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INITIAL LITERACY VIA SYSTEMATIC TEACHING FOR CHILDREN WITH EXTERNALIZING BEHAVIORS

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ABSTRACT

Externalizing behaviors such as throwing tantrums and aggression are often competing with academic learning. The higher frequency of one behavior over another may indicate flaws in the planning of teaching conditions. It was verified if three boys, between nine and 10 years old, with externalizing behaviors measured by the TRF instrument and not literate, would learn to read and write when exposed to ALEPP (LRWSS - Learning to Read and Write in Small Steps). Teaching program according to equivalence-based instruction and operational approach to symbolic behaviors, with four units, divided into 17 teaching steps, preceded and succeeded by tests. There was no intervention on externalizing behaviors. The results showed more than 80% of correct responses in reading and writing. Future research should verify the replicability of these results with more participants and if the acquisition of academic repertoires would affect the frequency of externalizing behaviors, considering the teacher's abilities to reinforce academic repertoires at the expense of externalizing behaviors.

Keywords: teaching; school learning; behavior problems.

Alfabetización inicial vía enseñanza sistemática para niños con comportamientos externalizantes

RESUMEN

Comportamientos externalizantes como rabietas y agresividad, son frecuentemente competidores al aprendizaje académica. La mayor frecuencia de un comportamiento en detrimento de otro puede indicar fallas en la planificación de las condiciones de enseñanza. Se verificó si tres niños, entre nueve y 10 años, con comportamientos externalizantes evaluados por el instrumento TRF y no alfabetizados, aprenderían lectura y escritura cuando expuestos al ALEPP (Aprendiendo y Leer y Escribir en Pequeños Pasos). Programa de enseñanza con instrucción basada en equivalencia y abordaje operacional de comportamientos simbólicos, con cuatro unidades, divididas en 17 pasos de enseñanza, precedidos y sucedidos por testes. No hubo intervención sobre comportamientos externalizantes. Los resultados apuntaron más del 80% de aciertos en lectura y escritura. Futuras investigaciones deben verificar la replicabilidad de esos resultados con más participantes y si la adquisición de repertorios académicos evaluaría la frecuencia de comportamientos externalizantes, considerando las habilidades del profesor de reforzar repertorios académicos en detrimento de los comportamientos externalizantes.

Palabras clave*:* enseñanza; aprendizaje escolar; problemas de comportamiento.

Alfabetização inicial via ensino sistemático para crianças com comportamentos externalizantes

RESUMO

Comportamentos externalizantes como birra e agressividade são frequentemente concorrentes à aprendizagem acadêmica. A maior frequência de um comportamento em detrimento de outro pode indicar falhas no planejamento das condições de ensino. Verificou-se se três meninos, entre nove e 10 anos, com comportamentos externalizantes aferidos pelo instrumento TRF e não alfabetizados, aprenderiam leitura e escrita quando expostos ao ALEPP (Aprendendo a Ler e Escrever em Pequenos Passos). Programa de ensino com instrução baseada em equivalência e abordagem operacional de comportamentos simbólicos, com quatro unidades, divididas em 17 passos de ensino, precedidos e sucedidos por testes. Não houve intervenção sobre comportamentos externalizantes. Os resultados mostraram mais de 80% de acertos em leitura e escrita. Futuras pesquisas devem verificar a replicabilidade desses resultados com mais participantes e se a aquisição de repertórios acadêmicos afetaria a frequência de comportamentos externalizantes, considerando as habilidades do professor de reforçar repertórios acadêmicos em detrimento dos comportamentos externalizantes.

Palavras-chave*:* ensino; aprendizagem escolar; problemas de comportamento.

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INTRODUCTION

For the analysis of behavior, reading and writing are complex behavioral processes. They are amenable to analysis and teaching in an efficient way by means of their description and operationalization, that is, a description of the target answer and the conditions under which they take place. Providing support to students who are late in learning how to read and write has been the object of many researchers, who aim at describing successful pedagogical procedures to teach reading and writing skills (de Rose, 2005).

One of the adopted models has been the stimuli equivalence relation, an operational model of symbolic behavior (Sidman & Tailby, 1982; Sidman, 2000). The model consists of the establishment of at least two conditional discriminations such as "if… so…" as a common element. The most employed procedure is the *Matching to Sample* (MTS) which consists of the presentation of one stimulus with the function of model and at least two with the function of comparison. The task of the apprentice is to select one of the two stimuli by comparison, depending on the presented model (Rossito, & de Rose, 1989).

For example, if a child hears the word "boneca" and points to a doll rather than at other objects and, if when the child hears the word "boneca" the child points to the written word "boneca" rather than at other words, the child can, without direct teaching, associate the written word to the object and vice versa, while establishing relations between physically different stimuli (Sidman & Taiby, 1982). That is an operational measure of the symbolic behavior and of reading comprehension. Considering that the dictated word, the written word, and the illustration are interchangeable and make up a stimuli equivalence class, the child is already capable of saying "boneca" when referring to the right object, the relations of control exercised by the "boneca" object can be extended to the written word BONECA, and the child acquires the ability to say "boneca" when looking at the word, so that all stimuli in the class start controlling the answer that consists of saying "boneca" (Sidman, 2000), while this is an additional measure for the reading comprehension.

The model of the equivalence relations between the stimuli (Sidman & Taiby, 1982) and between the stimuli and responses (Sidman, 2000) is the basis of programs for the teaching of generalized reading (Zaine, Domeniconi, & de Rose, 2014). Considering the relations between stimuli and responses, if the repertoire of response construction is established, for example (B-O-N-E-C-A), another process, known as recombinative generalization, might lead to the emergence of new words by means of recombinations of minimal verbal units of the taught words (BOCA, BONÉ, CABO). One of the procedures that favors recombinative generalization is the *Constructed Response Matching to Sample* (CRMTS), (de Souza et al., 2009).

The study on the application of this model has demonstrated promising results in the teaching of reading and writing and its prerequisites in individuals with different special education needs, such as, Autistic Spectrum Disorder (Gomes & de Souza, 2016), students with normal development but with a recognized delay in the learning of reading (Reis, de Souza, & de Rose, 2009), children with intellectual disability (Benitez & Domeniconi, 2012), with deaf and hard hearing users of LIBRAS (Santos & Almeida-Verdu, 2012), children with visual deficiency (Quinteiro, 2015) and children who were deaf and hard of hearing with cochlear implant (Lucchesi, Almeida-Verdu, Buffa, & Bevilacqua, 2015). In a large scale, the ALEPP, was tested in a resource room (Cravo & Almeida-Verdu, 2018) and in an even larger scale, in partnership with the Bureau of Education of one of the municipalities of the metropolitan region of São Paulo, while assessing the efficacy of the program with over 500 students with difficulty in the learning of reading and writing, on students from the 2nd to the 5th year of elementary school aged between 7 and 15 years, from eight municipal schools (de Souza et al., 2019), both with positive results considering the target behavior, which is the learning of reading and writing.

Although in the realized research the participants generally had a good performance in tasks involving the selection of words or of pictures corresponding to the respective dictated words, before the teaching programs, in the reading and dictation tasks, the performance is not satisfactory. After going through the teaching programs, the percentage of correct answers for reading and writing increased considerably, reaching 100% of correct answers for trained words and a considerable increase for new words, with or without meaning. Recombinative reading represents an amplification of the students' repertoire. They start reading words that are not directly taught, because of previous learning. When a student starts presenting recombinative reading, it is possible to consider that this student is effectively learning to read fluently.

The software named "Aprendendo a Ler e Escrever em Pequenos Passos" – ALEPP, or "Learning to Read and Write by Small Steps (Rosa Filho, de Rose, Souza, Hanna, & Fonseca, 1998) aims at promoting the learning of essential repertoires to reading and writing and was developed based on the literature on equivalence relations. Its most important characteristics are procedures for the teaching of conditional discriminations between words and dictated syllables and words and printed syllables that minimize mistakes, differential consequences for correct or wrong responses and the gradual progression of content to be taught as

learners gain precision and repertoires ranging from the simplest to the most complex. It includes teaching modules that have already proven efficient in laboratory research works and, nowadays, are available for use in different clinical and educational conditions, which allows for their use and verification for effectiveness in more applied situations and in large scale.[1]

This study has questioned the effectiveness of the ALEPP for children with externalizing behaviors, who traditionally display impulsiveness, aggression, restlessness, as well as defiant, antisocial characteristics (Achenbach & Rescorla, 2000). These behaviors are currently focused on the physical environment (i.e., throwing things onto the floor, breaking stuff) or on the social environment (i.e., assaulting someone physically or verbally). Bandeira, Rocha, Souza, Del Prette and Del Prette (2006) point at the fact that, in the literature on behavioral psychology, it has been possible to observe the coincidence of problem behaviors and learning difficulties, reaching an international scale of about 12% of the children at school age. However, there is still controversy over the origin and causal direction of the relation between the two variables. This study considered that, if they are coincidental behaviors, the choice of emission of academic behaviors, rather than externalizing behaviors, can be affected by available reinforcing consequences (Souza & Coelho, 2019). Immediate, continual consequences, though differentiated for correct and wrong responses, favoring correct responses and minimizing wrong responses planned in the ALEPP, can be conducive to the emission of reading and writing behaviors required by the ALEPP, rather than externalizing behaviors.

Thus, this study proposes that teaching technologies based on well-structured practices, which are sequenced in small steps, with the presentation of few stimuli per attempt and with systematic, immediate, and consistent application of schedules for differential reinforcements towards the attentional response, might minimize losses due to attentional deficits (Duarte & de Rose, 2006). However, the literature that connects behavioral problems and the effects of intervention programs for reading and writing is still scarce (D'abreu & Marturano, 2010) on the one hand. On the other hand, psychology and education have accumulated a large amount of debate throughout decades on the issue of identification of conditions of inequality among students, which promote the exclusion of a segment with stigmatizing characteristics, and that aims at identifying such conditions and neutralizing them by means of variables related to distant community contexts and the formation of guilds and associations (i.e., Guzzo, Mezzalira, Moreira, Tizzei, & Silva Neto, 2010). Beyond the proposal of technical solutions for problems supposedly centered on the individual, this study is in agreement with the debate that assesses the variables responsible for the poor learning of school content by certain groups of students (i.e., Paula & Tfouni, 2009), recognizing that the external conditions for the apprentice might favor or compromise the learning of academic behaviors as well as the ones classified as "externalizing". Nevertheless, this study proposes assessment and intervention on variables more proximal to the target behavior, in this case, procedure aspects related to the learning of reading and writing. Thus, the planning of teaching conditions for one behavior will be the factor leading to the teaching of one behavior rather than another.

Considering the coincidence of academic deficits and externalizing behaviors (Bandeira, et al. 2006), although more recent literature is still scarce, we have been able to find previous records of intervention recommendations such as acting on the reduction of behavioral problems followed by the promotion of academic skills (Harris & Sherman, 1974).

Another direction would be to intervene first on all the academic performance of the students, with answers directly connected to the accomplishment of tasks and the verification of the effects on the so-called problem behaviors. Guilhardi, Betini and Camargo (1977) adopted this proposal with a seven-year-old participant, who had difficulty in reading and writing and presented behavioral problems (standing up at the wrong time, wandering around the class, getting into fights, pushing chairs). The intervention consisted of reinforcing only academic performance. Results verified that it was possible to reduce the frequency of the externalizing behaviors. This study demonstrated that academic behavior can be the target of direct teaching without the necessity to previously eliminate externalizing behaviors caused by the academic tasks.

These results strengthen the hypothesis that behavioral problems and learning problems, concerning the student in the study, were in a scheme of concurrent reinforcement and were incompatible. When the contingencies increased, the reinforcing value for the emission of academic behaviors rather than behaviors incompatible with these, the student started to present, more frequently, the behavior related to the academic task.

In fact, a functional analysis of behavior problems could reveal what keeps them (e.g., if the student is getting attention, in the form of a compliment or criticism, due to such behaviors; or if such behaviors are a way of escaping/avoiding adverse situations involving activities with people at the school or the learning situation itself). An intervention that promoted the alteration of the contingencies of reinforcement

[1] The program is available on the GEIC (Gerenciador de Ensino Individualizado por Computador – Individual Computerized Pedagogical Manager), located at the UFSCar.

present during the emission of behavioral problems could change their probability in those contexts (Hanley, Iwatta, & McCord, 2003). However, that is not the scope of this study. The present study proposes that the intervention on the academic repertoire, although benefiting from an intervention on the social repertoire, cannot be dependent on its occurrence when externalizing behavior problems coincide.

Thus, the intervention assessed whether the still illiterate children with externalizing behaviors, when receiving systematic teaching in reading and writing by the ALEPP software, would learn the academic responses taught and would bring down the frequency of externalizing behaviors monitored by means of the teacher's report.

METHOD

Participants

The participants of the research were three boys aged between 9 and 10 years, enrolled in the third and fourth years of elementary school, with externalizing behavior problems, and who were still illiterate. During the stage of screening and selection of the participants, the teachers indicated students with behavioral problems and learning difficulties and filled out the *Teacher Report Form* (TRF), better described in the section named "environment, materials, and instruments", instrument for tracking externalizing behavioral problems, internalizing behavioral problems, and attention deficits; for this research, we have considered only the results concerning externalizing behavior problems.

The reading and writing skills were assessed by means of the Reading and Writing Diagnosis – RWD (Diagnóstico de Leitura e Escrita - DLE), also hosted on the GEIC server, better described in the section named "environment materials, and instruments", which measured the percentage of correct responses to stimuli-stimuli relations and between stimuli and responses such as oral reading and writing.

Table 1 shows the result of the screening and the most important characteristics of the participants.

The research was approved by the research Ethics Committee of the science department of Unesp Bauru, decision number 254.407) and all ethical procedures were adopted.

Environment, materials, and instruments

Collection was realized in a room available at the school where the students received formal lessons. Multi-functional, the room was equipped with a computer for the management of the activities planned by the ALEPP, loudspeakers from which students would listen to the instructions, and a mouse used for accomplishing the task. Only the student and the researcher stayed in the classroom. The following instruments were adopted:

- *Teacher Report Form* – TRF (Achenbach & Rescorla, 2000): it investigates the frequency of 113 answers that indicate behavioral problems, such as "keeps mumbling or makes strange noises in the classroom?", "restless, hyperactive, or cannot keep quiet?", "disobedient?" or "keeps getting into fights?", in children aged from 6 to 18 years, answered by the teacher. Data were stored in the software, which presented curves, by means of T Scores from zero to 100, indicating whether the child presented problems considered clinical (from 70 to 100), whether the child is on the border line (between 66 and 69) or does not present problems at a clinical level (from 50 to 65), and the externalizing and internalizing scales, also presenting a global analysis of the scales (total) at the end.

– The Reading and Writing Diagnosis – RWD (Diagnóstico de Leitura e Escrita - DLE), which is a software included in the GEIC platform, which assesses 16 types of relations that describe reading and writing, better described in "Design and Procedure". The relations demanded different types of responses, which in his study have been subdivided into selection, composition (writing by selection sequences of syllables on the computer screen) and oral production (reading).

Learning to Read and Write by Small Steps – LRWSS (Aprendendo a Ler e Escrever em pequenos Passos - ALEPP (Rosa Filho et al., 1998): *software* provided

Table 1. *Characterization of the selected participants for research according to the results of the screening*

	Age	year	previous diagnosis	externalizing - TRF	RWD (pre-test)	
					reading[a]	writing[b]
P1	10	3º	F80.9 - unspecified disorder of language or speech development	clinical	56%	87%
P2	9	3º	none	clinical	0%	60%
P3	10	4º	none	clinical	6.7%	40%

Note: according to the RWD subtitle, Reading is represented by the CD relation and [b] Writing is represented by the AE and AF relations.
Source: the authors.

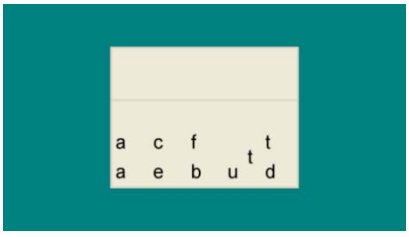
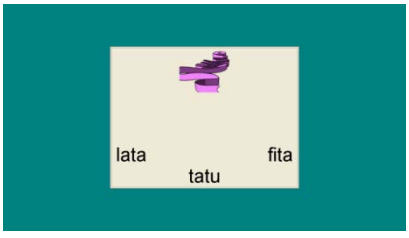
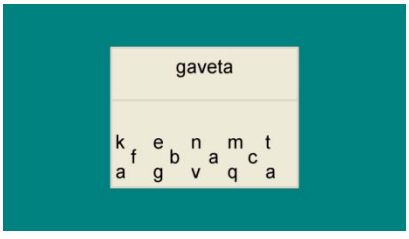
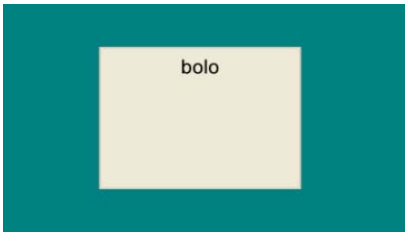
by the GEIC platform, adopted for the assessment and teaching of academic behaviors, made up of a succession of individual tasks, organized into teaching steps, which are put together into units. The program has a total number of five teaching units, divided into 20 steps; each step teaches 3 words at a time. Each session lasted approximately 20 minutes (average time for the execution of a step) and there were three sessions per week. Box 1 displays examples of the types of tasks and computer screens of the program considering the relations between the stimuli (selection-based tasks) and between stimuli and responses (tasks based on composition and on oral production).

Design and Procedure

The study was divided into three stages.

Stage 1 – teachers filled out the TRF for the identification and characterization of externalizing

Box 1. *Relations between stimuli (tasks based on selection answers) and between stimuli and answers (task based on composition and on oral production), representations on the computer screens and audio stimuli present in the RWD(DLE) and LRWSS (ALEPP).*

Relations	representation on screen	audio stimulus	type of response
dictated word and picture		"point to apito"	selection
dictated word and spelling (dictation)		"write tatu"	constructed response
picture and written word		"point to word"	selection
written word and spelling (copy)		"write igual"	constructed response
written word and oral production (reading)		"what is written?"	oral production

Source: the authors.

behaviors by the students recommended for the study. After that, the participants were assessed by the RWD, for the characterization of repertoire in relations of reading and writing in dictation. The RWD tasks were organized into blocks of 15 attempts, designated by two letters: the first one represented the characteristics of the model stimulus (A – dictated word; B – picture; C – written word) and the second one represented the characteristics of the stimuli in comparison with the selection tasks (B – picture; C – written word) or of the topography of the response in construction tasks (E – selection of anagrams; F – writing) and of oral production (D – participant's speech). There was no programmed consequence for correct or wrong responses.

In the selection-based tasks, participants were supposed to choose between the printed word and the picture, the correct comparison stimulus conditioned to: visual stimuli based on relations of physical similarity as picture – picture (BB) and printed word - printed word (CC); auditory stimuli, dictated word - picture (AB) and dictated word - printed word (AC); and visual stimuli based on arbitrary relations such as the relations between picture - printed word (BC) and printed word - picture (CB) (cf. Box 1).

In the oral production tasks, after a stimulus was presented on the computer screen (picture or printed word), participants were supposed to be able to produce the verbal response designated as correct, thus realizing the picture naming (BD), and the reading of words (CD), letters (CD letr.), syllables (CD síl.) and vowels (CD vog.) (cf. Box 1).

In the construction tasks, participants were supposed to produce the correct response conditioned to: words dictated by the computer loudspeaker, such as the dictation tasks by construction of letters (AE) or handwritten (AF) down with paper and pencil; or two written words such as in the copy tasks by composition of letters (CE) and handwritten (CF) down with paper and pencil (cf. Box 1).

Stage 2 – consisted of the teaching of reading by means of exposition to the teaching units of the LRWSS (ALEPP), which also include the pre and post-tests that check on the repertoire for reading and for dictation before and after each teaching unit as a means to check the effects of these.

Each teaching unit was subdivided into steps, and each step presented three words at a time; there was a total number of 20 teaching steps presenting 60 words. The criterion for a student to finish a step and go on to the next step was 100% of correct responses; the conclusion of successive teaching steps established a network of cumulative relations between the dictating word, written word, picture, and syllables. Each teaching unit was preceded and succeeded by selection-based reading tests (BC and CB), oral reading tests (CD), and tests with the dictation of words by construction based on syllables and letters (AE). The assessments before and after each teaching unit presented not only the taught words, but also a set of new words made up by the recombination of the syllables of the taught words, to check whether the student would be able to read new words, in this article, only the results of the taught words will be considered.

Stage 3 - the teachers once again filled out the TRF and the participants were exposed again to the RWD.

RESULTS

This section presents the percentages of correct responses by the participants in the pre and post general tests with the tasks of the Reading and Writing Diagnosis, the percentages of correct responses in the pre and post-tests of the ALEPP, and the results of the TRF, which measures behavioral problems based on the teacher's report.

P1 was exposed to five units of the program and participants P2 and P3 were exposed only two teaching units one and two because it was the end of the school year and the beginning of summer vacation when the children would have to attend another school for the second part of their elementary education.

Although they were exposed to only two teaching units, the post-test of the RWD was given to the participants because they concluded the first 10 teaching steps, which represented the teaching of 30 words.

Reading and Writing Diagnosis

The percentages of correct responses obtained by the participants on the pre (solid bars) and on the post (patterned bars) test of the RWD are displayed on Figure 1, grouped up in accordance with the type of response.

On the pre-test, in the selection tasks, all participants got over 50% of correct responses in all relations between stimuli and, in some that involved relations of physical similarity between pictures (BB), between written words (CC) and the recognition of the relation between dictated word and picture (AB), were precise, practically. In the arbitrary relations involving the written word, that is, recognition of words (AC), between picture – printed word (BC) and printed word – picture (CB), P1 obtained over 93% of correct responses, P2 between 53% and 73% and P3 between 60% and 73%. In the tasks of oral production, the greatest percentage of correct responses was 53% obtained by P1 in the reading of words (CD); P2 did not obtain the correct responses and P3 obtained only 7% of correct responses. In the other relations of oral production, be it the picture naming (BD), of letters (CD letters) or syllables (CD syll), the performance was 50% of correct responses. In the

relations that involved composition, the results in copy (CE, by selection of letters on the screen and CF, writing) were always above the ones of the dictation (AE and AF), and the lower results in dictation registered for P2 and P3 (between 60% and 40% correct responses).

After the exposition of all teaching units by the ALEPP, the post tests of the RWD were superior for all relations involving printed words (AC, BC e CB), reading of words (CD) or writing by dictation (AE and AF), being superior to 85% of correct responses or reaching precision for the three participants, as we can observe in Figure 1.

Teaching unit of the LRWSS (ALEPP)

Percentages of correct responses on the pre and post-tests of the teaching units are presented in Figure 2. Data were extracted from the relations of reading words (CD), and dictation (AE), and relations of selection of pictures involving printed words and vice-versa (BC and CB).

The relations based on selection (BC and CB) that were already good, reached precision for all participants.

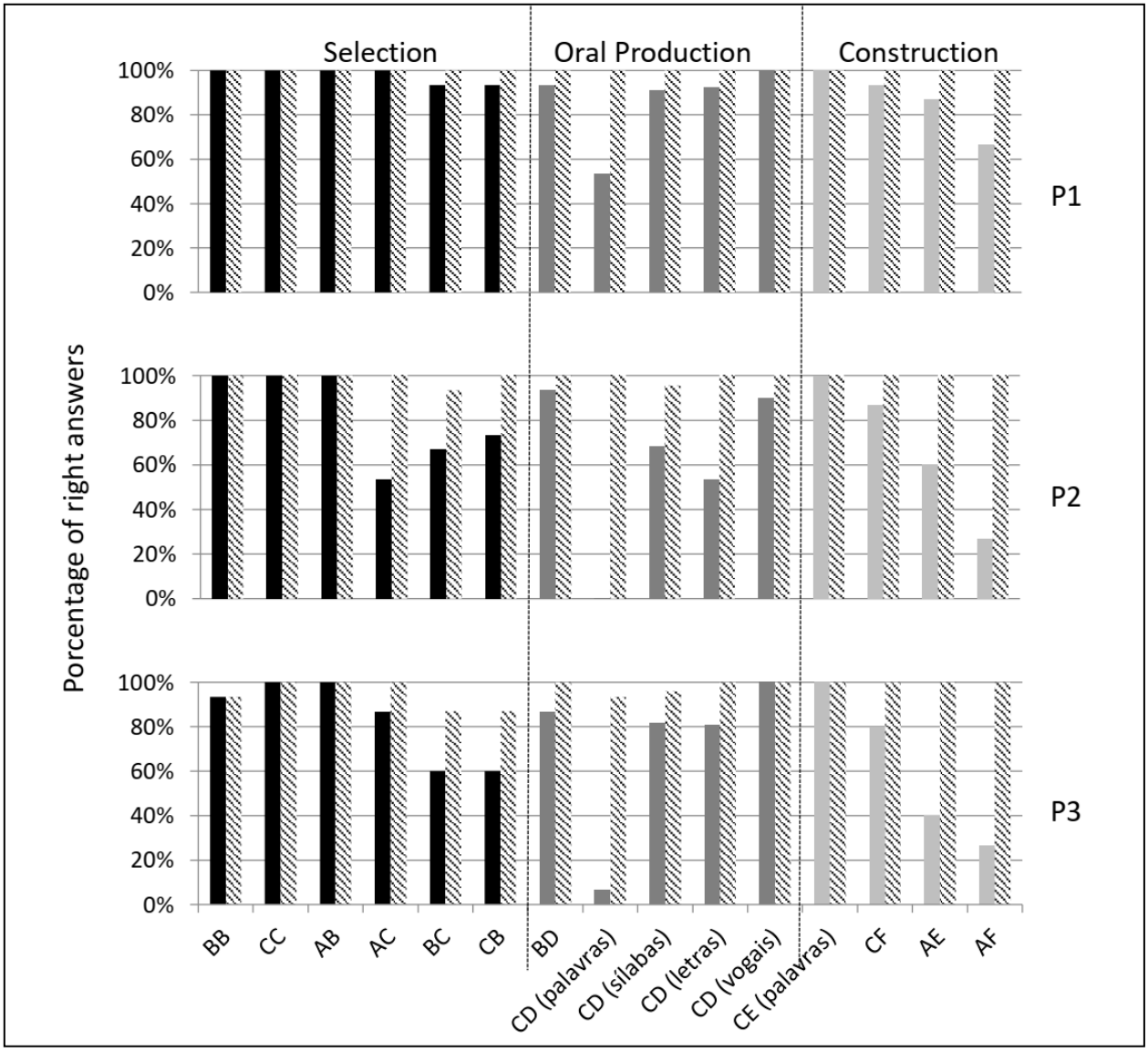


Figure 1. Tested relations.

CD (palavras) – Words; CD (sílabas) - Syllables; CD (letras) – Letters; CD (vogais) – Vowels; CE (palavras) - Words

Note: the performance of the participants in the selection, oral production, and construction tasks in the Reading and Writing Diagnosis as pre-tests (solid bars) and post-tests (patterned bars). The letters represent relations between stimuli and stimuli and responses. A, B, and C represent stimuli, where A = dictated word; B = picture; C = written word; D, E and F represent topography-based responses, where D = oral production, E = construction of responses by means of the selection of syllables and F = writing.

Although P1 presented 56% of correct responses in reading for the RWD, in the pretests of the unit, with fewer words, their performance was already precise in the pre-test. The only exception was for unit 2 where there were 90% of correct responses on the pre-test and there was precision on the post-test; P2, who had null results and the reading pretest, presented results superior to 60% in the post tests; P3 who already had results around 50% of correct responses, reached precision in the post tests of the units in the relations based on selection. In writing, considering the results on the pretest of the RWD, the results were 87% of correct responses for P1, 60% for P2, and 40% for P3; in comparison with the post-tests of the teaching units, P1 and P3 obtained 100% of correct responses and P2 reached 90% in unit 2.

Teacher Report Form – TRF

Table 2 contains the scores of the TRF inventory obtained before and after the intervention. For the classification of results, according to the instrument, it was considered that scores equal or above 71 meant that the child was considered of "clinical" level, and equal or below 66 is considered a non-clinical level. The scores close to 71 (for example, 67-70) are classified as limit values between "clinical" and "non-clinical" (Achenbach & Rescorla, 2000).

Table 2. *Distribution of scores obtained in the TRF in externalizing behaviors in the pre and post-test.*

Participants	Total score	
	Pre-intervention	Post-intervention
P1	80	51
P2	77	74
P3	71	79

Source: the authors.

According to Table 2, all participants presented clinical levels for externalizing behavior problems in the beginning of the study, considering the 65 score as normal, 65 to 69 score as limit, and a score above 70 was considered clinical. Participant P1 was the one who presented an important reduction in the TRF score (from

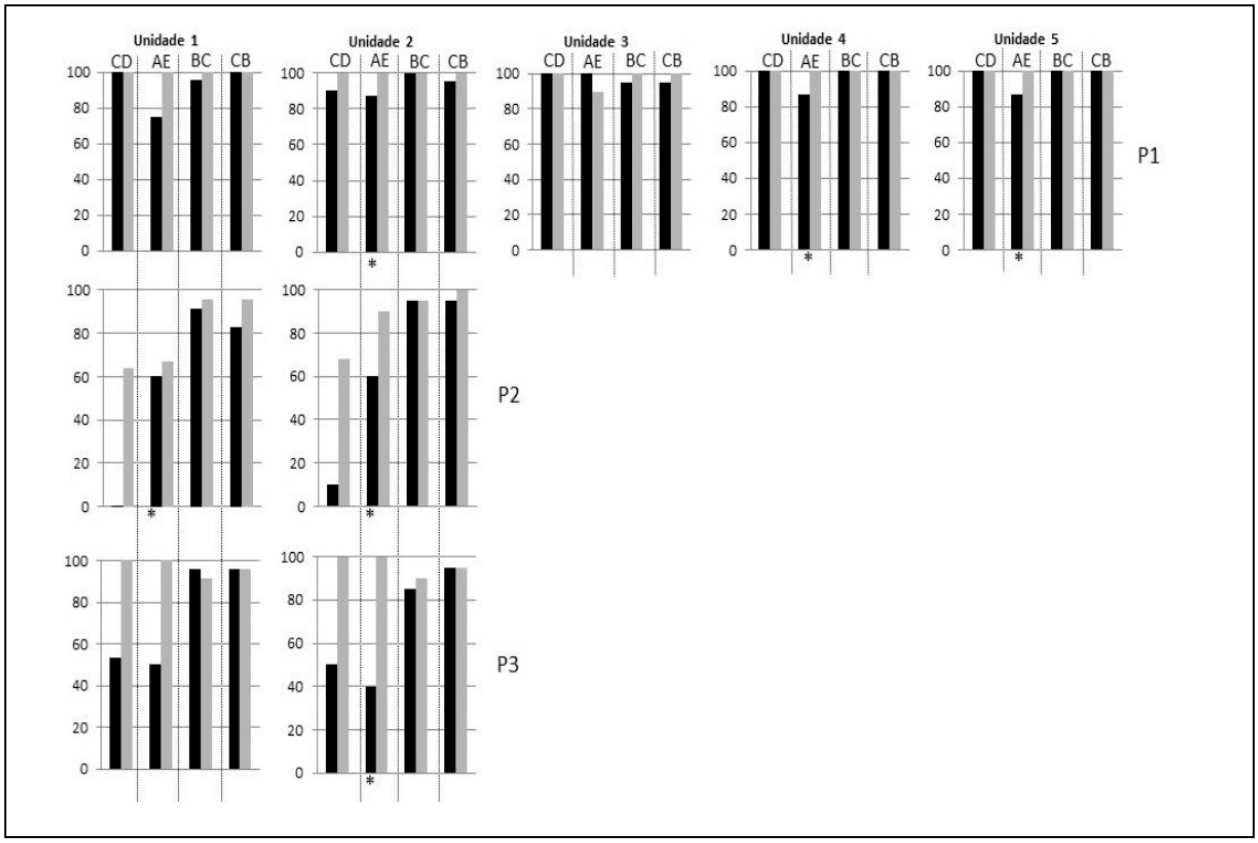


Figure 2. Teaching Units and Trained Relations (Unidade – unit).

Note: performance of the participants in the pre and post-tests of the teaching units. The asterisk (*) indicates that because of a failure in programming, the relation AE was not tested in the pre-test of the unit; in these cases, the percentage of correct responses of the RWD was repeated. The black bars indicate the pretests, and the gray bars indicate the post tests. Abbreviations for relations: CD – reading; AE – dictation; BC - picture – printed word and CB - printed word – picture.

82 to 51), leaving a classification considered clinical towards externalizing behavior problems. Although P2 has gone down in the score (from 77 to 74), it was not enough for this participant to move from the clinical level to the level of externalizing behaviors. Participant P3 obtained an increase in the score (from 71 to 79), remaining and aggravating the emission of externalizing behavior problems.

DISCUSSION

The occurrence of externalizing behavior problems might make it difficult and present challenges to the learning of other socially relevant behaviors, such as academic ones (Bandeira et al., 2006). In the literature, externalizing behaviors and academic repertoires are extensively studied, although either in a correlational way or even in an independent way. The existence and the nature of the relations between these two repertoires is still a scarcely explored territory (D'abreu & Marturano, 2010). This study intended to intervene on the academic behavior of children who are considerably recognized by their externalizing behavior problems and who had not yet learned the basic repertoires of reading and writing, while in the advanced levels of the first part of their elementary education.

After the presentation of the teaching program (ALEPP), the three participants demonstrated high percentages of correct responses in the post tests for assessment of reading and writing (RWD), especially in the most important relations that described reading and writing as an operational measure for comprehension according to the model of the equivalence relations (BC and CB), the oral reading of words (CD), and the writing by dictation (AE).

These studies replicate the literature with quite distinct populations and target Special Education (Benitez & Domeniconi, 2012; de Souza et al., 2019; Gomes & de Souza, 2016; Lucchesi et al., 2015; Quinteiro, 2015). In general, previous studies demonstrated that, with tasks of a systematized program for the teaching of reading based on equivalence relations (de Rose et al., 1989; de Souza et al., 2009), it is possible to observe in an efficient way and with few mistakes, the fast acquisition, and the refining of academic repertoires in diverse populations. Considering the general nature of the results for participants with externalizing behaviors, the present study extends the effects of the contingencies programmed by the ALEPP on the learning of reading and writing for this population. The participants needed to go through each teaching step only once, so that the contingencies presented by the ALEPP were enough to keep the participants engaged in the task. The teaching steps that constitute the units demand precision in order to advance; and the adopted procedure based on exclusion (in which familiar words are excluded to establish a relation between unknown stimuli) minimizes the occurrence of mistakes.

The teaching situations programmed by the ALEPP were enough to keep the participants in the tasks. Advancing in the programming after only one exposition to the teaching units allows us to infer that, according to the analysis of the behavior of choice (Souza & Coelho, 2019), the participants preferred, in that context, to realize the tasks of reading and writing in detriment of the emission of externalizing behaviors. The results of the TRF, discussed in the following lines, corroborate this interpretation.

After exposition to the ALEPP, the three participants learned relations that involve reading and writing, reaching the level of precision, measured by the RWD. Independently of the number of units to which they were exposed, all participants demonstrated high percentages of correct responses in the tests at the end of the program, especially in the relations that involved comprehension (relation between the printed word and picture and vice-versa, BC and CB) of oral reading (CD) and writing by dictation (AE). The results for the participants of the final RWD indicated that the participants benefited a lot from the teaching tasks in the procedure of the CRMTS (*Constructed Response Matching-To-Sample*), by their capacity to generate new repertoires by means of the learning of segmentation of words that participated in the teaching of smaller units and in the recombination of these new units (de Souza et al., 2009).

The progression of teaching happened due to the characteristics of the individualized teaching of gradual progression of content to be taught and the level of difficulty, by means of the establishment of a cumulative baseline, of teaching with no mistakes or consequences that would make a difference in performance. As the contingencies programmed by the ALEPP increased the reinforcing value for the emission of academic behaviors, the participants started to present with greater frequency the behavior is related to the academic task during the teaching sessions.

The results in the TRF, which is an instrument based on the teacher's report, demonstrated that the externalizing behaviors decreased in the teachers' perception for P1 and P2, although only P1 left the clinical level. These data suggest that, for these participants, the externalizing behavior problems were competing with the learning of academic content. By doing the intervention only on academic behaviors, the participants in this study started to emit that behavior more frequently, in detriment of externalizing behaviors such as in the study by Guilhardi et al. (1977).

Participant P1 needed 66 sessions to conclude all the five units of the ALEPP successfully and 33 sessions were needed so that P2 and P3 could conclude two

teaching units. Thus, the program proved effective when it comes to teaching the reading of words without any spelling difficulty to participants who are being resistant to learning that lesson in regular conditions without, however, the necessity to intervene, before or directly, on the behavior problems, thus corroborating the observations of Guilhardi et al. (1977).

An expressive reduction in the externalizing behavior problems did not occur for P2 and, for P3. In fact, there was an increase. Therefore, we wonder if the score for externalizing behavior problems would have gone down for non-clinical levels, as in the case of P1, had the participants concluded the teaching tasks of the ALEPP.

An additional analysis might be a pertinent idea. It is possible that the maintenance of the emission of academic behaviors in the classroom, in detriment of externalizing behaviors, might be related to the repertoire of the teacher for perceiving, selecting, and keeping the academic behavior in the context of the classroom, while favoring the generalization of these in the individualized context (where they were learned) for the context of the collective class where they must be kept and made more complex and refined. Future studies must better control the variable of the repertoire of the teacher in the management of behaviors in the classroom and their skill to effectively reinforce the emission of academic and externalizing behaviors.

Thus, had the teachers received training in the management of behaviors for classroom situations, would they have been better at selecting and maintaining the academic behaviors more often than the externalizing ones? Recent research, whose object of study has been the teacher as a responsible agent in the presentation of teaching conditions, points at the fact that teachers do differentiated practices for students who present behavior problems. They are more skillful in their interaction with children with no behavior problems and more aggressive with the ones who do present behavior problems, which might be conducive to the emission of inadequate behaviors (Bolsoni-Silva & Mariano, 2014).

In addition, in order to promote such educational practices, there have been training programs for teachers so that they become more capable of intervening efficiently on behavior problems presented by the students in the teaching of functional analysis (Ferrari, 2016), softwares for the teaching of concepts and behavior analysis (Fornazari, Kienen, Tadayozzi, Ribeiro, & Rossetto, 2012), role playing for the training of skills (Jones, Fremouw, & Carples, 1977) and training in stimuli equivalence (Hayashi, 2007).

This research report intended to contribute to the discussion among areas of Psychology and Education when it comes to approaching school education demands at different levels of analysis and intervention. In the scope of this study, future research works might identify the replicability of the result obtained with P1 and under what conditions an intervention on academic behaviors would affect the frequency of externalizing behaviors, and to what extent the academic task leads to reinforcements (such as the minimalization of mistakes and progression in accordance with learning, as the ALEPP proposes) to diminish the behavior problems, since they are concurrent.

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