

## Psychometric properties of the School Anxiety Inventory-Short Version in Spanish secondary education students

José M. García-Fernández<sup>1</sup>, Cándido J. Inglés<sup>2</sup>, Juan C. Marzo<sup>2</sup>, María C. Martínez-Monteagudo<sup>2</sup>

<sup>1</sup> University of Alicante and <sup>2</sup> Miguel Hernández University of Elche

### Abstract

**Background:** The School Anxiety Inventory (SAI) can be applied in different fields of psychology. However, due to the inventory's administration time, it may not be useful in certain situations. To address this concern, the present study developed a short version of the SAI (the SAI-SV). **Method:** This study examined the reliability and validity evidence drawn from the scores of the School Anxiety Inventory-Short Version (SAI-SV) using a sample of 2,367 (47.91% boys) Spanish secondary school students, ranging from 12 to 18 years of age. To analyze the dimensional structure of the SAI-SV, exploratory and confirmatory factor analyses were applied. Internal consistency and test-retest reliability were calculated for SAI-SV scores. **Results:** A correlated three-factor structure related to school situations (Anxiety about Aggression, Anxiety about Social Evaluation, and Anxiety about Academic Failure) and a three-factor structure related to the response systems of anxiety (Physiological Anxiety, Cognitive Anxiety, and Behavioral Anxiety) were identified and supported. The internal consistency and test-retest reliability were determined to be appropriate. **Conclusions:** The reliability and validity evidence based on the internal structure of SAI-SV scores was satisfactory.

**Keywords:** adolescence, school anxiety, school fears, school phobia, secondary education.

### Resumen

**Propiedades psicométricas del Inventario de Ansiedad Escolar-Versión Abreviada en estudiantes españoles de Educación Secundaria.** **Antecedentes:** el School Anxiety Inventory (SAI) puede ser aplicado en diferentes ámbitos de la Psicología aunque, debido su tiempo de administración, puede que no resulte útil en ciertas ocasiones. Para solucionar este problema, el presente estudio desarrolló una versión breve del SAI (el SAI-SV). **Método:** este estudio examinó la evidencia de fiabilidad y validez extraída de las puntuaciones del Inventario de Ansiedad Escolar-Breve (SAI-SV) utilizando una muestra de 2.367 (47,91% varones) estudiantes españoles de Secundaria, entre 12 y 18 años. Con el fin de analizar la estructura dimensional del SAI-SV se aplicaron análisis factoriales exploratorios y confirmatorios. La consistencia interna (coeficientes alfa de Cronbach) y la fiabilidad test-retest se calcularon para las puntuaciones de la SAI-SV. **Resultados:** una estructura de tres factores correlacionados en relación con las situaciones escolares (Ansiedad sobre Agresividad, Ansiedad sobre la Evaluación Social y Ansiedad sobre el Fracaso Escolar) y una estructura de tres factores relativos a los sistemas de respuesta de ansiedad (Ansiedad Fisiológica, Ansiedad Cognitiva y Ansiedad Conductual) fueron identificados y apoyados. La consistencia interna y la fiabilidad test-retest fueron apropiadas. **Conclusiones:** la evidencia de fiabilidad y validez basada en la estructura interna de las puntuaciones del SAI-SV fue satisfactoria.

**Palabras clave:** adolescencia, ansiedad escolar, miedos escolares, fobia escolar, Educación Secundaria.

School phobia is considered to be a subset or symptom 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 5-17 years (Kearney, Cook, & Chapman, 2007). These authors argued that the first two reasons why youths refuse school are closely related to the concept of school anxiety or stress, as follows: (a) to avoid school-related objects and situations that provoke a general sense of negative affect (i.e., anxiety); (b) to escape from 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, p. 422). Thus, school anxiety can be defined as the response pattern, which includes cognitive symptoms (unpleasant thoughts and apprehension), physiological symptoms (high level of arousal), and behavioral symptoms (avoidance and/or escape behavior), that is elicited by stressful school situations that the student perceives as threatening and/or dangerous (García-Fernández, Inglés, Martínez-Monteagudo, & Redondo, 2008). In this line, the School Anxiety Inventory-Short Version (SAI-SV) is a self-report measure that assesses the frequency of five cognitive anxiety responses, five physiological anxiety responses, and five behavioral anxiety responses to 15 school situations that generate anxiety.

## Previous evidence of the reliability and validity of SAI scores

The conceptual basis of the SAI originated from the integration of Lang's three-dimensional theory (Lang, 1968), which was recently reviewed by Martínez-Monteagudo, Inglés, Cano-Vindel, & García-Fernández (2012), and the person-situation interaction model of anxiety proposed by Endler (1975).

Since its initial development (described by García-Fernández et al., 2011), the SAI has been translated into several languages. These translations include versions in French (Delgado, García-Fernández, Inglés, & Hugon, 2011), Chinese, Portuguese, and Chilean-Spanish (see García-Fernández & Inglés, 2012).

García-Fernández et al. (2011) administered the SAI to a sample of 520 Spanish secondary education students (12 to 18 years). The exploratory factor analyses (EFAs) applied to school situations in the SAI identified the following four factors: Anxiety about Academic Failure and Punishment (8 items), Anxiety about Aggression (6 items), Anxiety about Social Evaluation (5 items), and Anxiety about Academic Evaluation (4 items). The EFAs applied for each response system in the SAI identified the following three factors: (a) Cognitive Anxiety (9 items), Physiological Anxiety (5 items), and Behavioral Anxiety (5 items). To assess the adequacy of factor models, four confirmatory factor analyses (CFAs), one for school situations (correlated four-factor model) and three for each response system included in the SAI, were conducted. CFAs revealed a good fit to the data in all cases. García-Fernández et al. (2011) found adequate internal consistency coefficients (Cronbach's alpha) for all scores of the SAI. Furthermore, test-retest reliability over a 2-week period was also adequate for all scores of the SAI. The results also revealed positive and statistically significant correlations between the SAI and the State-Trait Anxiety Inventory (STAI).

The SAI finally included 23 school situations and 19 responses (9 cognitive, 5 physiological, and 5 behavioral). In this case, the Situations  $\times$  Responses interaction produces 200 items for the student to complete (García-Fernández et al., 2011).

The SAI can be applied in different fields of psychology. However, due to the inventory's administration time, it may not be useful in certain situations. Its length may be acceptable when it is administered alone. However, researchers and students often perceive the length of the SAI as excessive, especially when it is administered in combination with other instruments. To address this concern, the present study developed a shorter version of the SAI (the SAI-SV).

Therefore, the overall goal of the present study was to examine the reliability and validity of SAI-SV scores in a sample of Spanish middle and high school students.

The key study goals were as follows: (a) to examine the validity evidence based on the internal structure drawn from the scores on the SAI-SV using principal axis factoring (PAFs); (b) to examine the assumptions of univariate and multivariate normality or distribution of the SAI-SV items; (c) to examine the validity evidence based on the internal structure drawn from the scores on the SAI-SV using CFAs; (d) to estimate the internal consistency (Cronbach's alpha coefficients) of scores on the SAI-SV; and (e) to estimate 2-week test-retest reliability coefficients for SAI-SV scores.

## Method

## Participants

The research study took place in two provinces in southeast Spain during the 2010-2011 academic years. A cluster random sampling was performed throughout the five geographical areas (center, north, south, east and west) of the provinces of Alicante and Murcia, Spain. 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 selected from each school, with approximately 140 students per school.

The initial sample consisted of 2,415 middle and 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 of the students participated voluntarily, and no students declined to participate. The final sample included 2,367 students (1134 boys and 1233 girls), with ages ranging 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) 12-13-year-olds, 714 (351 boys and 363 girls) 14-15-year-olds and 908 (434 boys and 474 girls) 16-18-year-olds. A chi-square test of the gender and age differences in the distribution of adolescents found no significant differences for the six Age  $\times$  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 ( $\Phi = .02$ ).

## Instrument

*School Anxiety Inventory-Short Version (SAI-SV)*. A panel of experts reviewed the SAI to reduce the number of items while maintaining the relevant information for assessment. Thus, the SAI 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 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. The contents of the deleted items were reflected in the factors to which they belonged. Thus, the SAI factors continued to remain even though the number of school situations and anxiety responses (items) was reduced. As a result, the SAI-SV was composed of 15 items related to school situations and 15 items related to three response systems of anxiety (5 cognitive, 5 physiological, and 5 behavioral responses). In this case, the Situations  $\times$  Responses interaction produced 116 items.

The SAI-SV can be administered to students who range in age from 12 to 18 years. This instrument assesses the frequency of 5 cognitive anxiety responses, 5 physiological anxiety responses and 5 behavioral anxiety responses to 15 school situations.

The SAI-SV has a situation-response (S-R) 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 scale (ranging from 0 = *never* to 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 (cognitive, physiological or behavioral) on the vertical axis only when the intersection of the two is blank rather than black. Hence, the student must respond to 116 blank cells.

### Procedure

Prior to participation, adolescents provided assent and their parents provided 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.

### Data analyses

The data analytic plan proceeded as follows. First, although sole reliance on confirmatory factor analysis (CFA) might be ill advised (e.g., Thompson, 2004), factor analysts generally recommend that exploratory factor analysis precede CFA when evaluating a new test or theory (e.g., Schmitt, 2011). Bearing in mind these recommendations, to analyze the dimensional structure of the SAI-SV by means of cross-validation, the total sample was divided into two subsamples. The random split was performed in SPSS version 20.0 (IBM Corp. Released, 2011) via the SAMPLE command to generate random samples of approximately 50% of the cases, as follows:  $n_1 = 1199$  and  $n_2 = 1175$ .

Four PAFs were performed in the first subsample. One PAF for school situations was performed with promax rotation because of the assumption of correlated factors (Schmitt, 2011). Three PAFs were performed for the triple response system of anxiety as assessed by the SAI-SV. Research has shown that the Kaiser criterion for eigenvalues greater than 1 can either underestimate or overestimate the appropriate number of factors (Floyd & Widaman, 1995); thus, the factorial solution was determined using the scree plot method. Only factors with a loading of .30 or higher were extracted (Child, 2006). Second, CFAs were conducted on the second subsample to test the models obtained in the PAFs. For this analysis, 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). Finally, we computed internal consistencies and test-retest reliability of the SAI-SV scores using Cronbach's alpha and Pearson correlation coefficients, respectively.

## Results

### Validity evidence based on the Internal Structure of the SAI-SV Scores: Principal Axis Factoring

The PAF applied to school situations in the SAI-SV identified three factors, which accounted for 70.23% of the variance (see Table 1), as follows: Anxiety about Aggression (AA; eigenvalue = 7.83) accounted for 52.23% of the variance and included 5 items (e.g., "If I am insulted or threatened"). Anxiety about Social Evaluation (ASE; eigenvalue = 1.99) accounted for 13.29% of the variance and included 5 items (e.g., "If I ask the teacher in class"). Finally, Anxiety about Academic Failure (AAF; eigenvalue = 1.56) accounted for 10.37% of the variance and consisted of 5 items related to anxiety caused by academic failure (e.g., "If I get bad marks"). The scree plot was consistent with a three-factor solution. The correlations between the factors presented a large magnitude ( $r > .50$ ; Cohen, 1988), as follows: .58 (AA-ASE), .59 (AA-AAF), and .52 (ASE-AAF).

The PAF applied to each response system in the SAI-SV identified the following three factors (see Table 2): (a) Physiological Anxiety (PA; eigenvalue = 3.28) accounted for 58.10% of the variance. This factor consists of 5 items that assess nervous system activation to the school situations (e.g., "My heart beats quickly"). The scree plot was consistent with a one-factor solution. (b) Cognitive Anxiety (CA; eigenvalue = 3.19) accounted for 56.32% of the variance. This factor consists of 5 items that indicate thoughts and feelings about the various school situations (e.g., "It frightens me and it makes me nervous"). The scree plot was consistent with a one-factor solution. (c) Behavioral Anxiety (BA eigenvalue = 2.76) accounted for 47.06% of the variance. This factor consists of 5 items that assess readily observable behavioral responses to school situations (e.g., "my voice trembles"). The scree plot was also consistent with a one-factor solution (see Table 2).

### Validity evidence based on the Internal Structure of the SAI-SV Scores: Confirmatory Factor Analyses

We examined the data for univariate and multivariate normality assumptions by obtaining univariate skewness and univariate kurtosis values and the Mardia's normalized multivariate kurtosis coefficient. These analyses were conducted via the EQS version 6.1 software program (Bentler, 2005). Finney and DiStefano (2006) suggested that univariate skewness and kurtosis values that are closer to 0.0 indicate a normal distribution. Studies on the impact of univariate normality on maximum likelihood procedure (ML)-based results have suggested that problems may occur when univariate skewness and univariate kurtosis approach values of 2 and 7, respectively, and that skewness  $\geq 2$  and kurtosis  $\geq 7$  indicate a severely non-normal distribution (e.g., Bentler, 2005; Finney & DiStefano, 2006). In addition, data associated with a value of Mardia's normalized multivariate kurtosis greater than 3 could produce inaccurate results when used with ML estimation (Bentler, 2005).

We found that univariate skewness and univariate kurtosis values for all of the SAI-SV items were within the expected range of normality (see Tables 1 and 2). However, values of Mardia's normalized multivariate kurtosis for the SAI-SV items were 130.51 (situational dimensions of the SAI-SV; AA, ASE, and AAF),

Table 1  
Exploratory and confirmatory factor analyses of situational dimensions of the SAI-SV

Items	Principal axis factoring. Subsample 1			Confirmatory factor analysis. Subsample 2							
	PAF			Distribution of SAI-SV scores					CFA		
	Loadings	$h^2$	M	SD	Skewness	Kurtosis	Loadings	Error	R <sup>2</sup>		
Anxiety about Aggression (Rank: 0-140)	AA	ASE	AAF								
S1. If people criticize me at school	.95	-.01	-.05	.85	1.99	.89	.86	.19	.92	.40	.84
S2. If people laugh or make fun of me	.92	.05	-.03	.88	2.07	.94	.80	-.04	.94	.33	.89
S3. If people treat me with contempt or with an air of superiority	.85	-.00	-.02	.71	2.05	1.01	.85	-.02	.83	.55	.69
S4. If I am insulted or threatened	.81	.02	.08	.76	2.13	.094	.72	-.15	.88	.45	.78
S5. If I am ignored by classmates	.74	-.01	.12	.65	2.23	1.05	.70	.32	.80	.60	.63
Anxiety about Social Evaluation (Rank = 0-176)	AA	ASE	AAF								
S6. If I go up to the blackboard	-.04	.87	.02	.73	1.93	.84	1.08	.73	.86	.51	.74
S7. If I talk to the class	.03	.84	-.05	.70	1.89	.88	1.13	.81	.77	.63	.60
S8. If the teacher asks me a question	.00	.83	.09	.77	1.94	.81	1.03	.74	.90	.44	.81
S9. If I ask the teacher in class	.06	.81	-.07	.67	1.63	.72	1.45	2.02	.83	.55	.70
S10. If I read aloud in front of the class	.00	.75	-.07	.52	1.65	.79	1.62	2.57	.72	.69	.52
Anxiety about Academic Failure (Rank: 0-148)	AA	ASE	AAF								
S11. If I get bad marks	-.04	-.07	.96	.83	2.79	.84	.17	-.32	.91	.42	.82
S12. If I fail an exam	.03	.03	.85	.79	2.49	.83	.49	-.27	.88	.47	.78
S13. If I show my school report to my parents and it is not good	.02	.00	.76	.60	2.67	.99	.46	-.57	.80	.60	.64
S14. If I repeat the year	.06	-.09	.76	.57	3.37	1.09	.31	.70	.73	.68	.54
S15. If I take a written exam	-.02	.25	.47	.49	2.38	.92	.55	-.35	.66	.75	.44

Note: PAF: Principal axis factoring; CFA: confirmatory factor analysis;  $h^2$ : communality coefficient; R<sup>2</sup>: proportion of explained variance; AA: Anxiety about Aggression; ASE: Anxiety about Social Evaluation; AAF: Anxiety about Academic Failure. Promax rotation was performed.

42.63 (PA), 15.37 (CA), and 55.65 (BA). These values support the presence of severe multivariate non-normality in the distribution of the study data. Therefore, based on the recommendations of Finney and DiStefano (2006), CFAs were conducted using robust ML estimation. Thus, we used the Satorra-Bentler chi-square ( $S_B\chi^2$ ) scaling method (Satorra & Bentler, 1994) because researchers have recommended its use for non-normal multivariate data (Dimitrov, 2010; Satorra & Bentler, 1994). The following fit indexes were also examined: (a) the robust comparative fit index (R-CFI), (b) the robust root mean square error of approximation (R-RMSEA), and (c) standardized root mean square residual (SRMR).

A good fit is indicated by CFI values greater than .90 or close to .95 and SRMR values less than .08. R-RMSEA values less than .06 indicate a good fit; R-RMSEA values as high as .08 indicate a reasonable fit (Hu & Bentler, 1999).

CFA supported the correlated three-factor model (i.e., AA, ASE, and AAF) of the SAI-SV that was identified by the PAF. Thus, the overall fit was reasonable, and the values for fit indexes were adequate;  $S_B\chi^2 = 785.23$ ,  $df = 87$ ,  $p = .000$ ; R-CFI = .966, R-RMSEA = .058 (90% CI .055-.062), and SRMR = .050. For the 5 items of the factor AA, the factor loadings ranged from .80 to .94 ( $M = .87$ ). For the 5 items of the factor ASE, the factor loadings ranged from .72 to .90 ( $M = .82$ ). Finally, for the 5 items comprising the factor AAF, the factor loadings ranged from .73 to .91 ( $M = .80$ ). All correlations between situational dimensions of the SAI had a large effect size ( $>.50$ ; Cohen, 1988), as follows:

.54 (AA-ASE), .60 (AA-AAF), and .64 (ASE-AAF). The average intercorrelation between the situational factors of the SAI-SV was .59.

Regarding the factors related to the three response systems of anxiety, the 5 items of the factor PA had factor loadings from .48 to .90 ( $M = .74$ ). The overall fit of this model with correlated errors (items P1-P3) was adequate, with appropriate values for all indexes;  $S_B\chi^2 = 48.19$ ,  $df = 4$ ,  $p = .000$ ; R-CFI = .989, R-RMSEA = .068 (90% CI .052-.086), and SRMR = .018. The 5 items that compose the factor CA had factor loadings from .51 to .85 ( $M = .75$ ). The overall fit of this model with correlated errors (items C2-C4 and C3-C5) was adequate, with reasonable values for all indexes;  $S_B\chi^2 = 35.69$ ,  $df = 3$ ,  $p = .000$ ; R-CFI = .994, R-RMSEA = .066, 90% CI [.047, .087], and SRMR = .014. Finally, the factor loadings of the 5 items of the factor BA ranged from .33 to .86 ( $M = .65$ ). The overall fit of this model with correlated errors (items B3-B4) was adequate, with reasonable values for all indexes;  $S_B\chi^2 = 62.24$ ,  $df = 4$ ,  $p = .000$ ; R-CFI = .981, R-RMSEA = .068, 90% CI [.052, .086], and SRMR = .020.

#### Reliability evidence of SAI-SV Scores

The Cronbach's alpha coefficients were as follows: .94 (AA), .91 (ASE), .89 (AAF), .84 (PA), .85 (CA), and .77 (BA). The 2-week test-retest reliability coefficients were as follows: .87 (AA), .85 (ASE), .83 (AAF), .78 (AP), .76 (AC), and .74 (AC).

Table 2  
Exploratory and confirmatory factor analyses of dimensions of the SAI-SV concerning response systems of anxiety

Principal axis factoring, Subsample 1			Confirmatory factor analyses, Subsample 2						
Items	PAFs		Distribution of SAI-SV scores				CFA		R <sup>2</sup>
	Loadings	h <sup>2</sup>	M	SD	Skewness	Kurtosis	Loadings	Error	
Physiological Anxiety (Rank: 0-172)									
P1. My breathing is rapid	.89	.79	1.89	.86	.95	.30	.90	.43	.81
P2. My heart beats quickly	.84	.71	2.12	.92	.72	-.15	.88	.48	.77
P3. My stomach begins to hurt	.76	.58	1.95	.91	.83	-.12	.70	.71	.49
P4. I blush	.73	.53	1.83	.86	1.16	.88	.73	.68	.54
P5. My head begins to hurt	.54	.29	2.17	1.36	.83	-.66	.48	.88	.23
Cognitive Anxiety (Rank: 0-160)									
C1. It frightens me and it makes me nervous	.89	.79	2.58	.81	.05	-.56	.85	.52	.73
C2. I'm worried about what people will say about me	.84	.70	2.21	.93	.50	-.58	.84	.54	.71
C3. I repeat it in my head. I think of nothing else.	.81	.66	2.92	1.04	.02	-.80	.85	.53	.71
C4. I'm frightened of making a mistake	.67	.44	2.42	.90	.45	-.38	.71	.70	.51
C5. I think that I should have worked more	.48	.23	3.93	.96	-1.20	.92	.51	.86	.26
Behavioral Anxiety (0-116)									
B1. I cannot find words to say what I want	.84	.71	1.93	.79	.92	.35	.84	.55	.70
B2. My voice trembles	.83	.69	1.70	.80	1.40	1.69	.86	.51	.74
B3. My legs shake	.78	.61	1.63	.80	1.55	2.18	.79	.62	.62
B4. I cry without meaning to	.44	.20	1.85	.94	1.09	.38	.41	.91	.17
B5. It's easy for me to put on a false smile	.36	.13	1.78	.90	1.27	1.18	.33	.94	.11

Note: PAF: Principal axis factoring; CFA: confirmatory factor analysis; h<sup>2</sup>: communality coefficient; R<sup>2</sup>: proportion of explained variance

### Discussion

At present, there is a significant lack of questionnaires, inventories and scales that assess school anxiety in adolescence. The resulting gap in knowledge is of great concern because school anxiety/stress is considered to be one of the most prevalent internalizing disorders. Furthermore, through measurement, this problem could be brought to the attention of a school psychologist (Miller & Jome, 2008). In this sense, the current study contributes to the evaluation of school anxiety in middle and high school students.

The present study developed a short version of the SAI (the SAI-SV), with the aim of reducing the administration time while maintaining the necessary items for a precise evaluation. With the help of a panel of experts, this goal was achieved. Furthermore, statistical analyses supported the reliability and validity evidence based on the internal structure of SAI-SV scores. In the study conducted by García-Fernández et al. (2011), the SAI included 23 school situations and 19 responses. The situations × responses interaction results in 200 items that the student must complete. However, in the present study, the SAI-R included 15 school situation items and 15 responses. In this case, the situations × responses interaction results in 116 items. Therefore, 84 items were removed from the original version (García-Fernández et al., 2011). In summary, despite the number of items eliminated by the panel of experts, the SAI-SV scores present fully satisfactory reliability and validity evidence based on factorial structure. Based on this result, it is reasonable to assume that most of the items that were

deleted added little to the total variance explained and that their content was not relevant or significant.

The factor structure of the SAI-SV is multidimensional, composed of three situational factors (i.e., Anxiety about Aggressiveness, Anxiety about Social Evaluation, and Anxiety about Academic Failure) and three response systems of anxiety (Physiological Anxiety, Cognitive Anxiety, and Behavioral Anxiety). The PAFs and CFAs identified and confirmed these dimensions. Furthermore, the average intercorrelation between the situational factors of the SAI-SV was of high magnitude (.59). Clearly, these three situational factors are directly related to the following two functions or reasons behind school refusal behavior (Kearney et al., 1995): (a) to avoid school-related objects and situations that provoke a general sense of negative affect (i.e., anxiety) and (b) to escape from aversive social and/or evaluative situations at school. In fact, these two functions or reasons are closely related to the concept of school anxiety or stress (Kearney et al., 2007).

Several authors have established criteria for internal consistency or Cronbach's alpha coefficients (e.g., Ponterotto & Ruckdeschel, 2007). The current internal consistency analyses showed that the SAI-SV scores have satisfactory internal consistency reliability estimates, ranging from .77 to .94 ( $M = .87$ ). García-Fernández et al. (2011) found similar internal consistencies in Spanish students using the original version of this instrument (i.e., the SAI). The current test-retest reliability coefficients ranged from .74 to .87 ( $M = .80$ ), indicating a high magnitude (Cohen, 1988). These coefficients were similar to those reported by García-Fernández et al. (2011).

Although the current study provided valuable and new information about the SAI-SV that should be useful in interpreting this instrument, some degree of caution is warranted. Specifically, the study analyses were limited to the reliability and validity evidence of the SAI-SV across community samples of Spanish adolescents. Future research should replicate and extend these findings to clinical samples of adolescents, other language versions of the SAI-SV, and other ethnic/cultural groups. Furthermore, research should examine the factor structure and factorial invariance of the SAI-SV using samples of adolescents who have been diagnosed with a clinical disorder to determine whether the current findings can be extended to clinical populations. Finally, following indications of the Lagrange Test, some item errors have been correlated on the Physiological Anxiety, Cognitive Anxiety, and Behavioral Anxiety factors of the SAI-SV. The inclusion of new parameters (in this case, correlated errors) should be coherent with theoretical and methodological background. In accordance with theory, the error term is the part that it is not explained by the equation, so it is plausible to think that part of variance not explained for items of the same factor could be related. As mentioned, the EQS 6.1 program (Bentler, 2005) allows one to calculate the Lagrange test, which recommends the correlation of some item errors. Attending to such a recommendation, model adjustment is improved. Despite the enhancement of the measurement model, it would be necessary to pay attention to the formulation of these items. Do to the problems caused by these items, in future research, their relevance should be reconsidered.

In terms of study implications, at a pragmatic level, the SAI-R assesses situations, responses of anxiety, the response-situation interaction, and the three response systems separately. Regarding treatment, the SAI-R offers the possibility of a pre-scan to provide guidelines on the most problematic situations for the student and the type of responses that could be changed. Another positive feature of the SAI-R is that it collects specific cognitive, physiological and behavioral responses separately, which is highly relevant when selecting the appropriate techniques to use in specific psychological treatments. Thus, it is possible to obtain a score for each of the three systems of anxiety response.

#### Authors' Notes

This research was supported by a grant from the Spanish Ministry of Science and Innovation (EDU2012-35124) to the first author. Special thanks to the following researchers for their helpful comments on this article: Christopher A. Kearney, Distinguished Professor of Psychology, Director of Clinical Training at University of Nevada and Director of the UNLV Child School Refusal and Anxiety Disorders Clinic, USA; José Muñiz, Professor of Psychometrics at University of Oviedo (Spain) was president of the European Commission on Tests and Testing, the International Test Commission (ITC) and the European Association of Methodology (EAM); and Antonio Cano-Vindel, Professor of Cognition, Emotion and Health at Complutense University of Madrid (Spain) and president of the Spanish Society for the Study of Anxiety and Stress.

#### References

- Bentler, P.M. (2005). *EQS 6.1: Structural Equations Program Manual*. Encino, CA: Multivariate Software, Inc.
- Child, D. (2006). *The essentials of factor analysis (2nd ed.)*. New York, NY: Continuum.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Erlbaum.
- Delgado, B., García-Fernández, J.M., Inglés, C.J., & Hugon, M. (2011). *Preliminary psychometric properties of the French version of the School Anxiety Inventory*. Paper presented in the Conference of the European Association for Research on Adolescence (EARA), Toulouse, France.
- Dimitrov, D. (2010). Testing for factorial invariance in the context of construct validation. *Measurement and Evaluation in Counseling and Development*, 43, 121-149.
- 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: Hemisphere.
- Finney, S.J., & DiStefano, C. (2006). Non-normal and categorical data in structural equation modelin. In G.R. Hancock & R.O. Mueller (Eds.), *Structural equation modelling: A second course* (pp. 269-314). Greenwich: Information Age.
- Floyd, F.J., & Widaman, K.F. (1995). Factor analysis in the development and refinement of clinical assessment instruments. *Psychological Assessment*, 7, 286-299.
- García-Fernández, J.M., & Inglés, C.J. (2012). *Manual for the School Anxiety Inventory*. University of Alicante, Spain.
- 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.
- 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.
- IBM Corp. Released (2011). *IBM SPSS Statistics for Windows, Version 20.0*. Armonk, NY: IBM Corp.
- 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.
- Kearney, C.A., & Spear, M. (2012). School refusal behavior. School-based cognitive-behavioral interventions. In R.B. Mennutti, A. Freeman, & R.W. Christner (Eds.), *Cognitive-behavioral interventions in educational settings: A handbook for practice* (pp. 161-183). New York, NY: Taylor & Francis.
- Lang, P.J. (1968). Fear reduction and fear behavior: Problems in treating a construct. En J.U.H. Shilen (Ed.), *Research in psychotherapy*, Vol. 3 (pp. 90-102). Washington: American Psychological Association.
- 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.
- 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.

- Ponterotto, J.G., & Ruckdeschel, D.E. (2007). An overview of coefficient alpha and a reliability matrix for estimating adequacy of internal consistency coefficients with psychological research measures. *Perceptual and Motor Skills, 105*, 997-1014.
- 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.
- Schmitt, T.A. (2011). Current methodological considerations in exploratory and confirmatory factor analysis. *Journal of Psychoeducational Assessment, 29*, 304-321.
- Thompson, B. (2004). *Exploratory and confirmatory factor analysis: Understanding concepts and applications*. Washington, DC: American Psychological Association.