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# Translation and cultural adaptation of the Reading Processes Assessment Battery – PROLEC-SE-R

## *Tradução e adaptação cultural da Bateria de Avaliação dos Processos de Leitura – PROLEC -SE-R*

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### Descritores

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### ABSTRACT

**Purpose:** to translate and culturally adapt, for Brazil, the battery of tests “*Evaluación de los procesos lectores - PROLEC-SE-R*”, for students of Elementary School cycle II, and Senior High School. **Methods:** The following stages of translation and cultural adaptation were followed: (1) Translation; (2) Synthesis of translations; (3) Back-translation; (4) Evaluation by specialist committee; (5) Pilot study: Undertaken in a sample of 70 students, 10 from each school year, in two sessions; and (6) Evaluation and appreciation of all the reports written by the researcher and specialist committee. **Results:** modifications to the tests of PROLEC-SE-R are not necessary as indicated in the pilot study, both in the collective and individual version. The procedure received good acceptance by the evaluated students and there were no complaints or reports of difficulty in understanding the tests and instructions. **Conclusion:** the procedure is appropriate for the Brazilian reality and can be used to evaluate Elementary School II and Senior High School students. A standardization study is necessary in a representative sample of the population.

### RESUMO

**Objetivo:** traduzir e adaptar culturalmente, para o Brasil, a bateria “*Evaluación de los procesos lectores - PROLEC-SE-R*”, destinada aos escolares do Ensino Fundamental II e do Médio. **Método:** foram seguidos os seguintes estágios da Tradução e adaptação cultural: (1) Tradução; (2) Síntese das traduções; (3) Retrotradução; (4) Revisão por comitê de especialistas; (5) Estudo-Piloto, em que foram avaliados 70 escolares, sendo 10 para cada ano escolar, em duas sessões; e (6) Avaliação e apreciação de todos os relatórios escritos pelo pesquisador e comitê de especialistas. **Resultados:** o estudo-piloto não indicou necessidade de modificação nas provas do PROLEC-SE-R, tanto na versão coletiva quanto na versão individual. Os escolares apresentaram boa aceitação ao procedimento e não houve queixas ou relatos de dificuldade quanto à compreensão das provas e instruções. **Conclusão:** o procedimento está adaptado para a realidade brasileira, no entanto, ainda é necessário estudo de validação da população.

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## INTRODUCTION

According to the report by the International Student Assessment Program (PISA)<sup>(1-3)</sup>, coordinated by the OECD, in 2015, Brazil ranked 63rd in the overall ranking and 50th in reading. Approximately half (50.9%) of the students are below level 2, considered the minimum necessary for the exercise of citizenship. This means that out of ten students, five have not attained the skills necessary for reading and comprehension.

The picture portrayed by PISA<sup>(1-3)</sup> reflects the reality of speech therapy, in which there is a growing number of students over 11 years of age referred for speech evaluation with complaints of learning difficulties in reading and writing. This highlights not only the fragility of Brazilian educational speech therapy, but also of other professions that work with learning, combined with a lack of procedures to evaluate the reading and writing performance of elementary and high school students.

In order to fill this gap, the present study aims to translate and culturally adapt for use in Brazil the “*Evaluación de los procesos lectores*” [Evaluation of the Reading Processes] - PROLEC-SE-R” test<sup>(4)</sup>, aimed at students from 6th to 9th grade of elementary school II and the 1st to 3rd grades of High School, with tests that evaluate the lexical process (word recognition) through to the semantic process (reading comprehension).

## METHODS

Translation and cultural adaptation study approved by the Research Ethics Committee, under Resolution No. 1.125.746. This study is part of the doctoral dissertation “Translation and Cultural Adaptation of Reading Process Assessment (PROLEC-SE-R) for Elementary and Secondary School Students” of the Graduate Program in Education at the Faculty of Philosophy and Sciences of the Paulista State University “Júlio de Mesquita Filho” - FFC / Unesp / Marília – SP, Brazil.

The parents and/or guardians signed the free and informed consent form and their children signed a form agreeing to participate in the research.

Likewise, the participation by specialists (judges) in the research also required agreement with and signing of the Informed Consent Form.

Formal permission for cultural adaptation of PROLEC-SE-R was granted by *Tea Ediciones*. The PROLEC-SE-R<sup>(4)</sup> aims to evaluate the various processes involved in the reading of 12 to 18-year old students, seeking to identify difficulties preventing them from becoming proficient readers.

The complete battery has two versions: 1) individual application; and 2) collective application. Both aim to evaluate the general reading ability and cognitive processes involved in the lexical, syntactic and semantic processes, in order to diagnose any difficulties presented in reading and the skill level in this process (low, medium or high) compared to their peers in the same school year.

The collective version makes a quick evaluation, aiming to be used in educational centers, as it offers obtaining information about the possible presence of difficulties in the reading

processes among a large number of students (in the classroom) and within less than an hour of class. It is underscored that only the application is performed collectively, in that the students’ complete their respective answer sheet on an individual basis.

The complete battery provides detailed information on each of the processes evaluated. In this way, a broader set of data and information is obtained to characterize difficulties, refine the diagnosis, and establish a more detailed vision for the objectives of the intervention. This requires the application of all the tests of both versions. It should be clarified that the collective version can be applied either collectively or individually (according to the convenience of the person responsible for the evaluation), while the individual version can only be applied with one student at a time.

## Translation and cultural adaptation

To perform the cultural adaptation of the procedure, the following stages were followed as proposed by Beaton and Guillemin<sup>(5)</sup>: Stage 1 – Translation; Stage 2 - Synthesis of translations; Stage 3 – Back-translation; Stage 4 – Evaluation by specialist committee; Stage 5 – Pilot study and Stage 6 – Evaluation and appreciation of the written reports. The description of each stage was based on the work of Beaton and Guillemin<sup>(5)</sup>, Guillemin et al.<sup>(6)</sup>, Keller et al.<sup>(7)</sup>.

## Cultural adaptation process

To facilitate an understanding of the adaptation process, it was decided to describe each of its stages individually, test by test, for the collective and individual versions. Initially, we present the criteria adopted for the selection of words, elaboration of sentences and texts to be used in the version adapted to the Brazilian reality.

## Criteria for selecting the words

For the selection of high and low frequency words, the following criteria were met, as described in the original procedure: 1) syllable length (monosyllabic, disyllabic, trisyllabic and polysyllabic); and 2) word complexity according to the structure of the initial syllable.

The above criteria ensure that the selected words vary in regularity, length and syllabic complexity.

For the Brazilian adaptation of the words used in the PROLEC-SE-R, a word bank was elaborated, based on texts in the didactic material used by the state school system of Marília (São Paulo state), from the 6th grade of elementary school II to the 3rd grade of High School<sup>(8-10)</sup>.

Note that each test has its particular criteria for word selection, as presented in the description of each word.

## Criteria for elaboration of the phrases

The criteria presented by the author of the Spanish PROLEC-SE-R<sup>(4)</sup> for sentence formation are as follows: 1) alteration in the canonical placement of the syntagmas; 2) presence of two verbs in the sentence; 3) the need to maintain the first phrase

available, while analyzing the others; and 4) existence of a name that plays two different thematic roles in the sentence.

Therefore, the selected structures are: 1. Simple sentence: a) active voice with direct object in a prepositional phrase; b) passive voice; c) active voice with expression of highlight; and d) passive voice with expression of highlight; and 2. Compound sentence: a) Restrictive adjective subordinate clause, with relative pronoun exercising the function of the subject and b) Restrictive adjective subordinate clause, with relative pronoun exercising the function of the object.

### Criteria for elaborating the texts

The texts were translated from Spanish to Portuguese and, after defining the consensus version among the translators, they were revised to conform with the Brazilian reality regarding the use of expressions and words, but without changing the meaning of the original Spanish text.

### Collective tests version

*Test 1: Lexical Selection.* For the selection of words, the criterion adopted was the choice of those that started with the same syllabic and graphic structure as the Spanish word. For example, for the word “*sylvestre*” [sylvan] in Spanish (structure of the initial syllable CVC) the word “*salsicha*” [sausage] in Portuguese was selected (structure of the initial syllable CVC).

The pseudowords were derived from low frequency real words, contained in the word bank of the Elementary School II: E-READING II<sup>(8-9)</sup> and High School: E-READING III<sup>(8,10)</sup>. The real words were chosen according to the structure of the initial syllable of the pseudowords in Spanish. Therefore, if the Spanish pseudoword began with the syllable CV, the real word selected in Portuguese and the pseudoword also began with CV.

For derivation of the low frequency real word into a pseudoword, the criterion of maintaining the radical of the real word and modifying the suffix was adopted, or that is, derivation by suffixation.

In the lexical selection (LS), proof of recognition between real and invented words, a list of 50 words (25 real and 25 invented) is presented. The students’ task is to indicate the nature of each word. The students themselves should mark the alternative that they consider correct on the answer sheet. The time to perform the test is four minutes.

*Test 2: Semantic Categorization.* In the semantic categorization test “Animal (A) or not (N)?”, the words corresponding to beings from the animal kingdom were taken from the high, medium and low frequency word bank of E-READING II<sup>(8-9)</sup> and III<sup>(8-10)</sup>. As there were only three nouns that corresponded to animal names, we used the words “*orca*”, “*girafa*” and “*hiena*” [killer whale, giraffe and hyena], which are found in the original Spanish procedure.

Words that do not correspond to living beings from the animal kingdom originate from the low frequency word bank of E-READING II and III, respecting the structure of the initial syllable of the Spanish word. For example, for the Spanish

word “*catamarán*” (structure of the initial syllable: CV), in Portuguese the word “*catarata*” was chosen.

In this test, the student is presented with a list of 90 words, including animal names. The task is to indicate whether or not each word corresponds to the name of an animal. To do so, the student should write down his or her answers on the answer sheet: option A if he/she considers it to be an animal name, or option N if it is another type of word. In this test, it is important to draw attention of the examiner to the two-minute time limit.

*Test 3: Grammatical Structures I (GSI).* The same drawings as the original procedure were used. To elaborate the sentences, the criteria mentioned above were adopted and the sentences were adapted to the respective drawing.

In this test, 24 drawings are presented, each with three sentences (A, B and C), plus an example. The task of the subject is to verify which sentences correctly describe what the drawing represents. For this, the student should mark option (A, B or C) on the answer sheet, according to which they consider is correct. The duration of the test is five minutes.

*Test 4: Grammatical Judgment.* In this test, 35 sentences are presented, 18 of which are grammatically correct and 17 incorrect. The student’s task is to quickly check whether or not each sentence is grammatically correct by marking their answers on the answer sheet as follows: option C if the sentence is correct or option I if incorrect. In this test, it is important to draw the examiner’s attention to the two-minute time limit and to calm the student down if necessary, by clarifying that it is not necessary to answer all the items, only as many as they can do correctly.

*Test 5: Expository Comprehension (EC).* The text is expository and has ten multiple choice questions with four answer options (A, B, C or D). Only one of the alternatives is correct and this should be explained on the answer sheet. In this test, the student has to read the text “*O Ornitorrinco*” [The Platypus] and, after reading, answer the questions without further consultation of the text.

Thus the examiner should allow five minutes to read the text and then approximately five minutes to answer the questions; it is important that the student does not refer to the text at this time.

*Test 6: Narrative Comprehension (NC).* The text presents ten multiple choice questions with four answer options (A, B, C or D). The student should only mark the correct alternative on the answer sheet. It is an expository text, with literal and inferential questions. Answers can be found by consulting the text. There is no set time for reading the text and answering the questions.

### Individual version tests

*Test 7: Word Reading (WR).* The words were divided according to frequency and extension, i.e. high and low frequency, short and long. The short words are disyllabic and the long words are trisyllabic and polysyllabic.

For the choice of words, the criteria and characteristics of the original version of PROLEC-SE-R<sup>(4)</sup> were followed, and the frequency of the words and their length were respected. In the elaboration of the word list for the procedure adapted to the Brazilian reality, if the Spanish word, such as “*carta*”

[letter], coincided with the Portuguese word and that word was included in the word bank and also coincided with the frequency of occurrence, the word was inserted in the list.

It was also sought to ensure that the initial syllable structure of the Spanish word coincided with the initial syllable structure in Portuguese. For example, for the word “*carta*” in Spanish, the Portuguese word “*carta*” was used; For the word “*fama*” [hunger] in Spanish, the word “*fome*” was used in Portuguese. This, however, was not possible with all words, since the selected words must be part of the E-READING II and III word bank. This fact, however, is not a source of preoccupation because, in the original procedure, the authors focused more on the extension of the word and its length in number of letters rather than on the structure of the initial syllable.

Despite the above, a balance was sought between the words, not only in terms of extension but also in the structure of the initial syllable. High frequency words, due to the small number of words available for selection, were the most distant in terms of presenting the same structures of the initial syllable and number of letters in each structure. While, with the list of low frequency words, it was possible to guarantee the initial syllable structures and the number of letters for proximal structures.

The word lists were divided as follows:

- ❖ **List 1 (WL1):** 24 high frequency short words with the following syllabic structures (initial syllable): V (1), VV (1), VC (4), CV (8), CCV (1), CVC (8) and CVVC (1). The words are disyllabic comprised by three to seven letters.
- ❖ **List 2 (WL2):** 24 high frequency long words with the following syllabic structures (initial syllable): V (3), VC (2), CV (11), CVC (3), CCV (4) and CVV (1). The words are trisyllabic (13) and polysyllabic (11) and their length varies from six to 14 letters.
- ❖ **List 3 (WL3):** 24 low frequency short words with the following syllabic structures (initial syllable): V (1), VC (3), CV (5), CCV (5), CVC (6), CVV (1), CCVC (2) and CVVC (1). The words are disyllabic comprising three to six letters.
- ❖ **List 4 (WL4):** 24 low frequency long words with the following syllabic structures (initial syllable): V (2), VC (2), CV (5), CVV (2), CVC (7), CCV (4), CCVC (1) and CVVC (1). The words are trisyllabic (8) and polysyllabic (16) with six to 14 letters.

The student’s task is to read aloud four lists of words (LW1 to LW4). In this test, the examiner must register the time in seconds that the student takes to read each list.

*Test 8: Pseudoword Reading (PWR).* The pseudowords were derived from real high and low frequency words from Test 1 Word Reading, as performed in the original procedure in Spanish.<sup>(4)</sup> For the derivation of real words into pseudowords, the following criteria were adopted: (1) maintenance of the real word radical and modification of the suffix; (2) syllable inversion; (3) letter insertion; and (4) alteration of one or more letters.

The pseudowords were divided into short (disyllabic) and long (trisyllabic and polysyllabic), as follows:

- ❖ **List 1 (LPS1):** 24 short pseudowords (monosyllabic and disyllabic), derived from the list of high frequency words, and 12 derived from the list of low frequency words, with the following syllabic structures (initial syllable): V (1), VC (2), CV (6), CVC (8), CCV (3), CVV (1), CVVC (1) and CCVC (2).

- ❖ **List 2 (LPS2):** 24 long pseudowords derived from the list of high frequency words, and 12 long pseudowords derived from the list of low frequency words, with the following syllabic structures (initial syllable): V (1), VC (2), CV (7), CVC (7), CVV (1), CCV (5) and CCVC (1). The pseudowords were trisyllabic (13) and polysyllabic (11).

Similarly to Reading Words, the student’s task is to read aloud the two lists (LPS1 and LPS2). In this test, the examiner must record the time (in seconds) it takes the student to read each list.

*Test 9: Grammatical Structures II (GS II).* This test aims to evaluate the ability to process different types of grammatical structures and to verify the difficulty that can be produced when using different syntactic structures. For each elected grammatical structure, four sentences were adapted (according to the sentence elaboration criteria, presented above), totaling 24 sentences.

In this test, the student’s task is to identify the drawing that corresponds to the one indicated by the sentence. This test contains 24 stimuli and an example. To indicate the response of each stimulus, the student should point to the drawing or verbalize the number that corresponds to their answer.

In the answer sheet, the examiner should note the option chosen by the student, regardless of whether it is correct or not.

*Test 10: Punctuation Marks (PM): Text “Maldito Apêndice” [Cursed Appendix].* This test aims to evaluate the reading accuracy and whether the student is able to perform pauses and intonations in accordance with the punctuation marks.

The text is narrative and offers various punctuation marks. The student’s task is to read aloud the text entitled “*Maldito Apêndice*” In the meantime, the examiner should pay attention to the correct intonation of the designated punctuation marks by noting, in the spaces enclosed next to each mark, an ‘x’ only in case of an intonation error.

In this test, the examiner must record the time in seconds that the student takes to read the text.

*Test 11: Reading comprehension I: “Annapurna”.* The student’s task is to read the text aloud until the end, while the examiner records the time it takes to read and notes this on the answer sheet. Then the examiner asks the ten questions one by one and evaluates the answers as correct (C) or incorrect (I). Some important features of this test are:

- A) The examiner asks the student one by one and can repeat them as many times as he or she considers necessary.
- B) The student can consult the text to answer the questions.

The text is expository type with literal and inferential questions. It aims to evaluate the ability of the student to answer inferential questions, which can only be answered by a full understanding of the text, integrating the information in their memory and making the corresponding inferences.

*Test 12: Reading Comprehension II: "Os Papuas Australianos"* [The Australian Papua]. The student's task is to read the text slowly, silently and comprehensively for five minutes. The examiner then asks the 10 questions one by one, referring to the stimuli notebook, and evaluates the answers as correct (C) or incorrect (I). The important characteristics of this test are:

- A) The examiner does not record the reading time, but ensures that the silent reading does not exceed five minutes.
- B) The examiner asks the questions one by one to the student while the student silently reads them in his/her section of the stimuli notebook. In this case, the reading of the questions should not be repeated.
- C) The student cannot consult the text to answer the questions.

The text is expository and the questions of the literal type, in order to evaluate the ability of the student to extract and remember information from the text.

*Test 13: Oral comprehension: Text "Os Esquimós"* [The Eskimos]. In this test, the examiner reads a text to the student twice, aloud and slowly, with clear pronunciation. Then, one by one, performs the 10 questions, based on the stimuli notebook, and analyzes the answers as correct (C) or incorrect (I), in order to evaluate the student's oral comprehension of the text. The important features of this test are: (1) the examiner should read the text aloud twice; (2) the student cannot consult the text while the examiner reads it; (3) the examiner asks the questions one by one while the student mentally follows the statement in his/her part of the stimuli notebook. The reading of the questions should not be repeated and (4) the student cannot consult the text to answer the questions.

### **Translation of the procedure into portuguese**

As already mentioned, the translation and cultural adaptation took place simultaneously and interdependently. It is underscored therefore, that the presentation according to distinct topics is only for didactic purposes. The following paragraphs describe how the translation was conducted.

#### *1 Translation (stage 1)*

The original instrument was translated into the target language of Brazilian Portuguese. Beaton and Guillemin<sup>(5)</sup> recommend that two translations are done (T1 and T2) and that each translator provides written details for the various stages of the translation that cover any questions and difficulties. One translator should be informed regarding the objectives of the procedure and be familiar with the academic language, while the second should not be aware of the purpose of the procedure nor be familiar the subject. Beaton and Guillemin<sup>(5)</sup>, refer to this second professional as the "naive translator", in that he or she is not influenced by the academic environment, and as such will offer a translation that reflects the language used by the target population; often highlighting ambiguous meanings of the language used In the original procedure.

Consequently, this stage, was performed by two native Brazilian translators, with fluency in both Spanish and Portuguese. One is qualified in Languages with specialization in Spanish and the other in Speech Therapy, working in the area of reading and writing, with a DELE B2 certificate, granted by *Instituto Cervantes*. The objective of the procedure was only explained to the latter translator.

Translators were asked to perform the Portuguese language version of the instrument independently and preserving the semantic equivalence of all items in the original procedure.

#### *2 Synthesis of the translations (stage 2)*

This stage refers to the synthesis of translations into a single version. To obtain the consensus version, the two translators met with the researchers who explained the purpose of this stage.

The translators were told to reach an agreement regarding any differences between their translations, thus creating a single version. The meeting was held at the Faculty of Philosophy and Sciences - FFC / UNESP - Marília (SP), Brazil.

The researchers participated in the meeting and followed the process for the elaboration of this version, assisting the translators whenever there were any questions. At the end of this meeting, the first version for the translation of the procedure was obtained.

#### *3 Back-translation (stage 3)*

After the necessary cultural adaptations were completed, two translators performed the back-translation (Portuguese - Spanish). The translators were not the same as the first stage. One translator spoke Spanish as his mother tongue and taught that language in a language school in the interior of São Paulo. The second was a teacher of Spanish, but from another language school in the same city. Both translators were unaware of the purpose of the procedure and worked on translating the single version into Spanish without having access to the original. Thus, two back-translations were created (BT1 and BT2).

The purpose of this step was to verify that the version reflected the contents of the original version. Then the original version and the two back-translations were compared and corrected so that errors in translation or interpretation were excluded. In this study, as it was necessary to adapt all the stimuli to the Brazilian reality, we chose to focus on the descriptions and instructions of the procedure.

#### *4 Revision by specialist committee (stage 4)*

In this stage, a consensus should be reached from all versions of the translations produced so that a pre-final version is prepared.

The materials made available to the committee were the original procedure and all the translations along with the corresponding reports to clarify the decisions taken in the previous stages.

This stage aims to make any changes necessary to the instrument to ensure both cultural equivalence and semantic, idiomatic, and conceptual equivalence.

The work of semantic, cultural, idiomatic and conceptual equivalence was performed with the assistance of an experienced

professional, trained in Languages, to ensure it is adapted to the Brazilian reality regarding the use of expressions and words, while verifying the spelling and grammar correction. When necessary, the sentences were restructured to respect Portuguese grammar, but without changing the meaning of the original Spanish text.

In this stage, the researcher and study advisor met with the specialist committee to review the original procedure and all versions produced to prepare a Pre-Final Version. It was clarified that the researcher, before delivering the single version to the committee, made modifications with the Languages professional to adapt the sentences and texts, as well as grammar and spelling correction.

The specialist committee was formed by researchers from the Learning Deviation Research Laboratory, comprising three PhDs in education and four doctoral students, as well as two professors from the Faculty of Philosophy and Sciences - FFC / UNESP / Marília (SP), Brazil.

### 5 Application of the pre-final version of the instrument – pilot study (stage 5)

The objective of the Pilot study is to detect possible errors, assess the quality of adaptation and the practical aspects of its application. This stage allows researchers to refine the wording in the instructions and tests, as well as to verify the application time of the instrument.

#### Participants

The students participating in the pilot study were selected at random. Seventy students from the 6th grade of elementary school to the 3rd year of high school, from state public schools, were evaluated individually, with 10 representatives for each school year.

The following inclusion criteria were adopted: 1) be regularly enrolled in elementary school cycle II or high school; 2) signing the Informed Consent Form by parents or guardians; and 3) the student signing the Consent Form. The following were excluded: 1) students who refused to participate, although their parents or guardians signed the consent form; 2) students with an interdisciplinary diagnosis of learning disorder, dyslexia and attention-deficit/hyperactivity disorder; 3) learning complaint; 4) language or speech alteration; 5) impairment in visual and auditory acuity; 6) diagnosis of genetic or neurological syndromes; 7) history of repetition; and 8) intellectual demotion.

This information was observed in the school records or obtained from the teachers.

Of the 70 students who participated in the pilot study, 40 (57.1%) are from Elementary School II (mean age 12.4 years, SD = 1.19) and 30 (42.9%) from High School mean age 15.8 years, SD = 1.1).

#### Procedures:

- Reading Process Evaluation Tests – collective version, applied at the first meeting.
- Reading Process Evaluation Tests - individual version, applied at the second meeting.

The collective version was applied in a classroom provided by the school, with a maximum of ten students and a minimum of five. The students were not necessarily in the same class.

The individual version was applied in a classroom made available by the school or in the reading room, during school time. For withdrawal of the student from their class, prior authorization was requested from the teacher. Thus the student leaving their class was subject to authorization of the teacher in charge and the subject being taught at the time.

### 6 Evaluation and appreciation of all reports provided by researcher and specialist committee (stage 6)

All translations and back-translations as well as the material used for the pilot study and the material with corrections made after this stage were forwarded to the audit process to verify that all steps of the translation and cultural adaptation process had been followed. After this stage, any changes to the contents of the procedure were not permitted.

Two researchers of Educational Speech Therapy were invited to participate in the audit process, together with the speech therapists from the Learning Disorders Research Laboratory - LIDA. They had access to the research project approved by the Research Ethics Committee and were informed about the purpose of the research. They were asked to indicate whether each stage of the translation and cultural adaptation process had been followed and whether the procedure, by means of the information provided and pilot study, was appropriate for the evaluation of reading processes in elementary and high school students.

## RESULTS

The results are presented according to the stages of translation. It is clarified that the adaptation process for the procedure, as well as word selection, sentence and text appropriateness were described above in the topic related to the adaptation process.

### Stage 1 (translation) and stage 2 (synthesis of the translations)

Two translators performed the translations separately, without communicating between themselves. Decisions regarding the terms used and the best structure for the Portuguese version were detailed in a report written for the researcher of this study. In Stage 2, the translators met with the researchers and together prepared a single version from the two translations.

The translators experienced difficulty translating single words, since some of them, depending on the context, presented different meanings (for example: *selo* [seal] – verb and *selo* [stamp] - noun). Two idiomatic expressions in the text entitled “*Maldito Apêndice*” [Cursed Appendix] were not translated (“*Pues a mí, plin*” and “*¿Cree usted me chup el scalpel?*”) because the expressions have no equivalents in Portuguese.

Both translator 1 and 2 translated “*Papuas*” [Spanish] as “*papues*” [Portuguese] following the form of Spanish writing and, in the phrase “*¿En qué se basan para decir que la demografía de los papúes es de signo decreciente?*” they chose to translate *signo* with *sinal*, but considered that it could be *signo* as in *signo*

linguístico. Similarly, in the text “Os esquimós” [The Eskimos], Translator 1 translated “hundido” with “soterrado” [buried] while Translator 2 used “afundado” [sunken]. Thus, in the phrase “*en la que se sienta el esquimal prácticamente hundido entre pieles*”, it was agreed to use “soterrado” for the consensus version.

The translators differed as to the use of *série* and *ano* [grade and year] for the translation of *seriação escolar*. Together with the researchers, it was decided to use *ano escolar* [school year]. Both translators explained that in the texts of the procedure in Spanish, the pronoun “*Les*” was used frequently (indirect complement pronoun used in Spanish to understand the subject). For the consensus version, it was decided to always repeat the name of the subject.

The instructions and questions in Spanish were given in indirect order. For the consensus version, the translators chose to use direct order to facilitate understanding by the target audience. Regarding the wording, there was no concern over the translations that could have more than one meaning, as they could not be used (considering that the frequent and non-frequent words in Spain are not the same as in Brazil); therefore, the words were taken from the word bank elaborated for this study.

After finalizing the single version, the work was sent to a professional trained in linguistics. The researchers, along with this professional, performed the adjustment of instructions, phrases and texts to facilitate their understanding.

The expressions “*Pues a mí, plin*” and “*¿Cree usted que me chupo el bisturi?*” Were defined together with this professional and considering the context of the text as: “*Para mim deu*” (Pues a mí, plin) and “*O senhor quer ensinar o Padre Nosso ao vigário?*” (¿Cree usted que me chupo el bisturi?) [“For me that’s done” and “Do you want to teach Our Father to the Vicar?”, respectively]. The word “*papues*” was replaced by “*papuas*” and the word “*soterrado*” [buried] to translate “*hundido*” was replaced by “*escondido*” [hidden].

After this stage, the adaptation process for the procedure (as described above) was performed before continuing to Stage 3 – Back-translation.

### Stage 3 (back-translation)

In this stage, it was determined that the instructions and texts reflected the contents of the original version. As for the sentences, although they retain the meaning of the original procedure, the grammatical structure needed alteration to be appropriate in Portuguese. Regarding the texts, only the idiomatic expressions and slang words did not correspond to the Spanish version of the procedure and as stated in some sentences, the grammatical structure had to be changed; however, the meaning of the text remained unchanged. Details about alterations in the grammatical structure are explained above in the process of adapting the tests.

### Stage 4 (revision by specialist committee)

The judges agreed that the instructions and texts reflect the content of the original version; however, the sentences and texts, although maintaining the meaning of the original procedure, had their grammatical structures changed to the Brazilian reality.

Experts only indicated changes in the pseudowords, whenever they were not appropriate.

In the individual version, the committee pointed out that the pseudowords “*lagridade*”, “*sociedal*”, “*dantavem*”, “*trafiteiro*”, “*finalizagem*” and “*vizinheiro*” needed to be changed due to derivation problems as orthographically close words could easily be activated (regularization of these pseudowords into real words). The pseudo words “*promable*” and “*cuicirto*” were indicated for replacement, as their complexity could impair reading. In the collective version, replacement of the pseudoword “*historiadilio*” was recommended for the same reason.

Another observation was regarding item 24 of test 3 “Grammatical Structures”, because drawings number three and four were identical. Since the images used were the same as in the original procedure, the researchers contacted *TEA Ediciones*, who provided the correct drawing given the fact that they had already effected this modification in the current original procedure.

Approval of the final version of the instrument was conditional upon the correction of the above drawings, because such modification was necessary for the pilot study to be performed. Nevertheless, it was not considered necessary to reconvene the committee merely for approval of this item.

### Stage 5 (application of the pre-final version of the instrument – pilot study)

Among elementary school students, the mean time to complete the collective version tests was 42.7 minutes (SD = 4.0) and for high school students 42.0 minutes (SD = 4.6), while for the individual version, this was 35.5 minutes (SD = 6.2) and 31.7 minutes (SD = 4.7), respectively.

The pilot study indicated no need for modification of the PROLEC-SE-R tests, either in the collective version or in the individual version. There was only a modification in the answer book; where in the evaluator’s version, a question was different from the procedure, concerning the text “*Esquimós*”. In question three there was a typo in the phrase: “*Por que os esquimós precisam da iluminação, mais do que outros povos?*” [Why do Eskimos need electric light more than other peoples?] instead of “*outros povos*”, it was written incorrectly as “*outro povo*”.

The students presented good acceptance of the procedure and there were no complaints or reports of difficulty regarding comprehension of the tests and instructions.

### Stage 6 (evaluation and appreciation of all the reports prepared by the researcher and specialist committee)

With the finalization of the translations, back-translations, pilot study and appropriateness as indicated in the pilot study, the final version of the procedure (collective version, individual version and answer sheet) was reached. Two researchers from Educational Speech Therapy participated in the audit process, together with LIDA’s speech therapists (PhDs and Masters), to verify that the steps of the translation and adaptation process had been followed correctly and met all criteria.

The audit process concluded that all steps were completed and that the procedure was apt to proceed to the characterization of the population phase.

## DISCUSSION

To perform the cultural adaptation of the procedure, the criteria proposed by Beaton and Guillemin<sup>(5)</sup> were adopted. The technique of translation and adaptation, aiming at cultural equivalence, as in the case of words classified into frequency of occurrence and syntactic structure of clauses, cannot be achieved by translation and adaptation techniques alone, but by taking into account the linguistic criteria of the Portuguese language of Brazil<sup>(11-14)</sup>.

Therefore, the process is not merely to translate the procedure into Portuguese. The process is similar to the development of a new instrument, in this case, seeking its cultural equivalence so that it can be used in Brazil without loss of effectiveness<sup>(11-14)</sup>.

The pilot study was conducted to detect possible errors and to evaluate the quality of the adaptation and practical aspects of its application, as well as to verify the time required for application of the instrument. Regarding the time for completing the tests, both in the collective and individual versions, the mean for the Brazilian students is very close to that of their Spanish counterparts<sup>(4)</sup> who presented an average time of 45 minutes in both the collective and the individual versions.

After completion of all stages, it could be affirmed that the translation and adaptation to the Portuguese language was satisfactory. Nevertheless, it will still be necessary to validate the study with elementary and high school students prior to its use.

## CONCLUSION

The goal of translating and culturally adapting the PROLEC-SE-R for use in Brazil was achieved. The procedure is adapted to the Brazilian reality, although a validation study is necessary with the population of elementary and high school students.

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## Author contributions

AMO participated in the conception and planning of the research project, data collection and analysis, redaction and critical review of manuscript; JLFS participated in planning the research project, data analysis and interpretation, and critical review of manuscript; FCV participated in planning the research project and critical review of manuscript; SAC participated in the conception, planning and guidance of the research project, redaction and critical review of manuscript