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Brazilian Teachers' Beliefs about Literacy Learning: Adaptation and Validation of a Questionnaire

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**Brazilian Teachers' Beliefs about Literacy Learning: Adaptation and Validation of
a Questionnaire**

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Resumo

Crenças podem ser identificadas pela sensação que as pessoas têm de algo ser verdadeiro. Os humanos possuem crenças sobre vários aspectos das suas vidas, e quando muitas crenças existem em grupos para explicar a nossa vida, elas podem ser classificadas como sistemas de crenças. Professores possuem múltiplos sistemas de crenças que são usados para dar sentido a realidade e guiar a sua prática. Para medir as crenças dos professores em formação, o “questionnaire of preservice teachers’ beliefs on learning to write” (QPTBLW) foi desenvolvido por Seoane et al. (2020). O QPTBLW mede o nível de concordância de professores em formação com seis sistemas de crenças sobre aprendizagem da escrita, respectivamente as psicolinguísticas, behavioristas, maturacionistas, nativistas, socioculturais e construtivista. O objetivo desta pesquisa foi o de adaptar e validar uma versão do QPTBLW para o português do Brasil, para assim medir as crenças dos professores alfabetizadores brasileiros sobre a alfabetização. Depois do QPTBLW ser traduzido e adaptado, chamámo-lo à versão brasileira do questionário: Crenças dos Professores sobre Alfabetização (CPA). O CPA foi então aplicado em 25 558 participantes de 1 778 cidades brasileiras participando no curso online ABC. As respostas dos participantes foram analisadas usando análise fatorial confirmatória para testar a validade e fiabilidade do CPA. Os resultados indicaram que de forma geral o questionário possui bons índices de ajustamento, boa consistência interna, bons pesos fatoriais e baixa correlação entre fatores, no entanto, ainda são necessárias mudanças para melhorá-lo, mas ele se mostra promissor como um instrumento válido e fiável para medir as crenças dos professores alfabetizadores brasileiros sobre a alfabetização e assim ser útil aos investigadores da área.

Palavras-chave: Professores Brasileiros; Crenças; Professores alfabetizadores; Leitura; Escrita; Sistema de crenças.

Abstract

Beliefs can be identified by the feeling that individuals have of something being true. Individuals have beliefs about various parts of their life, and when multiple beliefs exist in groups to explain our lives, they can be classified as beliefs systems. Teachers' have multiple beliefs systems that are used to give sense to reality and guide their practice. To measure pre-service teachers' beliefs, the questionnaire of preservice teachers' beliefs on learning to write (QPTBLW) was created. It measures preservice teachers' agreements with 6 different beliefs systems on learning to write, namely psycholinguistics, behaviourist, maturation, nativist, sociocultural, constructivist. The aim of this research was to develop and validate a Brazilian Portuguese version of QPTBLW to measure Brazilian literacy teachers' beliefs on learning to read and write. After QPTBLW was adapted and translated we named it Teachers' Beliefs about Literacy Learning (TBLL). TBLL was then applied in 25 558 participants from 1 778 Brazilian cities participating in the ABC online course. Participants answers were analysed using confirmatory factor analysis to test the validity and reliability of TBLL. Results indicated that overall, the questionnaire had good fit indices, good internal consistency, meaningful factor loadings and low factor correlations. However, not all values were within a good range, indicating the necessity to improve TBLL. Suggested modifications are discussed. As overall the questionnaire showed good results, TBLL is promising to become a valid and reliable instrument to measure Brazilian literacy teachers' beliefs about literacy learning.

Keywords: Brazilian Teacher's; Teachers Beliefs; Literacy Teachers; Reading; Writing; Belief System.

1. Introduction

Beliefs can be defined as “psychologically held understandings, premises, or propositions about the world that are felt to be true” (Richardson, 2003, p. 2). As understanding, premises or propositions they are representations about the world, such as “it’s raining outside”, they work as a map, guiding how individuals interact with the world, in this case taking an umbrella before going outside (Churchland & Churchland, 2013). As stated by Harris et al. (2008, p. 141), “when one accepts a statement as true, it becomes the basis for further thought and action; rejected as false, it remains a string of words”. In groups, beliefs can be classified in systems. These systems are stories individuals use as mechanism to make sense of the world, such as religion, science, philosophy, arts, among others. Using these beliefs systems, individuals organize societies, create institutions, laws, etc. (Usó-Doménech & Nescolarde-Selva, 2015).

In the area of education, multiple beliefs systems exist and are used to organize its functioning. Some of these beliefs systems can be classified as theories, such as behaviorist, constructivist, socio-cultural, etc. These theories have specific beliefs about what is education, what is the purpose of education, what are good practices of education, etc. As members of these institutions, teachers may hold part of the beliefs from these systems, agreeing with beliefs advocated by these theories, explicitly or implicitly. Teachers may, for example, believe that learning is a process of strengthening the mind through training, without explicitly knowing that this belief is part of the Mental Discipline, a theory with its first writings found in philosopher Plato’s (428-347 B.C) texts (Tracey & Morrow, 2006). Knowledgeable or not about where their beliefs come from, teachers’ beliefs will influence their practice, as many studies have shown that both are associated (Buehl & Beck, 2015; Graham et al., 2002; Hsiang et al., 2020; Kang, 2008). Depending on beliefs teachers hold, the learning of their students may vary, this evidence led to a growing body of researchers advocating for the study of teachers’ beliefs as a way to improve education outcomes (Pajares, 1992; Richardson, 1996, 2003; Richardson & Placier, 2001; Skott, 2015).

Considering the importance of teachers beliefs, Seoane et al. (2020) developed the “Questionnaire of pre-service teachers’ beliefs on learning to write” (QPTBLW). This questionnaire was developed to measure pre-service teachers’ degree of agreement with

beliefs from six different theories. The development of the questionnaire had as premise that teachers would hold multiple beliefs related to different theories and that some of these beliefs would be more representative of one theory than other theories, while some beliefs could represent multiple theories. To measure the degree of agreement with each theory separately, the statements that highly represented one theory but not others were identified, in a process of two studies, and used to create QPTBLW. Also, taking into consideration that teachers may not always know from which theory their beliefs originated, the questionnaire was structured to identify teachers' beliefs, using statements such as "I consider that there are children who precociously discover writing by themselves"(Seoane et al., 2020, p. 181), that make it possible to identify if teachers agree with the belief of a theory, in this case nativist, without teachers needing to consciously know about the theory.

In a first study, Seoane et al. (2020) used socio-historical techniques to select the theories they would use as basis to identify and classify beliefs. The scientific theories selected were psycholinguistic, behaviourist, maturation, nativist, socio-cultural, and constructivist. After the theories were selected, sessions of brainstorming were conducted with a sample of 16 teachers from the Canary Islands to generate statements related to each theory. Multiple statements were collected and selected by a team of five experts, to create a questionnaire with 124 statements. This questionnaire was then applied to 550 university students and data was analysed using typicality and polarity tests to identify the 60 statements that had a higher value of representation with their respective theory and a lower value of representation with other theories. These 60 statements were selected to create a reduced questionnaire.

In a second study, Seoane et al. (2020) applied the 60 statements questionnaire on 319 pre-service teachers, and used the information collected to further reduce the questionnaire to 30 statements. To accomplish this, a model was specified with 6 latent factors (one per theory) and 10 statements per factor. This model presumed that statements have high positive correlation with their own factor, and a small association with other factors. Using confirmatory factor analysis (CFA), it was possible to identify if any of the statements was not following the model specifications and if not to what degree. From 60 statements, the 30 statements that showed a higher discrepancy from the specified model and presented other problems such as conceptual overlap, were selected to be removed. The 30 statements questionnaire was then tested using CFA, to compare if the data collected fitted with the model specified in the study. Results showed that statements had a meaningful correlation with their factors, that statements were not correlating with more than one theory,

that factors were measuring different constructs, and that factors had good internal consistency, suggesting the questionnaire was a good instrument to measure pre-service teachers' beliefs on learning to write with psycholinguistics, behaviourist, maturation, nativist, socio-cultural, and constructivist theories.

The final version of the QPTBLW is Spanish, it has 30 statements with 5 statements representing each theory. The questionnaire is structured with statements, describing variables that impact the process of learning to write, which pre-service teachers can express their degree of agreement in a Likert-type scale ranging from 0 to 10. Participants are instructed that if they answer closer to 0, they strongly disagree, and if they answer closer to 10, they strongly agree. Psycholinguistics statements express that child's development of oral language is an important factor in learning to write. Behaviourist statements express that the immediate correction of mistakes is important in learning to write. Maturation statements express that child need to be developmentally ready to learn how to write. Nativist statements express that learning to write is an innate ability and that some children can precociously learn how to write by themselves. Socio-cultural statements express that the environment is important in learning how to write. Constructivist statements express, that to learn how to write, children need spaces where they can write freely, without correction and interference. The questionnaire gives a scores of the degree of agreement with each theory.

In 2020, the online course “Alfabetização Baseada na Ciência (ABC)” (<https://avamec.mec.gov.br/#/instituicao/sealf/curso/12361/informacoes>) was created in a joint partnership among the Brazilian Ministry of Education, the University of Porto, the Polytechnic of Porto, and the Open University of Portugal. The course was created as a source of continued formation for Brazilian literacy teachers, with the objectives of updating teachers' knowledge about the latest scientific evidence on learning to read and write, of identifying literacy teachers' needs, of promoting the use of methods based in science, of capacitating literacy teachers to plan lessons with basis on science, and of supplying useful resources for literacy teaching (Ministério da Educação e Cultura, 2020), with over 100 000 literacy teachers and other education professionals expected to participate. Considering the target population of the course, measuring participants beliefs could give valuable information to deepen our understanding of literacy education in Brazil and of how teachers' beliefs function in general. As improvement and promotion of literacy education is one of Brazilian government and a worldwide objective (Ministério da Educação, 2014; United Nations Educational Scientific and Cultural Organization, 2017), we developed this research to measure Brazilian literacy teacher beliefs on learning to read and write.

Since, to our knowledge, there are few studies of Brazilian literacy teachers' beliefs and we could not find a questionnaire to measure Brazilian literacy teachers' beliefs on learning to read and write, we designed this study with the general objective of validating a questionnaire to measure Brazilian literacy teachers' beliefs on learning to read and write. To accomplish this general objective, this research had the specific objectives of translating QPTBLW to Brazilian Portuguese, adapting QPTBLW to reading and writing, and assessing if the adapted and translated version of QPTBLW is valid and reliable with the population of Brazilian literacy teachers. As research question, we put forward the following: is the translated and adapted version of the QPTBLW valid and reliable with Brazilian literacy teachers? To answer this question, we had to answer the five additional questions:

Q1. Does the Brazilian literacy teachers' pattern of response have a good fit with the specified model (Figure 1)?

Q2. Are the statements correlated only to one factor?

Q3. Do the factors have good internal consistency?

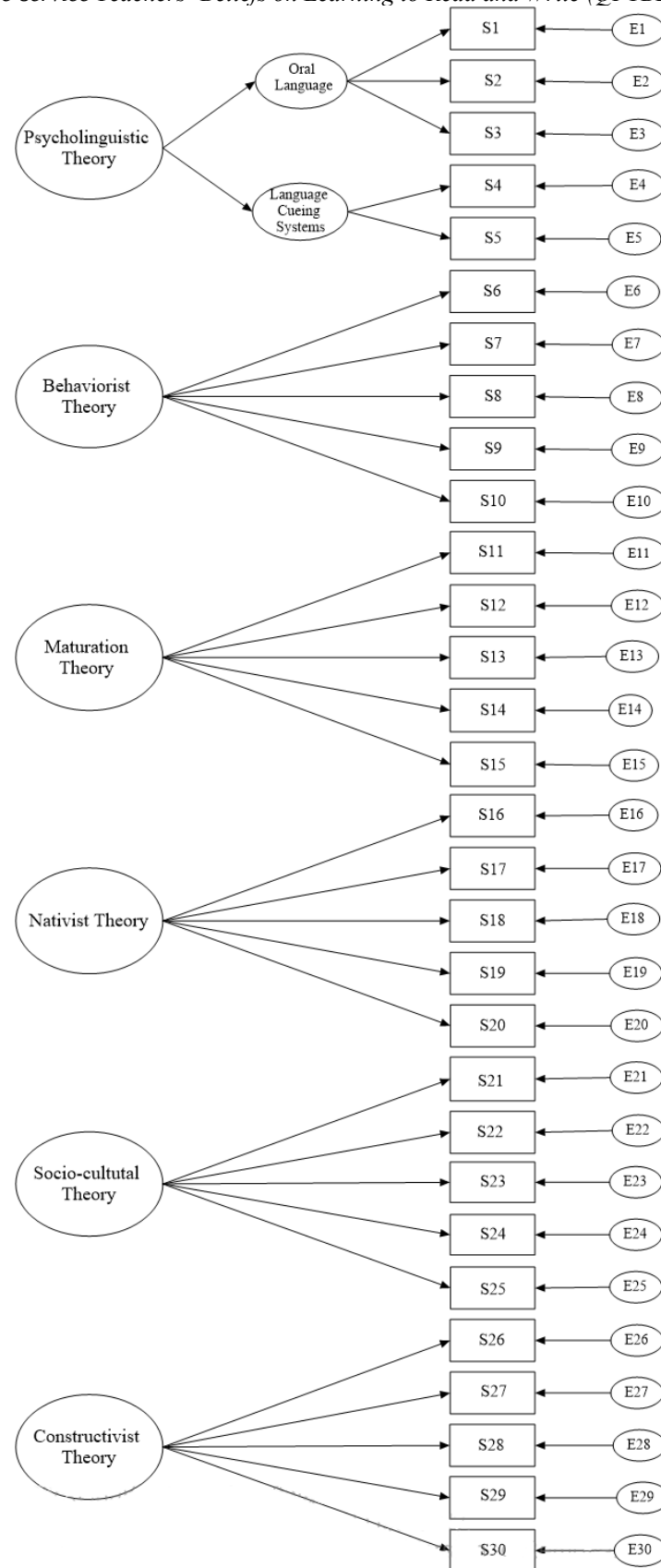
Q4. Are the factors measuring different constructs?

Q5. Are the statements meaningfully correlated to their factors?

Here we report on the first application of the translated and adapted version of QPTBLW. Overall, we designed two studies, planned as pre and post-test, that is before and after the ABC online course. Information gathered in this first study will inform about adjustments that can be made to improve the questionnaire in the second study. Adjustments to the questionnaire will be discussed at the end of this dissertation.

Figure 1.

Questionnaire of Pre-service Teachers' Beliefs on Learning to Read and Write (QPTBLW) Model



Note. S = statement; E = measurement error; Adapted from Seoane et al. (2020).

2. Method

2.1. Procedure

To complete the study objectives three procedures were followed: 1) Translation and adaption of the QPTBLW, 2) Structure the survey in the Qualtrics platform, 3) Run the survey. The QPTBLW statements were translated from Spanish to Brazilian Portuguese and adapted to represent teachers' beliefs on learning to read and write. To also represent reading, in 27 statements the word reading or the Brazilian Portuguese term “Alfabetização”, that represents the process of learning to read and write, was added. These statements were then evaluated by a second researcher and modifications were made to improve the translation and adaptation.

The Likert type scale used in QPTBLW was restructured to improve visualization of the survey in Qualtrics platform via web pages and mobile phones. The Likert scale was reduced from 10 scales to 7 scales and the answers were changed from numbers (i.e., 1, 2, 3, 4, 5, 6, 7, 8, 9, 10) to words (i.e., totally disagree, disagree, somewhat disagree, neither disagree nor agree, somewhat agree, agree, totally agree).

The questionnaire was structured with 10 pages. The 1st page presented the informed consent and gave participants the option to participate or not participate in the survey. The 2nd page asked participants for their email, to prevent participants from answering the survey multiple times (after used one time the email was saved to a list and participants that filled the same email more than one time were sent to the end of the survey). The 3rd page collected participants sociodemographic information. From the 4th to the 9th page, statements of the questionnaire were randomly presented (in the same sequence for all participants) with 6 questions per page. The 10th page finished the survey and thanked the participants. All questions were programmed to force response (participants couldn't go from one page to the other without replying all the questions). Four researchers tested the online survey multiple times to identify possible problems.

After structured, three Brazilians graduated in pedagogy and with experience in teaching to read and write were asked to fill the survey and give feedback about comprehension and structure of the questionnaire. The three stated that they had no difficulties in understanding or filling the questionnaire. The translated and adapted version

of the Questionnaire of pre-service teachers' beliefs on learning to write (QPTBLW) was named Questionnaire of Teachers Beliefs about Literacy Learning (TBLL).

2.2. Questionnaire of Teachers Beliefs about Literacy Learning (TBLL)

The TBLL measures respondents' degree of agreement with psycholinguistic, behaviourist, maturation, nativist, socio-cultural and constructivist, beliefs on learning to read and write. The questionnaire has 30 statements, with 5 representing each theory. Participants can express their level of agreement through Likert type scale in 7 levels. In Portuguese the degrees of agreement are “discordo totalmente”, “discordo muito”, “discordo pouco”, “não discordo nem concordo”, “concordo pouco”, “concordo muito” and “concord totalmente”, in English the degrees can be translated as totally disagree, disagree, somewhat disagree, neither disagree nor agree, somewhat agree, agree, totally agree.

Except for the inclusion of the concept of learning to read, the questionnaire maintained the same content. Psycholinguistics statements express that child's development of oral language is an important factor in learning to read and write. Behaviourist statements express that the immediate correction of mistakes is important in learning to read and write. Maturation statements express that children need to be developmentally ready to learn how to read and write. Nativist statements express that learning to read and write is an innate ability and that some children can precociously learn how to read and write by themselves. Socio-cultural statements express that the environment is important in learning how to read and write. Constructivist statements express, that to learn how to read and write, children need spaces where they can read and write freely, without correction and interference.

Total scores for each theory are calculated by adding individual questions scores. Each question receives a score in accordance with the degree of agreement that participants have with it. Questions which participants answer totally disagree receive 1 point, which they answer disagree receive 2 points, which they answer somewhat disagree receive 3 points, which they answer neither disagree nor agree receive 4 points, which they answer somewhat agree receive 5 points, which they answer agree receive 6 points, and which they answer totally agree receive 7 points. Total score for each theory range between 5 to 35. Participants that answer 5-7 are classified as totally disagreeing, 8-12 as disagreeing, 13-17 as somewhat disagreeing, 18-22 as neither disagreeing nor agreeing, 23-27 as somewhat agreeing, 28-32 as agreeing, and 33-35 as totally agreeing.

Table 1

Statements of the Questionnaire of Teachers Beliefs about Literacy Learning (TBLL) in Portuguese and English.

Statements
Psycholinguistic Theory
S1. No meu ponto de vista, é necessário ensinar a criança a construir frases sintaticamente bem estruturadas praticando-as através da fala.
S1. From my point of view, it is necessary to teach children to construct well-structured sentences by practicing saying them.
S2. Penso que a criança deve discutir e expressar oralmente o que quer dizer, para em seguida poder escrever.
S2. It seems to me that the child should discuss and express orally what he wants to say, so that later he can write.
S3. Na minha opinião, uma criança que não se expressa bem oralmente tem dificuldade na leitura e na escrita.
S3. In my opinion, the child who does not express himself orally has a hard time reading and writing.
S4. Acredito que a crianças tem que emparelhar o fonema com o grafema para aprender a ler e a escrever.
S4. I think that the child needs to match the phoneme with the grapheme to learn to read and write.
S5. Considero que a linguagem oral é a base para a alfabetização.
S5. I think that oral language is the basis of reading and writing.
Behaviorist Theory
S6. Acredito que não se pode deixar as crianças lerem e escreverem errado, deve-se corrigi-las para evitar a fortificação do erro.
S6. I think you cannot let children read and write badly; you have to correct them in order to avoid strengthening the mistaken spelling.
S7. Para mim, quando as crianças leem ou copiam palavras de forma errada elas devem ser corrigidas imediatamente.
S7. It seems to me that when children are reading or copying words with errors, they should be corrected immediately.
S8. Considero que a correção imediata dos erros é muito importante na alfabetização.
S8. I think that the immediate correction of errors is very important in reading and writing instruction.
S9. No meu ponto de vista, deve-se sempre corrigir a leitura e a escrita da criança para que ela seja bem alfabetizada.
S9. From my point of view, you always must correct children's reading and writing for proper form.
S10. Na minha opinião, durante um exercício de ditado, os erros devem ser corrigidos imediatamente.
S10. In my opinion, during a dictation task, errors must be corrected immediately.
Maturation Theory
S11. No meu ponto de vista, quando as crianças estão motivadas e têm maturidade necessária, elas são capazes de comunicar através da leitura e escrita.
S11. From my point of view, when children are motivated and have the necessary maturity, they can communicate by reading and writing.
S12. Acredito que existem muitos fatores responsáveis pelos erros das crianças na leitura e escrita, especialmente problemas de lateralidade e orientação espacial.
S12. I believe that there are many factors that influence children's mistakes in reading and writing, especially problems of laterality and spatial orientation.
S13. Acredito que se colocarmos tudo no mesmo "saco", e.g. lateralidade, percepção espacial, conhecimento de direita e esquerda, esquema corporal etc. podemos dizer que todos esses elementos intervêm na alfabetização.
S13. I think that if we put everything in the same "bag", e.g., laterality, spatial perception, knowledge, or right and left or body schema, we can say that all these elements intervene in the learning of reading and writing.
S14. Parece-me que a leitura e a escrita requerem coordenação visual e manual.
S14. It seems to me that reading, and writing requires visual and manual coordination.
S15. Acredito que o nível de psicomotricidade da criança influencia na sua alfabetização.
S15. I think that the level of children's psychomotor skills influences in their learning to read and write.

Table 1. Continued

Nativist Theory

- S16. Acredito que existem crianças com 4 anos que já sabem ler e escrever.
S16. I believe that there are children who already know how to read and write when they are four years old.
- S17. Na minha opinião, existem crianças que em idade precoce podem conseguir comunicar através da leitura e escrita, mas isso depende do seu nível de maturação.
S17. In my opinion, there are children at an early age who can communicate through reading and writing, but it will depend in their maturity.
- S18. Apoio a ideia que aprender a ler e escrever é uma habilidade inata.
S18. I am a supporter of the idea that learning to read and write is an innate ability.
- S19. Acredito que existem crianças que descobrem precocemente a ler e a escrever por si próprias.
S19. I think that there are children who precociously discover how to read and write by themselves.
- S20. No meu ponto de vista, quando as crianças estão na pré-escola elas são como “esponjas”, são capazes de aprender a ler e a escrever facilmente com jogos.
S20. From my point of view, when children are in early childhood education they are like “sponges”, they can learn to read and write easily with games.

Socio-cultural Theory

- S21. Tenho a opinião que para aprender a ler e escrever é importante o ambiente no qual a criança se move.
S21. I am a supporter of the idea that in learning to read and write, the environment in which the child move is important.
- S22. Acredito que quanto mais interação existe entre a criança e o meio mais benéfico será para a alfabetização da criança.
S22. I think that the more interaction there is between the child and the environment, the more successful learning to read and write will be.
- S23. No meu ponto de vista, o processo de ensino e aprendizagem da leitura e escrita é uma interação social.
S23. From my point of view, the process of teaching and learning to read and write is a social interaction.
- S24. Na minha opinião, é na interação entre colegas que se vai melhorando e alcançando a habilidade de leitura e escrita.
S24. In my opinion, the interaction between peers is a way to achieve and improve reading and writing ability.
- S25. Acredito que o ambiente sociocultural influencia no desenvolvimento da leitura e da escrita.
S25. I believe that the sociocultural environment influences the development of reading and writing.

Constructivist Theory

- S26. Parece-me importante dar as crianças diferentes espaços, nos quais elas possam escrever o que sentem sem se preocuparem com os erros ortográficos, com a caligrafia, etc.
S26. It seems to me that it is important to give children natural spaces where they can write what they feel without worrying about spelling.
- S27. No meu ponto de vista, quando uma criança não adquire a habilidade de ler e escrever naturalmente, se pressioná-la enquanto não estiver pronta ela vai demorar mais para adquiri-la.
S27. In my point of view, when a child does not acquire the ability to read and write naturally, pressuring her when she is not ready will only make the learning process take longer.
- S28. Apoio a ideia de que quando o momento certo chegar a criança terá aprendido a ler e escrever, mas não por serem corrigidas imediatamente.
S28. I am a supporter of the idea that when the time comes, children will learn to read and write without the need for immediate correction.
- S29. Acredito que é importante as crianças terem momentos nos quais possam ler e escrever livremente sem correções.
S29. I think it is important that children have moments when they can read and write freely without correction.
- S30. Penso que uma forma de correção é fazendo a criança perceber que está lendo e escrevendo errado.
S30. I think that one way of correcting writing is making children realize for themselves that they are reading and writing wrong.

2.3. Participants Selection

Participants were given access to the survey via an anonymous link generated by Qualtrics platform. The link was placed in the welcome area of the online course ABC and e-mails were sent with the link to students enrolled in the course. The data collection period started at the beginning of the course, between 11/01/2021 and 17/03/2021. Over 150 000 students enrolled in the course during the collection period, from that number 88 333 accessed the link and 64 029 (72.49%) accepted to participate in the study. Since the course was open to public and we wanted to validate the TBLL with a specific population, criterions of inclusion were used to select participants. The criterions of inclusion used were time of experience as literacy teachers greater than 0 years and complete graduation in pedagogy. From 64 029, the number of participants that met the criterions of inclusion were 31 259(48.82%).

Due to the structure of data collection in online surveys the control over participants behavior is limited, increasing the probability that participants will have patterns of behavior that compromise the quality of the data collected. For example, participants may multitask while answering, using multiple windows at the same time, watching videos, listing to audios, etc., they may also start doing other tasks and forget about the questionnaire, finishing it hours later, or answer quickly, without reading the questions. Participants with these patterns of behavior are considered low effort and the use of methods to detect and eliminate their answers from the data analysis is necessary to increase data quality by reducing the effect of strange variables (Meade & Craig, 2012). Considering the structure of our online survey, indicators used to identify low effort participants were unlikely sociodemographic characteristics, time of responses, and strait lining response pattern, all described below.

Sociodemographic characteristics considered unlikely were the following. Since bachelors in pedagogy has a duration of 3 to 4 years and younger students enter in university with at least 17 years, participants younger than 20 were eliminated. Participants with more than 75 years were eliminated because that's the age of compulsory retirement in Brazil. From the age of 20 to 75 the maximum years of experience as literacy teachers is 55, so participants that declared more were eliminated. With 55 years of experience teachers should have finished their graduation at maximum 55 years ago (1965) and teachers that declared graduating in 2021 or later hadn't graduated yet in the time of the collection, so participants that declared graduating before 1965 and after than 2020 were discarded.

To calculate the minimum time of response in seconds, the equation used was $T_{\min} = 60(Ch/Ch_{\min})$, adapted from Buchanan and Scofield (2018). In the equation, $T_{\min}$ represents the minimum time of response in seconds, Ch represents the number of characters read, and $Ch_{\min}$ represents the maximum characters read per minute. In Ch we inserted the minimum number of characters a participant would have to read to comprehend the questionnaire. For comprehension, we considered the sociodemographic questions and the statements as essential, both totalizing 6 804 characters. In $Ch_{\min}$ we inserted the maximum number of characters read per minute by a Brazilian Portuguese reader. According to Trauzettel-Klosinski and Dietz (2012), 95% of Brazilian Portuguese readers, reads between 1 203 characters per minute to 623 characters per minute, so we inserted 1 203 characters. The calculation resulted in a minimum time of response of 339s (5.66 min). Participants that read faster than 339s were eliminated from the sample and from this new sample, we calculated the maximum time of response using a robust version of Mahalanobis squared distance (Leys et al., 2018). The analysis resulted in a maximum time of response of 2 324s (38,73min).

Straight lining is a response patterns were participant answer all question with the same answer, in a straight line, and partial straight lining is a response pattern were participants answer part of the questions with the same answer (DeSimone et al., 2018). To identify participants with these patterns of response we calculated the maximum number of answers in a straight line that each participant had. The mean number of same answers in a sequence were 5 and, using a robust Mahalanobis analysis(Leys et al., 2018), we defined that participant answering more than nine equal answers in sequence were considered outliers and classified them as low effort respondents. This method is recommended for TBLL structure, since statements are organized randomly and participants are not expected to have the same level of agreement with multiple theories (Meade & Craig, 2012). The number of participants classified as low effort and eliminated were 5 701.

2.4. Participants

The sample consisted of 25 558 Brazilian teachers graduated in Pedagogy with 0.8 to 51 years of experience as literacy teachers ($M = 9.73$, $SD = 7.77$), with age varying from 20 to 75 ($M = 41.71$, $SD = 8.57$), and with bachelor graduation year varying from 1968 to 2020 ($M = 2010$, $SD = 7.03$). Participants' sex, home area, school area, and education level are presented in Table 1. The sample consisted of participants from 1 778 Brazilian cities (Figure 2), 31.92% of the total Brazilian cities, and from all Brazilian states (Figure 3).

Table 2*Sample sociodemographic characteristic's*

Characteristic's	n	%
Sex		
Female	24 349	.953
Male	1 066	.042
Other	138	.005
Home Area		
Urban	23 115	.904
Rural	2 443	.096
School Area		
Urban	22 235	.870
Rural	3 323	.130
Education Level		
Complete Bachelors	11 230	.439
Specialist	13 532	.529
Masters	650	.025
PhD	110	.004
Post-Doctoral	36	.001
Teaching year		
Child Education	6 651	.260
1° Grade	5 948	.233
2° Grade	4 255	.166
3° - 5° Grade	6 264	.245
6° - 9° Grade	526	.021
High School	103	.004
Currently not Teaching	1 811	.071

Figure 2

Brazilian map with number of participants per city

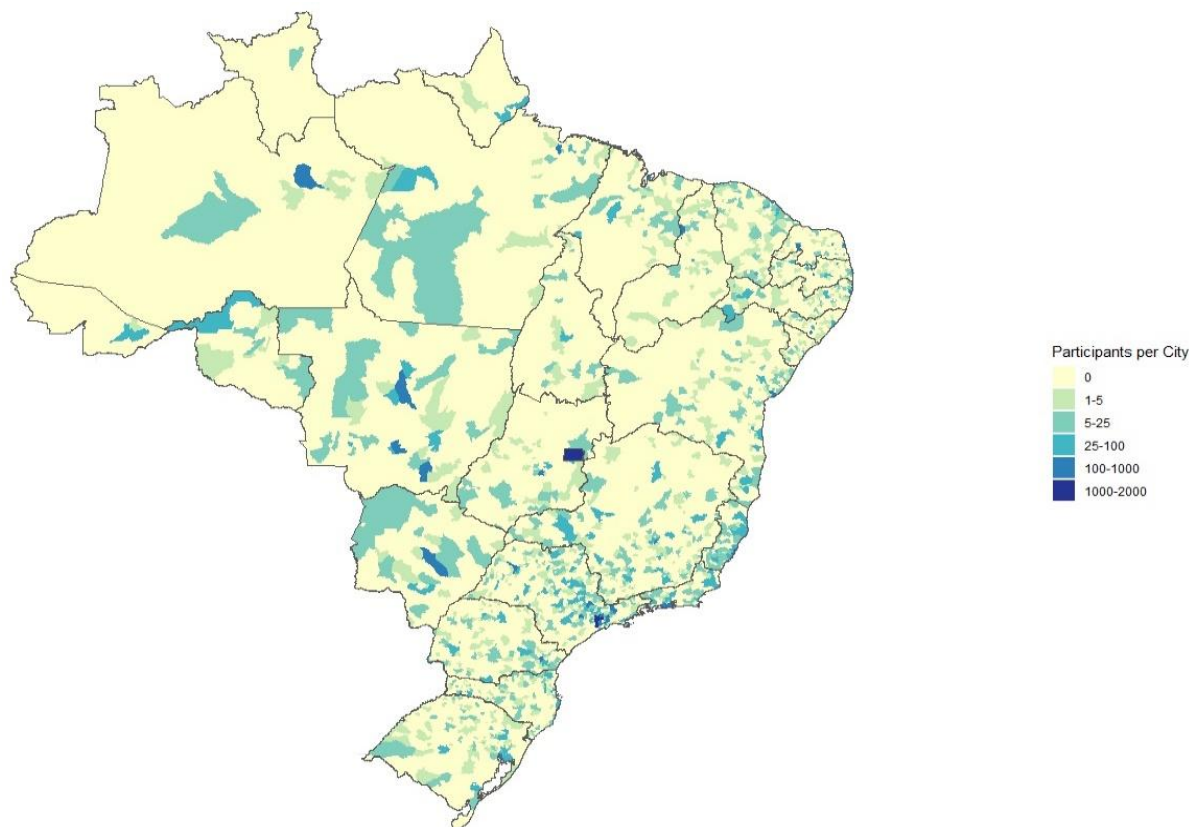
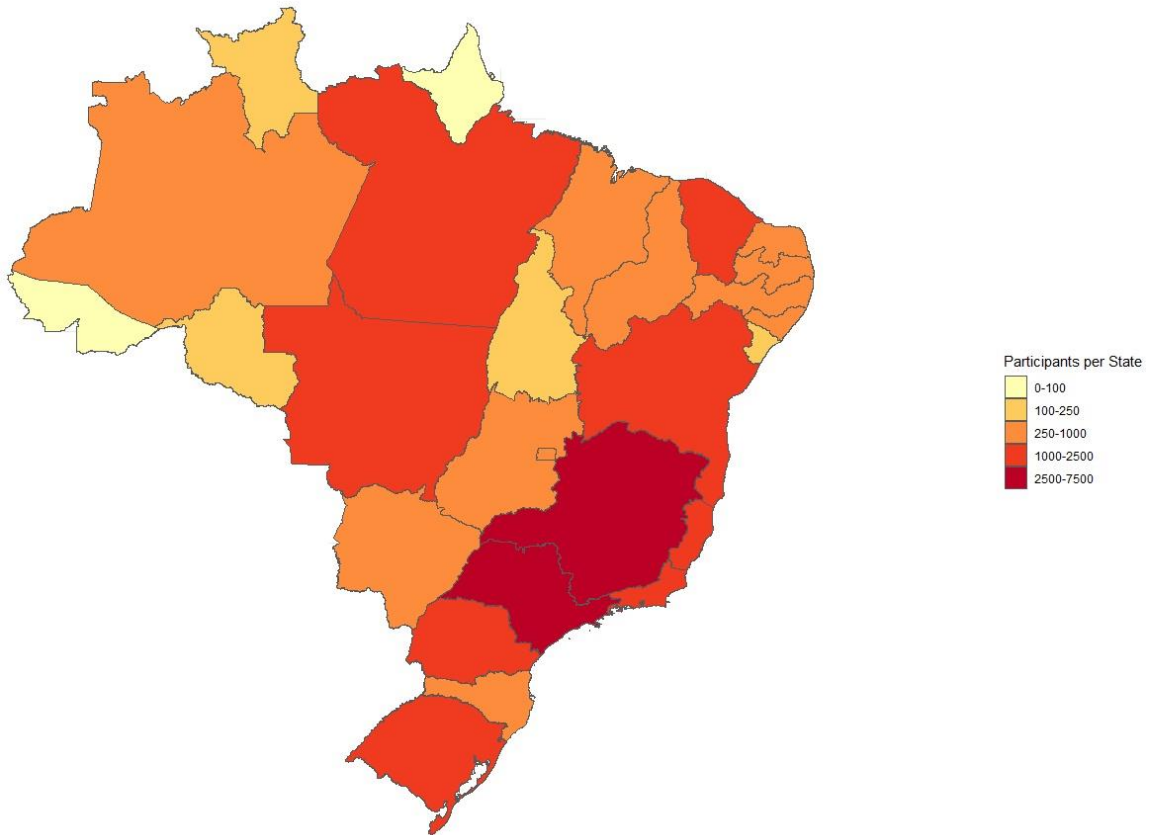


Figure 3

Brazilian map with number of participants per state.



2.5. Statistical analysis

To complete the objectives of this study, the data collected was analysed using R version 4.0.4 (R Core Team, 2021), with Lavaan package version 0.6-8 (Rosseel, 2012), semTools package version 0.5-4, psych package version 2.0.12, mass package version 7.3-54, and careless package version 1.2.1.

To answer our research questions, we analysed our data using CFA. In this analysis CFA estimates parameters values for a mathematical model as close as possible to the data inserted. In this study, data gathered from Brazilian literacy teachers were used to estimate parameters for the model in Figure 1. The analysis estimates parameters as close as possible to the data observed, however in CFA the estimation is restricted by the associations hypothesized by the model, so associations not stipulated by the model, such as statements having correlation with multiple factors, generate a discrepancy between the observed data and the estimated values. To compare the degree of discrepancy between the observed data and the estimated values, X^2 is calculated by comparing the correlation matrix of the observed data with the correlation matrix of the estimated values. X^2 is then tested for

significance and if, p value is higher than .05, the estimated model is rejected as a good model to explain the observed data. Since, rarely X^2 does not reject the estimated model, other indices that use X^2 or the residual correlation matrix (the subtraction of the estimated correlation matrix from the observed correlation matrix) are calculated to test if the observed data fits the model estimated by CFA. In this study, to assess if the observed data had a good fit with the estimated model, we used the following goodness of fit indices SMRS, GFI, CFI, TLI, and RMSEA. If CFI, TLI and GFI, values are above .9 they indicate a good fit, if SMRS value is under .08 it indicates a good fit, and if RMSEA value is under .8 it indicates a good fit (Gana & Broc, 2019).

However, goodness of fit indices are comparisons of the observed correlation matrix with the estimated correlation matrix as a whole, and in some CFA tests these indices are not sensitive to localized discrepancies that may exist between the observed correlation matrix and the estimated correlation matrix. Depending on the model estimated, correlations between some variables may be meaningfully higher in the observed matrix than in the estimated correlation matrix and goodness of fit indices won't detect it. To identify if the model estimated in this study had localized discrepancies, expected parameter change (EPC) was used. To classify EPC values between statements and factors meaningful the a cut-off value used was .4 and to classify EPC values between statements and statements meaningful the value used was .1 (Saris et al., 2009).

After assessing the fit of the model, internal consistency was measured using standardized Cronbach alpha and composite reliability. Composite reliability was calculated as described by Raykov (2001). Standardized Cronbach alpha and composite reliability values under .6 were considered unacceptable, above .6 were considered acceptable and above .7 were considered good (Maroco & Garcia-Marques, 2006). To assess if factors were measuring different constructs, we used factor correlation and heterotrait-monotrait (HTMT). Values under .85 were considered acceptable for both (Brown, 2015; Henseler et al., 2014). Statements were considered meaningfully correlated with their factors, if factor loadings were above .4 (Brown, 2015).

In summary, to answer the first question, goodness of fit indices and EPC values were used to assess if Brazilian literacy teachers' patterns of response have a good fit with the model in Figure 1. To answer the second, EPC values were used to assess if statements have a meaningful correlation with factors not hypothesized by the model. To answer the third, standardized Cronbach alpha and composite reliability were used to assess if correlation between statement and factor loading are high enough, justifying the existence

of the construct. To answer the fourth, factor correlation and HTMT ratio were used to assess if factors have a not meaningful correlation and therefore are measuring different constructs. To answer the fifth, factor loadings were used to assess if each one of the statements is meaningfully correlated to their factors.

Prior to performing confirmatory factor analysis, outliers were searched using a robust version of Mahalanobis squared distance (Leys et al., 2018), and multivariate normality was assessed using multivariate coefficients of skewness (Sk) and kurtoses (Ku). The number of outliers identified was 3 398, multivariate Sk was 79 and multivariate Ku was 1 368. The cut-off value of Sk is 3 and of Ku is 10, indicating that multivariate normality was severely violated (Kline, 2016). Since the questionnaire consisted of ordinal variables and multivariate normality was violated, polychoric correlation was used to calculate the correlation matrix and robust weighted least square (WLSMV) was used to estimate parameters for the model (Brown, 2015; Gana & Broc, 2019; Marôco, 2014).

3. Results

Results indicated that, comparing the observed correlation matrix with the estimated correlation matrix, Brazilian literacy teachers' pattern of response had a good of fit with the estimated model ($X^2_{388} = 78\,012$, $p < .001$; RMSEA = .088; RMSEA CI [90%] = .088 - .089; GFI = .972; CFI = .930; TLI = .921; SRMR = .075; ECVI = 3.070). However, as shown in Table 3, EPC identified 45 discrepancies between the observed matrix and the estimated matrix. From these, statements with the highest number of discrepancies were statement 30, with 11 misspecifications, and statement 27, with 6 misspecifications, other 11 statements presented 2 misspecifications, and 9 statements presented 1 misspecification. These discrepancies indicate that variable not specified in the model are causing higher correlations values in the observed matrix. Possible explanations for these discrepancies will be presented in the discussion session.

Table 3

Meaningful EPC values between statements	
Statements	Statements (EPC)
30	9 (.353), 8(.307), 7(.276), 6(.267), 5(.153), 3 (.187), 25 (.122), 15 (.207), 14 (.117), 10(.258), 1(.128).
27	10(.146), 17(.141), 6(.196), 7(.157), 8(.244), and 9(.239).
28	18(.193), 19(.101), and 24(.101)
9	4(.118), and 5(.113)
22	1(.203), and 11(.104)
21	11(.110), and 6(.106)
20	18(.125), and 19(.196)
19	16(.164), and 18(.183)
18	10(.153), and 9(.110)
29	26(.221), and 3(.125)
25	15(.230), and 3(.177)
6	4(.182)
24	23(.11)
23	17(.131)
17	11(.107)
16	12(.122)
14	9(.166)
13	12(.231)
12	2(.120)
11	4(.214)

As shown in Table 2, EPC values are also indicating 16 discrepancies between statements and factors. Statements with the highest number of discrepancies were statement 30, with five discrepancies, followed by statement 17, with three, statement 3, with three,

statement 27, with two, and statements 11, 14 and 15, with one discrepancy each. EPC values ranged between .410 and .883.

Table 4

Meaningful EPC values between statements and factors.

Statement	Factor (EPC)
30	Socio-cultural (.883), Nativist (.658), Maturation (.614), Psycholinguistic (.543), and Behaviorist (.445)
17	Socio-cultural (.506), Psycholinguistics (.809), and Maturation (.863)
3	Socio-cultural (.617), Maturation (.861), and Psycholinguistics (.410)
27	Socio-cultural (.526), and Nativist (.439)
11	Psycholinguistics (.552)
14	Psycholinguistics (.773)
15	Socio-cultural (.565)

Standardized Cronbach alpha (α) and composite reliability values ranged between .55 to .89, indicating that behaviourist ($\alpha = .89$; CR = .89), maturation ($\alpha = .74$; CR = .76), and socio-cultural ($\alpha = .77$; CR = .78) factors had good internal consistency, while psycholinguistics ($\alpha = .68$; CR = .66) had an acceptable internal consistency, constructivist ($\alpha = .59$; CR = .62) had an acceptable internal consistency according to composite reliability but unacceptable according to standardized Cronbach alpha, and nativist ($\alpha = .57$; CR = .55) had an unacceptable internal consistency according to both (Table 4). While the removal of any of the statements from psycholinguistics and nativist factors reduced their standardized Cronbach alpha and composite reliability, the removal of statement 30 increases constructivist standardized Cronbach alpha to .62 and composite reliability to .64.

Table 5

Standardized Cronbach's alpha, composite reliability of the Questionnaire of Teachers Beliefs about Literacy Learning (TBLL).

	Standardized Cronbach Alpha (α)	Composite reliability (CR)
Psycholinguistic	.68	.66
Behaviorist	.89	.89
Maturation	.74	.76
Nativist	.57	.55
Socio-Cultural	.77	.78
Constructivist	.59	.62

Most of the factors had factor correlation and HTMT ratio values below the threshold, with exception of psycholinguistics factor and maturation factor ($r = .911$; $p < .001$; HTMT ratio = .908), and psycholinguistics factor and socio-cultural factor ($r = .859$; $p < .001$; HTMT ratio = .786). Contrary to the other factors associations, the only negative correlation was between behaviorist factor and constructivist factor factor ($r = -.341$; $p < .001$; HTMT ratio = .577), see Table 5.

Table 6

Factor correlation matrix and Heterotrait-monotrait (HTMT) ratio of the Questionnaire of Teachers Beliefs about Literacy Learning (TBLL).

	Psycholinguistic	Behaviorist	Maturation	Nativist	Socio-Cultural	Constructivist
Psycholinguistic	1.000 (1.000)					
Behaviorist	.467* (.452)	1.000 (1.000)				
Maturation	.911* (.908)	.322* (.327)	1.000 (1.000)			
Nativist	.668* (.594)	.318* (.321)	.672* (.621)	1.000 (1.000)		
Socio-cultural	.850* (.786)	.101* (.122)	.807* (.794)	.669* (.604)	1.000 (1.000)	
Constructivist	.575* (.576)	-.341* (.577)	.574* (.622)	.603* (.663)	.755* (.789)	1.000 (1.000)

Note: * $p < .001$; HTMT ratio is represented in brackets.

The percentage of teachers who agreed with each theory ranged from 58% to 98.6%. The theories which teachers most believed in were socio-cultural ($A = 98.6\%$), maturation ($A = 94.5\%$) and psycholinguistics ($A = 93.4\%$), followed by constructivist ($A = 88.7\%$), nativist ($A = 69.9\%$), and behaviorist ($A = 58.6\%$). The theories that teachers neither agreed nor disagreed were nativist ($DA = 23.6\%$) and behaviorist ($DA = 18.7\%$), followed by constructivist ($DA = 9.52\%$), psycholinguistics ($DA = 5.57\%$), maturation ($DA = 4.68\%$) and socio-cultural ($DA = 1.17\%$). The theories that teachers most disagreed with, was behaviorist ($D = 22.7\%$), followed by nativist ($D = 6.53\%$), constructivist ($D = 1.82\%$), psycholinguistics ($D = 1.01\%$), maturation ($D = .849\%$), and socio-cultural ($D = .203\%$). Overall, more than half of the teachers agreed at least at some degree with all the theories, and, with exception of behaviorist ($D = 22.7\%$), a smaller than 7% of teachers disagreed with each one of the other theories (see Table 6).

Table 7

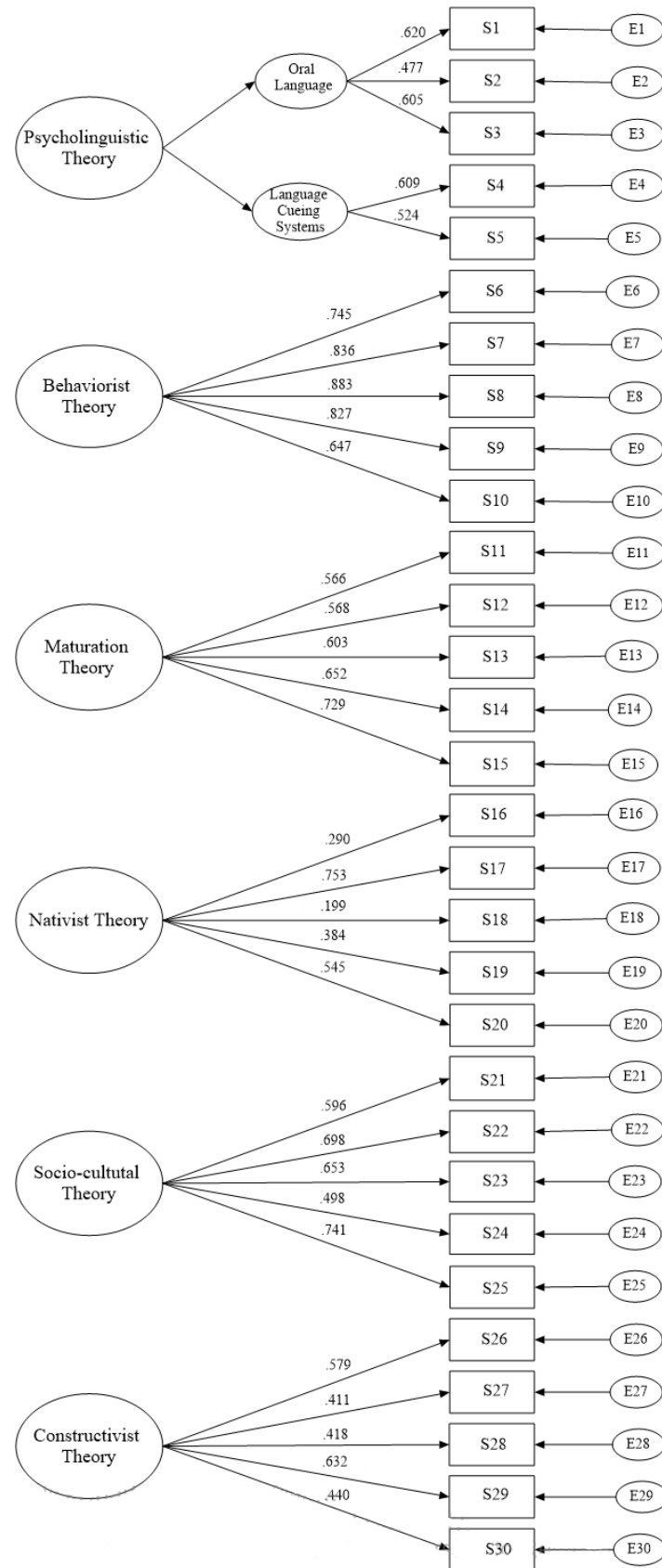
Percentage of teachers that totally disagree, disagree, somewhat disagree, neither disagree nor agree, somewhat agree, agree, and totally agree with each theory.

	Disagrees(D)	Neither Disagree nor Agree (DA)	Agrees (A)
TBLL Score	5-17 %	18-22 %	23-35 %
Psycholinguistics	1.01	5.57	93.4
Behaviorist	22.7	18.7	58.6
Maturation	.849	4.68	94.5
Nativist	6.53	23.6	69.9
Socio-cultural	.203	1.17	98.6
Constructivist	1.82	9.52	88.7

Statements factor loadings indicated that, with exception of statement 16 ($\lambda = .290$), 18 ($\lambda = .199$), and 19 ($\lambda = .384$) all statements had factor loading values above threshold. Statements within and acceptable value ranged between .411 and .833 (Figure 4).

Figure 4.

Questionnaire of teachers' beliefs about literacy learning (TBLL) Model with factor loadings.



Note. S = statement; E = measurement error;

4. Discussion

This study had the general objective of validating a questionnaire to measure Brazilian literacy teachers' beliefs on learning to read and write. To accomplish this general objective, this research had the specific objectives of translating QPTBLW to Brazilian Portuguese, adapting QPTBLW to reading and writing, and assessing if the adapted and translated version of QPTBLW is valid and reliable with the population of Brazilian literacy teachers. To accomplish this, QPTBLW was translated and adapted as an online survey in Qualtrics platform, creating TBLL. TBLL was then applied in 25 558 Brazilian literacy teachers and the data collected was used to test the validity and reliability of the TBLL with Brazilian literacy teachers using CFA. To assess the validity and reliability of the questionnaire five questions were elaborated.

4.1 Question 1 and Question 2

To answer the first question, goodness of fit indices and EPC values were used. What these values indicated is that, comparing the correlation matrix observed in Brazilian literacy teachers answer to the correlation matrix estimated by CFA, goodness of fit indices indicates a good fit of the observed data with the estimated model. However, goodness of fit indices generated in this study are not sensitive to multiple discrepancies between matrices. EPC values indicated 61 discrepancies (see table 3 and 4). Understanding why these discrepancies exist can provide information in how to improve TBLL and what variables may affect its results. The discrepancies in correlations presented in Table 3 were grouped according to common reasons why the discrepancies were higher in the observed correlation matrix than in the estimated matrix. We thus found six discrepancies groups.

The first group consisted of discrepancies between statement 30 with 6 (EPC = .267), 7 (EPC = .276), 8 (EPC = .307), 9 (EPC = .353), and 10 (EPC = .258), and statement 27 with 6 (EPC = .196), 7 (EPC = .157), 8 (EPC = .244), 9 (EPC = .239), 10 (EPC = .146). Statements 27 and 30 are constructivist and statements 6, 7, 8, 9, and 10 are behaviorist, and in the observed matrix they have a positive correlation while in the estimated they have a negative correlation. These discrepancies exist due the influence of other constructivist and behaviorist statements which have a negative correlation in the observed matrix. These

discrepancies are probably caused by a conceptual difference, while statements 26, 28 and 29 express that correcting children's writing and reading is not what makes them learn, statements 27 and 30 do not express this directly. Since all behaviorist statements explicitly state that correction is important in children's learning to read and write, teachers that agree with 26, 28 and 29 are disagreeing with behaviorist statements, while teacher that agree with 27 and 30 are not.

The second group consisted of discrepancies between statements 11 with 4 (EPC = .214) and psycholinguistics (EPC = .552), 3 with 25 (EPC = .177), socio-cultural (EPC = .617), maturation (EPC = .861), and psycholinguistics (EPC = .410), 22 with 1 (EPC = .203) and 11 (EPC = .104), 14 with psycholinguistics (EPC = .773), 15 with socio-cultural (EPC = .565). All these discrepancies are between maturation, psycholinguistics, and socio-cultural statements. A possible explanation is that they belong to the same factor or that they have a higher order factor in common. This group will be further discussed below.

The third group consisted of discrepancies between statements 30 with 3 (EPC = .187), 5 (EPC = .153), 1 (EPC = .128), 25 (EPC = .122), 14 (EPC = .117), socio-cultural (EPC = .883), nativist (EPC = .658), maturation (EPC = .614), psycholinguistics (EPC = .543), and behaviorist (EPC = .445). All these discrepancies are from statement 30 with other factors, indicating that what conceptually it states that is: children need to realize what they are doing wrong so they can learn how to correct it, is a concept consensual among teacher from different theoretical orientations. To eliminate these discrepancies, statement 30 needs to be reformulated or eliminated from the questionnaire. The reformulation is preferable to increase the factors alpha and CR, and to identify if in the translation any conceptual meaning was lost that is more specific to constructivist theory and if added could improve constructivist factor statistically and theoretically.

The fourth group consisted of discrepancies between statements 15 with 25 (EPC = .230) and 30 (EPC = .122), 18 with 28 (EPC = .193) and 10 (EPC = .153), 12 with 16 (EPC = .122) and 2 (EPC = .120), 21 with 11 (EPC = .110) and 6 (EPC = .106), 28 with 19 (EPC = .101) and 24 (EPC = .101). All discrepancies in this group are from statements that are before or after one another (see Appendix C). They can be explained by CFA estimation process. In CFA patterns of answering the questionnaire that occur due to the questionnaires structure are not used in the calculation of the estimated correlations. So, if TBLL is inducing a pattern of response this will increase the correlation between some statements and they will not be considered in CFA estimation, resulting in discrepancies. Further analysis with the use of CFA analysis adapted to these patterns could improve the fit of the data and

confirm if these discrepancies are caused by the instruments structure or if other explanations are warranted (Ozkok et al., 2019).

The fifth group consisted of discrepancies between statements 17 with 27 (EPC = .141), 23 (EPC = .131), 11 (EPC = .107), socio-cultural (EPC = .506), psycholinguistics (EPC = .809), and maturation (EPC = .863). The discrepancy in this group is probably caused by the word maturation present in statement 17. What our results have shown in table 3, 4 and 6, is that psycholinguistics, maturation and socio-cultural have a higher positive correlation, so the word maturation probably increased statements 17 positive correlation with these factors and their statements causing discrepancies in the model.

And the sixth group consisted of discrepancies between statements 19 with 16 (EPC = .164), 18 (EPC = .183), and 20 (EPC = .196) and 18 with 20 (EPC = .125). All these statements are from nativist factor. There discrepancies are probably caused due to statements 17 presence in nativist factor. Since statement 17 has a higher correlation with multiple factors and statements from other factors, it could be altering the estimation of other statements from nativist by reducing their estimated correlation.

The answer for question 1 and 2 is that overall, the data collected has a good fit with the model estimated. However, there are localized discrepancies not detected by goodness of fit indices, indicating that changes need to be made to the questionnaire to improve its fitness to the model. The improvement of the questionnaire fitness is essential in validating the questionnaire to measure teachers' beliefs about literacy learning on psycholinguistics, behaviorist, maturation, nativist, socio-cultural and constructivist as different construct. If multiple discrepancies exist in the CFA model, then beliefs are representing more than one theory.

4.2. Question 3, 4 and 5

To answer question 3 the values of standardized Cronbach alpha and composite reliability were used. As can be seen in table 5, results indicated that behaviorist, maturation, and socio-cultural factors had good values, while psycholinguistics had acceptable values, constructivist had acceptable values according to composite reliability and unacceptable values according to standardized Cronbach alpha, and nativist had unacceptable values according to both analyses. Behaviorist higher values of internal consistency are probably explained by the similarities in the words used between its statements, all statements used the word correction and three used the word immediate. While other factors with a good but lower internal consistency, like maturation and socio cultural had a more diverse use of words. Maturation statements used terms as laterality, psychomotricity, manual and visual

coordination among others, and socio cultural used the words social interactions, environments, interactions between friend, varying the social connections.

In relation to constructivist factor, its lower internal consistency, can be explained by statement 30 lower correlation with other constructivist statements. Since factors from TBLL have a small number of statements, presenting only one statement with a lower correlation with others statement could have caused the higher decrease of internal consistency in constructivist factor in comparison to the other factors. The reformulation and retest of statement 30 could increase the internal consistency of constructivist factor to acceptable for both composite reliability and standardized Cronbach alpha. In this current version statement 30 is not recommended to stay in the questionnaire, since it is presenting multiple EPC values and is lowering constructivist internal consistency.

In relation to Nativist factor, both composite reliability and standardized Cronbach alpha, indicate that this factor should be eliminated from the questionnaire. Brazilian literacy teachers are not presenting a reliable and consistent pattern of response to nativist statements. Considering that 23.6% (Table 7) of literacy teachers neither disagreed nor agreed with nativist statements and internal consistency is low, a possible explanation is that the concept expressed in the statements are not part of the day to day reality in classrooms or personal life and the theory is not used in manuals or classroom books in a larger scale, so in our large sample consisting of teachers from all Brazilian states a consistent pattern of agreement and disagreement with the scale does not exist, resulting in a factor with low consistency. However, as shown in the sixth group of discrepancies presented above, the word maturation is probably affecting the estimation of the statements factors loadings. Since composite reliability is calculated using factor loadings, another data collection with statement 17, without the word maturation, could result in a factor with higher factor loadings and consequently a higher composite reliability.

To answer question 4, factor correlation and HTMT ratio were used. As seen in table 6, most factors presented acceptable values in both analyses, with exception of psycholinguistics factor with maturation factor, and psycholinguistics factor with socio-cultural factor. These values are in accordance with the second group of discrepancies presented above, which showed higher values of correlation between these factors' statements. This suggests statements from these three statements have a higher correlation than expected in this current model and that combining them into one factor or adding a higher factor could be more appropriate to explain the relation of these factors. However, another explanation could be that, as data in table 7 is showing, answers between these

factors are agglomerating in the agreement column, with over 93.4% of maturation, psycholinguistics and socio-cultural participants scoring as agree. Since the number of degrees that teachers can use to agree with the statements is three, the questionnaire could be limiting the variability of their answers in the agree columns, forcing most of the teachers to agglomerate their degree of agreement with these theories in a straight line. This should be further explored analyzing teachers' patterns of response in these three factors and testing factor correlation results with a longer scale. A Likert type scale with more than seven scales however does not facilitate the visualization of the questionnaire in Qualtrics or in electronics such as mobile phones, so other scales can be used.

To answer question 5, factor loadings were used. As seen in Figure 4, what they indicated is that most of the statements presented a meaningful correlation to their factors, with factor loadings over .4. The only exception were statements 16, 18 and 19, from nativist factor. As discussed above in the sixth group of discrepancies, factors loading estimation could have been affected by statement 17, so the removal of the word maturation in statement 17 could improve these factor loadings, more research is needed to confirm this.

As answer to question 3, 4 and 5, results indicate that the primary problems of the questionnaire are psycholinguistics, maturacionist, and socio-cultural high correlation between statements and factors, nativist low internal consistency, statements 16, 18 and 19 low factor loadings with nativist factor, statement 30 low correlation with other constructivist statements, statement 30 and 27 high discrepancies, and the word maturation in statement 17. However, most of the factors and statements present good values of internal consistency, factor correlation and factor loading, suggesting that the use of some adjustment can improve the quality TBLL

4.3. Limitations and future studies

The two main limitations of this study were its sampling method and data collection. The sampling method, although it provided a high number of participants which is required to run confirmatory factor analysis and our sample consisted of a diversity of Brazilian literacy teachers, we can't confirm if teachers that decided to participate in the course do not have a characteristic that impacts our analysis, and therefore with a different sample of the population the results we obtained would be different, so the replication of these results with different sample of the population is necessary. The data collection limited our control over participants pattern of responses, and despite the use of different methods to select participants with pattern of high effort response, participants with low effort response could

still not have been detected if they took 20 minutes answering while doing other things or if their pattern of low effort response was other than straight lining. So, more research and the use of other methods could improve the detection of high effort participants and inform if results change due to detection method. Methods detection that could be included in the second data collection are: time of response per page and use of bogus items to identify participants not reading the statements.

The data collection period for this study occurred between the first weeks of the course ABC. To improve TBLL, changes will be made to the structure of the questionnaire and tested with participants in a second data collection at the end of the course. Considering the results and discussion above, recommendations for changes in the questionnaire are: 1) removal or change of the word maturation in statement 17; 2) Revision of the translation of statements 30 and 27; 3) Collection of time of response by page instead of total time; 4) Addition of bogus statements; 5) Increase in the number of scales and/or change of scale type. With this changes we could expect that the precision of detection of low effort respondents will increase, that most of the higher discrepancies between the observed data and the specified model will decrease resulting in an improved questionnaire, and that Mahalanobis will identify fewer numbers of outliers. Considering that one of our explanations is that the use of technical terms could be increasing the positive correlation between maturation and psycholinguistics factors and that they will have passed through a one-year course on literacy teaching, a recommendation is that the second data collection occurs with three samples. In the first sample we test if results with the same scale size but after one year of study show a decrease in the factor correlation between maturation and psycholinguistics, in the second sample we test if with a change in scale size and a year of study we observe a difference in factor correlation in comparison to the first sample, and in the third sample we collect data from participants that have not answered TBLL until now and test if our results generalize

5. Conclusion

In summary, our study showed that TBLL is a promising instrument to measure Brazilian literacy teachers' beliefs on learning to read and write. Most of the results are within a good range and future studies could improve its values with the modifications recommended. A second study will show if the modifications suggested by this study will yield good results.

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Appendix

Appendix A – Informed consent

1ª Parte do Estudo Sobre o Curso Online ABC

Caro/a Participante,

Convidamos você a participar num estudo científico conduzido por investigadores da Universidade do Porto, no âmbito do acordo entre a CAPES, a FPCEUP, o IPP e a UAb. Este estudo está dividido em duas partes, no próximo módulo pediremos que responda a segunda parte. Caso concorde em participar, vamos fazer um conjunto de perguntas no início e no fim do curso online ABC, com o objetivo de avaliarmos o curso e o seu impacto nos professores alfabetizadores. O tempo de resposta média neste estudo é de 15 minutos. É muito importante que responda a todas as perguntas.

Os dados recolhidos serão mantidos em absoluto anonimato e serão analisados com total confidencialidade, sendo apenas utilizados para fins de investigação científica. Em uma das questões sociodemográficas, pedimos que forneça o seu email com o único objetivo de possibilitar que também responda em outros momentos do curso. Não iremos usar o seu email para associá-lo as suas respostas, iremos priorizar o anonimato. Os dados recolhidos serão analisados coletivamente preservando a confidencialidade, podendo ser incluídos em publicações e apresentações científicas.

Agradecemos a sua participação, se prosseguir isso significa que: (a) aceita participar voluntariamente neste estudo; (b) tem conhecimento dos objetivos do estudo; (c) tem conhecimento de que os dados recolhidos serão analisados exclusivamente para fins de investigação científica. Se em algum momento não desejar mais participar poderá interromper a sua participação.

Muito obrigada pela sua colaboração!

Pela equipa de investigação:
Rui A. Alves, Universidade do Porto

Se desejar mais informações, pode contactar pelo email:
ralves@fpce.up.pt

- ☐ Aceito participar do estudo
- ☐ Não aceito participar do estudo

A2.15 14. Quantos cursos online você já frequentou?

0 1-3 4-6 7-9 Mais de 10

A2.16 15. Qual aparelho você mais usa para acessar ao curso?

Celular Computador Tablet

A2.17 16. Em qual local você acessa à internet?

Casa Escola Outro

A2.18 17. Para qual ano você leciona?

1º Ano 2º Ano 3º-5º Ano Ensino Fundamental Ensino Médio Não leciono

A2.19 18. Qual é a sua função na escola?

Appendix C – Questionnaire of Teacher Beliefs about Literacy Learning (TBLL)

A3.0

Caro/a Participante,

A seguir apresentaremos a você 30 afirmações. Logo abaixo das afirmações, marque se você discorda totalmente, se discorda muito, se discorda pouco, se não discorda nem concorda, se concorda pouco, se concorda muito ou se concorda totalmente. Leia cuidadosamente cada afirmação.

☐ **Li e compreendi as instruções acima.**

S11 1. No meu ponto de vista, quando as crianças estão motivadas e têm a maturidade necessária, elas são capazes de comunicar através da leitura e escrita.

Discordo Totalmente	Discordo Muito	Discordo Pouco	Não discordo Nem concordo	Concordo Pouco	Concordo Muito	Concordo Totalmente
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S1 2. No meu ponto de vista, é necessário ensinar a criança a construir frases sintaticamente bem estruturadas praticando-as através da fala.

Discordo Totalmente	Discordo Muito	Discordo Pouco	Não discordo Nem concordo	Concordo Pouco	Concordo Muito	Concordo Totalmente
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S21 3. Tenho a opinião que para aprender a ler e escrever é importante o ambiente no qual a criança se move.

Discordo Totalmente	Discordo Muito	Discordo Pouco	Não discordo Nem concordo	Concordo Pouco	Concordo Muito	Concordo Totalmente
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S6 4. Acredito que não se pode deixar as crianças lerem e escreverem errado, deve-se corrigi-las para evitar a fortificação do erro.

Discordo Totalmente	Discordo Muito	Discordo Pouco	Não discordo Nem concordo	Concordo Pouco	Concordo Muito	Concordo Totalmente
------------------------	-------------------	-------------------	---------------------------------	-------------------	-------------------	------------------------

S22 5. Acredito que quanto mais interação existe entre a criança e o meio mais benéfico será para a alfabetização da criança.

Discordo Totalmente	Discordo Muito	Discordo Pouco	Não discordo Nem concordo	Concordo Pouco	Concordo Muito	Concordo Totalmente
------------------------	-------------------	-------------------	---------------------------------	-------------------	-------------------	------------------------

S2 6. Penso que a criança deve discutir e expressar oralmente o que quer dizer, para em seguida poder escrever.

Discordo Totalmente	Discordo Muito	Discordo Pouco	Não discordo Nem concordo	Concordo Pouco	Concordo Muito	Concordo Totalmente
------------------------	-------------------	-------------------	---------------------------------	-------------------	-------------------	------------------------

S16 7. Acredito que existem crianças com 4 anos que já sabem ler e escrever.

Discordo Totalmente	Discordo Muito	Discordo Pouco	Não discordo Nem concordo	Concordo Pouco	Concordo Muito	Concordo Totalmente
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S12 8. Acredito que existem muitos fatores responsáveis pelos erros das crianças na leitura e escrita, especialmente problemas de lateralidade e orientação espacial.

Discordo Totalmente	Discordo Muito	Discordo Pouco	Não discordo Nem concordo	Concordo Pouco	Concordo Muito	Concordo Totalmente
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S3 9. Na minha opinião, uma criança que não se expressa bem oralmente tem dificuldades na leitura e na escrita.

Discordo Totalmente	Discordo Muito	Discordo Pouco	Não discordo Nem concordo	Concordo Pouco	Concordo Muito	Concordo Totalmente
------------------------	-------------------	-------------------	---------------------------------	-------------------	-------------------	------------------------

S26 10. Parece-me importante dar as crianças diferentes espaços, nos quais elas possam escrever o que sentem sem se preocuparem com os erros ortográficos, com a caligrafia, etc.

Discordo Totalmente	Discordo Muito	Discordo Pouco	Não discordo Nem concordo	Concordo Pouco	Concordo Muito	Concordo Totalmente
------------------------	-------------------	-------------------	---------------------------------	-------------------	-------------------	------------------------

S7 11. Para mim, quando as crianças leem ou copiam palavras de forma errada elas devem ser corrigidas imediatamente.

Discordo Totalmente	Discordo Muito	Discordo Pouco	Não discordo Nem concordo	Concordo Pouco	Concordo Muito	Concordo Totalmente
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S13 12. Acredito que se colocarmos tudo no mesmo “saco”, e.g. lateralidade, percepção espacial, conhecimento de direita e esquerda, esquema corporal etc. podemos dizer que todos esses elementos intervêm na alfabetização.

Discordo Totalmente	Discordo Muito	Discordo Pouco	Não discordo Nem concordo	Concordo Pouco	Concordo Muito	Concordo Totalmente
------------------------	-------------------	-------------------	---------------------------------	-------------------	-------------------	------------------------

S27 13. No meu ponto de vista, quando uma criança não adquire a habilidade de ler e escrever naturalmente, se pressioná-la enquanto não estiver pronta ela vai demorar mais para adquiri-la.

Discordo Totalmente	Discordo Muito	Discordo Pouco	Não discordo Nem concordo	Concordo Pouco	Concordo Muito	Concordo Totalmente
------------------------	-------------------	-------------------	---------------------------------	-------------------	-------------------	------------------------

S8 14. Considero que a correção imediata dos erros é muito importante na alfabetização.

Discordo Totalmente	Discordo Muito	Discordo Pouco	Não discordo Nem concordo	Concordo Pouco	Concordo Muito	Concordo Totalmente
------------------------	-------------------	-------------------	---------------------------------	-------------------	-------------------	------------------------

S23 15. No meu ponto de vista, o processo de ensino e aprendizagem da leitura e escrita é uma interação social.

Discordo Totalmente	Discordo Muito	Discordo Pouco	Não discordo Nem concordo	Concordo Pouco	Concordo Muito	Concordo Totalmente
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S17 16. Na minha opinião, existem crianças que em idade precoce podem conseguir comunicar através da leitura e escrita, mas isso depende do seu nível de maturação.

Discordo Totalmente	Discordo Muito	Discordo Pouco	Não discordo Nem concordo	Concordo Pouco	Concordo Muito	Concordo Totalmente
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S9 17. No meu ponto de vista, deve-se sempre corrigir a leitura e a escrita da criança para que ela seja bem alfabetizada.

Discordo Totalmente	Discordo Muito	Discordo Pouco	Não discordo Nem concordo	Concordo Pouco	Concordo Muito	Concordo Totalmente
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S14 18. Parece-me que a leitura e a escrita requerem coordenação visual e manual.

Discordo Totalmente	Discordo Muito	Discordo Pouco	Não discordo Nem concordo	Concordo Pouco	Concordo Muito	Concordo Totalmente
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S28 19. Apoio a ideia de que quando o momento certo chegar a criança terá aprendido a ler e escrever, mas não por serem corrigidas imediatamente.

Discordo	Discordo	Discordo	Não discordo	Concordo	Concordo	Concordo
Totalmente	Muito	Pouco	Nem	Pouco	Muito	Totalmente
			concordo			

S18 20. Apoio a ideia que aprender a ler e escrever é uma habilidade inata.

Discordo	Discordo	Discordo	Não discordo	Concordo	Concordo	Concordo
Totalmente	Muito	Pouco	Nem	Pouco	Muito	Totalmente
			concordo			

S24 21. Na minha opinião, é na interação entre colegas que se vai melhorando e alcançando a habilidade de leitura e escrita.

Discordo	Discordo	Discordo	Não discordo	Concordo	Concordo	Concordo
Totalmente	Muito	Pouco	Nem	Pouco	Muito	Totalmente
			concordo			

S10 22. Na minha opinião, durante um exercício de ditado, os erros devem ser corrigidos imediatamente.

Discordo	Discordo	Discordo	Não discordo	Concordo	Concordo	Concordo
Totalmente	Muito	Pouco	Nem	Pouco	Muito	Totalmente
			concordo			

S19 23. Acredito que existem crianças que descobrem precocemente a ler e a escrever por si próprias.

Discordo	Discordo	Discordo	Não discordo	Concordo	Concordo	Concordo
Totalmente	Muito	Pouco	Nem	Pouco	Muito	Totalmente
			concordo			

S20 24. No meu ponto de vista, quando as crianças estão na pré-escola elas são como “esponjas”, são capazes de aprender a ler e a escrever facilmente com jogos.

Discordo	Discordo	Discordo	Não discordo	Concordo	Concordo	Concordo
Totalmente	Muito	Pouco	Nem	Pouco	Muito	Totalmente
			concordo			

S4 25. Acredito que a criança tem que emparelhar o fonema com o grafema para aprender a ler e a escrever.

Discordo	Discordo	Discordo	Não discordo	Concordo	Concordo	Concordo
Totalmente	Muito	Pouco	Nem concordo	Pouco	Muito	Totalmente

S29 26. Acredito que é importante as crianças terem momentos nos quais possam ler e escrever livremente sem correções.

Discordo	Discordo	Discordo	Não discordo	Concordo	Concordo	Concordo
Totalmente	Muito	Pouco	Nem concordo	Pouco	Muito	Totalmente

S5 27. Considero que a linguagem oral é a base para a alfabetização.

Discordo	Discordo	Discordo	Não discordo	Concordo	Concordo	Concordo
Totalmente	Muito	Pouco	Nem concordo	Pouco	Muito	Totalmente

S25 28. Acredito que o ambiente sociocultural influencia no desenvolvimento da leitura e da escrita.

Discordo	Discordo	Discordo	Não discordo	Concordo	Concordo	Concordo
Totalmente	Muito	Pouco	Nem concordo	Pouco	Muito	Totalmente

S15 29. Acredito que o nível de psicomotricidade da criança influencia na sua alfabetização.

Discordo	Discordo	Discordo	Não discordo	Concordo	Concordo	Concordo
Totalmente	Muito	Pouco	Nem concordo	Pouco	Muito	Totalmente

S30. Penso que uma forma de correção é fazendo a criança perceber que está lendo e escrevendo errado.

Discordo	Discordo	Discordo	Não discordo	Concordo	Concordo	Concordo
Totalmente	Muito	Pouco	Nem concordo	Pouco	Muito	Totalmente