were equivalent across gender (p = .07), supporting scalar invariance. Last, the factor variances and covariances were constrained to be equal across gender groups (M3[1]). The SBS$\Delta\chi^2$ showed no statistically significant differences (p = .06). Therefore, this model is also equivalent (i.e., structural

Table 3. Invariance Constraints for the School Anxiety Inventory–Short Version Across Gender.

Model	χ^2	SBχ^2	*df*	R-CFI	R-RMSEA (90% CI)	SRMR	SB$\Delta\chi^2$	Δdf	*p*
Situational Dimensions (ASE, AAF, AA)									
M0	1264.74	780.18	168	.969	.056 (.052–.069)	.053			
M1	1286.78	797.76	180	.969	.054 (.050–.058)	.054	20.43	12	.25
M2	1315.25	816.56	192	.965	.056 (.053–.060)	.054	18.06	11	.11
M3[1]	1335.36	828.47	198	.962	.59 (.056–.063)	.118	11.25	6	.06
Physiological Anxiety									
M0	69.77	25.13	6	.989	.052 (.032–.074)	.018			
M1	79.42	41.09	10	.988	.050 (.035–.066)	.026	6.85	4	.14
M2	98.93	44.12	14	.988	.082 (.070–.094)	.033	8.58	4	.07
M3[2]	110.23	47.05	15	.984	.084 (.073–.096)	.095	3.01	1	.08
Cognitive Anxiety									
M0	82.605	36.43	5	.993	.073 (.052–.096)	.023			
M1	99.69	47.33	9	.990	.068 (.052–.085)	.033	8.97	4	.062
M2	119.33	52.08	12	.996	.047 (.032–.062)	.034	6.90	3	.075
M3[2]	123.82	55.39	13	.989	.095 (.082–.107)	.082	2.87	1	.091
Behavioral Anxiety									
M0	154.31	52.56	6	.980	.081 (.061–.101)	.049			
M1	170.92	68.23	10	.970	.077 (.061–.092)	.064	8.94	4	.06
M2	195.64	73.52	14	.976	.110 (.097–.123)	.053	8.23	4	.08
M3[2]	205.23	77,08	15	.971	.110 (.097–.122)	.102	3.57	1	.06

Note. SBχ^2 = Satorra–Bentler scaled chi-square; R-CFI = robust comparative fit index; R-RMSEA = robust root mean square error of approximation; CI = confidence interval; SRMR = standardized root mean square residual; ΔSBχ^2 = adjusted SBχ^2 difference; ASE = anxiety about social evaluation; AAF = anxiety about academic failure; AA = anxiety about aggressiveness; M0 = free model (baseline); M1 = M0 with invariant factor loadings; M2 = M1 with invariant intercepts; M3[1] = M2 with invariant factor variances and covariances; M3[2] = M2 with invariant factor variance.

invariance). Taken together, these results suggest that acceptable measurement invariance (i.e., metric and scalar invariance) and acceptable structural invariance exist across age groups for the situational dimensions of the SAI-SV (AA, ASE, AAF).

Factorial invariance across age groups for physiological anxiety, cognitive anxiety, and behavioral anxiety dimensions of the SAI-SV was tested to determine whether the factor structure of the SAI-SV was the same for adolescents of the three age groups. Similar data were obtained (see Table 4). These results suggest that acceptable measurement invariance (i.e., metric and scalar invariance) and acceptable structural invariance exist across age groups for these three dimensions of the SAI-SV.

The presence of measurement invariance in all factors of the SAI-SV is critical for practical comparisons of groups in terms of latent variables/constructs (Dimitrov, 2010).

Structured Latent Means Differences Across Gender and Age Groups on the SAI-SV

Latent means are better indicators of true differences than observed means because they are not associated with measurement error (Brown, 2006). To be certain that the latent means of the SAI-SV were equal across gender and age groups, restrictions on the observed variable means need to be imposed. The latent mean differences on the SAI-SV were also tested with EQS 6.1. This software program imposes equality constraints on item intercepts and fixes the factor intercepts for one of the samples to zero. As a result, the estimated latent mean for the others groups represents the mean difference in the construct between groups.

The model for comparing gender groups used boys as the reference group. Because there are three age groups, three models were established to make all possible comparisons.

Table 4. Invariance Constraints for the School Anxiety Inventory–Short Version Across Age Groups.

Model	χ^2	SBχ^2	*df*	R-CFI	R-RMSEA (90% CI)	SRMR	SB$\Delta\chi^2$	Δdf	*p*
Situational Dimensions (ASE, AAF, AA)									
M0	1448.80	918.69	252	.969	.057 (.053–.060)	.053			
M1	1483.01	972.25	276	.966	.057 (.053–.060)	.057	34.82	24	.07
M2	1512.14	1028.17	300	.969	.064 (.060–.067)	.069	34.28	24	.07
M3[1]	1555.02	1039.2	312	.968	.063 (.060–.067)	.088	20.06	12	.06
Physiological Anxiety									
M0	82.28	32.97	9	.99	.047 (.028–.067)	.018			
M1	87.09	46.55	17	.99	.041 (.026–.057)	.025	4.12	8	.85
M2	101.23	58.08	25	.99	.055 (.042–.068)	.026	9.61	8	.29
M3[2]	117.02	63.23	26	.98	.055 (.043–.068)	.060	4.62	1	.06
Cognitive Anxiety									
M0	128.22	69.36	9	.989	.078 (.060–.096)	.027			
M1	146.75	92.55	17	.986	.68 (.054–.082)	.045	14.62	8	.07
M2	163.13	112.30	25	.979	.082 (.069–.094)	.045	14	8	.08
M3[2]	175.58	114.25	26	.976	.077 (.065–.089)	.052	5.6	1	.06
Behavioral Anxiety									
M0	82.28	32.97	9	.99	.047 (.028–.067)	.018			
M1	87.09	46.55	17	.99	.041 (.026–.057)	.025	4.12	8	.85
M2	101.23	58.08	25	.99	.055 (.042–.068)	.026	9.61	8	.29
M3[2]	111.35	63.20	27	.98	.049 (.035–.063)	.054	5.06	2	.08

Note. SBχ^2 = Satorra–Bentler scaled chi-square; R-CFI = robust comparative fit index; R-RMSEA = robust root mean square error of approximation; CI = confidence interval; SRMR = standardized root mean square residual; ΔSBχ^2 = adjusted SBχ^2 difference; ASE = anxiety about social evaluation; AAF = anxiety about academic failure; AA = anxiety about aggressiveness; M0 = free model (baseline); M1 = M0 with invariant factor loadings; M2 = M1 with invariant intercepts; M3[1] = M2 with invariant factor variances and covariances; M3[2] = M2 with invariant factor variance.

In each model, we set the lowest age group to zero: Model 1 = 12 to 13 versus 14 to 15 year olds, Model 2 = 12 to 13 versus 16 to 18 year olds; and Model 3 = 14 to 15 versus 16 to 18 year olds.

For gender groups, the fit statistics of the latent mean structures were reasonable: χ^2 = 1264.75, *df* = 171, $p < .00$, R-CFI = .972, R-RMSEA = .057 (.053–.061), and SRMR = .053 (ASE, AAF, and AA); χ^2 = 152.05, *df* = 16, $p < .00$, R-CFI = .987, R-RMSEA = .065 (.051–.079), and SRMR = .090 (PA); χ^2 = 130.72, *df* = 15, $p < .00$, R-CFI = .984, R-RMSEA = .085 (.071–.099), and SRMR = .074 (CA); $\chi^2 = 424.44$, *df* = 16, $p < .00$, R-CFI = .940, R-RMSEA = .081 (.072–.095), and SRMR = .093 (BA). For the age groups, the fit statistics of the latent mean structures were reasonable in all cases (see Table 5).

The structured means differences across gender and age groups are presented in the Table 6. Girls had significantly higher structured means than boys on all subscales of the SAI-SV (AA, ASE, AAF, PA, CA, and BA).

Compared with the 12 to 13 year olds, the 14 to 15 year olds had significantly lower means on AA, ASE, and AAF; PA; CA; and BA (see Table 6). Furthermore, compared with the 12 to 13 year olds, the 16 to 18 year olds do not show statistically significantly different means on ASE. However, compared with the 12 to 13 year olds, the 16 to 18 year olds had significantly lower means on AA and AAF. Regarding the response systems, compared with the 12 to 13 year olds, the 16 to 18 year olds do not show statistically significantly different means on PA, but they do have significantly lower means on CA and significantly higher means on BA.

Last, compared with the 14 to 15 year olds, the 16 to 18 year olds had significantly higher means on ASE, AAF, PA, CA, and BA.

Table 5. Fit Statistics of the Latent Mean Structures for the Age Groups on Dimensions of the School Anxiety Inventory–Short Version.

	χ^2	*df*	*p*	CFI	RMSEA (90% CI)	SRMR
School Situational Dimensions (AA, ASE, AAF)						
Model 1	1021.40	201	000	.968	.060 (.055–.064)	.079
Model 2	1179.07	201	000	.966	.061 (.057–.066)	.069
Model 3	1146.41	201	.000	.967	.060 (.056–.065)	.070
Physiological Anxiety						
Model 1	235.48	18	.000	.955	.111 (.095–.127)	.083
Model 2	249.84	18	.000	.958	.112 (.097–.127)	.056
Model 3	247.69	18	.000	.942	.116 (.101–.131)	.069
Cognitive Anxiety						
Model 1	221.64	18	.000	.945	.135 (.119–.151)	.052
Model 2	219.92	17	.000	.959	.127 (.111–.142)	.053
Model 3	166.19	19	.000	.983	.107 (.091–.123)	.049
Behavioral Anxiety						
Model 1	154.02	18	.000	.946	.086 (.70–.103)	.062
Model 2	197.47	18	.000	.951	083 (.068–.099)	.067
Model 3	110.02	18	.000	.977	.070 (.054–.085)	.058

Note. χ^2 = chi-square; CFI = comparative fit index; RMSEA = root mean square error of approximation; CI = confidence interval; SRMR = standardized root mean square residual; AA = anxiety about aggressiveness; ASE = anxiety about social evaluation; AAF = anxiety about academic failure. Model 1 = 12 to 13 versus 14 to 15 year olds; Model 2 = 12 to 13 versus 16 to 18 year olds; Model 3 = 14 to 15 versus 16 to 18 year olds.

Discussion

Although increasing attention has been given to the assessment of school anxiety in adolescence (see Martínez-Monteagudo et al., 2013, for a review), very little is known about cross-gender and cross-age equivalence in the expression of school anxiety among adolescents. This gap in knowledge is of great concern because school anxiety is an internalizing disorder that is widely considered within the professional literature to be among the most prevalent. This disorder is also a problem that would potentially come to the attention of a school psychologist (Miller & Jome, 2008). The current study is the first to assess the equivalency of symptoms of school anxiety in adolescence, as measured by the SAI-SV, across gender and age groups in a sample of Spanish adolescents.

Internal Consistency Reliability

Supporting our first study hypothesis, the analyses of internal consistency showed that the SAI-SV scores have internal consistency reliability estimates within an acceptable range across gender and adolescent age groups. In most samples, behavioral anxiety (BA) had the lowest internal consistency (omega coefficients ranging from .73 to .80), and anxiety about aggressiveness (AA) had the highest internal consistency (omega coefficients ranging from .93 to .95). These internal consistencies are comparable with those reported by García-Fernández et al. (2014) in another sample of Spanish adolescents using alpha coefficients. In any case, as indicated by some researchers (e.g., Onwuegbuzie & Daniel, 2002; Streiner, 2003), it is important to remember that the reliability of a test's scores depends as much on the sample being tested as on the test. Therefore, reliability estimates can vary significantly among different administrations of the same instrument (Onwuegbuzie & Daniel, 2002). This notion has been reinforced in the guidelines for publishing the results of studies (e.g., Wilkinson & the Task Force on Statistical Inference, 1999).

Table 6. Structured Mean Differences Across Gender and Age Groups on School Anxiety Inventory–Short Version Scores.

	Constructs					
	AA	ASE	AAF	PA	CA	BA
Boys (Reference)	.00	.00	.00	.00	.00	.00
Girls						
Mean estimate (ME)	.301	.251	.233	.204	.290	.212
Standard error (SE)	.034	.031	.026	.027	.030	.027
Test statistic (TS)	8.74*	8.1*	8.84*	7.40*	9.57*	7.64*
12–13 year olds (Reference)	.00	.00	.00	.00	.00	.00
14–15 year olds						
ME	−.167	−.114	−.228	−.140	−.222	−.090
SE	.045	.038	.033	.036	.040	.036
TS	−3.71*	−3.07*	−6.86*	−3.845*	−5.507*	−2.512*
16–18 year olds						
ME	−.060	.065	−.189	.023	−.113	.119
SE	.043	.039	.034	.035	.038	.033
TS	−1.372**	1.67	−5.53*	.660	−2.968*	1.60
14–15 year olds (Reference)	.00	.00	.00	.00	.00	.00
16–18-year-olds						
ME	.112	.182	.074	.158	.110	.119
SE	.041	.039	.034	.034	.037	.033
TS	1.17	4.40*	2.20*	4.63*	2.967*	3.60*

Note. AA = anxiety about aggressiveness; ASE; anxiety about social evaluation; AAF; anxiety about academic failure; PA = physiological anxiety; CA = cognitive anxiety; BA= behavioral anxiety.
*$p < .01$. **$p < .05$.

Construct Validity Evidence of Scores on the SAI-SV

Consistent with our second hypothesis, the findings revealed that the three correlated factors related to school situations and the three factors related to the three response systems of anxiety were equivalent across gender and age groups. Thus, all factors of the SAI-SV showed configural and measurement invariance, which include metric invariance (i.e., equal factor loadings across groups), scalar invariance (i.e., equal item intercepts across groups), and structural invariance (i.e., invariance of factor variances and covariances).

Confirmation of the invariance of intercepts (i.e., strong or scalar invariance) allowed comparison of the latent means across gender and age groups (Dimitrov, 2010). In practical terms, this means that our findings indicate that boys and girls and adolescents from different age groups appeared to ascribe the same meanings to the SAI-SV items. Therefore, it is possible to use the SAI-SV to test specific hypotheses about gender and age differences in school anxiety among Spanish adolescents.

Gender and Age Latent Mean Differences on the SAI-SV

Our third study hypothesis examined the latent mean differences in scores of the SAI-SV across gender and age groups. For gender, analyses revealed that girls exhibited higher latent means than boys on all scales of the SAI-SV (AA, ASE, AAF, PA, CA, and BA). In addition, the latent means on AA, ASE, AAF, PA, CA, and BA decreased significantly with age (i.e., from 12 to 13 year olds to 14 to 15 year olds). Gender differences in latent means for all scores on the SAI-SV are consistent with previous studies that evaluated gender differences using observed means in

adolescent school anxiety (e.g., García-Fernández, Martínez-Monteagudo, et al., 2011; Steinhausen, Müller, & Winkler, 2008). These differences have also been found using latent means in adolescents with anxiety (e.g., Fonseca, Sierra, Lemos, Paino, & Muñiz, 2012), anxiety about social evaluation (e.g., Inglés, La Greca, Marzo, García-López, & García-Fernández, 2010), and anxiety about academic failure or test anxiety (Nasser, Takahashi, & Benson, 1997).

For age, analyses revealed that AA, AAF, PA, CA, and BA significantly diminished from 12 to 13 year olds to 16 to 18 year olds, while BA increased significantly over this age range. Last, compared with the 14 to 15 year olds, 16 to 18 year olds had significantly higher means on ASE, AAF, PA, CA, and BA. These data are consistent with those obtained by Van Oort, Greaves-Lord, Verhulst, Ormel, and Huizink (2009). The authors measured anxiety symptoms three times (biennially) over a 5-year period in a sample of 1,653 early adolescents (10–12 years old). Their results show that anxiety tends to follow a curvilinear trend across adolescence, presenting an initial decrease followed by a slight increase.

School anxiety tends to occur between 5 and 6 years of age (school) and especially between 10 and 11 years (Ollendick & Mayer, 1984). Generally, three peaks of prevalence have been noted, which tend to be between 5 and 6 years, 11 and 12 years, and after 15 years, coinciding with the beginning of schooling, the transition from primary to secondary school, and the end of compulsory education, respectively (Ollendick & Mayer, 1984). In adolescence, students experience changes in their school and peer group and increased academic demands. These transitions across educational levels are a critical challenge for many adolescents, which could lead to higher levels of school anxiety (García-Fernández, Martínez-Monteagudo, et al., 2011). In particular, 12 to 13 years of age coincides with the transition from primary education to secondary education, coinciding in this study with the highest latent means in school anxiety. Along these lines, using latent means, Fonseca et al. (2012) found that girls tend to score higher than boys and that younger adolescents (aged 11–14 years) tend to score systematically lower than older ones (aged 15–18 years) in anxiety. However, school anxiety levels increase significantly with age (16–18 years old) for any of the SAI-SV factors (ASE and AAF). This may indicate that adolescents face different risk factors across age groups.

Overall, an important conclusion from our study is that the latent means differences across gender and age groups that were obtained can be attributed to differences in the actual responses of Spanish adolescents and not to differences in the way that the SAI-SV works within this population. These findings pave the way for future studies of school anxiety among Spanish adolescents using the SAI-SV measure.

Study Limitations and Implications for Future Research and Practice

The current study provided valuable information about the utility of the SAI-SV for Spanish adolescents. However, several considerations warrant further attention. First, the study analyses were limited to establishing the measurement invariance of the SAI-SV across community samples of Spanish adolescents. Replication and extension of these findings to clinical samples of adolescents and other ethnic/cultural groups will be important. In this sense, the availability of questionnaires for use with individuals whose primary language is Spanish is especially important. Little is understood about school anxiety symptoms among Hispanic American adolescents, despite the fact that Hispanic Americans comprise the fastest growing segment of the U.S. population (Bureau of the Census, 2011), and are the least likely to use mental health services (Glover, Pumariega, Holzer, Wise, & Rodriguez, 1999). Efforts are needed to understand school anxiety among Hispanic American adolescents to develop culturally appropriate intervention programs for such youth. Utilization of assessment tools that are in the parents' primary language is a major step toward forging the collaboration

between school psychologists, parents, educators, and children. However, it is important to bear in mind that the lexical–semantic properties of the Spanish-language change according to the country from which students and their families come (e.g., Spain, Mexico, Cuba, Colombia) and the places of the United States in which they have lived (Roca, 2000). Therefore, as is suggested by the standards for educational and psychological testing (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 1999), if the Spanish version of the SAI-SV is used with Mexican, Puerto Rican, Colombian or Hispanic, and Latin American populations, the score reliability and validity of SAI-SV score inferences should be established with members of each of these groups separately. Furthermore, this research advances knowledge that is relevant for C&D researchers and practitioners working in English-speaking parts of the world. Thus, these researchers and practitioners should translate into English the SAI-SV using the back-translation method (e.g., Hambleton, 1994; Hambleton & Kanjee, 1995) and conduct an analysis of the cultural equivalence of the SAI-SV scores (factorial invariance across cultural/ethnic groups). If the SAI-SV is culturally equivalent, the scores may be used with confidence in these populations.

Second, further evaluation of the age-related differences on scores of the SAI-SV in Spanish adolescents is needed. In particular, we do not know the potential mechanism underlying the age-related differences in school anxiety. Future research on the mechanisms underlying age-related differences in school anxiety would be informative.

Third, this study used a cross-sectional design to analyze age differences in the latent means on the SAS-A subscales. Therefore, replication and extension of these findings using longitudinal designs will be important in future research. Thus, it could be interesting, for example, to examine the longitudinal factorial invariance of scores on the SAI-SV, because support for these findings would enable researchers to further test hypotheses about the development (i.e., change) and growth in adolescents' school anxiety across developmental stages and/or education levels (e.g., Keefer, Holden, & Parker, 2013; Rosen, Beron, & Underwood, 2013).

Fourth, in terms of practical implications, demonstrating factorial invariance across gender and age groups for Spanish youth is important because adolescent gender and age are important moderators of treatment outcome for adolescent anxiety disorders (e.g., Beidel et al., 2007; Silverman, Pina, & Viswesvaran, 2008). Without support for the invariance of the SAI-SV factor structure across gender and age groups, we could not justifiably compare school anxiety across boys and girls or across different age groups of Spanish youth. Our findings suggest that researchers focusing on school anxiety or stress in Spanish adolescents (alone or in comparison with other adolescents) may be able to confidently use the SAI-SV to evaluate treatment outcomes for school anxiety or stress interventions or to examine the trajectories of adolescents' school anxiety or stress over time.

In closing, our findings may also have implications for practitioners. For example, our findings of measurement equivalence across gender suggest that gender differences in the SAI-SV for Spanish youth are primarily differences of degree (with girls scoring higher than boys on all SAI-SV scales) rather than differences of kind. Thus, content interventions for school anxiety or stress (e.g., Weems et al., 2010) may be relevant for both boys and girls, although girls may need interventions with greater intensity or duration than boys to address girls' higher levels of school anxiety or stress.

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References

American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (1999). *Standards for educational and psychological testing*. Washington, DC: American Educational Research Association.

Beidel, D. C., Turner, S. M., Young, B. J., Ammerman, R. T., Sallee, F. R., & Crosby, L. (2007). Psychopathology of adolescent social phobia. *Journal of Psychopathology and Behavioral Assessment*, *29*, 47–54. doi:10.1007/s10862-006-9021-1

Bentler, P. M. (2005). *EQS 6.1: Structural Equations Program Manual*. Encino, CA: Multivariate Software.

Brown, T. (2006). *Confirmatory factor analysis for applied research*. New York, NY: Guildford Press.

Bureau of the Census. (2011). *US Census brief details Hispanic population*. San Diego, CA: Author.

Byrne, B. M. (2006). *Structural equation modeling with EQS: Basic concepts, applications and programming*. Mahwah, NJ: Erlbaum.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Erlbaum.

Curran, P. J., West, S. G., & Finch, J. F. (1996). The robustness of test statistics to nonnormality and specification error in confirmatory factor analysis. *Psychological Methods*, *1*, 16–29. doi:10.1037//1082-989x.1.1.16

Dimitrov, D. (2010). Testing for factorial invariance in the context of construct validation. *Measurement and Evaluation in Counseling and Development*, *43*, 121–149. doi:10.1177/0748175610373459

Endler, N. (1975). A person-situation interaction model for anxiety. In C. A. Spielberger & I. G. Sarason (Eds.), *Stress and anxiety* (pp. 145–164). Washington, DC: Hemisphere.

Finney, S. J., & DiStefano, C. (2006). Non-normal and categorical data in structural equation modeling. In G. R. Hancock & R. O. Mueller (Eds.), *Structural equation modelling: A second course* (pp. 269–314). Greenwich, CT: Information Age.

Fonseca, E., Sierra, S., Lemos, S., Paino, M., & Muñiz, J. (2012). Dimensional structure and measurement invariance of the Youth Self-Report across gender and age. *Journal of Adolescence Health*, *50*, 148–153. doi:10.1016/j.jadohealth.2011.05.011

García-Fernández, J. M., Inglés, C. J., Martínez-Monteagudo, M. C., Marzo, J. C., & Estévez, E. (2011). Inventario de Ansiedad Escolar: Validación en una muestra de estudiantes de educación secundaria [School Anxiety Inventory: Validation in a sample of Spanish secondary education students]. *Psicothema*, *23*, 301–307.

García-Fernández, J. M., Inglés, C. J., Martínez-Monteagudo, M. C., & Redondo, J. (2008). Evaluación y tratamiento de la ansiedad escolar en la infancia y la adolescencia [Evaluation and treatment of school anxiety in childhood and adolescence]. *Behavioral Psychology/Psicología Conductual*, *16*, 413–437.

García-Fernández, J. M., Inglés, C. J., Marzo, J. C., & Martínez-Monteagudo, M. C. (2014). Psychometric properties of the School Anxiety Inventory-Short Version in Spanish secondary education students. *Psicothema*, *26*, 286–292. doi:10.7334/psicothema2013.288

García-Fernández, J. M., Martínez-Monteagudo, M. C., & Inglés, C. J. (2011). Diferencias según sexo y curso en ansiedad escolar: estudio con una muestra de estudiantes españoles de Educación Secundaria [Gender and grade differences in school anxiety: Study with a sample of Spanish high school students]. *Ansiedad y Estrés*, *17*, 137–148.

Glover, S. H., Pumariega, A. J., Holzer, C. E., III, Wise, B. K., & Rodriguez, M. (1999). Anxiety symptomatology in Mexican-American adolescents. *Journal of Child and Family Studies*, *8*, 47–57. doi:10.1023/A:1022994510944

Gosch, E. A., Flannery-Schroeder, E., & Brecher, R. J. (2012). Anxiety disorders: School-based cognitive-behavioral interventions. In R. B. Mennutti, R. Christner, & A. Freeman (Eds.), *Cognitive-behavioral interventions in educational settings: A handbook for practice* (pp. 117–160). New York, NY: Taylor & Francis.

Hambleton, R. K. (1994). Guidelines for adapting educational and psychological tests: A progress report. *European Journal of Psychological Assessment*, *10*, 229–244.

Hambleton, R. K., & Kanjee, A. (1995). Increasing the validity of cross-cultural assessments: Use of improved methods for test adaptions. *European Journal of Psychological Assessment*, *11*, 147–157. doi:10.1027/1015-5759.11.3.147

Haynes, S., & Wilson, C. (1979). *Behavioral assessment*. San Francisco, CA: Jossey Bass.

Herzig-Anderson, K., Colognori, D., Fox, J. K., Stewart, C. E., & Masia-Warner, C. (2012). School-based anxiety treatments for children and adolescents. *Child and Adolescent Psychiatric Clinics of North America*, *21*, 655–668. doi:10.1016/j.chc.2012.05.006

Hu, L., & Bentler, P. M. (1999). Cut-off criteria for fit indices in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*, 1–55. doi:10.1080/10705519909540118

Inglés, C. J., La Greca, A. M., Marzo, J. C., García-López, L. J., & García-Fernández, J. M. (2010). Social Anxiety Scale for Adolescents: Factorial invariance and latent mean differences across gender and age in Spanish adolescents. *Journal of Anxiety Disorders*, *24*, 847–855. doi:10.1016/j.janxdis.2010.06.007

Kearney, C. A., Cook, L. C., & Chapman, G. (2007). School stress and school refusal behavior. In G. Fink (Ed.), *Encyclopedia of stress* (2nd ed., Vol. 3, pp. 422–425). San Diego, CA: Academic Press. doi:10.1016/b978-012373947-6.00337-8

Kearney, C. A., & Spear, M. (2012). School refusal behavior. School-based cognitive-behavioral interventions. In R. B. Mennutti, R. Christner, & A. Freeman (Eds.), *Cognitive-behavioral interventions in educational settings: A handbook for practice* (pp. 161–183). New York, NY: Taylor & Francis.

Keefer, K. V., Holden, R. R., & Parker, J. D. A. (2013). Longitudinal assessment of trait emotional intelligence: Measurement invariance continuity from late childhood to adolescence. *Psychological Assessment*, *25*, 1255–1272. doi:10.1037/a0033903

Lang, P. J. (1968). Fear reduction and fear behavior: Problems in treating a construct. In J. U. H. Shilen (Ed.), *Research in psychotherapy* (Vol. 3, pp. 90–102).Washington, DC: American Psychological Association.

Lang, P. J., Melamed, B. G., & Hart, J. (1970). A psychophysiological analysis of fear modification using an automated desensitization procedure. *Journal of Abnormal Psychology*, *76*, 220–234. doi:10.1037/h0029875

Martínez-Monteagudo, M. C., Inglés, C. J., Cano-Vindel, A., & García-Fernández, J. M. (2012). Estado actual de la investigación sobre la teoría tridimensional de la ansiedad de Lang [Current status of research on Lang's three-dimensional theory of anxiety]. *Ansiedad y Estrés*, *18*, 201–219.

Martínez-Monteagudo, M. C., Inglés, C. J., & García-Fernández, J. M. (2013). Evaluación de la ansiedad escolar: Revisión de cuestionarios, inventarios y escalas [Assessment of school anxiety: A review of questionnaires, inventories and scales]. *Psicología Educativa*, *19*, 27–36. doi:10.5093/ed2013a5

Marsh, H. W., Hau, K.-T., & Wen, Z. (2004). In search of golden rules: Comment on hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in overgeneralizing Hu and Bentler's (1999) findings. *Structural Equation Modeling*, *11*, 320–341. doi:10.1207/s15328007sem1103_2

Mash, E. J., & Barkley, R. A. (2007). *Assessment of childhood disorders* (4th ed.). New York, NY: Guildford Press.

McDonald, R. P. (1999). *Test theory: A unified treatment*. Mahwah, NJ: Erlbaum.

Merrell, K. W., Ervin, R. A., & Gimpel, G. A. (2006). *School psychology for the 21st century: Foundations and practices*. New York, NY: Guildford Press.

Merrell, K. W., & Gueldner, B. A. (2010). Preventive interventions for students with internalizing disorders: Effective strategies for promoting mental health in schools. In M. R. Shinn & H. M. Walker (Eds.), *Interventions for achievement and behavior problems in a three-tier model including RtI* (pp. 799–823). Bethesda, MD: National Association of School Psychologists.

Messick, S. (1995). Validity of psychological assessment: Validation of inferences from persons' responses and performance as scientific inquiry into score meaning. *American Psychologist*, *50*, 741–749. doi:10.1037/0003-066X.50.9.741

Miller, D. N., & Jome, L. M. (2008). School psychologists and the assessment of childhood internalizing disorders: Perceived knowledge, role preferences and training needs. *School Psychology International*, *29*, 500–510. doi:10.1177/0143034308096432

Miller, D., & Jome, L. (2010). School psychologists and the secret illness: Perceived knowledge, role preferences, and training needs regarding the prevention and treatment of internalizing disorders. *School Psychology International*, *31*, 509–520. doi:10.1177/014303431038262

Nasser, F., Takahashi, T., & Benson, J. (1997). The structure of test anxiety in Israeli-Arab high school students: An application of confirmatory factor analysis with miniscales. *Anxiety Stress & Coping: An International Journal*, *10*, 129–151. doi:10.1080/10615809708249298

Ollendick, T. H., & Mayer, J. A. (1984). School phobia. In S. M. Turner (Ed.), *Behavioral theories and treatment of anxiety* (pp. 367–411). New York, NY: Plenum. doi:10.1007/978-1-4684-4694-4_9

Onwuegbuzie, A. J., & Daniel, L. G. (2002). A framework of reporting and interpreting internal consistency reliability estimates. *Measurement and Evaluation in Counseling and Development*, *35*, 89–103.

Ost, L. G., Johansson, J., & Jerremalm, A. (1982). Individual response pattern and the effects of different behavioral methods in the treatment of claustrophobia. *Behaviour Research and Therapy*, *20*, 445–460.

Roca, A. (2000). *Research on Spanish in the United States: Linguistic issues and challenges*. Somerville, MA: Cascadilla Press.

Rosen, L. H., Beron, K. J., & Underwood, M. K. (2013). Assessing peer victimization across adolescence: Measurement invariance and developmental change. *Psychological Assessment*, *25*, 1–11. doi:10.1037/a0028985

Riccio, C., & Rodriguez, O. L. (2007). Integration of psychological assessment approaches in school psychology. *Psychology in the Schools*, *44*, 243–255. doi:10.1002/pits.20220

Satorra, A., & Bentler, P. M. (1994). Corrections to test statistics and standard errors in covariance structure analysis. In A. van Eye & C. C. Clogg (Eds.), *Latent variables analysis: Applications for developmental research* (pp. 399–419). Thousand Oaks, CA: Sage.

Satorra, A., & Bentler, P. M. (2001). A scaled difference chi-square test statistic for moment structure analysis. *Psychometrika*, *66*, 507–514. doi:10.2139/ssrn.199064

Silverman, W. K., & Ollendick, T. H. (2005). Evidence-based assessment of anxiety and its disorders in children and adolescents. *Journal of Clinical Child & Adolescent Psychology*, *34*, 380–411. doi:10.1207/s15374424jccp3403_2

Silverman, W. K., Pina, A. A., & Viswesvaran, C. (2008). Evidence-based psychosocial treatments for phobic and anxiety disorders in children and adolescents. *Journal of Clinical Child & Adolescent Psychology*, *31*, 105–130. doi:10.1080/15374410701817907

Spanish Ministry of Education and Science. (2013). *Datos básicos de la Educación en España en el curso 2011/2012* [Basic data of education in Spain during the course 2011/2012]. Madrid, Spain: Ministerio de Educación y Ciencia.

Steinhausen, H. C., Müller, N., & Winkler, C. (2008). Frequency, stability and differentiation of self-reported school fear and truancy in a community sample. *Child and Adolescent Psychiatry and Mental Health*, *2*(1), 1–11.

Streiner, D. L. (2003). Starting at the beginning: An introduction of coefficient alpha and internal consistency. *Journal of Personality Assessment*, *80*, 99–103.

Van Oort, F. V. A., Greaves-Lord, K., Verhulst, F. C., Ormel, J., & Huizink, A. C. (2009). The developmental course of anxiety symptoms during adolescence: The TRAILS study. *Journal of Child Psychology and Psychiatry*, *50*, 1209–1217.

Weems, C. F, Scott, B. G., Taylor, L. K., Cannon, M. F., Romano, D. M., Perry, A. M., & Triplett, V. (2010). Test anxiety prevention and intervention programs in schools: Program development and rationale. *School Mental Health*, *2*, 62–71.

Wilkinson, L., & the Task Force on Statistical Inference. (1999). Statistical methods in psychology journals: Guidelines and explanations. *American Psychologist*, *54*, 594–604.

Wolpe, J. (1977). Inadequate behavior analysis: The Achilles' heel of outcome research in behavior therapy. *Journal of Behavior Therapy and Experimental Psychiatry*, *8*, 1–13. doi:10.1016/0005-7916(77)90095-7

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