


Study of Adaptation and Validity Evidence of the Reading Anxiety Scale (RAS-20) - Version for Parents and Guardians

Melina Lima¹ 

Clarisse Pereira Mosmann¹ 

Abstract: Reading anxiety can hinder involvement and performance. This study aimed to present the adaptation and validity evidence of the Reading Anxiety Scale (RAS-20) for parents and guardians. A total of 240 parents and guardians with children aged from eight to 12 years ($M = 9.73$; $SD = 1.41$) took part in the study. A sociodemographic and health conditions questionnaire, the Child Behavior Checklist (CBCL) and the Reading Anxiety Scale (RAS) version for parents and guardians were applied. The results of the confirmatory factor analysis indicated good adjustment rates for the three dimensions assessed by the scale (enjoyment, independence, and difficulty). Convergent validity evidence supported the hypothesis of anxiety as a specific phenomenon, different from general anxiety. The RAS-Version for parents and guardians showed adequate psychometric properties and can contribute to the development of interventions in the clinical, family, and school context.

Keywords: anxiety, reading, parents, neuropsychological assessment

Estudo de Adaptação e Evidências de Validade da Reading Anxiety Scale (RAS-20) - Versão Para Pais e Cuidadores

Resumo: A ansiedade de leitura pode gerar dificuldades de engajamento e desempenho. O estudo teve como objetivo apresentar a adaptação e evidências de validade da *Reading Anxiety Scale* (RAS-20) para pais e cuidadores. Participaram 240 cuidadores com filhos de idades entre 8 e 12 anos ($M = 9,73$; $DP = 1,41$). Foi utilizado um questionário sociodemográfico e de condições de saúde, a lista de verificação comportamental para crianças ou adolescentes - *Child Behavior Checklist* (CBCL) e a *Reading Anxiety Scale* (RAS) versão para pais e cuidadores. Os resultados da análise fatorial confirmatória indicaram bons índices de ajustes para as três dimensões avaliadas pela escala (interesse, independência e dificuldade). As evidências de validade convergente reforçaram a hipótese da ansiedade de leitura como um fenômeno específico, diferente da ansiedade geral. A RAS-versão para pais e cuidadores possui adequadas propriedades psicométricas e pode contribuir com o desenvolvimento de intervenções no âmbito clínico, familiar e escolar.

Palavras-chave: ansiedade, leitura, pais, avaliação neuropsicológica

Estudio de Adaptación y Evidencia de Validez de la Reading Anxiety Scale (RAS-20) - Versión para Padres y Cuidadores

Resumen: La ansiedad por la lectura puede generar dificultades de compromiso y rendimiento. Este estudio tuvo como objetivo presentar la adaptación y las evidencias de validez de la *Reading Anxiety Scale* (RAS-20) para padres y cuidadores. Participaron 240 cuidadores con hijos de entre 8 y 12 años de edad ($M = 9,73$; $DE = 1,41$). Se utilizó un cuestionario sociodemográfico y de estado de salud, la lista de control conductual para niños o adolescentes - *Child Behavior Checklist* (CBCL) - y la *Reading Anxiety Scale* (RAS), versión para padres y cuidadores. Los resultados del análisis factorial confirmatorio indicaron buenos índices de ajuste para las tres dimensiones evaluadas por la escala (interés, independencia y dificultad). La evidencia de validez convergente reforzó la hipótesis de la ansiedad lectora como un fenómeno específico, diferente de la ansiedad general. La versión RAS para padres y cuidadores tiene propiedades psicométricas adecuadas y puede contribuir al desarrollo de intervenciones en el ámbito clínico, familiar y escolar.

Palabras clave: ansiedad, lectura, padres, evaluación neuropsicológica

¹Universidade do Vale do Rio dos Sinos, São Leopoldo-RS, Brazil

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Correspondence address: Melina Lima. Universidade do Vale do Rio dos Sinos. Av. Unisinos, 950, São Leopoldo, RS - Brasil. CEP 93.022-000. Email: lima.melina@gmail.com

The development of reading skills depends on a formal learning process; it is associated with success in school performance in the students' career, and is influenced by different environmental factors such as parents' schooling, appropriate encouragement and pedagogical practices (Peng et al., 2019). In addition to the cognitive and contextual

aspects of the environment, individual factors such as thoughts, emotions, motivation and behavior can influence the reading ability of children and adolescents (Joshi et al., 2012). Regarding thoughts and emotions, it is known that the more confident children are and the more positive emotions associated with learning they have, the better their performance will be (Hernández et al., 2016; Ramirez et al., 2019). Many studies show that children who express negative feelings towards reading and learning activities find it more difficult to get involved in tasks and have difficulties in their school career (Hernández et al., 2018; Nachshon & Horowitz-Kraus, 2018). The specific reading anxiety has been highlighted as a manifestation of a negative emotional reaction to reading, accompanied by avoidance behaviors (Piccolo et al., 2020).

Early clinical studies on reading anxiety indicated an unpleasant emotional reaction characterized by anticipation of pain and/or stress (Zbornik, 1988). Such reactions were observed when independence and curiosity were associated with parental disapproval and reading activities. In this sense, reading anxiety differs from the constructs of general anxiety, since general anxiety is characterized by an emotional state of uncertainty, agitation, or dread in the face of an unknown contingency, without a specific object towards which these feelings are directed (Stallard, 2010). There are different studies discussing the specificity of reading anxiety in the literature. The findings indicate that the emotional and behavioral reactions expressed by children are related to fear and apprehension in situations that require the processing of textual information (Macdonald et al., 2021; Piccolo et al., 2017; Ramirez et al., 2019).

Reading anxiety is mostly assessed using self-report scales (Macdonald et al., 2021; Ramirez et al., 2019), sometimes adapted from instruments used to assess other phenomena such as math anxiety (Davis et al., 2018; Katzir et al., 2018). In Brazil, the Reading Anxiety Scale (RAS-20) was translated into and adapted for the national context by Piccolo et al. (2020). The RAS-20 assesses feelings and behaviors in relation to reading activities, through self-report, based on three distinct dimensions. Aspects of school and home environments of children and adolescents aged from nine to 12 are assessed. The factor analyses conducted in the RAS-20 study showed satisfactory results and indicated that the original scale had an excessive number of items. Furthermore, new meanings were established for the factors, improving the scale measurement capacity.

The first dimension, Independence, refers to the extent to which children believe they need help to accomplish reading tasks. This dimension is probably associated with cognitive issues, such as the ability to concentrate and beliefs related to self-efficacy, as well as affective factors; for example, children may feel safer overcoming their fear of reading when assisted by someone. The second dimension, Enjoyment, refers to how comfortable the child feels performing reading tasks, regardless of their perceived ability to read. Thus, the Enjoyment dimension seems to be associated with cognitive, affective, and behavioral factors, given that lack of enjoyment may be associated with avoidance of written materials or tasks involving reading. Finally, Difficulty refers to the perception that reading is a difficult activity to carry out, given one's own abilities. Items 7, 14, and 17 specifically assess aspects of self-efficacy and self-concept, suggesting that the child's perception of their performance contributes significantly to anxious symptoms in relation to reading.

Therefore, this factor may be associated with cognitive, affective, and behavioral aspects that are in fact limited or perceived as not sufficient for the child to read proficiently.

Given this and the opportunity to collect evidence from another source of information on the manifestation of reading anxiety, such as parents and guardians, there is a good opportunity to contribute to the planning of interventions for the family environment. Moreover, the triangulation of the data collected from the clinician's observation and assessment, the child's self-report and perceptions of parents and guardians can help to qualify the assessment of children's emotional and behavioral symptoms. Also, due to the lack of specific instruments to evaluate this phenomenon in Brazilian children, especially from the parents and guardians' perspective, this study aimed to present the adaptation and validity evidence of the Reading Anxiety Scale (RAS-20) for parents and guardians.

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Method

Participants

The study included 240 parents and guardians of children aged from eight to 12 years ($M = 9.73$; $SD = 1.41$), 92.1% ($N = 221$) of whom were mothers, 5.8% ($N = 14$) fathers, 1.7% stepmothers ($N = 4$) and one aunt, all aged from 24 to 61 ($M = 40.13$; $SD = 6.06$). Among the participants, 98.3% (228) lived in the Southern Brazil, with a family income in Brazilian Reais (BRL) ranging from BRL1,100 to BRL 50,000 ($M = R\$9,969$; $SD = 8.78$). All participants who were parents or guardians of children aged from eight to 12 without neurodevelopmental disorders were included; two participants who were responsible for older children and one who was responsible for a child with an intellectual disability were excluded. Table 1 shows further data describing the sample.

Table 1
Characterization of the participants

Sociodemographic parameter		N	%
Schooling of parents and guardians	Complete primary education	4	1.7
	Incomplete primary education	2	0.8
	Complete secondary education	28	11.7
	Incomplete secondary education	7	2.9
	Complete tertiary education	45	18.8
	Incomplete tertiary education	36	15.0
Sex of children and adolescents	Postgraduate	118	49.1
	Female	114	47.5
Type of school of children and adolescents	Male	126	52.5
	Private	153	63.7
	Public	87	36.3

Instruments

Socioeconomic questionnaire and health conditions. The questionnaire was prepared by the researchers and filled in by the participants with questions on: sociocultural aspects, health, development, and schooling of the children. The questionnaire also investigated the socioeconomic conditions of the families based on the Brazil Criterion (Associação Brasileira de Empresas e Pesquisa [ABEP], 2022).

Child Behavior Checklist (CBCL). The CBCL is designed for parents and guardians to assess children aged from six to 18 years. It consists of 138 items and is divided into eight scales indicating behavioral problems and emotional symptoms. The version validated for the Brazilian population (Bordin et al., 2013) of the scale for investigating internalizing problems, composed of the anxiety/depression, withdrawal, and somatic complaints subscales were used.

Reading Anxiety Scale (RAS) version for parents and guardians – adaptation process. This scale was adapted for parents and guardians from the Reading Anxiety Scale – reduced Brazilian version – the RAS-20 (Piccolo et al., 2020). It consists of 20 items and is divided into three dimensions, which assess parents' perception of how children and adolescents feel about reading. Parents indicate which answer most applies to their child on a 5-point Likert scale (totally agree, agree, not sure, disagree, totally disagree), and the sum of the points is the maximum score. The higher the score, the lower the manifestation of reading anxiety symptoms. The process of adapting the instrument followed guidelines proposed in the literature (Cunha et al., 2016) and included the following stages: (1) adaptation of the items; (2) analysis by expert raters; (3) revision of the scale after the raters' evaluation; (4) analysis of the instrument by the target audience; (5) final development of the scale and (6) analysis of the instrument psychometric properties (Reppold et al., 2014).

Initially, the authors of the Reading Anxiety Scale – reduced Brazilian version – the RAS-20 (Piccolo et al., 2020) were contacted, to ask for authorization to adapt their version for parents and guardians. From their consent, the items were adapted regarding grammar and agreement, ensuring the conceptual equivalence of the original scale. The aim was to maintain the number of items and dimensions of the RAS-20 scale.

The second stage of the instrument adaptation involved the evaluation of expert raters in the field who assessed the criteria of clarity of language, practical pertinence, theoretical relevance, and evaluated dimensions (Pasquali, 2010). The raters panel included two clinical child psychologists, a neuropsychologist, a speech therapist, and a PhD in clinical psychology experienced in research with families. After the raters' analysis, an average Kappa agreement index of 0.41 was observed. Changes were made to the wording of six items (1; 2; 8; 9;16; and 18) in order to keep the full meaning of the sentences in the original scale. None of the items were considered inappropriate and were not excluded or inserted.

The study included a target audience review stage, in which three parents and guardians of children aged from

8 to 12 participated as respondents. They reported that their children were native speakers of Brazilian Portuguese and showed typical development. They were given guidelines for evaluating the items and indicating whether or not the scale instructions were easy to understand. In the end, their feedback resulted in a change to the presentation of the Likert scale for registering responses. As a result, the instruction on measuring the intensity of the feelings and behaviors observed was kept consistent throughout the instrument.

After the aforementioned adaptation procedures, data was collected which guaranteed the psychometric analysis of the adapted scale. Evidence of the psychometric and validity properties is presented in the Results section.

Procedures

Data collection. Due to the social isolation and other consequences imposed by the COVID-19 pandemic, the study was adapted to the online context. The research was publicized through social networks and electronic contact with teaching teams from schools in the metropolitan area of Porto Alegre. After reading the informed consent form and indicating that they were aware of the research conditions, the participants answered the questions using Google Forms, which lasted approximately 25 minutes.

Data analysis. Initially, descriptive analyses were carried out on the mean score, standard deviation and correlations between the dimensions proposed in the original scale. Then, to verify the psychometric properties of the scale, confirmatory factor analysis (CFA) was carried out. The internal consistency of the dimensions was also checked using the alpha coefficient. Finally, the evidence of convergent validity of the RAS-parents and guardians version with the CBCL was analyzed. The analyses were conducted using the IBM®SPSS® program (version 25) and the AMOS extension (version 24).

Ethical Considerations

This study followed ethical recommendations for conducting studies with human beings, in accordance with Resolution 510/2016 of the National Health Council. It was approved by the Research Ethics Committee of the Universidade do Vale do Rio dos Sinos, under CAAE No. 26093519.3.0000.5344.

Results

Descriptive analyses and associations between the factors of the RAS – for parents and guardians version

Initially, descriptive analyses were conducted on the RAS – Parents and Guardians Version and association analyses were applied between the scale dimensions. It was noted that the data collected was not normally distributed. Table 2 shows the results of the means, standard deviations, and Spearman's correlation analyses for the scale dimensions.

Table 2

Mean, standard deviation and association of the dimensions of the Reading Anxiety Scale – parents and guardians version results

	<i>M</i>	<i>DP</i>	1	2	3	4
1 RAS IND	29.70	7.30	-			
2 RAS ENJ	24.60	5.97	0.61**	-		
3 RAS DIF	29.50	6.50	0.78*	0.68**	-	
4 RAS-TOTAL	83.81	18.20	0.86**	0.86**	0.91**	-

Note. *M*: mean; *SD*: Standard deviation; RAS: Reading Anxiety Scale; IND: Independence; ENJ: Enjoyment; DIF: Difficulty; * $p < 0.05$; ** $p < 0.01$.

Confirmatory factor analysis and internal consistency of the scale

The initial results of the CFA indicated that the items presented in the three dimensions, as proposed by the original

scale, have satisfactory factor loadings with good model fit indices, according to the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy = 0.93 and Bartlett's test of sphericity ($\chi^2(190) = 4071.782, p < 0.001$). The standardized coefficients of the three dimensions of the scale are shown in Table 3.

Table 3

Factor structure of the RAS-Version for parents and guardians

Item	Independence	Enjoyment	Difficulty
11 Cannot improve their reading without help. / Não consegue melhorar a sua leitura sem ajuda.	0,813		
13 Cannot read well without help from other people. / Não consegue ler bem sem ajuda de outras pessoas.	0,796		
6 Cannot read well, no matter how hard he/she tries. / Não consegue ler bem, não importa o quanto tente.	0,791		
8 Says he/she cannot read without help. / Diz que não consegue ler sem ajuda.	0,785		
7 Says that others read better than him/her. / Diz que os outros leem melhor que ele(a).	0,776		
3 Needs help to read. / Precisa de ajuda para ler.	0,766		
5 Needs the teacher's help when there is a reading activity in class. / Necessita da ajuda do(a) professor(a) quando tem atividade de leitura em sala de aula.	0,750		
16 Feels more secure when he/she has someone to help with his/her reading homework. / Se sente mais seguro(a) quando recebe ajuda de alguém para fazer os deveres de casa de leitura.	0,646		
10 Can read, but does not like it. / Consegue ler, mas não gosta.		0,909	
12 Says he/she does not like reading. / Diz que não gosta de ler.		0,849	
20 Gets upset when he/she has too much to read. / Fica chateado(a) quando tem muita coisa para ler.		0,721	
18 Even if he/she could, he/she says would not want to improve his/her reading. / Mesmo que pudesse, ele(a) diz que não gostaria de melhorar a sua leitura.		0,766	
15 Does not like looking at books. / Não gosta de olhar para livros.		0,766	
19 Gets upset and/or nervous when looking at books. / Fica chateado(a) e/ou nervoso(a) ao olhar para livros.		0,761	
14 Says he/she could read better if he/she were a better person. / Diz que saberia ler melhor, se fosse uma pessoa melhor.			0,849
17 Does not feel intelligent enough to read well. / Não se sente inteligente o suficiente para ler bem.			0,728
9 Quickly forgets what he/she has read even when he/she has just finished reading / Esquece rapidamente o que leu mesmo quando recém acabou de ler			0,707
4 Can read, but cannot understand what they read. / Consegue ler, mas não consegue entender o que lê.			0,707
2 Says he/she has difficulty to understand what they read. / Diz que tem dificuldade para entender o que lê.			0,672
1 Says he/she finds it difficult to read. / Diz que acha difícil ler.			0,628

In addition, CFA were conducted based on the structure and dimensions specified in the RAS-20 (Piccolo et al.,

2020). Table 4 shows the results of the confirmatory factor analyses for the dimensions proposed in the original scale.

Table 4
Confirmatory factor analysis models of the scale dimensions

Model	X ² /df	Absolute fit measures			Incremental fit measure
		p	RMSEA	SRMR	CFI
RAS_IND	1.79	0.043	0.05	0.03	0.99
RAS_ENJ	2.65	0.047	0.08	0.04	0.99
RAS_DIF	2.40	0.013	0.07	0.03	0.98
RAS_TOTAL	1.89	0.042	0.08	0.03	0.97

Note. RAS: *Reading Anxiety Scale*; IND: Independence; ENJ: Enjoyment; DIF: Difficulty.

The reliability analyses showed satisfactory results, with the Cronbach's Alpha coefficient for the scale being 0.95. For the first dimension, Independence, the index was 0.92; for the Enjoyment dimension, 0.86; and finally, for the Difficulty dimension, the Alpha coefficient was 0.88.

Associations between the RAS- parents and guardians version and the CBCL

To verify evidence of convergent validity, association analyses were carried out between the dimensions of the RAS and the CBCL for internalizing symptoms. The results are shown in Table 5.

Table 5
Correlations between RAS-Version for parents and guardians and CBCL-internalizing problems

	1	2	3	4	5	6	7	8
1.RAS_IND	-							
2.RAS_ENJ	.61**	-						
3.RAS_DIF	.78**	.68**	-					
4.RAS_Total	.86**	.86**	.91**	-				
5.CBCL_DEP_ANS	-.29**	-.18**	-.34**	-.31**	-			
6.CBCL_RET	-.26**	-.16**	-.27**	-.25**	.42**	-		
7.CBCL_SOM	-.27**	-.19**	-.29**	-.29**	.54*	.29*	-	
8.CBCL_Internalizing	-.34**	-.23**	-.38**	-.36**	.93*	.54*	.76**	-

Note. *M*: mean; *SD*: standard deviation; RAS: *Reading Anxiety Scale*; IND: Independence; ENJ: Enjoyment; DIF: Difficulty; * $p < 0.05$; ** $p < 0.01$.

Discussion

This study aimed to adapt the Reading Anxiety Scale (RAS) for parents and guardians of Brazilian children and adolescents, in addition to presenting the psychometric properties and evidence of validity for the target audience. The stages of instrument adaptation were carefully conducted (Reppold et al., 2014) to ensure the quality of the final version of the instrument. Notably, the panel of participating raters contributed significantly to the suitability of the items and the maintenance of the scale conceptual equivalence. Regarding survey participants, most were women and it is well known that fathers and mothers may differ in the way they evaluate their children. However, there is still no consensus in the literature as to how these differences are manifested, and they may be more related to the observation of behavioral problems than to internalizing problems (Borsa & Nunes, 2008). However, in these cases, the gender of the responding guardian, the gender of the child being

assessed and/or their age should be considered. Evidence suggests that informants who observe children in the same context tend to maintain an adequate level of agreement (Seabra-Santos & Almeida, 2014). In this research, the option was for the understanding that regardless of the participant's gender—while observing the child in reading activities at home—they would be able to consistently assess the manifestations of reading anxiety

The results showed that parents and guardians evaluated their children with a satisfactory standard of behavior in relation to reading activities. The means presented in the dimensions and in the total score of the scale indicated that the children assessed by participants did not present significant symptoms of reading anxiety. As the dimensions and the total score were close to the maximum value, a higher average score was observed, specifically in the independence dimension. Thus, for the age group of children assessed by guardians, more autonomous reading behaviors were expected (Cunha & Capellini, 2013). Advancing age,

school grades and mastery of the cognitive processes of reading ensure greater confidence in reading tasks. A study with Portuguese students in the fifth year of secondary education corroborates this finding, as they indicate that with the progression from the initial to the higher grades, there is a reduction in the influence of the use of strategies (cognitive and metacognitive) for reading comprehension (Rodrigues et al., 2020).

The results showed a factor structure indicating a model with an adequate fit and confirmed the three dimensions of the scale, as the original scale aimed at children (Piccolo et al., 2020). The independence, enjoyment, and difficulty dimensions were maintained enabling the reading anxiety phenomenon to be assessed, in line with the self-report scales used by children (Katzir et al., 2018; Piccolo et al., 2020; Ramirez et al., 2019). Regarding the internal consistency indices, Cronbach's alpha results indicated satisfactory values, as the literature suggests over 0.7 indices as ideal (Hair et al., 2009). It was also observed that the results for the parents and guardians version were higher than the indices of the original scale (Piccolo et al., 2020). These results may be related to the fact that parents and guardians were able to report the phenomenon of reading anxiety more easily than children. according to the findings of a British study with children aged from 8 to 11, relating measures of self-efficacy to reading, it is probably harder for children in this age group to evaluate self-efficacy and difficulties in reading. The authors indicate that perceived self-efficacy can explain an individual's response to reading through the amount of effort spent reading, involvement in reading activities and choice of reading activities. However, they understand that this self-assessment is complex and depends on stimuli for self-perception exercises (Carroll & Fox, 2017). Therefore, it could be argued that children assessed in the adaptation of the RAS-20 (Piccolo et al., 2020) were not familiar with this type of self-assessment. Response options with more playful stimuli probably favor the measurement of this phenomenon, a format already used in scales that assess mathematics anxiety (Haase et al., 2012).

The analysis of associations between the dimensions of the scale and the instrument used for evidence of convergent validity revealed satisfactory results. Significant negative correlations were found between the RAS - parents and guardians version and the CBCL, albeit of weak magnitude. The results point to a path for understanding the phenomenon of reading anxiety. In this study, reading anxiety was shown to be a specific construct, a phobic reaction, different from the manifestation of generalized anxiety and the intensity of internalizing problems in general. These data corroborate similar findings from a study of 272 North American children in the fourth and fifth grades of primary education, which reported evidence that reading anxiety and general anxiety are distinct, rather than complementary or overlapping constructs (Macdonald et al., 2021). In the study adapting the RAS-20, only significant moderate negative associations were observed between the enjoyment and difficulty dimensions and the physical symptoms dimension

of the Multidimensional Anxiety Scale for Children - MASC (Piccolo et al., 2020). These findings reinforce the hypothesis of a specific manifestation of reading anxiety.

It is also important to develop different measuring instruments for the same phenomenon, as proposed by scales such as the CBCL (Bordin et al., 2013), even though there can sometimes be discrepancies in the perceptions of children/adolescents and guardians/parents on problems experienced by their children. However, the diversity of instruments to be used by different family members contributes to the design of more accurate clinical interventions and the planning of prevention programs in different contexts, especially with regard to meeting anxiety demands. In a meta-analysis study evaluating treatments for anxiety in childhood and adolescence, greater effects were observed for programs focusing on anxiety prevention (Teubert & Pinquart, 2011). In view of this, having screening instruments for internalizing symptoms, considering different perspectives, is also essential for designing preventive actions. In the case of reading anxiety, strategies to encourage and increase exposure to reading activities, especially in the family context would be useful.

This study provides a valid measure capable of differentiating the manifestation of reading anxiety from general anxiety in the Brazilian context, especially from parents' perspective. Evidence of convergent validity revealed satisfactory results, indicating that participants were able to differentiate between children's behaviors and thoughts. Using the scale, they were able to distinguish when their child's anxiety reaction was focused on reading activities. The version presented here contributes to alleviating the lack of instruments for assessing the phenomenon of reading anxiety in Brazil. There are limitations to this study that should be considered, such as the sample of mostly female participants, with high levels of education and socioeconomic status. In addition, at the time the survey was administered, health precautions imposed by the global COVID-19 pandemic were required and children could not be accessed. This made it difficult to conduct a comparative analysis between the results of the participants of the RAS - version for parents and guardians and their children in the RAS-20, in order to analyze equivalences in the assessment of reading-related behaviors.

Finally, it should be noted that the study had a community sample. Therefore, it is necessary to replicate and conduct further studies with a clinical sample of children with reading difficulties. There is also a need to invest in studies adapting the scale to the school context, aiming to enable teachers to understand the manifestation of reading anxiety in their students, to further qualify the processes of assessing the phenomenon through different informants.

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Melina Lima is a Professor of the Health School at the São Leopoldo of the Universidade do Vale do Rio dos Sinos, São Leopoldo-RS, Brazil.

Clarisse Pereira Mosmann is a Professor of the Health School at the São Leopoldo of the Universidade do Vale do Rio dos Sinos, São Leopoldo-RS, Brazil.

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