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INVESTIGATING THE STRUCTURE OF ANXIETY SYMPTOMS AMONG ROMANIAN PRESCHOOLERS USING THE SPENCE PRESCHOOL ANXIETY SCALES

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ABSTRACT

The purpose of this study was to test the psychometric properties of the Spence Preschool Anxiety Scales (Spence, Rapee, McDonald, & Ingram, 2001) in a Romanian sample of preschoolers. The measure was completed by 718 mothers and 95 fathers of children aged 3 to 7 years. Regarding the structure of anxiety symptoms, (exploratory) principal components analysis and confirmatory factor analysis indicated either a four- or a five-factor solution as the best fit for the data. Due to the small differences between these models and to theoretical arguments, a model with five intercorrelated factors (social anxiety, physical injury fears, obsessive-compulsive disorder, separation anxiety and generalized anxiety), or one with an additional higher-order "anxiety" factor were preferred (although a four-factor model also provided a good fit for the data). There was also evidence for the construct validity of the instrument. We found good or acceptable internal consistency indices, while test-retest reliability was relatively low. Anxiety scores were generally higher than the ones reported by Spence et al. (2001). Symptoms of physical injury fears and social anxiety were the most common, but we found limited evidence for gender or age differences.

KEYWORDS: *anxiety, preschoolers, Spence Preschool Anxiety Scales, confirmatory factor analysis.*

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INTRODUCTION

Anxiety represents a highly prevalent childhood disorder (see Cartwright-Hatton, McNicol, & Doubleday, 2006, for a review), with an early onset (Gregory et al., 2007; Kessler, Berglund, Demler, & Jin, & Walters, 2005), and with a dramatic impact upon the individual's developmental trajectory, predicting increased risk for adult mental disorders, substance use and academic underachievement (Kendall, Safford, Flannery-Schroeder, & Webb, 2004; Pine, Cohen, Gurley, Brook, & Ma, 1998; Woodword & Fergusson, 2001). Looking at the very early precursors of anxiety, a series of symptoms has been considered to present clinical significance, especially if their intensity, frequency, and duration surpass the typical "ontogenetic parade" of childhood fears (Scarr & Salapatek, 1970). However, even if there is a documented clinical significance of such early symptoms, their clustering into distinct categories, similar to adult diagnostic criteria has generated a longstanding debate in developmental psychopathology research (e.g., Costello, Egger, & Angold, 2004; Weems & Stickle, 2005).

Three main classification approaches have been used in research with preschoolers (as reviewed by Egger & Angold, 2006): 1) the use of "clinically significant" cutoff scores on symptom checklists; 2) interviews derived from the Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV, American Psychiatric Association, 1994), or 3) the Diagnostic Classification 0-3 (2005). We will focus on the benefits and problems associated with using DSM-IV criteria in very young children, since this is a prevailing approach used by practitioners in the field, which also constitutes the foundation for developing the preschool anxiety scales analyzed in this paper.

There are several arguments in favor of a DSM-based approach to early anxiety symptoms: the validation of such an approach for older children (e.g. Spence, 1997), some preliminary evidence that standard diagnostic constructs can be identified in young children (Egger et al., 2006; Task Force on Research Diagnostic Criteria: Infancy and Preschool–RDC-IP, 2003; Spence and collaborators, 2001, 2010), plus practical arguments regarding its accessibility and ease of use for practitioners. However, there are several reasons to apply DSM criteria with great caution when conducting research with preschoolers. To name just a few objections, DSM-defined disorders in young children are characterized by: 1) a high degree of *comorbidity* between different diagnostic categories (Weems, 2008); 2) *developmental insensitivity*, since they are relatively similar for children from 0 to 18 years old; 3) *subjectivity*, resulting from a lack of well-defined behavioral descriptors. More specific, regarding the last point, Egger and Angold (2006) stress the fact that the DSM uses various ambiguous adjectives to denote the clinical significance of anxiety symptoms (e.g. developmentally inappropriate, excessive, persistent, difficult to control), which are subject to the clinician's

interpretation. This can lead to biased clinical judgments, especially when very young children, for whom self-report is problematic, are the target of the assessment.

Constructed based on DSM-IV subtypes for anxiety disorders, the Spence Preschool Anxiety Scales (PAS, Spence et al., 2001) attempt to circumvent some of these critical issues by relying on parental report and by offering the respondents a clear set of anxiety symptoms which are to be rated according to their validity (and implicitly, to their severity) on a 4-point scale, ranging from "not true at all" to "very often true". The items, consistent with DSM anxiety categories, were selected by experts in the field, taking into account the existing literature, measures, international diagnostic criteria and psychiatric interviews (Edwards, Rapee, Kennedy, & Spence, 2010). The initial validation of the instrument (Spence et al., 2001), administered to 3- to 5-year old children, tested four alternative models and revealed a good fit for the five DSM categories: generalized anxiety disorder (GAD), social anxiety (SA), separation anxiety disorder (SAD), obsessive-compulsive disorder (OCD), and physical injury fears (PIF). However, there was also a higher-order "anxiety" factor which accounted for the high degree of covariance between the factors, suggesting that anxiety might be a more unitary construct during early development. The dimensions that accounted for enough variance to be considered as independent clusters were SA, OCD and PIF. SAD and GAD were highly intercorrelated and highly related to the general "anxiety" factor. The authors speculated that taken together, these results might indicate that there is some early differentiation of anxiety disorders sub-types, which become increasingly specific with age.

Other notable findings regarding the psychometric properties of the scale include its good construct validity, as revealed by its significant correlations with the Internalizing scale of the Child Behavior Checklist (CBCL; Achenbach, 1991). No significant differences were found between reports related to boys and girls. Finally, there were clear age differences, with 3-year-olds reported to show higher levels of anxiety symptoms in comparison to 4- and 5-year-olds. To account for this rather odd finding, the authors propose that it might be a reflection of the longer times spent by mothers with their younger children, which makes them more sensitive to their anxious behavior; alternatively, the youngest age might coincide with the beginning of daycare, and a corresponding true increase in anxiety symptoms (Spence et al., 2001).

Recently, the authors have introduced some modifications to the scale, generating a revised version, the PAS-revised (PAS-R, Edwards et al., 2010). More specific, they 1) removed seven items which were endorsed extremely infrequently by parents, 2) adapted three items to clarify their meaning, and 3) added nine items to offer a wider coverage of anxiety symptoms and to provide a clearer distinction between SAD and GAD scales. The PAS-R is best characterized by a four-factor

(SA, GAD, SAD, and specific fears) structure, all loading on a higher order "anxiety" factor. The internal consistency is high (alphas = .72-.92), with 12-month stability (*r*s = .60-.75), with good construct validity. Again, no significant gender differences were found (except for specific fears, with girls scoring higher than boys), and no significant age differences.

Cross-cultural evidence for the validity of the Spence Anxiety Scales is beginning to accumulate, more consistently with the version for older children, the Spence Childhood Anxiety Scale (SCAS; Spence, 1997). In a Hellenic sample of children, a factorial solution consistent with DSM anxiety subtypes was found; additionally, there was a decrease in anxiety symptoms with age. However, compared to the Australian sample, the authors found substantial higher anxiety scores, especially on SA and OCD subscales (Mellon & Moutavelis, 2007). In a large sample of South African children, Muris, Schmidt, Engelbrecht, and Perold (2002) found again an elevated level of anxiety compared to Western – Dutch – children (Muris, Merckelbach, Ollendick, King, & Bogie, 2002). In this sample, SCAS reliability was satisfactory, but convergent validity was rather modest. Some of the hypothesized categories (SA, Panic disorder, fears, and GAD) in Western cultures were confirmed in this cultural context. Good psychometric properties of the SCAS were also found in German and Japanese samples (Essau, Muris, & Ederer, 2002; Essau, Sakano, Ishikawa, & Sasagawa, 2004).

Even if well-established anxiety measures have been translated and adapted for the Romanian population, most of them target the adult age, such as Spielberger's State-Trait Anxiety Inventory (STAI, Pitariu & Peleaşă, 2007a), or the Endler Multidimensional Anxiety Scales (Miclea, Ciuca, & Albu, 2009). Anxiety assessment instruments specific for use with children, such as the STAI-Children (Pitariu & Peleaşă, 2007b), and the SCAS (Benga et al., in preparation) have been translated and adapted, but evidence collected from the use of these instruments is just beginning to crystallize.

To our knowledge, the present study is the first investigation to use the PAS in a different cultural context. This approach also provides the first Romanian instrument for assessing anxiety symptoms in very young children. It has been previously used in studies relating different aspects of cognitive functioning to anxiety levels in Romanian preschoolers (e.g. Susa, Pitică, & Benga, 2008; Ţincaş, Dragoş, Ionescu, & Benga, 2007; Visu-Petra, Miclea, Cheie, & Benga, 2009; Visu-Petra, Cheie, Benga, & Alloway, in press); however, its psychometric properties have not been investigated systematically. The explicit aim of the study is to test the psychometric properties of the Romanian PAS and to reveal the structure of anxiety symptoms in a large sample of Romanian preschoolers. Since the present data has been gathered during a long time interval, the original PAS, and not the PAS-R version has been used. The factorial structure of the Romanian PAS will be analyzed, along with indexes of internal consistency, reliability and construct

validity. Finally, symptom prevalence and potential differences according to age and gender will be investigated.

METHOD

Participants

Children from seven kindergartens in Northwest Romania were involved in this study. In each case, parents were contacted with the help of the kindergarten staff and invited to take part in the study. Questionnaires were distributed with the aid of teachers, and parents were asked to fill them in at home and then return them to the teachers.

The main sample consisted in 812 valid protocols which were returned, with either the mother or the father as the respondent. We collected mother reports for 718 children (350 boys, 367 girls; age range = 36-86 months, M = 61.03 months, SD = 12.50), while the sample for father reports was much smaller (N = 95; 51 boys, 44 girls; age range = 37-83 months, M = 61.80 months, SD = 12.83). Subgroups of these main samples were involved in the assessment of construct validity and test-retest reliability (see the *Measures* section).

Measures

Parents were asked to fill in the Romanian translation of the *Spence Preschool Anxiety Scale* (PAS-Ro). The translation and adaptation of the scale from English to Romanian were conducted in agreement with the guidelines of the International Test Commission (van de Vijver & Hambleton, 1996). The PAS-Ro is a caregiver-report instrument composed of 28 items assessing problems related to five types of anxiety disorders: GAD, SA, OCD, PIF, and SAD. An additional number of six items assess symptoms of posttraumatic stress disorder (PTSD). However, due to the very low sample of responses obtained for these PTSD items, they were not included in the present analyses (similar to Edwards et al., 2010). The parents are asked to rate their children on a 0-4 scale (where 0 = *not at all true* and 4 = *very often true*) for each item. Scale and total scores are computed by summing responses to the relevant items.

In order to obtain a measure of construct validity, a subsample of parents were also administered the *Children's Behavior Questionnaire* (CBQ; Rothbart, Ahadi, Hershey, & Fisher, 2001; Benga, 2004), a 195-item caregiver-report instrument designed to measure 15 temperament dimensions grouped into three higher-order factors, reflecting aspects of behavioral/emotional reactivity and self-regulation. The questionnaire asks parents to rate their children on a seven-point scale, ranging from 1 (*extremely untrue of my child*) to 7 (*extremely true of my child*). Scale and factor scores are obtained by computing the average score for items belonging to that scale. For the purposes of the present study, we selected the

Surgency/Extraversion and Negative Affect factors. Surgency/Extraversion is conceptually similar to the Extraversion dimension of the Big Five, as it reflects impulsivity, a preference for high-intensity stimulation, a high level of motor activity, and sociability. The Negative Affect factor resembles Neuroticism from the Big Five, measuring the child's tendency to experience negative emotions (fear, sadness, anger) and the ease of recovery from these negative emotions (see, Rothbart et al., 2001; Putnam & Rothbart, 2006 for details on the CBQ factors; see Goldberg, 1990 for a description of the Big Five personality model). Adequate internal consistency indices were reported for the original CBQ scales and factors (Rothbart et al., 2001). In a Romanian validation study on 676 children (Benga, 2004), the scales included in these two CBQ factors were reported to have Cronbach's α values ranging between .56 and .86 in 4- to 7-year-old children. We chose the CBQ as a concurrent measure for assessing the construct validity of PAS-Ro because at the time it was the only available instrument adapted into Romanian, targeting preschoolers, and whose theoretical construct included elements relevant to anxiety. A total of 130 valid protocols (58 boys, 72 girls; age range = 36 and 83 months; $M = 58.00$, $SD = 9.52$) were received back from the mothers.

Test-retest reliability was determined by re-administering the PAS-Ro six months after the initial administration to a group of the parents from the original sample. A total of 57 parents (both mothers and fathers) returned completed questionnaires. The children (33 boys, 24 girls) were aged between 36 and 78 months ($M = 57.00$, $SD = 10.52$) at the time of the first evaluation.

RESULTS

Most analyses were conducted separately for the mother- and father-report samples. However, due to the small number of father reports (subject to item ratio was approximately 3:1) factor structure analyses were conducted only on the mother reports sample. We considered that the results of such analyses would be too inaccurate for the father sample (see Costello & Osborne, 2005; Boomsma & Hoogland, 2001 for details).

Factor structure (mother reports)

Spence et al. (2001) tested four models to account for the data: a single factor model, a four correlated factors model (with separation anxiety and generalized anxiety loading onto the same factor), a five correlated factors model and a model involving five factors, loading onto one single overarching factor. Although the existence of these models proposed and tested by Spence et al. might have justified focusing only on the confirmatory factor analysis, we considered it useful to also report the results of our exploratory factor analysis, since it generated one additional model. Additionally, as specified by Mellon and Moutavelis (2007), it is possible that due to the distinct cultural factors involved in the adaptation of such an

instrument (different response styles, potentially different clustering of symptoms) the use of an exploratory approach is well justified.

Principal components analysis

The Kaiser-Meyer-Olkin measure of sampling adequacy (= 0.883) and Bartlett's test of sphericity (χ^2 = 4859.579; p <. 001) indicated that factor analysis was appropriate for the data. We used principal components analysis with obliminal rotation to extract the factors. The scree test pointed towards solutions with either five or four factors, accounting for 47.20% and 43% of the variance, respectively.

The five-factor solution resulted in solid factors for SA (eigenvalue = 6.82; 24.36% variance) and PIF (eigenvalue = 1.65; 5.89% variance), one factor containing three items from the OCD scale (eigenvalue = 2.10; 7.51% variance), and a final factor combining items from the SA, OCD and GAD scale (eigenvalue = 1.65; 5.89% variance). The last factor (eigenvalue = 1.17; 4.19% variance) was not interpretable. In general, items loaded strongly on their factors, with only four items loading below 0.40, and two items (item 17 and 28) loading below 0.30.

The four-factor solution indicated similarly clear factors for SA and PIF, and two additional factors similar to the ones presented above: one factor loading mainly in three OCD items (3, 9, 18) plus one GAD item, and one last factor composed of SAD, OCD, and GAD anxiety items. For this solution, items had similarly strong loadings, again with only four items loading below 0.40 and two items (6 and 17) loading below 0.30.

Confirmatory factor analysis

This analysis was based on Spence et al.'s (2001) results for the original version of the scale, and on the results of our principal components analysis reported above. As mentioned in the introductory section, Spence et al. analyzed four models. The same models were hypothesized in the present paper, plus a four-factor model that emerged from our previous exploratory analysis. The difference between our four-factor model and the model analyzed by Spence and collaborators resides in the manner in which items were hypothesized to distribute across factors. Thus, we analyzed five competing models: (1) one general "anxiety" factor, with all items loading on it; (2) four correlated factors (Spence et al.'s version); (3) four correlated factors (our version, derived from the exploratory analysis); (4) five correlated factors; (5) five first-order factors, with one higher-order factor.

The statistical analysis was conducted using LISREL 8.8 (Jöreskog & Sörbom, 2001). Due to the fact that scale items represent ordinal variables, we selected the diagonally-weighed least squared (DWLS) estimation method, using the polychoric correlation matrix. This approach is recommended by several authors (e.g., Flora & Curran, 2004; Olsson, Tros, Troye & Howell, 2000; Wang &

Cunningham, 2005) for this type of data instead of the "default" use of the maximum likelihood (ML) estimation method.

In order to assess the goodness of fit of the models tested, several indicators were selected from the ones generated by LISREL. The χ^2 statistic is probably the most well-known indicator of a model's fit. It determines the degree of discrepancy between the hypothesized model and the actual observed data. A large, statistically significant χ^2 indicates a poor fit of the model. However, the χ^2 statistic is highly dependent on sample size (MacCallum, Widaman, Zhang, & Hong, 1999; Marsh, Balla & McDonald, 1988; Miles & Shevlin, 2007), so that with large sample sizes there is a great risk of rejecting even relatively good-fitting models based on the value of this indicator. This is one of the reasons why it is generally recommended to use additional indices of model fit, which are less dependent on sample size. These include the Root Mean Square Residual index (RMR), which is an indicator of the discrepancy between the estimated and the observed covariance/correlation matrix, and the Root Mean Square Error of Approximation (RMSEA), which takes into account the degrees of freedom in computing this discrepancy. An RMR value close to 0.05 or lower indicates a good model fit, but values between 0.05 and 0.1 are also considered acceptable, while in the case of RMSEA "threshold" values are 0.05 and 0.08. A RMSEA value above 0.1 indicates the fact that the hypothesized model does not fit the data. Additional indices that we report in this paper include the Normed Fit Index (NFI), Non-Normed Fit Index (NNFI), and Comparative Fit Index (CFI). All of these are indices which provide a comparison between the hypothesized and the null model, and their values need to be at least 0.90 to indicate adequate model fit (see e.g., Hu & Bentler, 1999 for details on these indices).

Model 1: One single factor. Loadings on the single factor ranged between 0.22 and 0.69. Loadings below 0.40 were found for six items, two of which (items 3 and 9) had loadings below 0.30. The value of χ^2 was statistically significant, which would indicate a poor-fitting model. However, given the dependence of this statistic on sample size, model fit must be judged taking into account the rest of the indices. The NFI, NNFI and CFI indices all had values above 0.90, but the RMR and RMSEA values indicated a rather poor model fit (see Table 1).

Model 2: Four correlated factors (Spence et al.'s 2001 model). Item loadings ranged between 0.31 and 0.76, with four item loadings below 0.40. The χ^2 was again statistically significant. The rest of the indices pointed to a rather well-fitting model: NFI, NNFI and CFI values above 0.90, and RMR and RMSEA values below 0.80 (see Table 1). Comparison with the first model resulted in a large, statistically significant χ^2 change, indicating that this model provided a much better fit for the data.

Model 3: Four correlated factors. Item loadings ranged between 0.33 and 0.89, with only two items (6 and 9) below 0.40. Indicators of goodness of fit had values similar to the ones obtained in the previous model (see Table 1). The χ^2 was again statistically significant, but, as discussed earlier, this was probably due to the large sample size. Since models 3 and 4 all hypothesized four correlated factors, model 3 was compared not to model 2, but to model 1. The χ^2 decrease was larger than in the case of model 2, and, taking into account that item loadings were also larger, this model was kept for further comparison. Factor intercorrelations for this model ranged between 0.36 and 0.75.

Model 4: Five correlated factors. Loadings ranged between 0.32 and 0.76 (see Table 2), with four items (1, 3, 6, 9) loading below 0.40. As Table 1 indicates, except for the $\chi 2$, all goodness-of-fit indices are characteristic of a good model. Compared to the previous model, there was a $\chi 2$ increase, indicating that this model's fit was somewhat worse. However, as already mentioned, this statistic is sensitive to sample size. Additionally, the other fit indices were relatively similar to those of Model 3, and factors where more strongly interrelated than in the case of the previous model, with correlations ranging from 0.48 to 0.88 (see Table 3).

Model 5: Five first-order factors, one higher-order factor. This last model examined also provided a good fit for the data, with NFI, NNFI and CFI values all above 0.90, and RMR, RMSEA values below 0.80. Standardized loadings of the first-order factors upon the higher-order factor were high: 0.84 for SAD, 0.61 for PIF, 0.61 for SA, 0.61 for OCD, and 0.87 for GAD. Percentages of unique variance explained within each factor were 36% for SAD, 11% for PIF, 10% for SA, 15 % for OCD, and 49% for GAD. The target coefficient was computed as indicated by Marsh and Hocevar (1985), generating a coefficient of 0.98, which indicated that the higher-order model accounted in a satisfactory way for the covariance between the lower-order factors (the target coefficient value needs to be at least 0.90).

Table 1.
Fit indices for the five hypothesized models, with model comparison (mother-report data).

Model	χ^2	df	p	NFI	NNFI	CFI	RMR	RMSEA	Comparison	$\chi^2\Delta$	df Δ	p
Null model	22767	378		-	-	-	-	-	-	-		
Model 1	1883	350	<0.001	0.93	0.94	0.94	0.087	0.082		20884	28	<0.001
Model 2	1616	344	<0.001	0.95	0.96	0.96	0.075	0.068	Model 2 vs Model 1	267	6	<0.001
Model 3	1539	344	<0.001	0.95	0.96	0.97	0.070	0.061	Model 3 vs Model 2	344	6	<0.001
Model 4	1576	340	<0.001	0.95	0.96	0.96	0.074	0.067	Model 4 vs Model 3	37	4	<0.001
Model 5	1614	345	<0.001	0.94	0.95	0.96	0.077	0.068	Target coefficient = 0.98			

Note: Model 1 = one factor; Model 2 = four correlated factors (cf. Spence et al., 2001); Model 3 = four correlated factors (our version); Model 4 = five correlated factors; Model 5 = five first-order factors, one second-order factor.

Table 2
Item loadings for the five-correlated model (Model 4)

	Item	F1	F2	F3	F4	F5
SAD	6. Is reluctant to go to sleep without you or to sleep away from home	0.35				
	12. Worries that something bad will happen to his/her parents	0.65				
	16. Worries that something bad might happen to him/her (e.g., getting lost or kidnapped), so he/she won't be able to see you again	0.69				
	22. Has bad or silly thoughts or images that keep coming back over and over	0.50				
	25. Has nightmares about being apart from you	0.69				
PIF	7. Is scared of heights (high places)		0.61			
	10. Is afraid of crowded or closed-in places		0.75			
	13. Is scared of thunder storms		0.62			
	17. Is nervous of going swimming		0.54			
	20. Is afraid of insects and/or spiders		0.55			
	24. Is frightened of dogs		0.42			
	26. Is afraid of the dark		0.56			
SA	2. Worries that he/she will do something to look stupid in front of other people			0.61		
	5. Is scared to ask an adult for help (e.g., a preschool or school teacher)			0.63		
	11. Is afraid of meeting or talking to unfamiliar people			0.66		
	15. Is afraid of talking in front of the class (preschool group), e.g., show and tell			0.71		
	19. Worries that he/she will do something embarrassing in front of other people			0.75		
	23. Is afraid to go up to group of children and join their activities			0.67		
OCD	3. Keeps checking that he/she has done things right (e.g., that he/she closed a door, turned off a tap)				0.37	
	9. Washes his/her hands over and over many times each day				0.32	
	18. Has to have things in exactly the right order or position to stop bad things from happening				0.49	
	21. Has bad or silly thoughts or images that keep coming back over and over				0.72	
	27. Has to keep thinking special thoughts (e.g., numbers or words) to stop bad things from happening				0.76	
GAD	1. Has difficulty stopping him/herself from worrying					0.37
	4. Is tense, restless or irritable due to worrying					0.64
	8. Has trouble sleeping due to worrying					0.70

14. Spends a large part of each day worrying about various things	0.76
28. Aks for reassurance when it doesn't seem necessary	0.62

Note.
GAD = generalized anxiety disorder, SA = social anxiety,
SAD = separation anxiety disorder,
OCD = obsessive-compulsive disorder,
and PIF = physical injury fears.

In summary, the principal components analysis generated both a five-factor, as well as a four-factor model. While in the case of Spence et al. (2001) the four factor model reflected a potentially common factor combining SAD and GAD, in our analysis items from OCD, SA and GAD were distributed across two factors. The confirmatory factor analysis supported our four-factor model (while indicating a poor fit for Spence et al.'s four-factor model). However, it also supported the two five-factor models with intercorrelated factors (Model 4) or with a higher-order factor (Model 5), these five-factor models also having the largest theoretical support.

Table 3
Factor intercorrelations for Model 4 (five correlated factors).

	Separation anxiety	Physical injury fears	Social anxiety	Obsessive-compulsive disorder	Generalized anxiety disorder
Separation anxiety	-				
Physical injury fears	.75	-			
Social anxiety	.68	.67	-		
Obsessive-compulsive disorder	.74	.58	.48	-	
Generalized anxiety disorder	.83	.62	.76	.88	-

Reliability analysis

Internal consistency of the scale was determined by computing Cronbach's α. For the mother reports, whole-scale α was .87, indicating good consistency, while sub-scale consistencies ranged between .60 and .77: SAD α = .60, PIF α = .74, SA α = .77, OCD α =.77; GAD α = .66. In the case of father responses, Cronbach's α for the entire scale was .89, while sub-scale consistencies were .64 for SA, .75 for PIF, .82 for SA, .61 for OCD, and .73 for GAD. All these values indicate adequate levels of internal consistency.

As already mentioned, test-retest reliability was estimated based on a sub-sample of 57 children, assessed 6 months apart. The test-retest reliability coefficient was $r = .59$ for the total scale, while sub-scale coefficients were lower: separation anxiety $r = .37$; physical injury fears $r = .56$; social anxiety $r = .59$; obsessive-compulsive disorder $r = .52$; generalized anxiety $r = .57$, full-scale score, $r = .59$. Additionally, across the 6 months there were significant decreases in full-scale anxiety symptoms [$t(56) = 2.20$, $p < .05$] and separation anxiety [$t(56) = 2.55$, $p < .05$], as well as a marginally significant decrease in physical injury fears [$t(56) = 1.91$, $p = .06$].

Construct validity

As already mentioned, construct validity was determined using the Negative Affect and Surgency/Extraversion factors of the CBQ. Pearson's product-moment correlations were computed between these factors and PAS-Ro total scores and scales. Significant correlations with the Surgency/Extraversion scale were found only for social phobia ($r = -.28$, $p < .01$) and physical injury fears ($r = -.18$, $p < .05$); all other correlations were non-significant: all $|rs| < .14$, *ns*. By comparison, all anxiety scales (except obsessive compulsive disorder; $r = .12$, *ns*) correlated moderately or highly with the Negative Affect factor: total score ($r = .46$, $p < .001$), SAD ($r = .33$, $p < .001$), PIF ($r = .51$, $p < .001$), SA ($r = .37$, $p < .001$), GAD ($r = .24$, $p < .01$).

Anxiety symptoms

Means and standard deviations of the scores based on the mothers sample are reported in Table 4. To obtain a measure of the most prevalent anxiety symptoms, the percentage of ratings of 3 (*quite often true*) or 4 (*very often true*) was computed for each item for the mother-report sample. Across all ages, the most common problems were related to SAD, PIF and OCD disorder. Ranked-ordered items for the whole sample are presented in the table included in the Appendix section.

Table 4.
Means and standard deviations for sub-scale and total scores, by age group and gender, based on mother report.

Factor			Generalized anxiety		Social anxiety		Obsessive compulsive		Physical injury fears		Separation anxiety		Total score	
3-year olds	M	N=54	3.78	3.18	4.91	4.45	5.00	3.20	9.11	5.86	6.43	3.73	29.22	15.74
	F	N=64	4.31	3.11	5.50	3.94	4.92	3.31	8.55	5.50	5.95	3.53	29.23	14.17
	M+F	N=118	4.07	3.14	5.23	4.17	4.96	3.25	8.81	5.65	6.17	3.62	29.23	14.85
4-year olds	M	N=105	4.10	3.12	6.14	4.09	4.82	3.06	9.36	5.03	5.70	3.37	30.13	12.95
	F	N=95	4.54	3.79	6.92	5.22	4.87	3.23	10.44	6.17	6.38	3.55	33.15	17.14
	M+F	N=200	4.31	3.45	6.51	4.67	4.85	3.13	9.88	5.61	6.03	3.46	31.57	15.12
5-year olds	M	N=109	4.15	3.31	5.96	4.13	4.92	3.41	9.53	5.53	5.33	4.05	29.89	15.59
	F	N=127	4.06	2.96	6.23	4.52	4.90	3.05	10.02	5.46	6.06	4.03	31.25	14.12
	M+F	N=236	4.10	3.12	6.11	4.34	4.91	3.21	9.79	5.49	5.72	4.04	30.62	14.80
6-year olds	M	N=87	4.26	3.23	7.10	4.77	4.84	2.99	9.30	5.29	5.40	3.45	30.91	14.46
	F	N=87	5.17	3.41	6.59	4.97	5.55	3.34	11.41	6.26	5.47	4.14	34.20	16.89
	M+F	N=174	4.72	3.34	6.84	4.86	5.20	3.18	10.36	5.88	5.44	3.80	32.55	15.76
7-year olds	M	N=18	5.89	4.20	7.50	4.83	5.61	3.38	10.61	6.12	6.06	3.61	35.67	17.12
	F	N=19	5.32	4.82	7.68	5.74	5.00	3.79	13.05	6.42	7.00	4.85	38.05	21.77
	M+F	N=37	5.59	4.47	7.59	5.24	5.30	3.56	11.86	6.31	6.54	4.26	36.89	19.41
Total sample (PAS-Ro)	M	N=373	4.16	3.28	6.17	4.38	4.93	3.17	9.44	5.40	5.64	3.66	30.34	14.67
	F	N=392	4.53	3.41	6.44	4.77	5.04	3.23	10.33	5.94	6.02	3.89	32.35	15.93
	M+F	N=765	4.35	3.35	6.30	4.58	4.99	3.20	9.89	5.70	5.83	3.78	31.37	15.35
Total sample (Spence et al., 2001)	*M*	*N=255*	*2.23*	*2.86*	*4.69*	*3.68*	*1.29*	*2.16*	*6.46*	*4.48*	*2.73*	*2.89*	*17.41*	*12.63*
	F	*N=255*	*2.06*	*2.24*	*4.63*	*3.80*	*1.17*	*1.99*	*6.56*	*4.27*	*2.73*	*2.81*	*17.15*	*10.98*
	M+F	*N=510*	*2.15*	*2.57*	*4.66*	*3.74*	*1.23*	*2.08*	*6.51*	*4.37*	*2.73*	*2.85*	*17.28*	*11.83*

Age and gender effects

A two-way ANOVA performed on the total scores indicated a tendency towards higher scores for the girls. However, this tendency did not reach statistical significance: $F(3, 704) = 3.26$; $p = .07$. This trend was also found for the physical injury fears scale [$F(3, 704) = 3.64$; $p = .06$] and generalized anxiety [$F(1, 704) = 3.41$; $p = .07$]. A main effect of age was only found for the social phobia scale: $F(3, 704) = 2.96$; $p < .05$. Tukey's post-hoc test indicated significant differences between 3- and 6-year-old children, with the latter group manifesting significantly more social anxiety symptoms than the tree-year olds.

Within the father sample, we only found a main effect of gender in the case of generalized anxiety disorder [$F(1, 86) = 5.63$; $p < .05$), with boys reported as more anxious than girls. There were no statistically significant age or interaction effects.

DISCUSSION

The study examined the psychometric properties of the adapted PAS-Ro scale in a sample of Romanian preschoolers. Overall, the results supported the DSM-IV symptom clustering, and the previous findings in distinct cultural contexts, with some specifications which will be reported for each type of analysis. Mother reports constituted the object of most analyses, since they represented the vast majority of respondents. We will discuss the main findings and integrate them in the (limited) literature regarding PAS in other cultural contexts, looking at both the original and the revised versions. From the beginning, we have to regard these direct comparisons with a degree of caution, since our sample also contained older preschoolers than the ones in the abovementioned studies (3- to 7-year-olds in our sample, compared to 3- to 5-year-olds in the studies by Spence and collaborators).

First, regarding the structure of anxiety symptoms, we began by running an *exploratory* analysis, considering that such an approach is justified by the different cultural context, generating distinct meanings and distinct response styles (Mellon & Moutavelis, 2007). Moreover, a true differentiation could exist at the level of anxiety experience and manifestation in a different culture, potentially de-constructing the idea of a universality of anxiety and of the stimuli which generate it (Essau et al., 2004). The exploratory analysis revealed both a four-factor, and a five-factor solution, with two clear factors: SA and PIF. The third was mainly an OCD-factor, with an additional GAD item, while the last factor represented a mixture of items, difficult to integrate theoretically. In the original exploratory analysis of Spence et al. (2001), they found very similar evidence for SA and PIF factors, together with an OCD factor. However, the strongest factor in their analysis

was a mixed SAD/GAD factor which has not been replicated in the present study. The fact that across cultures, the PIF and the SA are the strongest extracted dimensions could be a correlate of their early emergence (Gadow, Sprafkin, & Nolan, 2001). However, it should be noted that SAD is also one of the first anxiety categories to emerge during the ontogenetic trajectory (Vallance & Garralda, 2008). Alternatively, it could be that across cultures, these are the easiest recognizable signs of anxiety in preschoolers, as compared to the harder identifiable dimension of GAD, which is more visible only in older children (Vallance & Garralda, 2008).

In the *confirmatory* analysis, five alternative models were tested. In order to ensure consistency and comparability of the results, the same four models tested in the Spence et al. (2001) study were also analyzed in the present paper, to which we added the four-factor model that emerged from our previous exploratory analysis. The one-factor solution provided a poor fit to the data, suggesting that anxiety is not a unitary construct, even in such a young population (Egger & Angold, 2006). We found support for the DSM-consistent 5-factor models (4 and 5), comprising the five anxiety dimensions (SA, GAD, OCD, SAD and PIF), plus an additional, higher-order anxiety factor accounting for the high covariance between first-order factors. These results were confirmed by both the original PAS study (Spence et al., 2001), and the revised version (Edwards et al., 2001). However, future research (with a revised version of the PAS-Ro) should attempt to determine whether a four-factor similar to the one evidenced in our exploratory analysis (and with good fit indices in the confirmatory analysis) might better reflect the underlying structure of anxiety in the Romanian preschool population.

Acceptable *internal consistency* was demonstrated across scales, with sub-scale consistencies ranging between .60 and .77, and an overall α of .87. These values are slightly lower that the PAS-R (all αs > .70), but still indicate good internal consistency. Temporal *reliability* of the PAS-Ro was moderate-to-low (general test-retest reliability of .59), with overall anxiety scores, and two dimensions (SAD and PIF) presenting significant decreases over the 6-months period. These results do not confirm the higher stability evidenced in the study using the PAS-R (general test-retest reliability of .74), although they also registered the lowest stability for the SAD subscale. The decreases in anxiety symptoms documented in our study can be interpreted as true developmental phenomena, especially considering that the mean age in our study is higher than the one in the PAS-R study, which might explain the more abrupt reduction in anxiety levels.

With regard to *construct validity*, anxiety symptoms correlate little (and negatively) with temperamental Surgency/Extraversion, but have positive (mostly moderate or high) correlations with Negative Affect from the CBQ. This offers some tentative supporting evidence for the construct validity of the PAS-Ro. In a similar way (although multiple instruments were used for convergent and divergent validity), PAS-R correlated in the low range with measures of conduct problems

and hyperactivity, and in the moderate to high range with measures of internalizing problems and emotional symptoms (Edwards et al., 2010).

Looking at the *prevalence* of distinct anxiety symptoms, one striking result emerges even at a quick glance. Both total scores, as well as factor scores are considerably larger than the ones reported by Spence et al. (2001) for the Australian sample. Similar discrepancies were seen for the South-African (Muris et al., 2002) and Greek (Mellon & Moutavelis, 2007) adaptations of the SCAS, with scores being higher than those obtained in the original Australian (or Dutch) sample. Unfortunately, for the preschoolers' scale discussed in this paper, the only reference for direct comparison is Spence at al.'s (2001) original study, reporting on the construction of the scale (since the PAS-R had a different scoring method). Although there is a tendency for an increase in anxiety symptoms in the older age groups (significant only in the case of social phobia), the fact that our sample also included older preschoolers cannot fully account for the higher anxiety levels documented, since this difference is obvious also in the youngest children. Two explanations could account (perhaps complementary) for these findings. First, there could be a distinct response style, favoring greater disclosure of emotional problems or greater sensitivity towards anxiety symptoms in Romanian respondents. Unfortunately, we found no studies evidencing that Romanian culture encourages either emotional self-disclosure (similar to the Greek data reported in the Mellon and Moutavelis study) or sensitivity towards emotion more than other communities. Second, a true elevated level of anxiety symptoms could be found in Romanian children. Unfortunately, we found no epidemiological studies targeting children; in one of the few epidemiological studies on Romanian adults (Florescu, Moldovan, Mihăescu-Pintia, Ciutan, Sorel, 2009), anxiety was found to be the most prevalent disorder (4.9% of respondents). This percentage is in the lower range of cross-cultural reported 12-months rates of anxiety (see the WHO Bulletin, 2000), but the results might be confounded by the restricted access to mental health services in our country. To account for potentially higher levels of anxiety symptoms in Romanian children, differences according to socio-economical indexes could be analyzed in a further study (similar to the findings in the Hellenic or South African samples). Finally, a less fortunate explanation would be that the items themselves have a distinct cultural meaning. For instance, the high endorsement of the item "Washes his/her hands over and over many times a day" (38.61% of participants) or "Keeps checking that he/she has done things right" (21.60%) might reflect that those behaviors are looked upon as less undesirable by the Romanian community, reflecting encouraged repetitive practices to make sure that the task is accomplished successfully. However, all these conjectures are highly speculative and warrant further investigation. As will be specified in the paragraph regarding study limits, the restricted geographical areas (and number of kindergartens) from which the

reports were collected does not guarantee that these results are representative for the whole Romanian preschool population.

Looking at between-subscales differences, the highest scores were obtained for PIF and SA. The PIF scale remained the one with the highest mean across all age groups, but SA was second in place only in children aged 4 years or older, while 3-year-olds seemed to manifest more SAD symptoms. These results are highly similar to the ones obtained by Spence et al. (2001), who also found PIF items to be most prevalent, along with SA concerns. As mentioned above, when comparing the rank-ordered percentages in our study to the Spence et al. study, the percentage of respondents to endorse a certain statement is much higher in the Romanian sample (although the ordering of the type of concerns is relatively similar), accounting for the elevated anxiety levels discussed above.

Finally, there was very limited evidence for *age and gender* effects. In terms of age, there was only a significant increase in social phobia, similar to several studies which show age-related increases in this dimension, especially beginning with school age (Cartwright-Hatton, McNicol, & Doubleday, 2006). The lack of age effects is consistent to the developmental stability of anxiety symptoms shown in several studies (Rapee, Schniering, & Hudson, 2009). The absence of gender effects is also consonant with both the PAS and PAS-R findings. However, the tendency noted in our study for higher levels in girls is similar to findings of several developmental studies of anxiety (see Miu & Visu-Petra, 2010 for a review, and Spence et al., 2001, for an extended discussion regarding the presence/absence of gender differences in anxiety studies). Finally, it could be a reflection of "normative gender related differences in the reinforcement and punishment of fear disclosure, rather than in the levels of fear per se" (Mellon & Moutavelis, 2007). These normative influences might have affected mother's responses regarding their daughters; interestingly, in the father's responses, gender differences are inexistent (with except to the GAD scale, on which boys are reported as more anxious than girls).

There are several *limitations* in the present investigation which make our conclusions regarding the validity and psychometric properties of the PAS-Ro tentative. First, as mentioned above, the study is not representative for the whole Romanian population: it is limited to preschoolers in Northwest Romania, from an urban background. Second, most analyses were carried out for mother reports, and there was no index of mother-father concordance in their evaluation of the child's anxiety symptoms (such as the one presented for the PAS-R in Edwards et al., 2010). Third, the original PAS, and not the revised version was used, which means that the problematic issues found in the original version regarding item content and breadth of coverage for certain anxiety categories (Edwards et al., 2010) are also present in this study. Further research, using the PAS-R, potentially controlling for the cultural meaning of certain items (see the discussion above for the OCD items),

and using multiple measures for convergent and divergent validity is needed in order to have a comprehensive analysis of this instrument in the Romanian population. The practical implications of having well-standardized instruments, with cross-cultural validity are paramount, especially when it is an essential step in the very early detection of mental health problems (Essau et al., 2004). The Practice Parameter for the Assessment and Treatment of Children and Adolescents with Anxiety Disorders (Connolly & Bernstein, 2007) suggests that if screening instruments, such as the PAS, reveal significant anxiety levels, then assessment should proceed with a formal clinical evaluation to determine which anxiety disorder may be present, the severity of anxiety symptoms, and the degree of functional impairment. In the Romanian context, this formal assessment could be offered by the Structured Clinical Interview for DSM-IV, children version (KID-SCID; David et al., 2007 for the Romanian version). However, even if the screening process reveals non-clinical, but simply elevated levels of anxiety in the preschool population, there are several well-validated anxiety prevention protocols (e.g. Ginsburg, 2009; Rapee, Kennedy, Ingram, Edwards, & Sweeney, 2005) which might be implemented in order to reduce the lifelong impact of the potential development of childhood anxiety.

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Appendix

Rank-ordered percentage of children receiving ratings of 3 (quite often true) or 4 (very often true) for each item in the mother report sample.

Item		Scale	Percent.
6	Is reluctant to go to sleep without you or to sleep away from home	SAD	41.03
13	Is scared of thunder storms	PIF	40.75
9	Washes his/her hands over and over many times each day	OCD	38.61
20	Is afraid of insects and/or spiders	PIF	31.80
26	Is afraid of the dark	PIF	30.43
7	Is scared of heights (high places)	PIF	22.52
2	Worries that he/she will do something to look stupid in front of other people	SA	22.12
3	Keeps checking that he/she has done things right (e.g., that he/she closed a door, turned off a tap)	OCD	21.60
24	Is frightened of dogs	PIF	21.50
12	Worries that something bad will happen to his/her parents		17.94
1	Has difficulty stopping him/herself from worrying	GAD	17.85
11	Is afraid of meeting or talking to unfamiliar people	SA	16.56
16	Worries that something bad might happen to him/her (e.g., getting lost or kidnapped), so he/she won't be able to see you again	GAD	14.85
19	Worries that he/she will do something embarrassing in front of other people	SA	14.53
10	Is afraid of crowded or closed-in places	PIF	12.94

28	Asks for reassurance when it doesn't seem necessary	GAD	11.41
5	Is scared to ask an adult for help (e.g., a preschool or school teacher)	SA	10.76
17	Is nervous of going swimming	PIF	10.16
22	Becomes distressed about your leaving him/her at preschool/school or with a babysitter		10.03
15	Is afraid of talking in front of the class (preschool group) e.g., show and tell	SA	9.92
18	Has to have things in exactly the right order or position to stop bad things from happening	OCD	9.36
4	Is tense, restless or irritable due to worrying	GAD	9.30
25	Has nightmares about being apart from you		4.74
21	Has bad or silly thoughts or images that keep coming back over and over	OCD	4.52
14	Spends a large part of each day worrying about various things	GAD	4.29
8	Has trouble sleeping due to worrying	GAD	3.64
23	Is afraid to go up to group of children and join their activities	SA	3.64
27	Has to keep thinking special thoughts (e.g., numbers or words) to stop bad things from happening	OCD	1.08

Note:
SAD = separation anxiety disorder,
PIF = physical injury fears,
OCD = obsessive-compulsive disorder,
GAD = generalized anxiety disorder,
SA = social anxiety.