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The Trait Anxiety Scale for Children: A validation study for European Portuguese children and adolescents

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Abstract

The State-Trait Anxiety Inventory for Children is a self-report instrument inspired on the State-Trait theory extended by Spielberger that measures a momentary state of anxiety (state) and a stable tendency to experience anxiety (trait). This study presents an exploratory adaptation of the Trait Scale and provides its psychometric properties for European Portuguese children and adolescents. The influence of sex and age were also explored. Our sample, composed of 402 participants aged 8-14 years, revealed a mean anxiety value of 28.37 (*SD* = 5.99). As expected, females revealed higher levels of anxiety than boys. Higher anxiety was obtained in our youngest group as compared to the oldest group. The exploratory factor analysis led to retaining only 16-items that presented acceptable adjustment to a one-factorial solution. Good indexes were obtained in the confirmatory analysis. The results also revealed good internal consistency and good test-retest reliability. Our results provide initial evidence that this scale is adequate to measure trait-anxiety in European Portuguese young people.

Keywords: Trait Anxiety; Trait Anxiety Scale for Children (TASC); European Portuguese children; European Portuguese adolescents; psychometric proprieties

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Introduction

Anxiety is an essential brain response that allows individuals to adapt to real or potential threats. However, sometimes this response is excessive and maladaptive becoming a psychopathological condition (e.g., Perkins & Corr, 2014). Particularly in children and adolescents, anxiety disorders are one of the most common psychopathologies that negatively impact various areas (e.g., Mazzone et al., 2007). Additionally, when occurring at young ages, they tend to prevail into adulthood and are also frequently related with other psychopathologies (Beesdo, Knappe, & Pine, 2009).

The State-Trait Anxiety Inventory for Children (STAIC; Spielberger, Edwards, Lushene, Monturoi, & Platzek, 1973) is widely used to assess anxiety in young people (Beesdo et al., 2009). This instrument includes two independent scales: The State Scale - aims to measure the current feelings of anxiety, and the Trait Scale - assesses a more stable and long-lasting tendency to experience anxiety. This work focused on the latter, henceforth designated by *Trait Anxiety Scale for Children* (TASC).

The TASC has been used in various research areas denoting its utility to measure children and adolescents' anxiety. For example, it has been used to characterize clinical and non-clinical samples in studies on anxiety disorders and to assess the effectiveness of intervention programs (e.g., Seligman, Ollendick, Langley, & Baldacci, 2004). In health-related settings it has been useful to assess psychological adjustment (e.g., Wechsler & Sánchez-Iglesias, 2013). Studies exploring the relation between anxiety and cognitive performance have also used this instrument (e.g., Owens, Stevenson, Hadwin, & Norgate, 2014). Finally, professionals dealing with anxiety-related problems in clinical and educational settings frequently use it (Psychountaki, Zervas, Karteroliotis, & Spielberger, 2003). Thus, the potential utility of this instrument is as large as the variety of these examples.

The TASC has been translated and adapted into several languages, such as Brazilian Portuguese[1] (Biaggio, 1980), Spanish (Gómez-Fernández & Spielberger, 1990), Greek (Psychountaki et al., 2003), and Chinese (Li & Lopez, 2004), with most

[1] One could question the need to adapt this instrument into European Portuguese considering the existence of a Portuguese Brazilian version. Considering that the two countries have substantial cultural (Brazil is mostly influenced by a South-American culture, whereas Portugal, being a European country, has a western culture), as well as language differences (both grammatically and in typical expressions), the Brazilian version would not be appropriate to evaluate trait-anxiety in European Portuguese children and adolescents.

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studies revealing good psychometric proprieties. Additionally, when applicable, these studies have supported the one-factor solution of the scale proposed in studies that have specifically assessed its factorial structure (Cross & Huberty, 1993; Dorr, 1981; Hedl & Papay, 1982). A couple of adaptation studies have been conducted in Portugal but they do not provide a full psychometric characterization of the scale. Specifically, Dias and Gonçalves (1999) only reported Cronbach's alfa as a measure of reliability; Neither this study nor the one by Matias (2004) presented a Confirmatory Factor Analysis (CFA). The current work aims to overcome these limitations.

Developmental research and practitioners will also benefit from this instrument as the analogous instrument to assess anxiety in 15-69 years-old individuals - the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) - has been validated in Portugal and is widely used (Silva, 2003). Providing a validated TASC for young ages will allow practitioners and researchers to use a similar instrument to assess trait-anxiety across different developmental periods. Although TASC was originally designed for ages 9-12, it can be used in younger or older children (Spielberger et al., 1973). We chose the age range of 8-14 years to cover a wider developmental period and to potentiate the utility of the instrument. Thus, a similar instrument to assess trait-anxiety in ages 8-69 will become available which will improve the reliability of developmental comparisons. We acknowledge, however, the existence of alternative instruments in Portugal to assess anxiety in children which differ in many respects (e.g., CMAS-R-Dias & Gonçalves, 1999; SCARED-R-Pereira & Barros, 2010).

In this study participants responded to the scale in two different moments allowing us to assess its test-retest reliability. The following aims were pursued: (1) translate and adapt the TASC for European Portuguese children and adolescents[2]; (2) provide its preliminary psychometric properties; (3) evaluate its factorial structure via Exploratory Factor Analysis (EFA) using the first administration data (data-set-1), and then confirm it using CFA with the second administration data (data-set-2); and, (4) assess anxiety differences between sexes and among age groups.

[2] During the entire process of adaptation of the instrument, we complied with all the formal requirements imposed by Mind Garden, Inc.©, owner of the copyrights of the instrument which, when contacted, informed us of the inexistence of a validated European Portuguese version of this instrument. We also thank Mind Garden, Inc.© for their sponsorship of this project and Professor Ana M. Costa (University of Aveiro) for her contribution to this translation process.

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Method

Participants and procedure

Participants aged 8-14 years were recruited from seven schools of the Aveiro district (Portugal)[3]. Schools were selected by convenience while providing participants from different educational environments. Previous consent for participating was obtained from the participant's guardians and from the participants (for more details see Supplementary Material [SM]-1). The characterization of the sample is presented in Table 1. The scale was administered in groups of 12-28 participants by one of the authors in two independent sessions lasting approximately 15-20 minutes (interval between test-retest was 3-4 weeks).

Measures

The *TASC* includes 20-items that describe anxiety experiences a person might experience (e.g., item 6-"I worry too much"©). For each item, participants choose one of three options that indicate how often they experience the described situation - "hardly-ever", "sometimes" or "often"; these options are scored with 1, 2, and 3 points, respectively (total score range: 20-60). Higher scores indicate higher anxiety.

The translation of the TASC included four phases: (1) translation of the original questionnaire to European Portuguese by two of the authors highly proficient in English; (2) blind back-translation by an English Professor from the University of Aveiro; (3) examination of the translated and retranslated versions and adjustment of some of the terms by two of the authors highly proficient in English; and, (4) implementation of a think-aloud protocol by two psychologists with clinical experience with 15 children and adolescents (M_{age} = 9.87; *SD* = 2.26) to assess understandability of the items.

[3] A special acknowledgment is made to the group of schools from Águeda, Águeda-Sul, Aveiro, Estarreja, Murtosa, Oliveira do Bairro, Colégio Frei Gil, and Colégio D. José I, for their collaboration in this study. We also thank the collaboration of Lígia Ribeiro and Patrícia I. Marinho for their assistance in the data collection.

Results

Overall results, sex and age groups comparisons

A description of the conducted analysis is presented in SM-2 and the raw database corresponds to SM-6.

Our sample revealed an anxiety mean score of 28.37 (*SD* = 5.99) for the 16-items scale (see analysis below), with scores non-normally distributed (Skewness = .386; Kurtosis = -.054). The overall descriptive data broken down by sex and age groups and the corresponding normality tests, are presented respectively, in Table 1 and in SM-3. An independent samples *t*-test revealed significantly higher anxiety values in females than in males, $t(394.3) = 3.89$, $p < .001$, $d = 0.39$. Additionally, the Oneway ANOVA revealed a reliable main effect of age group, $F(2,399) = 6.10$, $p = .002$, $\mu_p^2 = .03$; The pairwise comparisons between groups revealed that the younger group reported significantly higher levels of anxiety than the older one ($p = .002$); no other significant differences were obtained for the remaining comparisons (lowest $p = .348$).

Table 1. Sample and sub-samples sizes and percentages from the total sample. The Means and Standard Deviations regarding age, as well as the total trait-anxiety score obtained from the 16-items scale, are also presented for the total sample and according to sex and age groups.

	Groups		Age		TASC Totals	
	N	*%*	*Mean*	*SD*	*Mean*	*SD*
Total Sample	402	100	11.40	1.87	28.37	5.99
Sex						
Girls	202	50.25	11.50	1.86	29.51	6.25
Boys	200	49.75	11.29	1.87	27.23	5.49
Age groups						
Youngest	101	25.12	8.88	.70	30.02	5.44
Intermediate	75	18.66	10.43	.62	28.60	6.09
Oldest	226	56.22	12.84	.78	27.56	6.05

Note: See more details regarding the definition of the age groups in Supplementary Material 1.

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Factorial Structure

First we conducted an EFA using data-set-1 and then, a CFA using data-set-2. Given the categorical nature of the scale, and the violation of multivariate normality in both datasets (Mardia's Test; g1p = 33.897, g2p = 456.943; chi.skew = 22271.13, $p < .001$; z.kurtosis = 5.726, $p < .001$, for data-set-1; Mardia's Test; g1p = 36.155, g2p = 471.931; chi.skew = 2422.396, $p < .001$; z.kurtosis = 10.791, $p < .001$, for data-set-2), the Weighted Least Squares with Mean and Variance adjustment (WLSMV; Finney & DiStefano, 2006) estimator, which relies on the polychoric correlation matrix[4], was used in both analyses. Analyses were conducted using M-Plus 7.4 (Muthén & Muthén, 2012). The screeplot analysis indicated retaining a maximum of two factors. Both the 1- and 2-factors solutions achieved acceptable global adjustment. Given that the confidence interval for the RMSEA overlapped between these solutions, because a 1-factor solution has been put forward in the literature, and looking for the most parsimonious model (Fabrigar, Wegener, MacCallum, & Strahan, 1999), we opted for the 1-factor solution $X^2(170) = 395.348$; $p < .001$; $X^2/df = 2.326$; CFI = .908; PCFI = .81; RMSEA = .057; $P(rmsea \leq 0.05) < .049$) (see also SM-4). Considering a minimum loading of .40, items 8, 11, 15 and 16 fell below the criteria for practical significance (Hair, Black, Babin, & Anderson, 2014). Their exclusion led to an acceptable 1-factor solution via an EFA.

To confirm the 16-items one-factor solution obtained by the exploratory method, we conducted a CFA using data-set-2. This model revealed an acceptable global adjustment, $X^2(104) = 340.431$; $p < .001$; $X^2/df = 3.273$; CFI = .927; PCFI = .803; RMSEA = .075; $P(rmsea \leq 0.05) < .001$. All the items reached high factor weights ($\lambda \geq .5$) and appropriate individual reliabilities ($R^2 \geq .25$), showing good local adjustment and indicating to be a reflection of the latent factor being measured (Marôco, 2014) (see also SM-4). Importantly, by eliminating these 4-items we only lose 4.2% (adjusted-R^2 = .958) and 3.5% (adjusted-R^2 = .965) of the explained variance of the final score with 20-items from data-set-1 and data-set-2, respectively.

[4] We would like to thank one of the reviewers for calling our attention to this issue.

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Reliability

To evaluate the reliability of the 16-items scale, we assessed the internal consistency (Cronbach's α), the test-retest reliability (Intraclass Correlation Coefficient-ICC) and the composite reliability (construct reliability using the method of Fornell & Larcker, 1981) (see Table 2). We obtained a good internal consistency considering our overall $\alpha > .80$ (Nunnally & Bernstein, 1994). The overall ICC value was above .75, the cut-off point defined by Fleiss, Levin, and Paik (2003) for a good test-retest reliability. The composite reliability value above .70 ($CR_{TASC} = .915$) indicates an appropriate construct reliability.

Table 2: Internal consistency and reliability data of the 16-items model of TASC for the total sample, by sex and by age groups.

	Total Sample	Sex		Age Group		
		Boys	Girls	Youngest	Intermediate	Oldest
Cronbach's α	.873	.864	.875	.853	.885	.879
Mean inter-item correlation	.301	.286	.304	.264	.332	.313
Mean corrected item-total correlation	.510	.495	.514	.474	.541	.523
Test-retest reliability (ICC)	.757	.706	.785	.712	.832	.757

Discussion

This study presents preliminary evidence for a reliable and valid scale to assess trait-anxiety in European Portuguese children and adolescents. We performed a proper translation process and a CFA, elements lacking in the previous Portuguese validation studies. Our participants reported overall anxiety levels similar to those obtained in other countries (e.g., Greece) as well as in the most recent Portuguese study by Matias (2004) (see a brief summary in SM-5).

Our result of higher anxiety in females than males is consistent with previous validation studies (e.g., Matias, 2004; Psychountaki et al., 2003) and with studies that specifically explored sex differences in anxiety (e.g., Chaplin & Aldao, 2013). This result confirms that our instrument is sensitive to sex differences which contributes to

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establish its validity. The influence of age on anxiety is less consensual in the literature. In our study, only the youngest group reported significantly higher anxiety than the oldest which diverges from studies where no differences were found (e.g., Matias, 2004). However, the anxiety reported by the Youngest and Intermediate age groups did not differ significantly which is consistent with other work (e.g., Psychountaki et al., 2003). Older participants tend to exhibit higher anxiety than younger children (Kozina, 2014), but few studies have compared age groups similar to ours which limits our discussion of this variable.

The exploratory analysis revealed that 4-items did not organize into coherent factors. The remaining 16-items saturated in a consistent way to a single factor. The one-factor solution of the 16-items was confirmed with good global and local adjustments. Previous studies that specifically tested the factorial structure of this scale (e.g., Cross & Huberty, 1993; Dorr, 1981; Hedl & Papay, 1982), and other validation studies (e.g., Chinese-Li & Lopez, 2004; Greek-Psychountaki et al., 2003) have also argued for a one-factor structure. Although they maintained the 20-items instrument, their factorial analyses indicated that some items did not adequately saturate the one-factor solution. Interestingly, three of the 4-items we excluded, namely items 8, 15 and 16, have consistently failed to reach a reasonable saturation level in several of these studies (e.g., Cross & Huberty, 1993; Dorr, 1981; Matias, 2004; Psychountaki et al., 2003). The other item differs, though, which could be related to cultural differences, one of the reasons underlying the need to adapt instruments for the population of interest (Beaton, Bombardier, Guillemin, & Ferraz, 2000).

This 16-items scale revealed good internal and test-retest consistency. These values are generally better than those obtained in the abovementioned studies without losing a significant amount of the explained variance (see SM-5 for a summary of similar reliability indexes reported in other studies).

We propose an adaptation of TASC for European Portuguese children and adolescents. These results should be taken as an initial adaptation given a few limitations of the study such as the circumscribed geographical provenience of our sample and the lack of a concurrent validity test. Future studies including samples from other regions of Portugal and exploring the concurrent validity of this scale, would contribute to establish its validity. The universal usage of this instrument speaks for its overarching impact in the study and consideration of this individual characteristic that

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plays a major role in a wide variety of contexts. Providing validated instruments for other researchers and professionals wishing to assess anxiety is quintessential to assure the adequate study of this characteristic.

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Disclosure statement

No potential conflict of interest was reported by the authors.

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Supplementary Material 1

Detailed characterization of the Participants

Our sample included 402 children and adolescents aged 8-14 years recruited from schools of the Aveiro district (Portugal). Data from 13 other participants were excluded due to missing values or because they turned 15 years old between the first and second testing moments that allowed to measure the test-retest reliability of the scale.

Our age groups were created according to the school years participants were attending to which also correspond to different school levels. In Portugal, the first four years of formal education correspond to the 1st cycle of studies and includes, usually, children aged 6-10 years; our *youngest* age group belongs to this cycle and includes 101 children attending the school years 3 and 4 (M_{age} = 8.88; *SD* = 0.70). The 2nd cycle of studies corresponds to the school years 5 and 6 of formal education and normally includes children aged 10-12 years; this is our *intermediate* age group which includes 75 children (M_{age} = 10.43; *SD* = 0.62). The 3rd cycle of studies corresponds to the 7th through the 9th years of formal education being attended by adolescents aged 12-14 years; this is our *oldest* age group which includes 226 adolescents (M_{age} = 12.84; *SD* = 0.78). This form of creating the different age groups has been used in previous studies (e.g., Psychountaki et al., 2003).

Schools were selected by geographical convenience. However, in an effort to increase the representativeness of our sample regarding different educational environments we included five public and two private schools belonging from rural as well as from urban areas. Approval to conduct the study was initially obtained by the Portuguese Directorate-General for Education and the Directors of the selected schools. The to-be-tested groups were indicated by the Director of each school according to a random selection performed by each school. Parents of the children and adolescents of those groups were contacted with a request to consent the participation of the students. Previously to the collection of the data consent to participate was also obtained orally from the participants. Anonymity of the data was fully assured to participants and their parents.

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Each participant responded to the scale in two different occasions. The interval between test and retest was 3-4 weeks, respecting the minimum of two weeks (e.g., Psychountaki et al., 2003). A specific code was created for each participant during the first session which allowed us to pair the responses obtained in the two assessment moments ensuring total anonymity.

In the session, each participant responded to a small set of self-report instruments. According the aim of this paper, we only report the data from the Trait Anxiety Scale for Children (TASC).

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Supplementary Material 2

Data Analysis

Data Analysis was carried out with SPSS (v.22). To evaluate sex and age group differences in the total TASC scores we conducted an independent-samples *t*-test and a one-way Analysis of Variance, respectively. A Bonferroni correction was applied to the pairwise comparisons among age groups. All of these analyses were two-sided. Corrected degrees of freedom are presented when equality of variances was not obtained.

The Exploratory Factor Analysis (EFA) using the dataset-1 was conducted using the Weighted Least Squares with Mean and Variance adjustment (WLSMV; Finney & diStefano, 2006) given the categorical nature of the scale, and the fact that this dataset was not multivariate normal. This estimator relied on the polychoric correlation matrix. Global adjustment and loading values were considered when analyzing the EFA results. As a result, a new EFA was carried out using the same database but considering only the 16-items that obtained loadings of practical significance (i.e., ≥ 0.40; Hair, Black, Babin, & Anderson, 2014). A confirmatory factor analysis was then conducted using the dataset-2. Provided that this dataset was also not multivariate normal, the WLSMV estimator was again used. These analyses were conducted using M-Plus 7.4 (Muthén & Muthén, 2012).

The overall goodness-of-fit of the factor model was assessed using the following indices: χ^2/df, CFI, PCFI, RMSEA, the P[rmsea ≤ 0.05], and the Confidence Intervals of the RMSEA (e.g., Marôco, 2014). The local adjustment was evaluated by the factor weights and individual reliability of the items. A Composite Reliability, an accurate measure of factorial reliability, was calculated as described by Fornell and Larcker (1981). The internal consistency was evaluated by Cronbach's α (inter-item and item-total correlations are provided) and the test-retest reliability (temporal constancy) by the Intraclass Correlation Coefficient (ICC) (e.g., Bédard, Martin, Krueger, Brazil, 2000; Weir, 2005). The latter constitute the assessment of the reliability of the scale.

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Supplementary Material 3

Normality tests for the Total score (based on the final 16-items solution), results by Sex and by Age groups for datasets-1 and -2

	Mean	Score range	Skewness	Kurtosis	Kolmogorov-Smirnov[§]		
					Statistic	Df	*p*
Total score dataset-1	28.37	16-47	.386	-.054	.068	402	<.001
Total score dataset-2	27.98	16-47	.429	-.112	.064	402	<.001
Sex							
Dataset-1							
Males	27.23	16-44	.352	.004	.078	200	<.01
Females	29.51	16-47	.317	-.206	.082	202	<.01
Dataset-1							
Males	26.79	16-47	.714	.472	0.83	200	<.01
Females	28.27	16-46	.184	-.268	0.53	202	.200
Age Group							
Dataset-1							
Youngest	30.02	16-47	.488	.996	.089	101	<.01
Intermediate	28.60	17-44	.527	-.209	.102	75	.050
Oldest	27.56	16-45	.404	-.253	.081	226	<.01
Dataset-2							
Youngest	27.32	16-46	.282	.057	.076	101	.162
Intermediate	27.61	17-47	.714	.561	.083	75	.200
Oldest	27.84	16-45	.402	-.349	.074	226	<.01

Notes: [§] Lilliefors significance correction.

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Supplementary Material 4

Comparison between the two models obtained in the Exploratory Factor Analysis using 20-items, and the Exploratory and Confirmatory Factor Analysis using the 16-items

	EFA – 20 items[a]		**EFA – 16 items[a]**	**CFA – 16 items[b]**
	1-factor model	**2-factors model**		
X^2	395.348 (df = 170)	284.396 (df = 151)	274.164 (df = 104)	340.431 (df = 104)
x^2/df	2.326	1.883	2.636	3.273
CFI	0.908	0.945	0.923	0.927
PCFI	0.812	0.751	0.799	0.803
RMSEA	0.057	0.047	0.064	0.075
CI for RMSEA	0.050-0.065	0.038-0.055	0.055-0.073	0.066-0.084

Notes: [a]analysis using dataset-1; [b]analysis using dataset-2; CI = Confidence Interval for RMSEA; X^2- the lowest the value the better the adjustment; CFI = Comparative Fit Index, good adjustment values between .9 and .95; PCFI = Parsimony Comparative Fit Index, very good adjustment values when ≥ 0.8; RMSEA = Root Mean Square Error of Approximation, good adjustment between .05 and .10. The characterization of these values follows a systemization of the relevant information provided by Marôco (2014, p.51).

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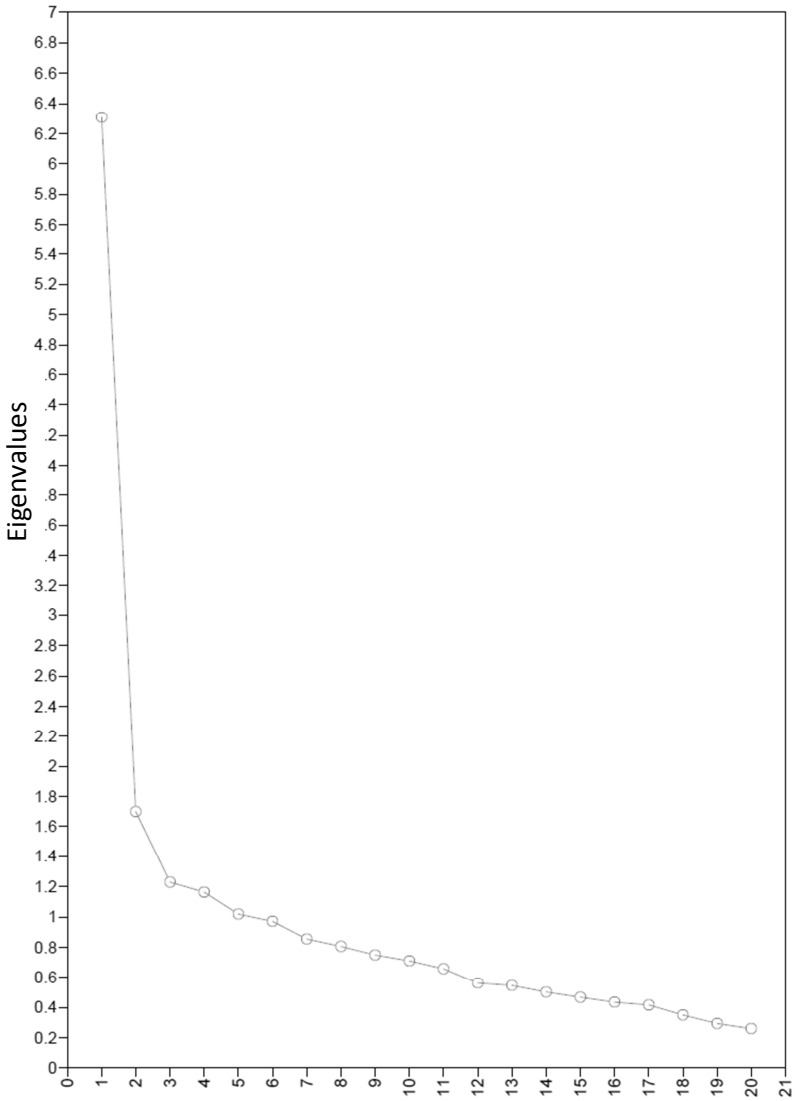
Scree plot on the EFA using 20-items



Note: Only the results from the 2-factor exploratory analysis are provided given the inflection in the screeplot.

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Component loadings obtained in the Exploratory and Confirmatory Analyses using the Weighted Least Squares with Mean and Variance adjustment (WLSMV) estimator (Finney, & DiStefano, 2006).

	Component Loadings		
	EFA - 20 items[a]	EFA - 16 items[a]	CFA -16 items[bc]
ITEM 1	0.520	0.512	0.569
ITEM 2	0.571	0.581	0.604
ITEM 3	0.645	0.649	0.708
ITEM 4	0.618	0.621	0.633
ITEM 5	0.611	0.619	0.696
ITEM 6	0.595	0.579	0.690
ITEM 7	0.554	0.556	0.585
ITEM 8	0.376	--	--
ITEM 9	0.541	0.562	0.603
ITEM 10	0.418	0.416	0.566
ITEM 11	0.306	--	--
ITEM 12	0.688	0.687	0.610
ITEM 13	0.599	0.600	0.572
ITEM 14	0.565	0.565	0.669
ITEM 15	0.381	--	--
ITEM 16	0.287	--	--
ITEM 17	0.662	0.645	0.715
ITEM 18	0.431	0.443	0.601
ITEM 19	0.504	0.508	0.668
ITEM 20	0.609	0.607	0.633

Notes: [a]analysis using dataset-1; [b]analysis using dataset-2; [c]Completely Standardized Component Loadings. A solid factor is present when five or more items load strongly (i.e., ≥ 0.40; Hair, Black & Babin, 2010).

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SYNTAX from MPLUs for the EFA and CFA

MPlus Syntax for EFA - 20 items

DATA: FILE IS TASC_dataset1.dat;

VARIABLE: NAMES ARE U1-U20;

categorical are u1-u20;

ANALYSIS: TYPE = EFA 1 5;

ROTATION IS CF-VARIMAX;

PLOT: TYPE = PLOT2;

MPlus Syntax for EFA – 16 items

DATA: FILE IS TASC_dataset1.dat;

VARIABLE: NAMES ARE U1-U20;

categorical are u1-u20;

usevariables are u1-u7 u9-u10 u12-u14 u17-u20;

ANALYSIS: TYPE = EFA 1 5;

ROTATION IS CF-VARIMAX;

PLOT: TYPE = PLOT2;

MPlus Syntax for CFA – 16 items

DATA: FILE IS TASC_dataset2.dat;

VARIABLE: NAMES ARE U1-U20;

usevariables u1-u7 u9 u10 u12-u14 u17-u20;

categorical are u1-u20;

analysis: estimator is WLSMV;

MODEL: total by u1-u7 u9 u10 u12-u14 u17-u20;

OUTPUT: STANDARDIZED MODINDICES;

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Supplementary Material 5

Brief Summary of the Mean values obtained for the Trait Scale, Cronbach's α and Test-retest reliabilities reported in other validation studies

This table summarizes information about some studies for which we were able to collect the relevant information. For each study we provide the age range of the sample along with the mean values obtained in the Trait Anxiety Scale for the Male and Female participants. The age range is important to consider given that some studies have reported differences between age groups. Therefore, this piece of information should be taken into account when drawing comparisons across studies.

Regarding the comparison of the mean values, considering that our values result from a 16-items scale (total results range between 16-48), whereas in the remaining cases the total was obtained from a 20-items scale (total results range between 20-60), we applied a linear transformation to our means to make them more comparable; Again, this transformation was applied only for the sake of comparison to other studies and the conclusions should take it into account.

We also present the alfa of Cronbach which most studies present separately for Males and Females. When available, we also report the test-reliability indicators from other studies although in many cases it is not clear which statistical test was used to determine the test-retest reliability; So care should be adopted when comparing these results.

In some of the validation studies, during the adaptation process, authors added new items to the scale that differ from the original Trait scale (e.g., Brazilian and Spanish validation studies). This factor might account for some variability in the presented data.

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			Mean Trait Anxiety		Cronbach's α		
		Age-range	Males	Females	Males	Females	Test-retest reliability
Portugal	**OUR STUDY**	8-14	34.04	36.89	.86	.88	.86
	Dias & Gonçalves[1]	8-17	41.70	45.61	.66	.76	
	Matias[2]	9-15	34.53	36.64	.76	.81	.78 (M) / .76 (F)
	Original[3]	9-12	36.7	38	.78	.81	.65 (M) / .71 (F)
	Brazil[4]	4th-6th grade#	39.39-44.86	34.70-40.44	.56		.73
	Spain*[5]	3rd grade$	44.41	44.00	.75	.85	n/a
	Greek[6]	9-12	34.4	36.02	.81	.78	.81
	Chinese[7]	7-12	32.88	32.81	.91	.92	.91

Notes: *The authors denote this is a particularly high score in comparison to other studies and discuss this issue extensively in their work (see page 201). # In the Brazilian Education System, these grades usually include children aged 9-12 years. $ In the Spanish Education System, this grade typically includes children aged 8-9 years. M – Males; F – Females.

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