

# VALIDITY AND RELIABILITY OF THE MULTIDIMENSIONAL ANXIETY SCALE FOR CHILDREN (MASC)

*Validade e confiabilidade da Escala Multidimensional de Ansiedade para Crianças (MASC)*

*Validez y confiabilidad de la Escala de Ansiedad Multidimensional para Niños (MASC)*

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**Abstract:** *The Multidimensional Anxiety Scale for Children (MASC) is an instrument used to assess anxiety symptoms in children and adolescents. It can be applied and scored in less than 25 minutes and is considered a useful tool for the routine assessment of problems related to anxiety in children and adolescents. The objective is to study the reliability and validity of the Portuguese version. 649 students participated in this study, from public schools in the city of SP, and 25 children and adolescents, diagnosed with anxiety disorder being treated at SEPIA (Child and Adolescent Psychiatry Service of the Psychiatry Institute of FMUSP Clinical Hospital). The instruments used were MASC and Children's Depression Inventory (CDI). MASC performed well in terms of internal consistency, discriminant validity, responsiveness validity and correlation analysis. The scale showed good psychometric performance and will be useful in future studies.*

**Keywords:** *Anxiety Scale for Children; Validity and Reliability.*

**Resumo:** A Escala Multidimensional de Ansiedade para Crianças (MASC) é um instrumento utilizado para avaliar sintomas de ansiedade em crianças e adolescentes. Pode ser aplicado e pontuado em menos de 25 minutos e é considerado um instrumento útil para avaliação rotineira de problemas relacionados à ansiedade em crianças e adolescentes. O objetivo é estudar a confiabilidade e validade da versão em português. Participaram deste estudo 649 alunos de escolas públicas da cidade de São Paulo com 25 crianças e adolescentes, com diagnóstico de transtorno de ansiedade em tratamento no SEPIA (Serviço de Psiquiatria Infantil e Adolescente do Instituto de Psiquiatria do Hospital das Clínicas FMUSP). Os instrumentos utilizados foram o MASC e o Children's Depression Inventory (CDI). O MASC teve um bom desempenho em termos de consistência interna, validade discriminante, validade de responsividade e análise de correlação. A escala apresentou bom desempenho psicométrico e será útil em estudos futuros.

**Palavras chave:** Escala de Ansiedade para Crianças; Validade e Confiabilidade.

**Resumen:** *La Escala de ansiedad multidimensional para niños (MASC) es un instrumento que se utiliza para evaluar los síntomas de ansiedad en niños y adolescentes. Se puede aplicar y puntuar en menos de 25 minutos y se considera una herramienta útil para la evaluación rutinaria de problemas relacionados con la ansiedad en niños y adolescentes. El objetivo es estudiar la fiabilidad y validez de la versión portuguesa. Participaron en este estudio 649 estudiantes de colegios públicos de la ciudad de SP y 25 niños y adolescentes, diagnosticados con trastorno de ansiedad en tratamiento en SEPIA (Servicio de Psiquiatría del Niño y del Adolescente del Instituto de Psiquiatría del Hospital das Clínicas FMUSP). Los instrumentos utilizados fueron MASC y el Inventario de Depresión Infantil (CDI). MASC se desempeñó bien en términos de consistencia interna, validez discriminante, validez de respuesta y análisis de correlación. La escala mostró un buen desempeño psicométrico y será útil en futuros estudios.*

**Palabras clave:** Escala de Ansiedad para Niños; Validez y Confiabilidad.

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## Introduction

Anxiety Disorders (ADs) are recognized as some of the most prevalent mental disorders in children and adolescents. The study by Vianna, Campos and Fernandez (2009) mentions that the incidence of anxiety disorders in Brazilian children and adolescents reaches 3.40% and 5.04%, respectively. Anxiety is the most common disorder in school-age children; the numbers are alarming and point to possible harm to children's development, family interaction and also in various sectors of society — health, education and economy, for example (Costello et al, 2011). A systematic review carried out by Fernandes, Carvalho, Izbicki and Melo (2014) indicates that, on average, 8% of this school-age population has relevant symptoms or suffers from some anxiety disorder (AD). Anxiety in children tends to be assessed using self-report questionnaires, parents/teacher reports, symptom checklists or standardized interviews. Majority of these evaluation methods are denoted scales or tests, where some such instruments present the psychometric parameters of validity and reliability. A number of instruments to measure child anxiety disorders are available in the literature. Several of these key instruments have been pooled below and classified by category:

a) Children's Manifest Anxiety Scale (CMAS) (Castañeda, McCandless & Palermo, 1956) and its revised version, Revised Children's Manifest Anxiety Scale (R-CMAS) (Reynolds & Richmond, 1978) - some items were devised based on how children think and feel about the manifestation of anxiety in the body, in thinking and behavior;

b) State and Trait concepts in the child version of the State-Trait Anxiety Inventory for Children (STAI-C) (Spielberg, Edwards & Lushene, 1973).

c) Multiple construct instruments which assess mental and behavioral comorbidities (depression, attention deficit disorder, hyperactivity, disruptive behavior, social withdrawal, etc.), presented in the form of scales or structured or semi-structured interviews containing some subscales or items which assess anxiety. These include "Conner's Rating Scale" (for parents and teachers) (Conners, 1969), the "Diagnostic Interview Schedule for Children" (DISC) (Costello, Edelbrock & Costello, 1985), the "Child Behaviour Checklist" (CBCL) (Achenbach, 1991), Children's Depression Inventory (CDI) (Kovacs, 1985), and Kids-Schedule for Affective Disorders and Schizophrenia (K-SADS) (Kaufman et al. 1997).

d) Instruments assessing specific anxiety disorders, such as the Revised Fear Survey Schedule for Children (FSSC-R) (Ollendick, Matson & Helsel, 1985), which investigates phobias and specific fears. The Social Anxiety Scale for Children (SASC) and Social Anxiety Scale for Children Revised (SASC-R) (La-Greca, 1998 & La-Greca, 1988) are scales for social phobia and the Children's Yale Brown Obsessive-Compulsive Scale (Scahill et al, 1997), which assesses obsessive-compulsive symptoms;

e) The most recent category of anxiety scales is the product of a series of research updates using other tests, based on DSM-IV diagnostic criteria. These instruments assess some anxiety symptoms and disorders. The Screen for Child Anxiety Related Emotional Disorders (SCARED) (Birmaher et al, 1997) is one such instrument developed using clinical samples of children. The Spence's Children Anxiety Scale (SCAS) (Spence, 1998), is an Australian instrument which demonstrates adequate and consistent psychometric qualities for the Oceanic population (Australia, New Zealand and Tasmania), Holland, Belgium and Hawaii. It has three versions: Child/adolescent, parents of schoolgoers and parents of pre-schoolers. Finally, there is the "Multidimensional Anxiety Scale for Children" (MASC) (March et al, 1997), developed with samples of school-aged children that focuses on detecting physical symptoms, social anxiety, avoidance of specific objects and separation anxiety.

The latter instrument cited was devised to assess a broad spectrum of anxiety symptoms in children and adolescents aged between 8 and 19 years, having been recognized for its good validity and reliability results in the United States. Recently, and thus adopted in multi-centric studies including: the "NIMH Collaborative Multi-site Multimodal Treatment" in children with hyperactivity disorder and attention deficit (March et al, 1997), epidemiological studies (Dierker, Merikangas & Szatmari, 1999) and clinical treatment trials (Greenhill, 1997; Asbahr, 2005). The MASC consists of 39 items spanning 4 main dimensions: (1) physical symptoms (tense/restlessness and somatic/autonomic); (2) social anxiety (humiliation/rejection and fear of presentations in public); (3) harm avoidance (perfectionism and anxious coping) and (4) separation/panic. In addition, the scale measures total anxiety as well as two main indices (anxiety disorder and inconsistency).

The inconsistency index is used to identify random responses or carelessness whereas the anxiety disorder is useful for identifying children and

adolescents who could benefit from more in-depth clinical assessment. In our milieu, only the State-Trait Anxiety Inventory for Children (IDATE) (Bia-ggio & Spielberger, 1983) - the Brazilian version of the STAI-C (Spielberg, Edwards & Lushene, 1973), is available. However, recently this test received an unfavorable report by the Federal Council of Psychology on account of its outdated norms (Conselho Federal de Psicologia, 2003). Other scales have been translated and adapted to the Brazilian context, although their use has only been for specific studies in an academic context, such as the Children's Form of Manifest Anxiety Scale (EAM-FI) (Rosamilha, 1976), an adapted version of the CMAS (Castañeda, McCandless & Palermo, 1956) and the R-CMAS (Reynolds & Richmond, 1978) validated for Brazil as the Children's Manifest Anxiety Scale "What I think and feel" (OQPS) (Gorayeb, 1997). Given the lack of specific instruments for assessing anxiety in children in Brazil, the present study aimed to study the reliability and validity of the Portuguese version of the MASC in a community sample of Brazilian children.

## Methods

### Sample:

a) Participants in this study fulfilled the diagnostic criteria for anxiety disorders, according to the Diagnostic and Statistic Manual of Mental Disorders - 4th. edition (DSM -IV). All subjects were attended at the Service of Child and Adolescent Psychiatry (SEPIA) of the Institute of Psychiatry of the Hospital das Clínicas of the University of São Paulo Medical School. The sample comprised 11 girls, aged between 10 and 13 years (mean: 11.45 years; standard deviation: 1.04), and 14 boys, aged between 10 and 13 years (mean: 11.29 years; standard deviation: 1.07). All participants attended primary school. The scales were filled out by the subjects at two different points in time: before and after treatment (following remission of symptomatology).

b) Comparative group: A total of 649 children took part in this study aged between 9 and 14 years: 360 girls (mean: 11.5 years; standard deviation: 1.63) and 289 boys (mean: 11.4 years; standard deviation: 1.71). All individuals were pupils enrolled at two state schools, studying from third to eighth grade of primary school, and were residents of the district of São Paulo.

## Translation

The MASC scale was translated into Portuguese by five bilingual professionals, after which content validation was performed using the "back translation" technique. For each item on the scale, the best alternatives were discussed for the translation in pursuit of understandable and appropriate language.

## Statistical Analysis

Quantitative variables were presented in terms of their values of central tendency and spread while qualitative variables were presented in terms of their absolute and relative values. Concerning quantitative variables, Levéne's test was employed for homogeneity of variance test whereas the Kolmogorov-Smirnov test was used for normality of variance. For variables satisfying these two principles, the student test was applied when the distribution was parametric, and the Mann-Whitney U test for non-parametric distributions. The level of significance adopted was 5%. Internal consistency was calculated using Cronbach's alpha, both in the schoolgoer group and the group of children and adolescents with anxiety disorder (before treatment and post symptomatic remission). Discriminant validity was determined by comparing the group of schoolgoers with the group of anxiety disorder patients (prior to treatment). Validity based on longitudinal responsiveness variation was ascertained for the anxiety disorder group at two points in time, prior to treatment and at post-remission of symptoms. Correlation was determined using Spearman's correlation test for the anxiety disorders group prior to treatment, and with schoolgoers group. All subjects signed the informed consent term approved by the Medical Ethics Committee of the University of São Paulo Medical School (FMUSP) under no. 258/01.

The Statistical Program for the Social Sciences (SPSS) version 10.0 was used for all statistical analysis.

## Results

### Internal Consistency

Values obtained following application of Cronbach's alpha coefficient for the group of schoolgoers and the group with anxiety symptoms evidenced

satisfactory internal consistency for the MASC. The lowest value for Cronbach's alpha coefficient was found in females from the anxiety group.

**Table 1:** Cronbach's Coefficients for the schoolgoer group and anxiety symptom group

Symptoms	Cronbach's Coefficient	
	Before	Remission
Schoolgoers 9 to 14 years (Females)	0.9157	-
Schoolgoers 9 to 14 years (Males)	0.9225	-
Schoolgoers 9 to 14 years (Male/Females)	0.9187	-
Anxiety Patients (Females)	0.9352	0.7340
Anxiety Patients (Males)	0.9640	0.8716
Anxiety Patients (Males/Females)	0.9519	0.8440

## Discriminant Validity

Analysis was performed comparing schoolgoers with children and adolescents with anxiety disorders, prior to undergoing treatment.

This analysis revealed that results discriminated to a statistically significant degree across all domains except: "harm avoidance" (perfectionism) ( $p < 0.765$ ); "harm avoidance" (anxious coping) ( $p < 0.180$ ) and "harm avoidance" (total) ( $p < 0.311$ ).

## Validity based on longitudinal variation (responsiveness)

Analysis was performed based on data for patients undergoing treatment for anxiety disorder at the Institute of Psychiatry of the Hospital das Clínicas of the FMUSP, at two points, the first prior to treatment and second, after remission of symptoms. Taking into account all domains of the MASC for the group of 25 patients with anxiety disorder undergoing treatment, a significant difference was observed amongst domains of the MASC between the two assessment points. (Mann-Whitney test).

**Table 2:** Discriminant validity of the MASC between schoolgoers and anxiety disorder patients prior to treatment, for both genders

Variable	Schoolgoer Group	Anxiety Disorder Group	Mann - Whitney Test
	N= 649	Prior to treatment N= 25	
Physical Symptoms	Mean (sd)	Mean (sd)	
Tense/ Restlessness	48.26 (10.63)	67.52 (10.97)	
Min - Max	35 - 81	45 - 82	$p < 0.000$
Somatic/Autonomic	48.66 (9.17)	57.68 (12.53)	
Min - Max	34 - 82	38 - 82	$p < 0.000$
Total	48.35 (9.78)	63.88 (11.74)	
Min - Max	33 - 83	46 - 85	$p < 0.000$
Harm avoidance			
Perfectionism	47.00 (11.97)	48.04 (9.18)	$p < 0.765$
Min - Max	25 - 67	29 - 67	
Anxious coping	46.59 (9.86)	49.64 (10.91)	$p < 0.180$
Min - Max	25 - 72	32 - 66	
Total	46.06 (11.20)	48.72 (10.09)	
Min - Max	25 - 71	30 - 64	$p < 0.311$
Social Anxiety			
Humiliation/Rejection	51.58 (11.32)	61.72 (12.89)	$p < 0.000$
Min - Max	35 - 81	38 - (76)	
Fear of presentations in public	52.96 (10.60)	60.12 (10.12)	$p < 0.002$
Min - Max	32 - 79	46 - 76	
Total	52.49 (10.59)	62.44 (12.27)	
Min - Max	32 - 81	41 - 79	$p < 0.000$
Separation/Panic	54.51 (11.34)	61.28 (14.91)	
Min - Max	7 - 90	35 - 85	$p < 0.021$
Anxiety disorder	45.56 (11.17)	58.20 (13.59)	$p < 0.000$
Min - Max	25 - 82	40 - 79	
MASC total	50.32 (10.99)	63.16 (13.79)	
Min - Max	25 - 85	42 - 82	$p < 0.000$

\*  $p < 0.050$

**Table 3:** Validity based on longitudinal variation of MASC domains for anxiety disorder patients before and after symptom remission, for both genders

Variable	Before	After	Paired t Test
	N= 25	N= 25	
Physical Symptoms	Mean (sd)	Mean (sd)	
Tense/ Restlessness	67.52 (10.97)	49.32 (9.29)	p<0.000
Min - Max	45 - 82	38 - 63	
Somatic/Autonomic	57.68 (12.53)	41.92 (5.64)	p<0.000
Min - Max	38 - 82	34 - 55	
Total	63.88 (11.74)	45.44 (6.88)	p<0.000
Min - Max	46 - 85	35 - 59	
Harm avoidance			
Perfectionism	48.04 (9.18)	29.52 (4.10)	p<0.000
Min - Max	29 - 67	25 - 41	
Anxious coping	49.64 (10.91)	38.36 (7.40)	p<0.000
Min - Max	32 - 66	28 - 54	
Total	48.72 (10.09)	31.36 (5.59)	p<0.000
Min - Max	30 - 64	25 - 45	
Social Anxiety			
Humiliation/Rejection	61.72 (12.89)	47.16 (9.59)	p<0.000
Min - Max	38 - 76	35 - 69	
Fear of presentations in public	60.12 (10.12)	43.96 (6.43)	p<0.000
Min - Max	46 - 76	32 - 55	
Total	62.44 (12.27)	45.28 (7.74)	p<0.000
Min - Max	41 - 79	32 - 64	
Separation/Panic	61.28 (14.91)	43.80 (7.21)	p<0.000
Min - Max	35 - 85	33 - 59	
Anxiety disorder	58.20 (13.59)	38.20 (6.35)	p<0.000
Min - Max	40 - 79	27 - 51	
MASC total	63.16 (13.79)	39.28 (5.74)	p<0.000
Min - Max	42 - 82	33 - 54	

\* p &lt; 0.050

**Table 4:** Validity based on longitudinal variation of MASC domains for anxiety disorder patients before and after symptom remission in male subjects

Variable	Before	After	Paired t Test
	N= 14	N= 14	
Physical Symptoms	Mean (sd)	Mean (sd)	
Tense/ Restlessness	68.50 (10.78)	48.36 (9.83)	p<0.000
Min - Max	53 - 81	38 - 63	
Somatic/Autonomic	57.79 (14.54)	42.29 (5.36)	p<0.000
Min - Max	38 - 82	35 - 55	
Total	64.50 (13.19)	45.14 (7.60)	p<0.000
Min - Max	46 - 85	35 - 59	
Harm avoidance			
Perfectionism	46.21 (9.43)	29.86 (5.30)	p<0.000
Min - Max	29 - 55	25 - 41	
Anxious coping	50.00 (12.78)	40.36 (7.44)	p<0.005
Min - Max	32 - 66	31 - 54	
Total	48.07 (11.14)	33.36 (5.94)	p<0.000
Min - Max	30 - 63	25 - 45	
Social Anxiety			
Humiliation/Rejection	61.64 (12.26)	48.50 (10.04)	p<0.001
Min - Max	45 - 76	37 - 69	
Fear of presentations in public	57.50 (9.69)	45.14 (6.75)	p<0.009
Min - Max	46 - 72	34 - 54	
Total	61.14 (11.03)	46.79 (8.16)	p<0.002
Min - Max	46 - 77	36 - 64	
Separation/Panic	63.50 (14.62)	46.71 (6.98)	p<0.004
Min - Max	47 - 82	39 - 59	
Anxiety disorder	58.86 (14.75)	40.36 (5.57)	p<0.001
Min - Max	40 - 79	31 - 51	
MASC total	63.21 (15.17)	40.86 (6.24)	p<0.000
Min - Max	42 - 82	34 - 54	

\* p &lt; 0.050

**Table 5:** Validity based on longitudinal variation of MASC domains for anxiety disorder patients before and after symptom remission in female subjects

Variable	Before	After	Paired t Test
	N= 11	N= 11	
Physical Symptoms	Mean (sd)	Mean (sd)	
Tense/ Restlessness	66.27 (11.61)	50.55 (8.86)	p<0.000
Min - Max	45 - 82	40 - 61	
Somatic/Autonomic	57.55 (10.10)	41.45 (6.22)	p<0.000
Min - Max	44 - 75	34 - 54	
Total	63.09 (10.17)	45.82 (6.18)	p<0.000
Min - Max	49 - 82	37 - 55	
Harm avoidance			
Perfectionism	50.36 (8.71)	29.09 (1.87)	p<0.000
Min - Max	41 - 67	28 - 32	
Anxious coping	49.18 (8.54)	35.82 (6.84)	p<0.003
Min - Max	38 - 64	28 - 49	
Total	49.55 (9.03)	28.82 (4.05)	p<0.000
Min - Max	40 - 64	25 - 37	
Social Anxiety			
Humiliation/Rejection	61.82 (14.25)	45.45 (9.18)	p<0.002
Min - Max	38 - 76	35 - 59	
Fear of presentations in public	63.45 (10.10)	42.45 (5.96)	p<0.000
Min - Max	48 - 76	32 - 55	
Total	64.09 (14.07)	43.36 (7.06)	p<0.001
Min - Max	41- 79	32 - 53	
Separation/Panic	58.45 (15.49)	40.09 (5.87)	p<0.002
Min - Max	35 - 85	33 - 49	
Anxiety disorder	57.36 (12.60)	35.45 (6.46)	p<0.000
Min - Max	40 - 77	27 - 46	
MASC total	63.09 (12.54)	37.27 (4.54)	p<0.000
Min - Max	47 - 82	33 - 48	

\* p &lt; 0.050

## Correlation Analysis

Spearman's correlation test showed that all domains of the MASC presented significant correlation with the CDI except: the "harm avoidance" (perfectionism) domain (-0.03), "harm avoidance" (anxious coping) domain (-0.04) and "harm avoidance" (total) domain (-0.04).

## Discussion

The present study aimed to validate the Portuguese version of the Multidimensional Anxiety Scale for Children (MASC) based on a population of young Brazilians aged between 9 and 14 years. Psychometric characteristics such as internal consistency, discriminant validity, validity in terms of longitudinal and male/female/mixed anxiety patients) to which the MASC was applied, according to Cronbach's coefficient, suggesting homogeneity and coherence of our results. Present results mirrored those found in studies carried out in Australia, China and Sweden (Baldwin, 2007; Yao S, 2007; Ivarsson, 2006). A comparative study by Muris (Muris et al, 2002) of child anxiety scales showed the internal consistency

**Table 6:** Spearman's Correlation Coefficient Test for anxiety disorder patients (before treatment) and schoolgoers (males and females) between domains of the MASC and the CDI (Children's Depression Inventory)

Variable	CDI
CDI	1.000
Tense-Restless	0.44*
Somatic-Automic	0.32*
Total	0.44*
Perfectionism	-0.03
Anxious Coping	-0.04
Total	-0.04
Humiliation-Rejection	0.28*
Fear of presentations in public	0.27*
Total	0.32*
Separation-Panic	0.12*
Anxiety Disorder	0.31*
MASC total	0.30*

\* p &lt; 0.0

of the MASC to be very reliable. Moreover, March and Sullivan (March & Sullivan, 1999) confirmed stability amongst all factors and subscales. According to

the discriminant validity used to compare the schoolgoer group to the group of patients with anxiety symptoms prior to treatment, there was a significant difference across all domains except three: harm avoidance (perfectionism) harm avoidance (anxious coping) and harm avoidance (total). In an article on validation of the MASC (March et al, 1997), anxious children did not score highly in these domains. In contrast, when the scale was filled out by children with obsessive-compulsive disorders, results presented were high. Comparison of the cited study results with the original article allows us to conclude that anxious children presented lower results in these domains because behaviors more closely related to obsessiveness-compulsiveness than to other symptoms of anxiety were involved (March et al, 1997). Other studies have shown the good capacity of this scale for discriminating anxiety from depression (Dierker et al, 2001; Rynn et al, 2006). Responsiveness validity assessment entailed analysis of patient data at two points in time, namely: before treatment and after symptom remission. Significant differences were observed across all MASC domains for the group of 25 patients with anxiety disorders. Group breakdown by gender showed that significant differences among MASC domains remained for both male and female subjects, suggesting that results are gender-independent.

In the validity study of the MASC in its original English version, March and colleagues (March et al, 1997) reported that girls were more anxious than boys, although this finding was not replicated in the present study, most likely due to our low sample size (N=25). Nevertheless, other studies in Sweden and China have confirmed this difference between genders (Yao, 2007 & Ivarsson, 2006).

Analysis of correlation between the different

domains of the MASC and CDI revealed that the domains “harm avoidance” (perfectionism), “harm avoidance” (dealing with anxiety) and “harm avoidance” (total), presented no correlation coefficients. The lack of correlation among these domains and the CDI may be related to the fact that the “perfectionist” and “anxious coping” symptoms are not necessarily affected by the anxiety symptom picture. Similarly, studies on children presenting Obsessive-Compulsive Disorders have shown these domains to present high scores (March et al, 1997). Ivarsson (2006) found good convergent validity through a moderate correlation with the CDI. Taken together, these data indicate that the psychometric properties of the Portuguese version are comparable to the original MASC (March et al, 1997). Given the ease of use, reliability and efficacy demonstrated by the Portuguese version of the MASC, this instrument may prove valuable for measuring anxiety symptomatology in the child-youth population. In clinical settings, (the Portuguese version of) the MASC may be useful for gathering data prior to the initial assessment, as well as along and after completion of treatment. In research settings, (the Portuguese version of) the MASC likely will be a useful instrument to document the relationship between anxious symptoms and other variables. Indeed, the Portuguese version of the MASC has already been adopted in a clinical trial held in our research laboratory [a comparison between two modalities of treatment, a psychological (group cognitive-behavioral therapy) and a pharmacological (sertraline) for youngsters with obsessive-compulsive disorder (Asbahr et al, 2005). Combining good psychometric performance with practicality, it is a useful tool in further studies assessing anxiety symptoms in youngsters.

## References

- Achenbach, T.M. (1991). *Manual for the Child Behaviour Checklist/ 4-18 and 1991 Profile*. Burlington, VT: University of Vermont, Department of Psychiatry.
- Asbahr, F.R., Castillo, A.R., Ito, L.M., Latorre, M.R., Moreira, M.N., & Lotufo-Neto, F. (2005). Group cognitive-behavioral therapy versus sertraline for the treatment of children and adolescents with obsessive-compulsive disorder. *J Am Acad Child Adolesc Psychiatry*, 44(11), 1128-1136.
- Baldwin, J.S., & Dadds, M.R. (2007). Reliability and validity of parent and child versions of the Multidimensional Anxiety Scale for Children in a community sample. *J Am Acad Child Adolesc Psychiatry*, 46 (2), 252-260.
- Biaggio, A.M.B., & Spielberger, C.D. (1983). *Inventário de Ansiedade Traço-Estado-IDATE-C- Manual para a forma experimental infantil em português*. Rio de Janeiro, Brasil: CEPA - Centro Editor de Psicologia Aplicada.
- Birmaher, B., Khetarpal, S., Brent, D., Cully, M., Balach, L., & Kaufman, J. (1997). The Screen for Child Anxiety Related Emotional Disorders (SCARED): scale construction and psychometric characteristics. *J Am Acad Child Adolesc Psychiatry*, 36(4), 545-53.

- Castañeda, A., McCandless, B.R., & Palermo, D.S. (1956). The Children's Form of Manifest Anxiety Scale (CMAS). *Child Development*, 27(3), 317-26.
- Conselho Federal de Psicologia. *Sistema de avaliação de testes psicológicos*. 2003. (quoted: 01/04/2005). Available at: <http://www.pol.org.br/satepsi/sistema/admin.cfm?lista2=sim>
- Conners, C.K. (1969). A teacher rating scale for use in drug studies with children. *Am J Psychiatry*, 126(6), 884-8.
- Costello, E.J., Edelbrock, C.S., & Costello, A.J. (1985). Validity of the NIMH Diagnostic Interview Schedule for Children (DISC): a comparison between psychiatric and pediatric referrals. *J Abnorm Child Psychol*, 13(4), 579-95.
- Costello, E. J., Egger, H. L., Copeland, W., Erkanli, A., & Angold, A. (2011). The developmental epidemiology of anxiety disorders: phenomenology, prevalence, and comorbidity. In W. K. Silverman & A. Field (Eds). *Anxiety disorders in children and adolescents: research, assessment and intervention* (pp. 56-75). Cambridge: Cambridge University Press.
- Dierker, L.C., Merikangas, K.R., & Szatmari, P. (1999). Influence of parental concordance for psychiatric disorders on psychopathology in offspring. *J Am Acad Child Adolesc Psychiatry*, 38 (3), 280-8.
- Dierker, L.C., Albaro, A.M., Clarke, G.N., Heimberg, R.G., Kendall, P.C., Merikangas, K.R., Lewinsohn, P.M., Offord, D.R., Kessler, R., & Kupfer, D.J. (2001). Screening for anxiety and depression in early adolescence. *J Am Acad Child Adolesc Psychiatry*, 40 (8), 929 – 936.
- Fernandes, L. F. B., Carvalho, F. A., Izbicki, S., & Melo, M. H. S. (2014). Prevenção Universal de ansiedade na infância e adolescência: Uma revisão sistemática. *Revista Psicologia: Teoria e Prática*, 16(3), 83-99.
- Gorayeb, M.A.M. (1997). *Adaptação, normatização e avaliação das qualidades psicométricas da RCMAS (Revised Children's Manifest Anxiety Scale) para uma amostra de escolares de oito a 13 anos de idade em Ribeirão Preto, SP*. [tese]. Ribeirão Preto: Universidade de São Paulo.
- Greenhill, L.L., Pine, D., March, J., Birmaher, B., & Riddle M. (1997). Assessment issues in treatment research of pediatric anxiety disorders: what is working, what is not working, what is missing, and what needs improvement. *J Am Acad Child Adolesc Psychiatry*, 36 (4), 554-65.
- Ivarsson, T. (2006). Normative data for the Multidimensional Anxiety Scale for Children (MASC) in Swedish adolescents. *Nord J Psychiatry*, 60 (2), 107-13.
- Johnson, J., Weissman, M.M., & Klerman, G.L. (1990). Panic disorder, comorbidity, and suicide attempts. *Arch Gen Psychiatry*, Sep;47(9), 805-8.
- Kaufman, J., Birmaher, B., Brent, D., Rao, U., Flynn, C., & Moreci, P. (1997). Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (K-SADS-PL): initial reliability and validity data. *J Am Acad Child Adolesc Psychiatry*, 36(7), 980-8.
- Keller, M.B., Lavori, P.W., Wunder, J., Beardslee, W.R., Schwartz, C.E., & Roth, J. (1992). Chronic course of anxiety disorders in children and adolescents. *J Am Acad Child Adolesc Psychiatry*, 31(4), 595-9.
- Kovacs, M., Gatsonis, C., Paulauskas, S.L., & Richards, C. (1989). Depressive disorders in childhood. IV. A longitudinal study of comorbidity with and risk for anxiety disorders. *Arch Gen Psychiatry*, 46(9), 776-83.
- Kovacs, M. (1985). The Children's Depression Inventory (CDI). *Psychopharmacol Bull*, 21(4), 995-8.
- La-Greca, A.M., & Lopez, N. (1998). Social anxiety among adolescents: linkages with peer relations and friendships. *J Abnorm Child Psychol*, 26(2), 83-94.
- La-Greca, A.M., Dandes, S.K., Wick, P., Shaw, K., & Stone, W.L. (1988). Development of the Social Anxiety Scale for Children: reliability and concurrent validity. *J Clin Child Psychology*, 17(1), 84-91.
- 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. *J Am Acad Child Adolesc Psychiatry*, 36(4), 554-65.
- March, J.S., & Sullivan, K. (1999). Test-retest reliability of the Multidimensional Anxiety Scale for Children. *J Anxiety Disorders*, 13 (4), 349 – 358.
- Muris, P., Merckelbach, H., Ollendick, T., King, N., & Bogie, N. (2002). Three traditional and three new childhood anxiety questionnaires: Their reliability and validity in a normal adolescent sample. *Behav Res Ther*, 40 (7), 753 – 772.
- Ollendick, I.H., Matson, J.L., & Helsel, W.J. (1985). Reliability and validity of Revised Fear Survey Schedule for Children (FSSC-R). *Behav Res Therapy*, 23(2), 465-7.
- Rapee, R.M. (1991). Generalized anxiety disorder: a review of clinical features and theoretical concepts. *Clin Psychol Rev*, 11(4), 419-40.
- Reynolds, C.R., & Richmond, B.O. (1978). What I think and feel: a revised measure of children's manifest anxiety. *Journal of Abnormal Child Psychology*, 6 (2), 271-80.
- Rosamilha, N. (1976). *Psicologia da ansiedade infantil*. São Paulo, Brasil: Pioneira.
- Rynn, M.A., Barber, J.P., Khalid-Khan, S., Siqueland, L., Dembisky, M., McCarthy, K.S., & Gallop, R. (2006). The psychometric properties of the MASC in a pediatric psychiatric sample. *J Anxiety Disorders*, 20 (2), 139-157.
- Scahill, L., Riddle, M.A., McSwiggin-Hardin, M., Ort, S.I., King, R.A., & Goodman, W.K. (1997). Children's Yale-Brown Obsessive Compulsive Scale: reliability and validity. *J Am Acad Child Adolesc Psychiatry*, 36(6), 844-52.
- Spence, S.H. (1998). A measure of anxiety symptoms among children. *Behav Res Ther*, 36(5), 545-66.
- Spielberg, C.D, Edwards, C.D, & Lushene R.E. (1973). *State-trait anxiety inventory for children (STAI-C)*. Palo Alto: Consulting Psychological Press.
- Strauss, C.C., Frame, C.L., & Forehand, R.L. (1987). Psychosocial impairment associated with anxiety in children. *J Consult Clin Child*

*Psychol.* 16:235-9.

Vianna, R. R. A. B., Campos, A. A., & Landeira-Fernandez, J. (2009). Transtornos de ansiedade na infância e adolescência: uma revisão. *Rev. bras. ter. cogn.* 5(1), 46-61.

Yao, S., Zou, T., Zhu, X., Abela, Jr., Auerbach, R.P., & Tong, X. (2007). Reliability and validity of the chinese version of the Multidimensional Anxiety Scale for Children among chinese secondary school children. *Child Psychiatry Hum Dev.* 38 (1), 1-16.

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