Revista de Psicología Clínica con Niños y Adolescentes
Vol. 3. Nº. 2 - Julio 2016 - pp 43-50

www.revistapcna.com - ISSN 2340-8340

Revista de Psicología Clínica con Niños y Adolescentes

Automatic Thoughts in Social Situations Scale for Adolescents: Factor structure and psychometric properties

Céu Salvador[1], Marina Cunha[2], José Pinto-Gouveia[1], & Carla Bento[1]
[1]*Universidade de Coimbra, Portugal*
[2]*Instituto Miguel Torga, Portugal*

Abstract

Given the importance and difficulty of assessing automatic thoughts in social situations, and the scarcity of instruments in this area for adolescents, the aim of the present study was to explore the factor structure and psychometric properties of the newly developed Automatic Thoughts in Social Situations Scale for Adolescents. A sample of 1,095 adolescents (14-18 years old) obtained in 17 schools from the centre of Portugal participated in the study. Several self-report questionnaires were used. An initial exploratory factor analysis suggested a three-factor structure, responsible for 56.40% of the total variance. This structure was corroborated in the confirmatory factor analysis, and the model was invariant across genders. Acceptable to high internal consistencies for the factors and total, high temporal stability, and good convergent and discriminant validities were obtained. There were no significant differences in the distribution of the variables according to gender.
Keywords: social anxiety, automatic thoughts, assessment, adolescents.

Resumen

Escala de Pensamientos Automáticos en Situaciones Sociales para Adolescentes: Estructura factorial y propiedades psicométricas. Debido a la importancia y dificultad en la evaluación de los pensamientos automáticos en situaciones sociales, y la escasez de instrumentos en esta área para adolescentes, el objetivo del presente estudio fue explorar la estructura factorial y las propiedades psicométricas de la recién desarrollada Escala de Pensamientos Automáticos en Situaciones Sociales para Adolescentes. Una muestra de 1.095 adolescentes (de los 14 a los 18 años), obtenida a partir de 17 escuelas del centro de Portugal participó en este estudio. Se utilizaron varios instrumentos de autoinforme. El análisis factorial exploratorio sugirió una estructura de 3 factores, que explicó el 56.4% del total de la varianza. Esta estructura fue confirmada mediante un análisis factorial confirmatorio, así como la invarianza en función del género. También se obtuvieron valores aceptablemente elevados de consistencia interna, elevada estabilidad temporal y buena validez convergente y discriminante. No se hallaron diferencias entre los géneros en la distribución de las variables.
Palabras clave: ansiedad social, pensamientos automáticos, evaluación, adolescentes.

Social anxiety disorder (SAD) is characterized by an intense fear of performance and interaction situations in which the individual may be scrutinized by others, which tends to follow a chronic course (American Psychiatric Association, 2013).

Although adolescence is associated with a normative increase of social fears (Westenberg, Drews, Goedhart, Siebelink, & Treffers, 2004), due to issues related to the maturity of cognitive functions and self-identity (Holmbeck, O'Mahar, Abad, Colder, & Updegrove, 2006; Sebastian, Burnett, & Blakemore, 2008), and to the huge importance peer relationships and peer approval present at that period (Parker, Rubin, Erath, Wojslawowicz, & Buskirk, 2006), if these social fears and social anxiety persist over time, are too frequent and intense, and involve the avoidance of social or performance situations, causing clinical distress or impairment in important areas of functioning we will thus be facing SAD (APA, 2013). In fact, the probable onset of SAD is in adolescence (APA, 2013; Wittchen & Fehm, 2003), being considered one of the most common mental disorders in this period, with prevalence ranging from 2% to 10% (Essau, Conradt, & Petermann, 2002; Kessler, Berglund, Jin, Merikangas, & Walters, 2005). Furthermore, SAD is responsible for numerous problems in several areas of the adolescent's life (for a thorough review, see Salvador, 2009).

The role of cognitions in the development and maintenance of psychological disorders and the cognitive specificity hypothesis (according to which specific disorders would be characterized by specific cognitions) are emphasized since the early times of cognitive therapy

Correspondence to:
Céu Salvador.
Faculdade de Psicologia e de Ciências da Educação. Universidade de Coimbra.
Rua do Colégio Novo, 3000-115, Coimbra, Portugal.
E.mail: ceusalvador@gmail.com

(Beck, 1976; Beck, Brown, Steer, Eidelson, & Riskind, 1987). For SAD, several models have proposed conceptualizations based on cognitive vulnerabilities and maintenance factors (Clark & Wells, 1995; Hofmann, 2007; Rapee & Heimberg, 1997). These cognitive aspects may range from cognitive schemas, to negative automatic thoughts anticipating (or rumination about) failure and negative evaluation from others, passing through attentional and imagery processes.

Regardless of the importance of automatic thoughts in the phenomenology, conceptualization, and treatment of SAD, and the high prevalence and negative impact of SAD in adolescence, very few self-report instruments aimed at assessing these variables in adolescents are available. The exceptions, are: the Social Cognitions Questionnaire-Spanish version for adolescents (Calvete & Orue, 2012), an adaptation of the same name questionnaire developed by Wells, Stopa, and Clark (1993), a 22-item measure to assess thoughts about social situations; and the more specific Self-Statements During Public Speaking Scale-Spanish version for adolescents (Rivero, Garcia-Lopez, & Hofmann, 2010), also an adaptation from the same scale for adults (Hofmann & DiBartolo, 2000).

In face of this, the aim of the present study was the development and validation of a new self-report scale to assess automatic thoughts in social situations, through the study of its factor structure, internal consistency, temporal stability, validity and behaviour according to gender. We hypothesized that this instrument would show good reliability, good validity, and higher scores among girls.

Method

Participants

Participants were obtained from 17 public and private schools (3rd cycle and secondary schools, 9th to 12th grade) of Portugal centre area. The two samples for this study, resulted from an initial sample of 1095 subjects, aged from 14 to 18 years old, from the 9th to the 12th grade that was subjected to a split-half procedure. The first half of the sample, used for the Exploratory Factor Analysis (EFA), included 542 adolescents, 230 (42.40%) boys and 321 (57.60%) girls, with a mean age of 16.08 (*SD* = 1.43). No differences were found between genders either on age ($t_{(540)} = 1.07$, $p = .28$) or on school years ($\chi 2_{(3)} = 6.28$; $p = .10$).

The second half of the sample, used for the Confirmatory Factor Analysis, reliability and validity, included 553 adolescents, 277 (50.10%) boys and 276 (49.90%) girls, with a mean age of 16.01 (*SD* = 1.32), from the 9th to the 12th grade. Again, no differences were found between genders either on age ($t_{(551)} = .22$, $p = .82$) or on school years ($\chi 2_{(3)} = 6.66$; $p = .08$).

Measures

Several questionnaires assessing social anxiety and general anxiety were used in this study.

Social anxiety

Participants completed the experimental version of the *Automatic Thoughts in Social Situations Scale for Adolescents* (ATSSS-A). This version was adapted from the same scale for adults (Pinto-Gouveia, Cunha, & Salvador, 2000), a self-report instrument to assess the frequency of automatic thoughts that may cross people's minds when they are in social situations, especially if they feel anxious in those situations. This scale belonged to a wider protocol to assess SAD relevant information which also included the Social Interaction and Performance Anxiety and Avoidance Scale (SIPAAS; Pinto-Gouveia, Cunha, & Salvador, 2003) and the Social Phobia Safety Behaviours Scale (SPSBS; Pinto-Gouveia et al., 2003). In the adaptation of the ATSSS-A, also part of a wider protocol to assess SA in adolescents, the instructions and the phrasing of some of the items were modified to ensure its adequate understanding, some items were withdrawn, and a few more items were introduced, to better suit the age of the subjects. The scale was applied to 30 adolescents for facial validity. No other modifications were needed. The experimental version of the ATSSS-A was therefore left with 29 items, rated in a 4-point scale (0 = *never*; 1 = *sometimes*; 2 = *many times*; 4 = *most of the times*). The aim of the present study was to explore its factor structure and psychometric properties.

The *Social Anxiety and Avoidance Scale for Adolescents* (SAAS-A; Cunha, Pinto-Gouveia, & Salvador, 2008) is a 34-item self-report instrument to assess the degree of anxiety and frequency of avoidance in social situations, divided in 2 subscales: the anxiety subscale and the avoidance subscale. Each subscale has 6 factors (interaction in new situations, interaction with the opposite sex, performance in formal situations, assertive interaction, being observed by others, and eating and drinking in public). The scale describes 34 social situations and the subjects have to rate each situation/item according to the degree of anxiety/discomfort felt in that situation and the frequency with which that same situation is avoided (in a 5-point scale, from 1 = *none/never* to 5 = *very much/almost always*). Higher scores indicate higher the anxiety and avoidance. The SAAS-A revealed high values of internal consistency for both subscales, high test-retest reliability, good convergent and divergent validity, and good sensitivity, specificity and discriminant validity (Cunha et al., 2008), as well as a good sensitivity to the results of a cognitive-behaviour treatment (Salvador, 2009). In this study, the SAAS-A was only used in the second sample to assess convergent validity, and only the total scores of the two subscales were used, with Cronbach's alphas of .93 for the anxiety subscale and .91 for the avoidance subscale.

General Anxiety

The *Multidimensional Anxiety Scale for Children* (MASC; March, Parker, Sullivan, Stallings, & Conners, 1997) is a 39-item scale, rated in a four-point scale (from 0 = *never* to 3 = *often*), to assess anxiety symptoms in children and adolescents. The higher the scores, the higher the anxiety experienced by the subject. The scale revealed 4 factors, three of which with 2 sub-factors: Physical Symptoms (12 items), with the sub-factors Tense/Restless and Somatic/Autonomic; Social Anxiety (9 items), with the sub-factors Humiliation/Rejection and Public Performance; Separation Anxiety (9 items); and Harm Avoidance (9 items), with the sub-factors Perfectionism and Anxious Coping (March et al., 1997). The original version revealed reasonable to good Cronbach's alphas for the total score and factors (and week to acceptable for the sub-factors), good test-retest reliability, and good convergent and divergent validity (Baldwin & Dadds, 2007; March et al., 1997; Rynn et al., 2006), which was also confirmed in the Portuguese version (Salvador et al., 2016). In this study, the MASC was also only used in the second sample, as a concurrent measure, and only the factors were used. The Cronbach's alphas found were: .88 for the Social Anxiety and Physical Symptoms factors, .75 for the Separation Anxiety factor, and .131 for the Harm Avoidance factor. This last factor was dropped in the analysis due to its very poor internal consistency.

Procedure

Before the study was conducted, all the necessary permissions from national entities, school boards, adolescent's parents, and the informed consents from the adolescents were obtained, ensuring confidentiality and the voluntary character of the study. The questionnaire was applied in a classroom setting.

Data analysis

Data was explored using the Statistical Package for the Social Sciences (SPSS), version 20 (IBM Corp., 2011) and AMOS, version 20 (Arbuckle, 2011). Items descriptive statistics and distributions were computed to examine the items characteristics. Descriptive statistics were conducted to explore the sample's characteristics. Gender differences were tested using independent sample t-tests, and chi-square tests. Item-total Pearson correlations and Cronbach's alpha calculation were carried out to determine the items' internal consistency. Exploratory Factor Analysis (EFA) were performed, using a Principal Component Analysis with Oblimin oblique rotation (once the factors were thought to be correlated) to assess items homogeneity (Carretero-Dios & Pérez, 2005). Confirmatory Factor Analysis (CFA) was performed to corroborate the factor structure obtained through the EFA, using a significance level of .05. A maximum likelihood method was the estimation method used. Goodness of fit was verified using the following indices: chi-square ($\chi 2$) statistics, $\chi 2$/ degrees of freedom ratio ($\chi 2/df$), Comparative Fix Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA; 90 % confidence interval [CI]). According to Byrne (2010), $\chi 2$ values should not be significant, the value of the $\chi 2/df$ should approach to zero (values between 2 and 5 indicate an acceptable fit), CFI and TLI should be higher than .90, and RMSEA should be lower than .08. Pearson correlations coefficients were performed to explore the association between the variables. Internal consistencies were explored using Cronbach's alpha value. Descriptive statistics and t-tests were used to obtain descriptive and concerning gender, age and grade, and to compare groups according to gender on the ATSSS-A variables.

Results

Preliminary Analysis

None of items revealed severe violations to normality. All values of the response scale were represented in each item, and values of kurtosis and skewness were within normal values (values below 1) (Carretero-Dios & Pérez, 2005; DeVellis, 2011).

Exploratory Factor Analysis

Item-total correlations ranged between .35 and .72, and the alpha value for the total scale (.95) would not improve should any of the items be removed. Therefore, all the 29 items were maintained in the subsequent EFA.

Preliminary analysis confirmed the sample adequacy for a Principal Components (Kaiser-Meyer-Olkin = .95; Bartlett´s test: $p < .001$). The initial solution indicated 5 factors with eigenvalues greater than one, explaining 58.20 % of the variance, although the scree plot analysis suggested 2 factors. In the subsequent refinement, factors were retained if they had eigenvalues greater than 1, conformed to the scree plot analysis, and had no less than 3 items (Costello & Osborne, 2005). Items were retained if they had loadings greater than .30, and did not have multiple loadings (Abell, 2009). The final model ended up with 3 factors (19 items), explaining 56.40% of the variance, with the scree plot also suggesting 3 factors. The first factor, with 10 items, was responsible for 41.60% of the variance, with its items assessing thoughts related to expectancies of a negative performance and the subsequent negative evaluation (e.g., "I'm going to look like a fool", "People will think I'm an idiot"). It was therefore called "Expectancies for negative performance and evaluation". The second factor, left with 4 items, explaining 7.9% of the variance, regarded rigid rules for social performance (e.g., "I have to say something interesting"), and it was called "Rigid Rules". Finally, the third factor, with 5 items, explained 6.9% of the variance. Its items seemed to assess thoughts related to the experience of physical symptoms and its subsequent expectancy of others noticing these symptoms (e.g., "I am shaking/blushing/sweating", "People will see me shaking/blushing/sweating"). We chose to name it "Felt Sense", in accordance with Clark and Wells (1995) definition.

Regarding correlations between factors, the highest correlation was found between factor 1 and factor 3 ($r = .67$). The correlations of factor 2 with factor 1 and 3 were, respectively, .48 and .47 (all with $p < .001$). Table 1 presents the results of the EFA (pattern matrix), for the final three-factor solution, as well as items' media and standard deviations, variance explained, Cronbach's alphas and communalities.

Table 1. Automatic Thoughts in Social Situation Scale for Adolescents: items descriptive statistics, variance explained, internal consistency, factor loadings, and communalities.

Item content	*M* (*SD*)	% variance explained	F_1	F_2	F_3	h^2
Factor 1 – Expectancies for negative performance and evaluation (α = .91)		41.60				
15. Nerd	0.78 (.87)		.90			.69
19. Abnormal	0.58 (.86)		.77			.51
14. Make fun	0.90 (.87)		.77			.60
18. Screw up	0.96 (.87)		.77			.61
04. Idiot	0.98 (.91)		.75			.58

Item content	*M* (*SD*)	% variance explained	F_1	F_2	F_3	h^2
09. Fool	0.91 (.82)		.64			.58
17. No interesting talk	1.08 (.86)		.63			.46
11. Boring talk	0.84 (.81)		.62			.60
16. Ignorance	0.98 (.82)		.61			.53
13. Nothing to say	1.31 (.90)		.48			.41
Factor 2 – Rigid Rules (α = .68)		07.90				
03. Interesting talk	1.55 (.91)			.78		.60
05. Good impression	1.77 (.95)			.73		.52
02. Pay attention	1.55 (.88)			.72		.55
01. Calm down	1.52 (.86)			.51		.39
Factor 3 – Felt sense (α = .84)		06.90				
07. Shaking voice	0.81 (.90)				-.85	.69
10. Shake/blush/sweat	1.01 (.93)				-.79	.69
8. Stutter	0.61 (.85)				-.72	.53
12. Visible shake/blush/sweat	0.93 (.96)				-.67	.66
06. Visible anxiety	1.15 (.96)				-.53	.54

SAAS-A: Social Anxiety and Avoidance Scale for Adolescents; MASC: Multidimensional Anxiety Scale for Children.

Confirmatory Factor Analysis

In the CFA, a one-dimensional model was first tested. There were two reasons for this procedure. First, because the ATSSS-A had been developed without a specific theory to create the items, and second, because the one-dimensional model would serve as a baseline model to evaluate the proposed three-factor model that resulted from the EFA.

Poor fit values were obtained for the one-dimensional model: $\chi^2_{(152)} = 888.18$, $p < .001$; $\chi^2 / df = 5.84$; CFI = .84; TLI = .82; RMSEA = .09; CI 90% = .09 - .10. We then tested the three-factor model, including a second order factor representing the total score. This model obtained a significantly better model fit ($\chi^2 diff = 308.32$, $\Delta df = 3$, $p < .001$). Although the chi-square value was still significant ($\chi^2_{(149)} = 579.86$, $p < .001$), since this value is highly sensitive to the sample size, we relied on the remaining indices which were considered good: $\chi^2 / df = 3.89$; CFI = .91; TLI = .89; RMSEA = .07; CI 90% = .07 - .08. The modification indices provided by AMOS suggested the correlation of the error residuals of four pairs of items to improve the model fit. Since these suggestions were plausible considering the phrasing of the items to be correlated, these correlations have been added to the model. The final model is shown in Figure 1.

The four added error covariances (items 7 and 8; items 10 and 12; items 14 and 15; and items 13 and 17) significantly improved the model fit ($\chi^2 diff = 218.14$, $\Delta df = 4$, $p < .001$), which showed good fit indices: χ^2 (145) = 361.72, $p < .001$; $\chi^2 / df = 2.50$; CFI = .95; TLI = .95; RMSEA = .05; CI 90% = .05 - .06. Additionally, this model also showed high factorial weights ($\lambda \geq 0.5$) and suitable individual reliability ($R2 \geq 0.25$).

The intercorrelations between the factors revealed moderate to high correlations. The highest correlation was again between factor 1 (negative expectancies of performance and evaluation) and factor 3 (felt sense) ($r = .71$, $p < .001$). The correlations between factor 1 and factor 2 (rigid rules) and between factor 2 and factor 3 were moderate (respectively, $r = .50$ and $r = .49$, $p < .001$).

Multi-Group analysis for gender invariance

In order to assess if the factor structure of the ATSSS-A would be equivalent for boys and girls, a multigroup CFA for gender invariance was computed, comparing the unconstrained model and the constrained model, by constraining various parameters across both groups. Although the chi-square was significant ($\chi^2_{(290)} = 590.463$, $p < .001$), all the other indices revealed a very good model fit for both boys and girls: $\chi^2/df = 2.036$; CFI = .94; TLI = .93; RMSEA = .04; CI 90% = .04 - .05. Furthermore, the results obtained confirm the invariance of measurement across genders for measurement weights ($\chi^2_{diff\,(16)} = 20.44$, $p = .20 < \chi^2_{0.95;\,(16)} = 26.30$), for structural covariances ($\chi^2_{diff\,(19)} = 21.84$, $p = .29 < \chi^2_{0.95;\,(19)} = 30.14$) and for measurement residuals ($\chi^2_{diff\,(45)} = 22.68$, $p = .42 < \chi^2_{0.95;\,(45)} = 61.66$).

Internal consistency and temporal stability

Cronbach's alpha was computed to assess the total scale and factors internal consistency. The alphas obtained revealed a very good internal consistency for the total score (α = .92), good internal consistencies for factor 1 and factor 3 (respectively, α = .91 e α = .82), and an acceptable internal consistency for factor 2 (α = .67).

To assess temporal stability, 30 adolescents were asked to complete the scale again, 4 to 5 weeks after the first application. Significant and moderate to high Pearson correlations were found ($r = .88$, for factor 1; $r = .52$, for factor 2; $r = .82$, for factor 3; and $r = .88$, for the total score, all with $p < .001$). Also, paired t-tests between scores showed no significant differences in means between both

Figure 1. Structural equation model of the second-order Confirmatory Factor Analysis of the Automatic Thoughts in Social Situations Scale for Adolescents.

time points (factor 1: $t_{(29)}$ = .41, p = .68; factor 2: $t_{(29)}$ = -.77, p = .45; factor 3: $t_{(29)}$ = -1.32, p = .20; total score: $t_{(29)}$ = -.56, p = .58).

Convergent and discriminant validity

To assess convergent validity Pearson correlations between the ATSSS-A, and other measures of social anxiety (total, and anxiety and avoidance subscales of the SAAS-A, and social anxiety factor from the MASC) were computed. The factor physical symptoms from the MASC was also used (even if it is not a specific measure of social anxiety), considering that the physiological expression of anxiety is similar in social anxiety as in other anxiety disorders, regardless of the feared stimulus. To assess discriminant validity, the MASC factor of separation anxiety was used. Results are presented in Table 2.

Overall, results show that the ATSSS-A revealed significant, positive and moderate correlations with all the measures of social anxiety and physical symptoms measure, and these correlations were higher than those obtained between the ATSSS-A and the MASC factor of separation anxiety, used for discriminant validity. Fisher's Z values compared correlations between the ATSSS-A, and convergent measures with correlations between the ATSSS-A and discriminant measures (Lee & Preacher, 2013). All differences were significant (p < .05), with correlations with the convergent measures being significantly higher than correlations with the discriminant measure, except for the comparison rigid rules-MASC physical symptoms with rigid rules-separation anxiety.

Table 2. Convergent and discriminant validity.

	ATSSS-A			
	Automatic Thougths (Total)	Negative Expectancies and Evaluation	Rigid Rules	Felt Sense
SAAS-A (anxiety)	.68***	.65***	.44***	.59***
SAAS-A (avoidance)	.60***	.58***	.39***	.52***
SAAS-A (total)	.68***	.65***	.44***	.59***
MASC (social anxiety)	.74***	.72***	.54***	.55***
MASC (physical simptoms)	.63***	.56***	.37***	.62***
MASC (separation anxiety)	.36**	.32**	.29**	.31**

ATSSS-A: Automatic Thoughts in Social Situations Scale for Adolescents; SAAS-A: Social Anxiety and Avoidance Scale for Adolescents; MASC: Multidimensional Anxiety Scale for Children.
*** p < .01; *** p < .001*

Table 3. Descriptive statistics for the total sample and by gender. T-tests to explore mean differences.

		ATSSS-A			
		Total	Factor 1	Factor 2	Factor 3
	N	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Total	553	20.48 (10.76)	9.61 (6.38)	6.42 (2.63)	4.45 (3.42)
Gender					
Male	277	20.27 (10.94)	9.57 (6.47)	6.48 (2.65)	4.22 (3.39)
Female	276	20.70 (10.58)	9.65 (6.30)	6.36 (2.60)	4.68 (3.44)
$t_{(551)}$		-.47	-.16	.54	-1.60

ATSSS-A: Automatic Thoughts in Social Situations Scale for Adolescents; M: Media; SD: Standard Deviation.

Descriptive data

Table 3 presents the media and standard deviation for boys and girls on ATSSS-A factors and total score as well as t-tests to explore possible mean values differences according to gender. T-tests revealed no statistically significant differences between boys and girls on any of the variables.

Discussion

The aim of the present study was to develop an instrument to assess adolescents' cognitions in social situations. The ATSSS-A was developed, starting from its adult version, adapting or withdrawing some items and adding some others. The initial number of items was 29. After the EFA, the scale remained with 19 items, with 3 factors, explaining 56.40% of the variance. The three factors seem to reflect important maintenance factors in SAD (Clark & Wells, 1985), at different levels: the anticipation of a negative social performance, followed by a negative evaluation (factor 1), which is the most striking feature of SAD; rigid rules for social behaviour (factor 2), believed to have to be followed to avoid rejection from others, and according to which people with SAD compare their social performance; anxiety symptoms and the assumed visibility they will have for other people, an aspect the authors called "felt sense" (factor 3), the sensation that what is felt, resulting from anxiety activation and self-focused attention, will be noticed by others.

A CFA, performed in another sample, confirmed a good model fit for this 3-factor structure, invariant regarding gender. The ATSSS-A showed a good and very good internal consistency for the total score and for factors 1 and 3 (between .82 and .92). Although the internal consistency of factor 2 , (α = .67) was slightly below what is considered an acceptable value , (α = .70), some authors (e.g., DeVellis, 2011) defend that in some cases of the social sciences, particularly with a reduced number of items, values below .70 may be acceptable. The temporal stability was also good, as well as the convergent and discriminant validity, with significantly higher correlations with other measures of social anxiety than with a measure of separation anxiety disorder. Although we were expecting higher scores for girls, like other studies have found (e.g., Essau, Conradt, & Petermann, 1999), T-tests analysis did not confirm this hypothesis.

The most important limitations of this study regard the fact that it was a Portuguese community sample with a limited age range. Cross cultural studies, with extended age ranges and clinical samples are needed. Despite these limitations, the ATSSS-A may be a promising instrument for prevention, assessment, intervention, and evaluation of therapeutic gains resulting from treatment, given the fact that it directly assesses cognitive products reflecting some of the most important maintenance factors in SAD.

Received manuscript: 15/05/2016
Accepted: 13/06/2016

Conflict of interests

None of the authors have academic, personal or political relationships with the participants or participating institutions. No financial, employment, consultancies or honoraria were involved in the relationships between participants or participating institutions and the research team.

References

Abell, N., Springer, D. W., & Kamata, A. (2009). *Developing and validating rapid assessment instruments*. New York: Oxford University Press.

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Arbuckle, J. L. (2011). *Amos (Version 20.0)*. [Computer Program]. Chicago: IBM SPSS.

Baldwin, J. S., & Dadds, M. R. (2007). Reliability and validity of parent and child versions of the Multidimensional Anxiety Scale for Children in community samples. *Journal of the American Academy of Child and Adolescent Psychiatry, 46*(2), 252–260. doi:10.1097/01.chi.0000246065.93200.a1

Beck, A. T. (1976). *Cognitive Therapy and Emotional Disorders*. New York: Int. Univ. Press.

Beck, A. T., Brown, G., Steer, R. A., Eidelson, J. T., & Riskind, J. H. (1987). Differentiating anxiety and depression: A test of the cognitive content-specificity hypothesis. *Journal of Abnormal Psychology, 96*, 179-183.

Byrne, B. M. (2010). *Structural equation modeling with AMOS: Basic Concepts, Applications, and Programming* (2ª ed.). Nueva York: Routledge Academy.

Casanova, C. (2013). *Entrevista para as Perturbacões de Ansiedade segundo o DSM-IV (ADIS-IV-C) aplicada a uma populacão adolescente: validade concorrente, validade discriminante, concordância inter-avaliadores e aceitabilidade da entrevista clinica*. [The Anxiety Disorders Interview Schedule for Children (ADIS-IV-C) applied to an adolescent population: concurrent and discriminant validity, interrater reliability and acceptability of the clinical interview]. Unpublished Masters Dissertation. Faculty of Psychology and Education Sciences, Coimbra University; Portugal.

Carretero-Dios, H., & Pérez, C. (2005). Normas para el desarrollo y revisión de estudios instrumentales [Norms for the development and revision of instrumental studies]. *International Journal of Clinical and Health Psychology, 5*(3), 521–551.

Clark & Wells (1995). A cognitive model of social phobia. In R. G. Heimberg, M. R. Liebowitz, D. A. Hope, & F. R. Schneier, (Eds.). *Social Phobia: Diagnosis, assessment and treatment*. New York: Guilford Press.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2 ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Costello, A. B., & Osborne, J. W. (2005). Best practices in exploratory factor analysis: four recommendations for getting the most from your analysis. *Practical Assessment, Research & Evaluation, 10*, 1-9.

Cunha, M., Pinto-Gouveia, J., & Salvador, M. C. (2008). Social Fears in Adolescence: The Social Anxiety and Avoidance Scale for Adolescents. *European Psychologist, 13*, 197-213. doi:10.1027/1016-9040.13.3.197

Cunha, M., & Salvador, M. C. (2013). *A versão portuguesa da Entrevista Estruturada para as Perturbacões de Ansiedade na infância e Adolescência (ADISIV-C)* [The portuguese version of the Anxiety Disorders Interview Schedule for Children (ADIS-IV-C)]. Unpublished manuscript.

DeVellis, R. F. (2011). *Scale development: Theory and applications* (3rd ed.). Thousand Oaks, CA: Sage Publications.

Essau, C. A., Conradt, J., & Petermann, F. (1999). Frequency and comorbidity of social phobia and social fears in adolescents. *Behaviour Research and Therapy*, *37*, 831-843. doi:10.1016/S0005-7967(98)00179-X

Essau, C. A., Conradt, J., & Petermann, F. (2002). Course and outcome of anxiety disorders in adolescents. *Journal of Anxiety Disorders, 16*, 67–81. doi:10.1016/S0887-6185(01)00091-3

Hofmann, S. G. (2007). Cognitive factors that maintain social anxiety disorder: a comprehensive model and its treatment implications. *Cognitive Behaviour Therapy, 36*, 193-209. doi:10.1080/16506070701421313

Hofmann, S. G., & DiBartolo, P. M. (2000). An instrument to assess self-statements during public speaking: Scale development and preliminary psychometric properties. *Behavior Therapy, 31*, 499-515. doi:10.1016/S0005-7894(00)80027-1

Holmbeck, G.N., O'Mahar, K., Abad, M., Colder, C., & Updegrove, A. (2006). Cognitive–behavioural therapy with adolescents. Guides from developmental psychology. In P. Kendall (Ed.), *Child and adolescent therapy. Cognitive–behavioral procedures* (3rd ed.) (pp. 419–464). New York: Guilford Press.

IBM Corp. (2011). *IBM SPSS Statistics for Windows Version 20.0* [Computer Program]. Armonk, NY: IBM Corp.

Kessler, R. C., Berglund, P., Demeler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the national comorbidity survey replication. *Archives of General Psychiatry, 62*, 593–602. doi:10.1001/archpsyc.62.6.593.

Lee, I. A., & Preacher, K. J. (2013, September). *Calculation for the test of the difference between two dependent correlations with one variable in common* [Computer software]. Retrieved from http://quantpsy.org

March, J. S., Parker, J. D., Sullivan, K., Stallings, P., & Conners, C. K. (1997). The Multidimensional Anxiety Scale for Children (MASC): Factor structure, reliability, and validity. *Journal of the American Academy of Child and Adolescent Psychiatry, 36*, 554–565. doi:10.1097=00004583-199704000-00019

Parker, J. G., Rubin, K. H., Erath, S. A., Wojslawowicz, J. C., & Buskirk, A. A. (2006). Peer relationships, child development, and adjustment: A developmental psychopathology perspective. In D. Cicchetti, & D. J. Cohen (Eds.), *Developmental psychopathology* (2nd ed.) (pp. 419–493). Hoboken, US: John Wiley & Sons.

Pinto-Gouveia, J., Cunha, M., & Savador, M. C., (2000). *Ansiedade Social: da timidez à Fobia Social* [Social Anxiety: From Shyness to Social Phobia]. Coimbra, Portugal: Quarteto.

Pinto-Gouveia, J., Cunha, M., & Salvador, M. C. (2003). Assessment of social phobia by self-report questionnaires: The Social Interaction and Performance Anxiety and Avoidance Scale and the Social Phobia Safety Behaviours Scale. *Behavioural and Cognitive Psychotherapy, 31*, 291-311. doi.org/10.1017/S1352465803003059

Rao, P. A., Beidel, D. C., Turner, S. M., Ammerman, R. T., Crosby, L. E., & Sallee, F. R. (2007). Social anxiety disorder in childhood and adolescence: Descriptive psychopathology. *Behaviour Research and Therapy, 45*, 1181–1191. doi:10.1016/ j.brat.2006.07.015.

Rynn, M. A., Barber, J. P., Khalid-Khan, S., Siqueland, L., Dembiski, M., McCarthy, K. S., & Gallop, R. (2006). The psychometric properties of the MASC in a pediatric psychiatric sample. *Journal of Anxiety Disorders, 20*, 139–157. doi:10.1016=j.janxdis.2005.01.004

Rivero, R., García-López, L. J, & Hofmann, S. G. (2010). The Spanish version of the Self-statements during Public Speaking Scale. Validation in adolescents. *European Journal of Psychological Assessment, 26*, 129-135. doi:10.1027/1015-5759/a000018

Salvador, M. C. (2009). *Ser eu próprio entre os outros: um novo protocolo de intervenção para adolescentes com fobia social generalizada* [To be myself among the others: a new intervention protocol for adolescents with generalized social phobia] (Doctoral Thesis). Retrieved from https://estudogeral.sib.uc.pt/bitstream/10316/12527/3/Tese%20Doutoramento%20Maria%20do%20C%C3%A9u%20Salvador.pdf

Salvador, M. C., Matos, A. P., Oliveira, S., March, J. E., Arnarson, E. O., Carey, J. C., & Craighead, W. E. (2016). *A Escala Multidimensional de Ansiedade para Crianças (MASC): Propriedades Psicométricas e Análise Fatorial Confirmatória numa amostra de Adolescentes Portugueses* [The Multidimensional Anxiety Scale for Children (MASC): Psychometric properties and onfirmatory factor analysis in a sample of Portuguese Adolescents]. Manuscript submitted for publication.

Sebastian, C., Burnett, S., & Blakemore, S. J. (2008). Development of the self-concept during adolescence. *Trends in Cognitive Science, 12*, 441-446. doi:10.1016/j.tics.2008.07.008

Silverman, W. K., Saavedra, L. M., & Pina, A. A. (2001). Test-retest reliability of anxiety symptoms and diagnoses with the Anxiety Disorders Interview Schedule for DSM-IV: Child and parent versions. *Journal of the American Academy of Child and Adolescent Psychiatry, 40*, 937-944. doi:10.1097/00004583-200108000-00016

Wells, A., Stopa, L., & Clark, D. M. (1993). *The Social Cognitions Questionnaire*. Unpublished manuscript. University of Oxford.

Westenberg, P. M., Drewes, M. J., Goedhart, A. W., Siebelink, B. M., & Treffers, P. D. (2004). A developmental analysis of self-reported fears in late childhood through mid-adolescence: Social-evaluative fears on the rise? *Journal of Child Psychology and Psychiatry, 45*, 481–495. doi:10.1111/j.1469-7610.2004.00239.x

Wittchen, H-U., & Fehm, L. (2003). Epidemiology and natural course of social fears and social phobia. *Acta Psychiatrica Scandinavica, 108 (Suppl. 417)*, 4 –18. doi:10.1034/j.1600 0447.108.s417.1.x

Wood, J. J., Piacentini, J. C., Bergman, R. L., McCracken, J., & Barrios, V. (2002). Concurrent validity of the anxiety disorders section of the Anxiety Disorders Interview Schedule for DSM-IV: Child and parent versions. *Journal of Clinical Child and Adolescent Psychology, 31*, 335-342. doi:10.1207/S15374424JCCP3103_05