EVIDENCE OF VALIDITY OF THE CHILDREN'S VERSION OF THE GROWING DISCIPLES INVENTORY (GDI) FOR USE IN PORTUGUESE LANGUAGE BRAZIL

EVIDÊNCIAS DE VALIDADE DO GROWING DISCIPLES INVENTORY (GDI) VERSÃO INFANTIL PARA USO NA LÍNGUA PORTUGUESA DO BRASIL

EVIDENCIAS DE VALIDEZ DE LA VERSIÓN INFANTIL DEL GROWING DISCIPLES INVENTORY (GDI) PARA USO EN LENGUA PORTUGUESA DE BRASIL

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ABSTRACT: This research aimed to carry out the cultural adaptation of the Growing Disciples Inventory (GDI), an inventory of spirituality for the Portuguese language of Brazil. In the first stage, the following procedures were performed: two translations, translation synthesis; two back-translations; synthesis of back-translations; review of the expert committee; and the pre-test. The pre-test was attended by 88 respondents aged approximately 10 and 11 years who raised doubts and suggested changes. The final version was applied in 797 children and adolescents, and the results underwent a reliability analysis using McDonald's ω. The inclusion of experimental methods composed the factor analysis and the use of Exploratory Factorial Analysis (EFA) brought to the present study to identify the different factor loads and the reference value for including each question in one of the factors explained in the text. The chi-2 value (Q2) divided by the number of degrees of freedom was 2.37, and the significance value less than 0.001 indicated that the EFA was adequate.

KEYWORDS: Spirituality. Child. Inventory. Cultural adaptation. Exploratory factor analysis.

RESUMO: *Essa pesquisa objetivou realizar a adaptação cultural do Growing Disciples Inventory (GDI) para a Língua Portuguesa do Brasil. Na primeira etapa foram feitos os seguintes procedimentos: duas traduções; síntese da tradução; duas retro traduções; síntese das retro traduções; revisão do comitê de especialistas; e o pré-teste. O pré-teste teve a participação de 88 respondentes com idades de 10 e 11 anos que apontaram dúvidas e sugestões de modificação. A versão final foi aplicada em 797 crianças e adolescentes e os resultados sofreram uma análise de confiabilidade através do ω de McDonald. A utilização da Análise Fatorial Exploratória (AFE) trouxe ao presente estudo a identificação das diferentes cargas fatoriais, e o valor de referência para inclusão de cada questão nos fatores explicitados no texto. O valor do qui-2 (Q2) dividido pela quantidade dos graus de liberdade igual a 2.37, bem como o valor de significância menor que 0.001 indicaram que a AFE foi adequada.*

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PALAVRAS-CHAVE: *Espiritualidade. Criança. Inventário. Adaptação cultural. Análise fatorial exploratória.*

RESUMEN: *Esta investigación tuvo como objetivo realizar la adaptación cultural del Growing Disciples Inventory (GDI), para la lengua portuguesa de Brasil. En la primera etapa se realizaron los siguientes procedimientos: dos traducciones; síntesis de traducción; dos traducciones retro; síntesis de retro traducciones; revisión del comité de expertos; y la prueba previa. La prueba previa contó con la participación de 88 encuestados con aproximadamente 10 e 11 años que señalaron dudas y sugerencias de modificación. La versión final se aplicó a 797 niños y adolescentes y los resultados se sometieron a un análisis de confiabilidad utilizando McDonald's ω. El uso del Análisis Factorial Exploratorio (AFE) trajo al presente estudio la identificación de las diferentes cargas factoriales, y el valor de referencia para incluir cada pregunta en los factores explicados en el texto. El valor de chi-2 (Q2) dividido por el número de grados de libertad fue 2,37, y el valor de significancia menor a 0,001 indicó que el EFA era adecuado.*

PALABRAS CLAVE: *Espiritualidad. Niño. Inventario. Adaptación cultural. Análisis factorial exploratorio.*

Introduction

Spirituality is something, apparently, distant from the scientific environment. However, through some questioning and reading, one realizes that this premise is no longer so assertive. Some may consider that religion and spirituality are related terms, but this is not true. Religion and spirituality have different interpretations and, even in the scientific environment, there is still questioning about their representations (FISHER, 2010; ZINNBAUER et al., 1997).

There is currently no clear distinction in the literature in studies on spirituality and religiosity. Many researchers still treat both terms ambiguously, sometimes using one term in place of the other (ZINNBAUER et al., 2016). There are also differences among scholars in the field about the definition of these two terms.

The idea of this research was constructed through some inquietude about how children experience their relationship with spirituality. After some reflections, there was a search for validated instruments in Brazil that evaluated the spirituality of children and adolescents. However, national protocols found did not apply to the cohort that was sought to cover. (JORGE; ESGALHADO; PEREIRA, 2016; MARTINS et al., 2015; DUARTE; WANDERLEY, 2011).

When searching the international literature for instruments that were adequate to the theme of the research, we found The Growing Disciples Inventory (GDI) and, after contacting the author, she authorized us to carry out the process of cultural adaptation for the Brazilian

Portuguese language. The use of this instrument was considered because, once it was validated for the Brazilian culture and Portuguese language, it could be used as a relevant tool for national researchers, making it possible to carry out different reflections on the theme of spirituality.

Method

This paper proposes the process of cultural adaptation of the children's version of a scale called "The Growing Disciples Inventory (GDI)", which is a tool that was created so that the individual can self-assess spiritual growth and reflect on it. The research was approved by the ethics committee of UNASP, under CAAE number: 66631317.0.0000.5377, opinion number: 2.012.419, and the approval date April 11, 2017.

Methodological procedures

In this research, the instrument built and validated in English by a researcher at Andrews University in the United States, "The Growing Disciples Inventory (GDI)" (BRADFIELD, 2014), is being adapted. This instrument was chosen because the scope and relevance of the work of spiritual growth and development in the institutions where the data would be collected is large and necessary, and obtaining a formal protocol with national validation for data collection regarding the topic of interest will be very useful. The methodology used for the cultural adaptation was Cosmin's Taxonomy. This methodological structure followed the whole process of making the versions until the final version and has five stages.

Stage 1 - Translation of the inventory into Portuguese

The instrument was sent to two bilingual translators, native speakers of Portuguese, fluent in English, who worked to ensure that the intentions of the original instrument were respected. One of the translators had specific knowledge about spirituality and the other did not. Both were professors of English Language and Linguistics. Cosmin's Taxonomy, used as a guide for this research, states that this first stage is very important, since its objective is to bring the original idea of the instrument into the target language. The translations by the responsible professionals are referred to in the literature as T1 and T2 (translations 1 and 2).

Stage 2 - Synthesis of the two translations

After the process of translations, a synthesis was made by joining translation 1 and 2. The literature calls this moment T12. From this moment on, the objective was to observe and solve the differences between the documents that the translators produced. In this phase a version was created to be sent to the expert committee (synthesis). The versions were compared, and the relevant differences were resolved by talking to the translators themselves. Then, a report was written describing the disagreements and how the changes were made. This phase of the process was carried out by a bilingual university professor, who knows the subject and has extensive experience in the process of cultural adaptation of scales

Stage 3 - Retro translations

The retro translations were performed by professionals born in an English-speaking country who lived and studied in Brazil and were fluent in Portuguese. These two individuals did not know the proposed theme and worked individually from version T12, which is the synthesized version of T1 and T2, and made their translations into the original language of the instrument. An analysis of the back-translations, RT1 and RT2, was performed. In this phase, the changes in these versions in relation to the original were evaluated, and the back translation did not have to be identical to the original instrument, but it could not lose the meaning of the instrument, that is, the main ideas contained in each question.

Stage 4 - Judges Review

At this stage all the previous processes were reviewed. For this, a committee of experts was assembled, composed of the two translators, a specialist in spirituality, a methodologist, an educator, two professionals specialized in cultural adaptation, and a psychologist. Previously, each of the judges was sent a file containing the original instrument, the two translations (T1 and T2), the two retro-translations (RT1 and RT2), and also the version proposed for the pre-test (T12). In addition to the files, the judges were sent guidelines to observe the semantic, idiomatic, and cultural characteristics of each item of the instrument.

On the day of the meeting with the experts, all questions had been previously analyzed and studied by each of those involved, generating a pre-final version so that the next step could take place: the pre-test. There were two moments for this meeting with the judges, and both

meetings lasted approximately three hours. The proposed changes are presented in the 'Results' section of this paper.

Stage 5 - Pre-Test

According to the COSMIN guidelines used in this study, it is necessary that the pre-test be applied to a minimum of 30 individuals. In the present study, the pre-test was applied to 88 children in 6th grade. The corresponding ages were consistent with the proposal for the cultural adaptation process of this scale. The purpose of this phase was to evaluate the children's understanding of each item of the proposed scale.

Estágio 6 - Aplicação Final

According to Hair e*t al*. (2005), it is appropriate to have 10 respondents for each question in the instrument, which led to a minimum of 660 respondents, since the post-test instrument, with the subdivisions of questions 31 to 36, was left with 66 questions. The data collection ended with a number of 797 respondents.

Pre-test results

This item shows the results of the pre-test application. After the application, other analyses were performed due to the suggestion of the respondents. During the process, the inventory was presented to the children, and after each question they were asked if they had any doubts or suggestions to make in order to better understand the questionnaire.

Chart 1 shows the suggestions made, which were returned to the expert committee for a final decision on whether to accept them or not. In this phase of the research, 88 children aged 10 and 11, all in the 6th grade, from the same school, answered the inventory.

Chart 1 – Modification after pre-test

Respondents' sugestions:	Modified final version:
In question 2, the children said that the term "confess" was meaningless and that the best term would be "tell Him". According to the author of the instrument, the meaning of the verb "confess" should be kept.	The question was modified.
In some statements, option 2, "I'm not sure," was replaced by the expression "sometimes" in section 1 (questions 4 to 10). In sections 3 and 4b, all questions were replaced with the expression "sometimes".	It was accepted by the Committee and the change was applied to the final version.
For questions 21 through 28, it was suggested that instead of using the term "not sure", the term "sometimes" should be used.	It was accepted by the Committee and the change was applied to the final version. The alternatives became "yes", "sometimes" and "no".
In questions 29 and 30, the children said that the term "not sure" would be better than "sometimes."	It was accepted by the Committee and the change was applied to the final version.
From question 37 to 42 it was presented by them the absence of meaning in the terms: "no", "sometimes" and "yes". They suggested putting the terms "not at all", "sometimes" and "very".	It was accepted by the Committee and the change was applied to the final version.

Source: Research data

The data collected in Google Forms generated an Excel table that was exported to SPSS 21.0 for statistical analysis. The Cronbach's Alpha value for this first sample was verified and was 0.913, demonstrating the reliability of the inventory initially tested.

Analysis of the final inventory application

This item presents the results of the application of the Inventory in a sample of 797 individuals, because according to the literature, the final sample, according to Kerlinger (1986), should use the largest possible sample for the process of cultural adaptation of instruments, suggesting a number of ten subjects per item of the instrument.

Kermarrec et al. (2006) also mention that the literature recommends applying the scale to 10 subjects per scale item in the cultural adaptation process.

In this phase of the research, 797 responses to the inventory were obtained, and the characteristics of the participants regarding gender and age are presented in tables 1 and 2:

Table – Frequency per gender

Gender	Frequency	Percentage	Valid percentage	Cumulative Percentage
Female	387	48.557	49.237	49.237
Male	380	47.679	48.346	97.583
I'd rather not say	19	2.384	2.417	100.000
Not answered	11	1.380		
Total	797	100.000		

Source: Research data

Table 2 – Frequency by age

Age	Frequency	Percentage	Valid percentage	Cumulative percentage
11	41	6.288	6.288	6.288
12	124	19.018	19.018	25.307
13	172	26.380	26.380	51.687
14	152	23.313	23.313	75.000
15	107	16.411	16.411	91.411
16	48	7.362	7.362	98.773
17	6	0.920	0.920	99.693
18	2	0.307	0.307	100.000
Not answered	0	0.000		
Total	652	100.000		

Source: Research data

In this research, reliability was assessed by internal consistency analysis, using ω of MacDonald, as the mentioned literature suggests this test as more sensitive than Cronbach's α to assess the accuracy of the results across factors (ŞIMŞEK; NOYAN, 2013; ZINBARG *et al*., 2006).

McDonald's ω analysis was applied using the open-source software, JASP®, version 0.13.1, and the general result of the Inventory can be seen in Table 3. The values close to 1 indicated a very good internal consistency, as reported in the literature. (GADERMANN; et al.,. 2012). The values of this Inventory were therefore very satisfactory, presenting 0.9 of McDonald's ω, and 0.89 of Cronbach's α.

Table 3 – GDI-Kids Reliability Scale

Estimate	McDonald's ω	Cronbach's α
Point estimate	0.900	0.899
95% CI lower bound	0.886	0.889
95% CI upper bound	0.910	0.909

Source: Research data

Exploratory Factor Analysis (EFA)

The EFA was used to identify the different factor loadings of each question, and the reference value for inclusion of the question in one of the factors should be greater than ≥ 0.30, and for the Kaiser-Meyer-Olkin (KMO) test ≥ 0.50. KMO index values that indicate that Factor Analysis is appropriate should be ≥ 0.80. (HONGYU, 2018).

The KMO test values of the GDI-KIDS are presented in Table 4, showing that the EFA was appropriate.

Table 4 – KMO Values

Kaiser-Meyer-Olkin test									
Question	MSA	Question	MSA	Question	MSA	Question	MAS	Question	MSA
1	0.926	14	0.830	27	0.766	40	0.885	53	0.840
2	0.905	15	0.844	28	0.835	41	0.882	54	0.864
3	0.831	16	0.907	29	0.913	42	0.862	55	0.907
4	0.858	17	0.887	30	0.893	43	0.900	56	0.909
5	0.811	18	0.897	31	0.870	44	0.885	57	0.881
6	0.791	19	0.901	32	0.841	45	0.864	58	0.898
7	0.920	20	0.849	33	0.855	46	0.914	59	0.877
8	0.878	21	0.906	34	0.882	47	0.899	60	0.880
9	0.897	22	0.923	35	0.895	48	0.902	61	0.901
10	0.850	23	0.833	36	0.923	49	0.915	62	0.829
11	0.872	24	0.860	37	0.854	50	0.864	63	0.841
12	0.917	25	0.868	38	0.879	51	0.875	64	0.918
13	0.890	26	0.887	39	0.891	52	0.881	65	0.922
								66	0.902

Source: Research data

Another indicator that shows that the EFA was adequate is the test (Q2), which should have a significance value less than 0.005, and the test value, divided by the degrees of freedom (df), should be less than 3.0. The values of the test (Q2) can be seen in table 5.

Table 5 – Test values (Q^2)

	Value	df	p
Model	4486.136	1887	< .001

Source: Research data

Thus, in this test, besides the significance value being less than 0.001, the value of the division of (Q2), divided by the number of degrees of freedom (df), is equal to 2.377, therefore, less than 3, indicating that the EFA was adequate. (DOU *et al*., 2018; MARTINEZ; CAMACHO, 2020; TOGNETTA et al., 2021)

The EFA was performed in the open-source software, JASP®, version 0.13.1, and it was decided to delimit four factors instead of leaving the number of factors free. The program itself indicated that the best rotation would be Orthogonal Promax.

After the first rotation, we removed from the statistical model the 24 questions that did not cluster in any of the four factors. Therefore, the GDI-KIDS inventory, which initially had 66 questions, now has 42 questions in its final version.

The factors were named, as shown in Chart 2:

Chart 2 – Questions present in the composition of each factor

Factor	Num.	Question	Construct
F1	32	31.B. How much do your friends encourage you to spend time with God every day?	**Spiritual connection with the community**
F1	35	31. E. How much do other people encourage you to spend time with God every day?	
F1	37	32.B. How much do your friends talk to you about how to have friendship with Jesus?	
F1	40	32.E. How much do other people talk with you about how to have friendship with Jesus?	
F1	42	33.B. How much do your friends teach you about Bible study and prayer?	
F1	45	33.E. How much do other people teach you how to study the Bible and pray?	
F1	47	34.B. How much do your friends help you learn how to forgive others?	
F1	50	34. E. How much do other people help you learn how to forgive others?	
F1	52	35.B. How much do your friends notice when you speak or act like Jesus?	
F1	55	35. E. How much do other people notice when you speak or act like Jesus?	
F1	57	36. B. How much do your friends help you discover the abilities that God gives you?	
F1	60	36. E. How much do other people help you discover the abilities that God gives you?	
F2	33	31.C. How much does your pastor encourage you to spend time with God every day?	**Connection with spiritual leaders**
F2	34	31.D. How much do your teachers encourage you to spend time with God every day?	

F2	38	32.C. How much does your pastor talk to you about how to have friendship with Jesus?	
F2	39	32.D. How much do your teachers talk with you about how to have friendship with Jesus?	
F2	43	33.C. How much does your pastor teach you about Bible study and prayer?	
F2	44	33.D. How much do your teachers teach you to study the Bible and pray?	
F2	48	34.C. How much does your pastor help you learn how to forgive others?	
F2	49	34.D. How much do your teachers help you learn how to forgive others?	
F2	58	36. C. How much does your pastor help you to discover the abilities that God gives you?	

Source: Research data

Chart 2 – Questions present in the composition of each factor (cont.)

F3		1	1. I like stories that teach me more about God.	**Understanding God and His Teachings**
F3		3	3. God will never stop loving me.	
F3		11	11. I believe God gave the Bible for me to learn about Him.	
F3		13	13. I believe that God created all things and cares about them.	
F3		14	14. I believe in God the Father, His Son Jesus Christ, and the Holy Spirit.	
F3		15	15. I believe that after the war in Heaven and the first sin of Adam and Eve, we all sinned.	
F3		16	16. I believe that the Ten Commandments help us understand what God is like and how to live joyfully.	
F3		17	17. I thank Jesus who died to pay for my sins, because He loves me so much.	
F3		18	18. I understand that baptism shows that I accept Jesus as my Savior and choose to follow Him.	
F3		19	19. I understand that Jesus is now in Heaven and will soon come for all who love God.	
F3		20	20. I believe that God will create a new earth at the end of the war between good and evil, and then there will be no more sin or sorrow.	
F4		4	4. Every day I ask God to help me discover what I can do for Him.	**Involvement in the divine mission of restoration**
F4		5	5. I show love for my family by helping at home without being asked.	
F4		7	7. I like to worship God in my church with other people.	
F4		12	12. I ask God to help me obey what the Bible teaches, even when it is difficult.	
F4		21	21. I pray that the Holy Spirit will help me understand what God wants me to do.	
F4		22	22. I choose to obey Jesus and His teachings even if my friends don't make that choice.	
F4		29	29. I want to help as many people as possible to be ready for Jesus' return.	
F4		36	32.A. How much does your family talk with you about how to have friendship with Jesus?	
F4		41	33.A. How much does your family teach you to study the Bible and pray?	
F4		66	42. I encourage my friends to use their talents to serve God.	

Source: Research data

After analyzing the questions that remained in each factor, it can be seen that there was a balanced distribution of the number of questions for each construct, with 12 questions in factor 1, nine questions in factor 2, 11 in factor 3, and 10 in factor 4.

Discussion

According to the recommendations of the COSMIN Taxonomy, the translation, synthesis, retro-translation of the GDI-KIDS Inventory, the analysis by the expert committee, and the pre-test of the pre-final version were performed. The expert committee meeting was attended by a methodologist, two linguists, one of the translators, a spirituality specialist, an educator, and the researcher. After the first meeting, some doubts were brought to the author of the scale and to the translators in order to reach a consensus. The evaluation of the semantic, idiomatic, cultural, and conceptual equivalence performed by the committee was satisfactory, and all members thoroughly analyzed and discussed each item of the Inventory.

After the pre-test, some modifications suggested by the children were discussed with the committee and the author of the instrument to decide which ones should be accepted. After this phase, the Inventory was applied to a larger sample.

According to the statistical values presented, the EFA proved to be satisfactory. The reliability index, obtained by MacDonald's ω (0.90), pointed to the internal consistency of the scale. (DOU *et al*., 2018; HONGYU, 2018). The chi-square value, as well as its ratio by the degrees of freedom, pointed to the appropriateness of the EFA.

In this cultural adaptation work, we chose to use the value of MacDonald's ω to obtain the reliability of the scale, because several recent studies show that this index is superior to Cronbach's Alpha, until then widely used in Cultural Adaptation research. (VIANA *et al*., 2012; HAYES; COUTTS, 2020; WECHSLER e*t al*., 2019).

The EFA, therefore, with four factors or constructs, which was the author's conception of the original version, was appropriate, as indicated by the statistical values presented in the results chapter. The author of the original instrument had predicted four constructs, as follows: 1. connecting with God, self, and others, 2. understanding Jesus and His teachings, 3. getting involved in the divine mission of restoration, and 4. living in community, helping each other to know, love, and serve. However, the Brazilian version adapted the constructs, keeping the issue of connection, understanding God and His teachings, and involvement in the divine mission, as shown in Table 2.

In all phases of the work, when contacting the literature, it was possible to visualize the importance of producing knowledge in the area of children's spirituality in Brazil, since research in this theme is still scarce in the national literature (BECKER; SILVA, 2018; MOTA, 2005; VALDIVIA, 2017).

In the international literature, one can find more studies on this theme, but still few are linked to the educational area. According to some authors, early childhood education services should promote and nurture growth and development in all aspects, including the spiritual side of the child. (BROOJENI; BROOJENI, 2015; NORTJÉ; VAN DER MERWE, 2016; OKUMOTO, 2019).

In a research conducted with Islamic children, a culture that has a model of programs to improve children's mental health, the authors reported that parents are the most important actors in implementing educational programs, and that obeying these programs protects children's health, and plays an important role in promoting their spiritual advancement (BROOJENI; BROOJENI, 2015).

A child's spirituality is strengthened by family members and community, especially if these gatherings are regular. A child's community can be defined in many ways, such as a classroom setting, recreational activity, spiritual activity, or sports team. Family members who enrich children's outdoor spiritual experiences provide them with new opportunities to express themselves creatively, expand their imagination, and be continually challenged (HARRIS, 2016).

Although there are several studies on family influence on children's spirituality (CROSBY; SMITH, 2015; HARRIS, 2016; YUST, 2017), the GDI-KIDS had several family-related questions that did not adhere to any factors. However, questions that addressed relationship with the community had good adherence on two factors. Studies emphasizing the important role of communities and spiritual leadership in children's spiritual development were also found in the international literature (CROSBY; SMITH, 2015; FERRARI; GUERRERO, 2017; FISHER, 2010; HOLDER; COLEMAN; WALLACE, 2010).

Final considerations

To be able to bring scientific reflection on spirituality at various levels that make up a school brought greater awareness of the relevance of having an instrument that could support this process. The search for a specific instrument related to the spirituality of the child, available in the Brazilian Portuguese language, revealed the absence of an adequate protocol for this. The

systematic review confirmed the scarcity of scientific methods that systematize concrete ways to measure spirituality in children's experiences. It is important that schools understand that the use of this instrument will raise the level of inter-relations between teachers and students, and will make the institution understand what is the best path to be followed as far as spirituality is concerned. The possibilities of reflection that this tool brings to the scientific environment regarding spirituality in children are undeniable.

Obtaining the results of the EFA in the process of cultural adaptation and showing the evidence of validity of the instrument was of great scientific relevance, since the search for other spirituality scales used in Brazil showed that more than 80% of these had not undergone an adequate process of cultural adaptation and evaluation of psychometric properties

The next step in this research will be to perform a Confirmatory Factor Analysis to evaluate the validity evidence of the Brazilian version, so that the GDI Kids can be widely used by researchers interested in this topic..

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