Teaching Rudimentary Reading Skills to Students with Autism[1]

Ensino de Habilidades Rudimentares de Leitura para Alunos com Autismo[2]

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ABSTRACT: This study aimed to verify the emergence of relations between printed word and picture, dictated word and printed word and naming words, with the instruction of relations between different stimuli (picture – printed word) and between stimulus and response (naming pictures), employing the multi-sample matching. Two students with a previous diagnosis of autism and enrolled in a special institution participated of this study. The multi-sample matching procedure for teaching the relations between pictures and printed words was employed. In this procedure, each student's attempt was composed of three sample stimuli and three comparison stimuli. The participant should match each of the comparison stimuli with the corresponding sample stimulus. Picture naming relation was also taught. In the test, it was assessed the emergence of relations between printed words and pictures, between dictated words and printed words and naming printed words. The two participants required a low number of attempts in the multi-sample matching procedure to achieve the learning criteria of the tasks and presented emergence of relations not directly taught. The results showed that, in the naming tasks, the participants presented improvement in the performance in the relations evaluated (naming pictures, words, letters and vowels). The two participants maintained zero performance in naming syllables. Future studies should consider the behavioral characteristics of the participants as a resource for teaching planning.

KEYWORDS: Special education. Autism. Reading teaching. Matching with the sample. Stimulus equivalence.

RESUMO: Este estudo teve como objetivo verificar a emergência de relações entre palavra impressa e figura, palavra ditada e palavra impressa e nomeação de palavras, a partir do ensino de relações entre estímulos (figura-palavra impressa) e entre estímulo e resposta (nomeação de figura), empregando o emparelhamento multimodelo. Participaram dois alunos com diagnóstico prévio de autismo que frequentavam uma instituição especial. Foi empregado o procedimento de emparelhamento multimodelo para ensino das relações entre figuras e palavras impressas. Nesse procedimento, cada tentativa foi composta por três estímulos modelo e três estímulos de comparação. O participante deveria parear cada um dos estímulos de comparação com o estímulo modelo correspondente. Também foi ensinada a relação de nomeação de figura. No teste, foi avaliada a emergência das relações entre palavras impressas e figuras, entre palavras ditadas e palavras impressas e a nomeação de palavras impressas. Os dois participantes necessitaram de um baixo número de tentativas no emparelhamento multimodelo para atingir o critério de aprendizagem nas tarefas de ensino e apresentaram emergência de relações não ensinadas diretamente. Os resultados demonstraram que, nas tarefas de nomeação, os participantes apresentaram melhora no desempenho nas relações avaliadas (nomeação de figuras, palavras, letras e vogais). Os dois participantes mantiveram desempenho nulo na nomeação de sílabas. Estudos futuros devem considerar as características comportamentais dos participantes como recurso para o planejamento de ensino.

PALAVRAS-CHAVE: Educação especial. Autismo. Ensino de leitura. Emparelhamento com o modelo. Equivalência de estímulos.

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1 Introduction

Autism Spectrum Disorder (ASD) is a developmental disorder that is characterized by changes present from a very early age, with multiple and variable impact in areas of human development such as communication, social interaction, learning and adaptive capacity. According to the Diagnostic and Statistical Manual of Mental Disorders - DSM 5 (American Psychiatric Association [APA], 2014), the diagnostic criteria for ASD are persistent deficits in social communication and social interaction in various contexts; restricted patterns of behaviors, activities or interests; such symptoms must be present from the onset of childhood, cause losses in social, professional functioning or other important areas of the individual's life.

Some of the characteristics of the person with ASD are difficulties in receptive and expressive language, difficulty in learning arbitrary relationships, difficulty in sequential memory, therefore demonstrating inappropriate behaviors because they do not know what will happen. Several of these abilities are important for learning reading and writing repertoires, and their lag can hinder the teaching and learning process, being then necessary to plan individualized teaching that meets the demands of this population.

Regarding reading, as highlighted by Gomes and Souza (2016), the researches indicate differences in learning to read the text and reading comprehension by people with autism. The oral reading of the text (textual behavior (Skinner, 1957)) is defined by the emission of a sequence of verbal responses corresponding to a text (Rose, 2005), without necessarily understanding, and reading comprehension requires the understanding of the word read or the content of a text (Rose, 2005). Still according to the authors, studies indicate better performances in oral reading than in reading with understanding of people with autism.

Reading comprehension can be identified when the learner, when reading a word, relates it to aspects of the world, that is, has a "referent" to the word read. For example, when the learner hears or reads the word "cake", so he/she can understand it, he/she must have his/her "referent" (the object). It is an arbitrary relationship between the spoken and printed word and the object that can be established by direct relation between stimuli through arbitrary matching to sample. In this procedure, the learner must choose between two or more comparison stimuli, conditionally to the presented model stimulus (Rose, 1993). The matching procedures with the model are relevant for the establishment of conditional relationships and have been used since the works developed by Itard with the Wild Boy (Souza & Rose, 2006). Considering the nature of the task, it is about an arrangement present in school tasks, for instance when the student must match elements of correspondent items.

From the establishment of conditional relations between stimuli, we can establish symbolic relations. According to Sidman (1994), the establishment of conditional relations between stimuli can lead to equivalence relations, that is, from the explicit teaching of some relations between stimuli (for example, between a word dictated and a picture; a word dictated and the printed word), other relationships can emerge (e.g. between a picture and the printed word and vice versa) without direct teaching (Sidman, 1994). The formation of equivalent stimulus classes must present the mathematical relations (among stimulus): symmetry, reflexivity and transitivity (Sidman & Tailby, 1982).

Symmetry can be observed when teaching a relation, for example between a stimulus A and a stimulus B, and the inverse relation BA emerges without being taught; reflexivity is observed when there is a relation of the stimulus with itself (AA); transitivity can be observed when, after teaching the relations with a common stimulus, for example teaching the relationship between AB stimuli and between AC stimuli, which presented the A stimulus in common, we observe the emergence of the relationship between the stimuli BC and CB, without these having been taught directly. For example, in teaching the relationship between the word "cake" dictated and the picture corresponding to cake (AB); and teaching the relationship between the word "cake" and the printed word cake (AC), we can verify the emergence of the relations between picture and printed word (BC) and printed word and picture (CB).

In this way, the equivalence of stimuli can be understood as the association of stimuli and the formation of meanings (Sidman, 1994). When reading the word "cake", the learner will be able to understand it, since word dictated, printed word and picture are part of the same class of equivalent stimuli. These stimuli may, under certain circumstances, replace one another (Sidman & Tailby, 1982). Moreover, the stimulus equivalence paradigm can demonstrate a teaching economy, since the direct teaching of some relationships allows the emergence of new relationships (not directly taught).

Gomes, Varella and Souza (2010) investigated empirical studies that used the stimulus equivalence model to teach varied skills to people with autism. The results indicated few studies (nine papers in national and international scientific journals published until 2009) and variability in participants' performance in relation to the use of the standard matching to sample teaching procedure. According to the authors, the failures seem to be more about difficulties in learning arbitrary relationships and less on the emergence of new relationships after acquisition of the baseline. In view of these results, the authors point out as a challenge for the area the development of procedures that favor the learning of arbitrary relations and, consequently, the formation of classes of equivalent stimuli.

Considering this result and seeking to broaden and evaluate teaching strategies for the establishment of arbitrary relationships, Gomes and collaborators (Gomes, 2008; Gomes & Souza, 2008) evaluated one of the variations of the matching with the model. Based on the structure of the Treatment and Education of Autistic and Related Communication Handicapped Children (TEACCH), a program proposed by Schopler in the 1970s at the University of North Carolina, in the matching with the adapted model proposed by the authors and called adapted/multimodel matching, the organization of the matching tasks was composed by the same number of model stimuli and comparisons simultaneously. The learner must relate each comparison stimulus to its respective stimulus model. For example, given the pictures (a ball, a motorcycle and a rooster) and their names printed, the learner should relate each picture with its printed name.

The matching with typical or standard model presents a model stimulus and two or more comparison stimuli (Rose, 1993; Gomes, 2008; Gomes & Souza, 2008). In this case, the learner must indicate the matching stimulus corresponding to the model stimulus. For example, a picture (motorcycle) as a model stimulus and three printed words (motorcycle, rooster and ball) (comparison stimuli), the learner should indicate the word corresponding to

the picture. In both procedures, the task of the individual would be to pair the stimulus model with the corresponding matching stimulus.

Considering the two matching procedures with model (standard and multimodel), Gomes and Souza (2008) aimed to evaluate the performance of people with autism in an identity-matching task under two procedures that differed in the way the stimuli were presented and the answer of choice. The matching procedure with standard and adapted model or multimodel were employed. In the standard matching procedure, each trial presented a model stimulus and three comparison; in the multimodel matching, three model stimuli and three comparison stimuli were presented simultaneously. Attempts at matching procedures with the model were presented in binder partitions, organized sequentially. Photographs, colored drawings, black and white pictograms, printed words, sequences of letters and pictures composed of numbers and quantities were used as stimuli. In standard matching, each attempt presented a model stimulus at the top of the page on the right and three comparison stimuli at its bottom. On the page to the left there was a wooden toothpick, fastened with Velcro (marker). Below each comparison stimulus, there was also a piece of Velcro on which the participant could attach the marker to indicate his/her choice. In multimodel matching, each attempt had three model stimuli on the right page and three mobile comparison stimuli, attached to the Velcro of the page on the left. These stimuli could be removed and pinned onto each of the model stimuli of the page to the right. The closing indication of the attempt was when the left page was empty; so the participant could turn the page and do the next activity.

Twenty people with autism between 4 and 31 years of age participated in this study, eleven used speech to communicate and nine did not speak. The results showed that, despite the variability in the performance of the participants regarding the number of correct answers, the most accurate and correct performances occurred in the multimodel matching. The data indicated that the nonverbal participants with lower scores in the characterization tests were those that presented greater discrepancies in the performance between the two types of matching, presenting better performance in the multimodel matching than in the typical one.

Gomes and Souza (2008) pointed out that the results can indicate combined effects of a series of variables, some related to the characteristics of autism, previous learning histories and the characteristics of the task organization itself. The authors also mentioned that visually structured tasks were indicated as facilitators by the authors of the TEACCH program. Thus, the way multimodel matching was structured could favor the perception of the beginning and the end of the task, besides indicating visually logical relations between the stimuli (each stimulus has its pair). The authors also emphasized the need for a broader evaluation in order to use the multimodel matching procedure, with participants with other repertoires (for example, with children with typical development).

Continuing the investigations, based on the results obtained by comparing the two procedures, Gomes (2008) empirically investigated conditions for the teaching of discriminations of more complex behavioral repertoires. The purpose of the second study was to verify if the explicit teaching of conditional relations, using compound stimuli and unit stimuli, in multimodel matching tasks, and teaching of naming relationships, would enable emergent performances, indicative of equivalence of stimuli in children with autism, among them the functional or

rudimentary reading. The study included children with a diagnosis of autism aged between 5 and 11 years old. The relationships between picture/printed word and printed word were taught using the multimodel matching procedure and the naming of the picture. The relationships between picture and printed word and printed word naming were tested.

In this study, the selection of the stimuli to be taught was made from topics of interest to each participant, with the choice of 18 preference items, whose names were composed preferably by simple syllables and different syllable families. The results showed that, in general, the four participants were able to learn the relationships between picture/printed word and printed word and also to name the corresponding pictures. In the tests, participants presented the emergence of relationships not taught directly. The results demonstrated the importance of the organization of the stimuli in the tasks with necessary condition for learning of abilities in people with autism.

The study conducted by Gomes, Hanna and Souza (2015) aimed to broaden the evaluation of multimodel matching tasks for the teaching of arbitrary relations between pictures and printed words. Three children with a previous diagnosis of autism, who used speech and were non-literate, aged between 5 and 12 years of age participated in the study. The relationships between pictures and printed words were taught through the use of compound stimuli and the naming of pictures. In addition, the emergence of the naming relations of printed word and between dictated words and printed words and between printed words and pictures and vice versa were tested. The words to be taught to each participant were chosen from a list of words indicated by those responsible, considering the use or interest; consisting mostly of simple syllables (consonant-vowel) and easily represented in the image. All participants learned the arbitrary relationships between pictures and printed words taught through multimodel matching. For two participants, changes were required in the procedure, with the decrease of three to two simultaneous stimuli models. The data of the study complement the results of Gomes and Souza (2008), which indicate that the learning of the relations between pictures and printed words was possible with the use of multimodel matching with two or three simultaneous models.

Cruz and Melo (2018) performed a partial replication of the study conducted by Gomes (2011), with the objective of evaluating the effect of the presentation of pairs of identical stimuli on typical/standard and multimodel matching tasks. Twenty-four individuals with Autistic Spectrum Disorder (ASD) between 5 and 13 years old participated in the study. The participants were divided into two conditions, with three blocks of trials each: typical, multimodel and the two mixed types. The order of exposure was counterbalanced among participants of the same condition. The visual stimuli used were: abstract symbols, black and white pictures, words printed with one or two syllables, four digit numeric sequences and colored pictures. The first two blocks contained teaching and testing attempts and the third block only test attempts. In Condition 1, at each correct pairing with multimodel matching, the model stimulus was removed from the screen; and in Condition 2, a compound stimulus with two equal elements (the paired stimuli: model and comparison) was presented. The results showed that the hit percentages were the same or higher in typical matching test attempts, regardless of the condition and order of exposure of the tasks. In Condition 2, scores were higher than Condition 1. The authors indicated that the study contributed to the description and analysis of parameters that should be considered when programming identity tasks for

individuals with autism, indicating the visual organization of tasks, using the compound stimulus to indicate the correct match, criteria for phase change, consequences for correct answers and response topography (click or drag).

Considering the above and the importance of teaching reading to individuals with autism using low cost strategies that may allow the use by most teachers, the present study, based on the studies of Gomes and collaborators, carried out a systematic replication with the objective of verifying the emergence of relations between printed word and picture, dictated word and printed word and naming of words from the teaching of relations between stimuli (picture-printed word) and between stimuli and responses (picture naming), employing multimodel matching in students with autism. In this study, the words to be taught were previously selected by the researcher, considering their composition by simple syllables (consonant-vowel) and facility to be represented by image.

2 Method

2.1 Participants

Two students with autism (with medical diagnosis) participated in this study. Participants were nominated by the special education institution and attended the autism sector. The researcher did not have access to the medical record of the participants. Participant P1 was 7 years old and attended special school and regular school in the extra hour classes, presented level 4 of the Assessment of Basic Learning Abilities (ABLA) (Kerr, Meyerson, & Flora, 1977) and score 36 in the Childhood Autism Rating Scale (CARS) (Schopler, Reichler, & Renner, 1988; Pereira, Riesgo, & Wagner, 2008), whose degree of autism was classified as mild-moderate. Participant P2 was 6 years old and attended the special education institution, presented ABLA level 6 and scored 30 on the CARS scale, classifying him as a typical development with minor autism symptoms. The participants communicated verbally and easily understood the instructions presented by the researcher. Table 1 shows the participants' descriptions, age, gender, ABLA level and CARS score. The research was approved by the Research Ethics Committee with Human Beings (CAAE 49252915.9.0000.5504, Opinion 1.241.432).

Participants	Age (years old)	Gender	Special School	Regular School	ABLA[1] (level)	CARS[2]
P1	7	Male	Yes	Yes	4	Score 36 Mild/Moderate
P2	6	Male	Yes	No	6	Score 30 Mild/Moderate

Table 1. Description of participants, age, gender, special school, regular school, ABLA level and CARS score

Source: Elaborated by the authors.

[1] ABLA: Level 1 - Motor imitation; Level 2 - Position discrimination; Level 3 - Simple visual discrimination; Level 4 - Visual conditional discrimination; Level 5 - Hearing discrimination; Level 6 - Conditional auditory-visual discrimination.

[2] CARS scale: Normal: 15 to 29,5; Mild/Moderate: 30 to 36,5; Severe: 37 a 60.

2.2 Location

The research was conducted in a special educational institution in the hinterlands of the State of São Paulo. The sessions were individual and were conducted twice a week, with an average duration of 20 minutes each.

2.3 Materials and equipment

Teaching and testing tasks were carried out in binders with sheets of cardboard paper for the presentation of visual stimuli (printed pictures and words). The pictures were presented in size 5 cm X 5 cm. The printed words were presented in capital letters with font type Arial, size 45, black with white background. The visual stimuli had Velcro for the accomplishment of the attempts of matching to sample adapted or matching to sample standard. To record the responses, protocols were used, as well as a camcorder and tripod for filming the sessions.

2.4 Instruments

To characterize the participants, two instruments were used, CARS (Schopler et al., 1988; Pereira et al., 2008) to characterize behavioral skills regarding socialization, language, and cognitive abilities. The Scale consists of 15 items that characterize behavior in personal relationships, emotional response, body language and use of objects, responses to changes, fear and nervousness, verbal and nonverbal communication and level of activity and awareness of the intellectual response, each item being scored, ranging from normal to severely abnormal, all contributing equally to the overall score. The respondent can be a relative, a teacher, a caregiver and also the researcher him/herself by observing the behaviors of the individual. According to the instrument, autism is characterized by a score of 30 points on a scale ranging from 15 to 60 points, being the range between 30 and 36.5 defined as characteristic of mild to moderate autism; and between 37-60 points, defined as severe autism. The CARS scale, for the Brazilian population, is an instrument validated by Pereira et al. (2008).

The ABLA test (Kerr et al., 1977) assesses the individual's discriminative repertoire through six tasks that require motor imitation skills (level 1), position discrimination (level 2), simple visual discrimination (level 3), visual conditional discrimination (level 4), auditory discrimination (level 5), and auditory-visual conditional discrimination (level 6). The test application lasts approximately 30 minutes. To carry out the tasks, a yellow can (15.5 cm diameter x 17.5 cm high), a red box (14 cm high x 14 cm wide x 10 cm deep), a piece of foam (5 cm x 5 cm), a red cube (5 cm x 5 cm x 5 cm) and a yellow cylinder (9 cm high x 4 cm in diameter) are used. The instrument was not validated in Brazil.

2.5 Experimental design

A pre and post-test design (Cozby, 2009) was used for general reading performance. The independent variable of the study was the teaching procedure and the dependent variable was the participant's performance in the reading skills.

The planning of unit teaching composed of blocks of instruction and the constant evaluation of the naming of the nine words before and after each teaching block allowed to use

a multiple baseline design (Cozby, 2009) between blocks of words taught. The multiple baseline design has the objective of demonstrating that changes occurring in dependent variables occur when an independent variable is applied. This type of design is used in the area of Special Education when the study involves some conceptual learning (Nunes & Walter, 2014).

2.6 Procedure

The general procedure was composed of seven steps, described below.

1) **Familiarization between participants and researcher:** The research was conducted by the first author of the study. Initially, the researcher became familiar with the research participants. The researcher accompanied the students in the classroom for three weeks, seeking to observe their behaviors and interacting individually with the students in class activities.

2) **Identification of preference items:** A survey of preference items was carried out to define which would be used as potentially reinforcing consequences during the teaching procedure. In order to select the preference items, the teachers of the participants indicated to the researcher the main toys they preferred, such as cars, miniatures of cartoon characters among others. The researcher selected the toys and observed which toy the student most played with, both during play time and frequency of toy choice. The researcher also observed or interacted by playing with the participant to identify how the student behaved when praised.

3) **Assessment of behavioral and discriminative repertoires:** CARS (Schopler et al., 1988) was applied to characterize the behavioral repertoire and ABLA (Kerr et al., 1977) to characterize the discriminative repertoire.

4) **Pre-test of general reading repertoire evaluation:** The pre-test was performed to evaluate the relationships between picture-picture (BB); printed word-printed word (CC); picture-printed word (BC); printed word-picture (CB); dictated word-picture (AB); dictated word-printed word (AC); picture naming (BD); naming printed words (CDp); naming syllables (CDsi); naming letters (CDI); naming vowels (CDv). The pre-test aimed to evaluate the initial repertoire of reading skills. The words tested were the same ones that would be taught during the procedure and were organized and presented in the binder (tabletop tasks). The matching procedure with standard model was used to conduct the general evaluation of the reading repertoire. This test was based on the Diagnostic of Reading and Writing (Fonseca, 1997; Rose, Souza, & Hanna, 1996). Table 2 shows the relationships tested and the number of attempts.

Tested relationships	Number of attempts
Picture-picture (BB)	4
Printed word-printed word (CC)	4
Dictated word-picture (AB)	18
Dictated word-printed word (AC)	18
Picture-printed word (BC)	9
Printed word-picture (CB)	9
Picture naming (BD)	18
Naming printed words (CDp)	18
Naming syllables (CDsi)	24
Naming letters (CDl)	26
Naming vowels (CDv)	5

Table 2. Pre and post-test tested relationships.
Source: Elaborated by the authors.

The two procedures were used in the teaching units:

5) **Teaching of the first unit consisting of nine words**; and 6) **Second unit teaching consisting of nine words**: The teaching procedure was composed of 18 words formed by simple syllables selected by the researcher and divided into two units. Each unit was composed of three blocks with the teaching of three words in each block. In the first unit, the following words were taught: motorcycle, juice and rooster - Block 1; mouse, finger and knife - Block 2; carpet, horse, and pan - Block 3. In the second unit, they were taught: glue, kite and mouth - Block 1; cow, frog and ball - Block 2; window, doll and shoe - Block 3. Table 3 shows the words taught in each block in the two units.

Unity	Block	Words	Unity	Block	words
Unity 1	Block 1	motorcycle juice rooster	Unity 2	Block 1	glue kite mouth
	Block 2	mouse finger knife		Block 2	cow frog ball
	Block 3	carpet horse pan		Block 3	window doll shoe

Table 3. Words taught in each teaching block of the two units.
Source: Elaborated by the authors.

Each teaching block began with a nomination assessment of the nine printed words. Then the first three words were taught. The matching procedure with multimodel was used to teach the relationship between picture and printed word (BC) and also the picture naming (BD) was taught.

Figure 1 illustrates the three moments of each attempt. The three model stimuli (words and pictures) were presented on the right side of the sheet (aligned side by side); the order of presentation was changed on each attempt. The comparison stimuli (printed words) were presented one below the other (column) on the left side of the sheet, at different positions on each attempt. At each attempt, the organization, the sequence of the model stimuli, and the comparison were randomly arranged to prevent the participant from being under the control of the positioning of the stimuli. Each attempt consisted of three moments.

Figure 1. Illustration of the three moments of each teaching attempt
Source: Elaborated by the authors.

At first, only the pictures were presented to the participant (the other stimuli were covered by a black EVA); the student should then name the pictures (left display in Figure 1). The researcher pointed each picture from left to right and asked the participant "what is this?", the student should name the picture. Faced with a correct answer, the researcher praised the student. Upon an incorrect answer, the researcher presented the correct name, and the student should repeat the spoken word. Faced with the absence of response (after five seconds of the presentation of the instruction), the researcher asked again "what is this?" and presented the correct name.

Subsequently, the compound stimulus (picture and printed word) was presented (i.e. EVA was removed from the printed stimuli aligned to the right of the sheet) and the researcher asked the student to heed the words. If necessary, the researcher would point to the word without speaking what was written, so that the student could observe the writing (intermediate display in Figure 1). At a third moment, the words composing the model stimuli were again covered by black EVA; and the comparison stimuli (printed words) were presented (column on the left of the sheet). The researcher pointed to the printed word without saying what was written and said "where are you going to put it?". The participant should select a printed word (from the column) and relate it with the corresponding picture to the right (right panel); then the participant should select the second word and relate to the corresponding picture; and, finally, the participant should select the third printed word and relate it to the corresponding

picture. It was not necessary for the participant to follow an order, he/she could select the stimuli in random order.

In this procedure, one attempt was considered for the three responses issued by the participant, each related to a relationship between stimuli (picture-printed word). In view of the correctness, a potentially reinforcing consequence was presented to the participant at each matching attempt, that is, after the three responses were issued, the consequence was presented. The reinforcers used for P1 were toys (the participant had access to the toy for approximately 10 seconds) and social reinforcers (such as praise and hand touch); for P2, social reinforcers (such as praise and hand touch) were used and the use of colored chips (at each correct attempt the participant received a chip and placed it on a board, when all the chips were on the board, the participant received a drawing that he/she could paint or the session was closed). In the case of an error, in the attempts of the relation picture and printed word, the researcher indicated the error saying "no, it's not!", removed the stimulus that formed the incorrect relation and placed it in the left column again and allowed the student to do the task again correctly, with a visual hint pointing to the correct stimulus (when necessary). The required learning criterion was to execute correctly at least three consecutive attempts without help or correction by the researcher. Figure 2 shows the schematic diagram of the network of relations between stimuli and between stimuli and response involved in the procedure used.

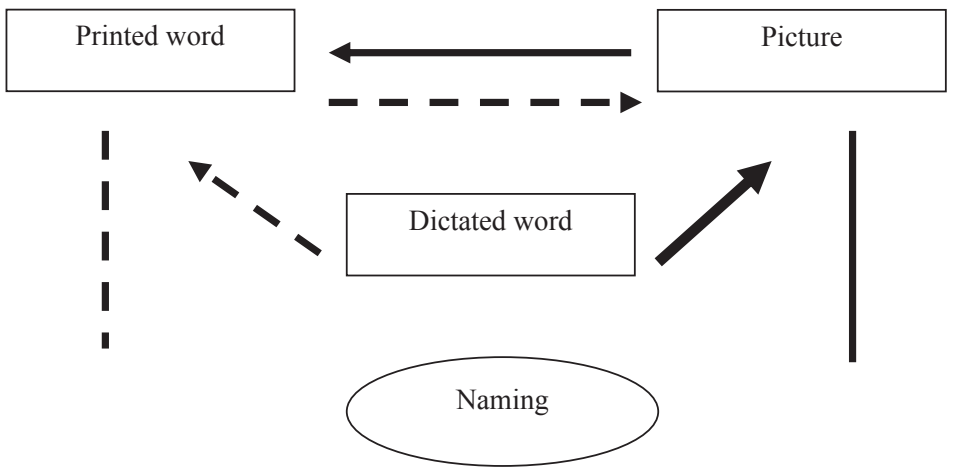

Figure 2. Schematic diagram of the network of conditional relationships involved in the procedure used.
Source: Elaborated by the authors.
* The full arrows indicate the taught performances (BC and BD) or supposedly known (AB), and the dashed arrows indicate the evaluated performances (AC, BC and CD).

After reaching the criterion, the relations printed word-picture were evaluated; dictated word-word printed; and naming printed words with the three words taught in the

teaching block. The relation taught between picture and printed word was also evaluated. The tasks with each relation between stimuli and between stimuli and responses were performed in separate blocks and performed in that order: the first block was composed of nine attempts of the relation between picture and printed word. The second block was composed of nine attempts of the relationship between printed word and picture. Next, the naming of the three printed words taught in nine attempts was evaluated. Finally, the block was conducted with nine attempts of the relationship between dictated and printed word.

The test with 36 attempts was conducted in a single session. In this evaluation, the visual stimuli between words and pictures were presented using the standard matching configuration: a single model stimulus and the three comparison stimuli were presented; the participant should relate the stimulus comparison (presented on the left side of the sheet) with the corresponding model stimulus (presented aligned to the right side of the sheet). In the auditory-visual relations, the researcher dictated the word and the participant should point the corresponding printed word among the printed words presented aligned in the central part of the sheet on the right side of the binder. After the test, a final evaluation of the naming of the printed words was conducted. In this evaluation the nine words taught in the teaching unit were presented. The same sequence was used to teach the other blocks composed of three words.

6) **Post-test evaluation of the general reading repertoire:** After reading the second unit, the post-test was carried out to evaluate the relationships between picture-picture; printed word-printed word; picture-printed word; printed word-picture; naming picture; dictated word-picture; dictated word-printed word; dictated letter-printed word; naming printed words; naming syllables; naming letters; naming vowels. The aim of the post-test was to evaluate the final repertoire of reading skills and to compare them with the initial performances.

2.7 Agreement between observers

The concordance index between observers (researcher and second observer) was calculated based on the recording of 30% of the filmed sessions. A second naive observer was properly trained to analyze the filming and to fill out the records protocols of the reading assessments conducted in the procedure. To perform the calculation, the number of concordances was divided by the sum of the number of concordances with the one of disagreements and multiplied by 100. The total agreement index was 89.7%.

3 Results

Regarding the teaching of the units, the participant P1, in blocks 1, 2 and 3 of Unit 1, made five, four and eight attempts until reaching the learning criterion. In Unit 2, P1 performed four, three and six attempts in blocks 1, 2 and 3, respectively, until reaching the learning criterion. Participant P2 required three, twelve and ten attempts to reach the hit criterion in blocks 1, 2 and 3, respectively, of Unit 1. In Unit 2, the participant made twelve, nine and six attempts, respectively, in blocks 1, 2 and 3 to reach the teaching criterion.

Figure 3 shows the performance in the emergent relations (CB, AC and CD) and in the relation taught (BC) of the two participants (P1 and P2). In the evaluations in Unit 1, P1 obtained 100% correct answers in the tests of relations BC (taught relationship) and in the emergent relations CB and AC and 66% of hits in CD in the first block; 100% of hits in all relationships in the second block; and 100% of correct answers in BC, CB, and CD and 83.3% of correct answers in the AC relationship in the third block. In Unit 2, P1 presented 100% correct answers in BC, CB, CD and AC relations in all evaluations. Participant P2, in Unit 1, in block 1, presented 100% correct answers in the BC, CB and AC relations and 83.3% in word naming (CD); 100% of correct answers in CB and AC relations; 83.3% of correct answers in relation CD and 66% of correct answers in relation BC in block 2; and 100% of correct answers in BC, CB and AC relations and 58% of hits in CD in block 3. In Unit 2, P2 presented 100% correct answers in BC, CB and AC relations and 83.3% of correct word naming (CD) in blocks 1 and 2; and 100% of correct answers in BC, CB and AC relations and 33.3% of hits in CD in block 3.

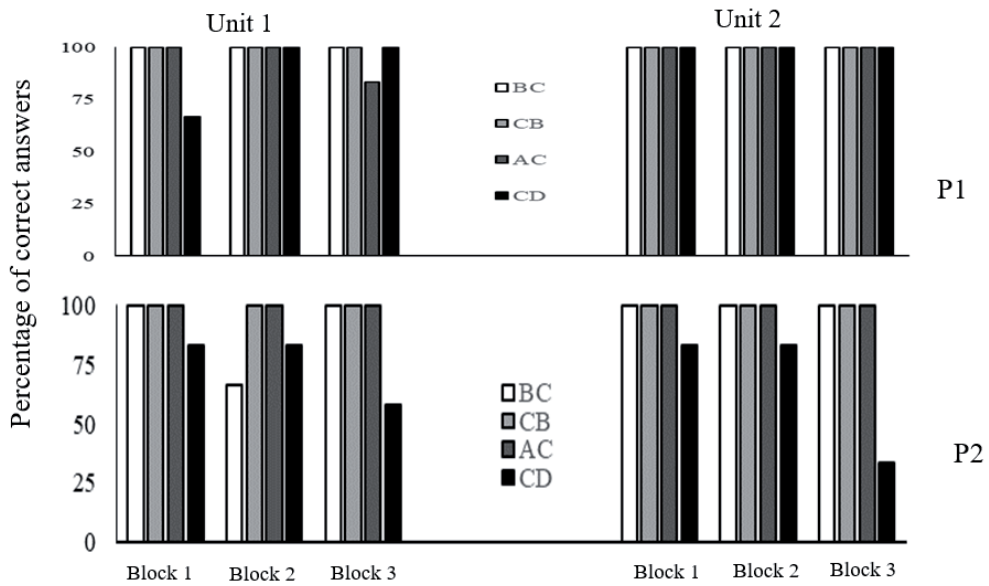

Figure 3. Percentage of correct answers in the relationships evaluated CB (printed word-picture), AC (dictated word-printed word) and CD (naming word) and taught BC (taught relationship between picture and printed word) of each set of stimuli.
Source: Elaborated by the authors.

Figure 4 represents the performance in the skills assessed in the general pre and post-test. It was verified that the participant P1 presented high percentages of correct answers in the relations between the evaluated stimuli (BB, CC, AB, AC, BC and CB) and maintained high or improved performance in the post-test. In the naming tasks, the participant presented 38.9% of correct answers in the task of naming pictures (BD) in the pre-test and 94.4% of correct answers in the post-test. In the word naming tasks, the participant obtained 11.1% of correct

answers in the pre-test and 77.8% of correct answers in the post-test. In the naming vowels, the participant maintained the performance of 100% of correct answers; in naming letters, the participant had 46.1% and 53.8% of correct answers in the pre-test and post-test, respectively; and maintained nil performance in naming syllables. Based on the analysis of performance errors in word and syllable naming, in the pre-test, the participant correctly answered only the words horse and glue; he answered "cat" when three distinct words were presented and named with syllables some words, for example, *sapo* (frog) the participant answered "*sa*" ("fro"); in the post-test, the participant named 14 words correctly. In the syllable naming task, in the pre-test the participant did not respond to the stimulus or answered by saying the name of a letter; in the post-test, the participant answered words when syllables were presented (in 14 of the 24 syllables presented), for example, "CA", the participant answered "carpet".

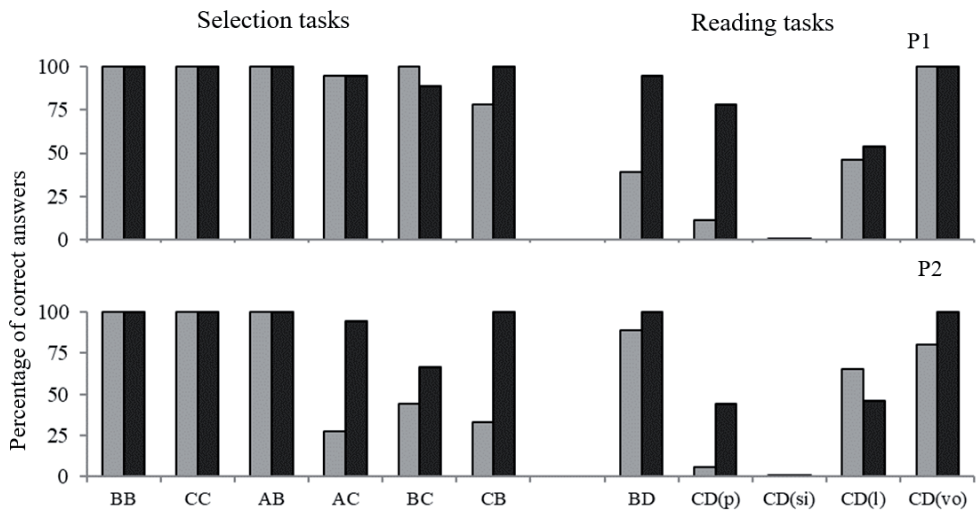

Figure 4. Percentages of correct answers in the selection and reading tasks. Gray bars indicate performance in the pre-test and black bars in the post-test
Source: Elaborated by the authors.

Participant P2 presented high percentages of correct answers in the relations between evaluated stimuli (BB, CC and AB) and maintained a high performance in the post-test. In the relations between dictated and printed word (AC), between picture and printed word (BC) and printed word and picture (CB), the participant presented 26.6, 46.7 and 33.3% of hits, respectively, in the pre-test; and showed improvement in the post-test, reaching 93.3, 66.7 and 100% of hits, respectively. In the naming tasks, the participant presented 88.8% of correct answers in the task of naming pictures (BD) in the pre-test and 100% of correct answers in the post-test. The participant obtained 5.5% of correct answers in the pre-test and 44.4% of correct answers in the post-test in naming words, 80% of correct answers in the pre-test and 100% of correct answers in the post-test in naming vowels; 65.3% and 46.1% of correct answers in the pre-test and in the post-test in naming letters. It is important to note that, in naming letters, in

the post-test, the participant pronounced some word that began with the letter presented. In relation to naming syllables, the performance of the participant remained null.

Figure 5 represents the reading performances of words evaluated before and after teaching (multiple baseline design). In Unit 1, the participant P1 correctly named the word juice in the pre-test and maintained the nomination in the post-tests; the word motorcycle was named correctly in the post-tests and before the word rooster, P1 presented a gradual increase in the number of hits. In block 2, the participant recognized the words in the pre-test. In the post-test, P1 maintained a high performance with the word knife and showed improvement in the performance of the words mouse and finger. In block 3, the participant showed improvement in the performance of the word carpet; before the words horse and pan, the participant presented oscillation in performance throughout the evaluations before the teaching and reached 100% of correct answers in the post-test. In Unit 2, in block 1, the participant P1, before the word kite, presented null performance in the pre-test and 100% of correct answers in the post-test; before the word glue, the participant presented 50% of correct answers in the pre-test and 100% of correct answers in the post-tests; and before the word mouth, the participant presented oscillation in the number of correct answers throughout the evaluations.

In block 2, before the word cow, the participant maintained the performance of 100% of correct answers; with the word frog, P1 showed improvement in performance after teaching; and with the word ball, the participant presented oscillation in the performance, in the first pre-test obtained 100% of correct answers, in the second 0% of correct answers and in the post-tests maintained the performance of 50% of correct answers. In block 3, with the words shoe and doll, the participant P1 presented null performance in the pre-tests and 100% of correct answers in the post-test; before the word window, the participant presented performance equal to or greater than 50% of hits since the pre-tests.

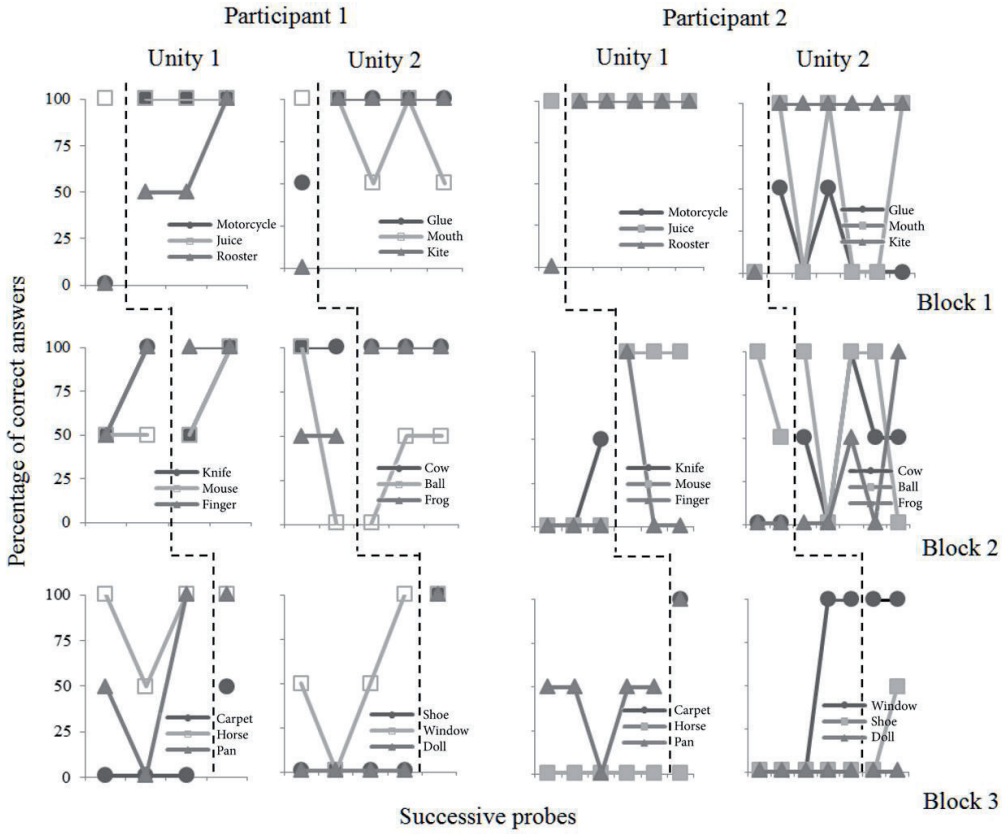

Figure 5. Percentage of correct answers to the readings of printed words from Unit 1 and Unit 2. The vertical dashed line represents the teaching of words (measures to the left of the line indicate before teaching and measures to the right of the line after the teaching of the words)
Source: Elaborated by the authors.

Participant P2, in Unit 1, did not name the words motorcycle and rooster in the pre-test and presented 100% correct answers in the post-test; with the word juice, the participant presented 100% of correct answers in all the evaluations. In block 2, with the word mouse, the participant presented null performance in the pre-tests and 100% of correct answers in the post-tests. In relation to the words knife and finger, the participant presented similar performances: few pre-test hits and 100% correct answers in the first post-test and drop in performance in subsequent post-tests. In block 3, the participant named the words carpet and pan after teaching and regarding the word horse, the participant maintained null performance. In Unit 2, in block 1, participant P2 did not name the words in the pre-test and correctly named the word kite in the post-test and maintained oscillating performance in the naming of the words glue and mouth. In block 2, the participant also presented variations in the performance regarding the words of the block, with an increase in the performance in relation to the words cow and frog. In block 3, regarding the words shoe and doll, the participant presented null performance in the pre-test and maintained in the post-test; concerning the word window,

the participant presented null performance in the first evaluation; in the last two pre-tests, P2 presented 100% correct answers and maintained this performance in the post-tests.

4 Discussion

The results of this research replicated those of Gomes and collaborators (Gomes, 2008; Gomes & Souza, 2008; Gomes, Hanna, & Souza, 2015), demonstrating that the multimodel matching procedure enabled the learning of relations between stimuli (picture- printed word) and between stimuli and answers (naming picture), and the emergence of relations between printed word and picture, dictated word and printed word and naming words. It was verified that participants P1 and P2 required a low number of attempts to reach the criterion of correctness in the teaching stages, using the multi-model matching procedure, which indicates to be a viable procedure for baseline establishment. The two participants presented emergence of relationships not taught directly.

The initial evaluation showed that the participant P1 presented high performances in the selection relations between pictures, printed words and dictated words and in naming vowels; intermediate indexes of correctness in naming pictures and letters; low performance in reading words and syllables. Participant P2 presented high performances in the relations of selection of identity between pictures and words and in the selection of the picture when the dictated word was presented and naming pictures and vowels; intermediate performance in naming letters; and below the 50% of correct answers in the relations between dictated word-printed word; picture-printed word and printed word-picture and in naming words and syllables. These performances demonstrate that the participants presented a repertoire considered as prerequisite for teaching reading skills. The use of multiple baseline design between blocks of words made it possible to follow the reading of words before and after teaching, helping to analyze the performances already presented by the participant before teaching, as well as the performance demonstrated in subsequent evaluations to each block of teaching.

A factor that can predict the ease in performing the task in the way it was planned refers to the levels in which the participants were in the Assessment of Basic Learning Abilities (ABLA), the participants presented level 4 (P1) and level 6 (P2). These levels refer to conditional visual-visual discrimination and auditory-visual conditional discrimination, respectively. With this, the participants presented a domain in the task of matching arbitrary stimuli from the beginning of the procedure. Varella, Souza and Williams (2017) aimed to characterize the ABLA-R test, to review the studies about its predictive potential and to discuss its practical implications. According to the authors, the reviewed studies suggest that the test has a good predictive potential for learning tasks involving the same types of discrimination it evaluates. The authors emphasize that, although the instrument has a good predictive potential, its results should not be considered definitive, nor should it be considered as an impediment to discriminative learning. They also emphasize the importance of basic learning repertoires, since ABLA-R presents limitations, characterizing as a discriminatory repertoire evaluation more appropriate for individuals with low functioning and with incipient verbal repertoires. Finally, they emphasize that the rapid application of tests and that the results may be useful to professionals or researchers who need to select target behaviors and/or teaching procedures.

Regarding the matching teaching procedure according to the adapted model, the multimodel procedure was based on the TEACCH structure. TEACCH is used in activities of special institutions. Both participants attended a special education school that employed TEACCH. For the participant P1, it was verified that the tasks facilitated the understanding of what should be done, without requiring many verbal instructions. Participant P2 also did not present difficulties in performing the teaching tasks with the teaching procedure employed. However, the performance in word reading suggests that the participant presented control by specific elements of the taught word. For example, the initial letter of each word; regarding the stimulus shoe, the participant answered juice or frog; in relation to doll, the participant answered mouth or ball. Such words were taught in previous blocks or units.

A strategy indicated to minimize the restricted control of stimuli refers to the use of the differential observing response procedure (DOR) proposed by Dube and McIlvane (1999). Hora and Benvenuti (2007) evaluated the problem of restricted stimulus control in a 6-year-old boy diagnosed with autism. The objectives were to identify restricted control of stimuli in a task of matching with the model using syllables and words and to evaluate the procedure of differential observing response (DOR), which prevented the response of the child to the stimuli comparison was based on only one of the syllables of the word presented as a model. Initial evaluations were conducted using either the matching with the Simulated Model (SMTS) or with delay (DMTS). The results indicated that the participant responded to the stimuli comparison based on only one of the syllables of the word presented as a model. The authors performed the analysis of the errors, verifying that the participant responded under control of the first syllable, that is, he chose any of the words presented as stimulus-comparison with the same first syllable of the word presented as the model. The evaluations performed after the DOR procedure indicated the reduction of the restricted control and change in the error pattern.

Another strategy indicated to maximize control by smaller units (for example, syllables) that makes up a larger unit (for example, words) refers to the Constructed Response Matching to Sample (CRMTS) procedure. In an attempt for CRMTS, the response must be constructed by selecting smaller elements that make up a larger unit. Recent studies conducted in children with ASD have employed the CRMTS procedure (Calado, Assis, Barboza, & Barros, 2018; Paixão & Assis, 2018). Paixão and Assis (2018) aimed to verify the effects of training through CRMTS in the development of textual and comprehension reading, and the construction of sentences, from a computerized procedure. Three studies were conducted. Overall, the results showed that three children with autism presented textual reading and word comprehension. Two children demonstrated textual reading, comprehension, and generalized construction of three and five-term sentences. One child demonstrated textual reading, comprehension, and generalized sentence construction with two terms. The authors indicated that the combined strategies for grading task difficulty, immediate reinforcement, and providing tips, added to the establishment of control by the syllables, contributed to participants' learning to read and construct words and sentences.

Regarding the syllable naming performance, it was verified in this research that the participants presented null performances in the post-test (after the teaching procedure). The teaching procedure did not plan the direct teaching of syllables and letters. Future studies should consider the teaching of syllables, as the study conducted by Gomes and Souza

(2016) that aimed to evaluate the teaching of oral reading and reading comprehension for three children with autism, not literate, aged five years and nine months and nine years and nine months, speakers and students from common schools. The procedure planned the direct teaching of naming simple syllables and naming pictures, with the purpose of establishing combinatorial reading with comprehension, that is, the ability to read orally and understand words composed of simple syllables, from the combination of syllables taught and the formation of classes of equivalent stimuli. The stimuli were divided into six sets of teaching. Participants were evaluated regarding the naming of letters, syllables, words and reading comprehension (relationship between pictures and printed words) before and after each set of teaching. The data were analyzed individually, comparing the performance of each participant before and after teaching. The results showed that the procedure used favored learning and maintenance of combinatorial reading with comprehension, with few teaching sessions and with a low number of errors during the process.

As highlighted by Gomes, Carvalho and Souza (2014), the variability in the profile of people with autism, due to the heterogeneity of the manifestation and the degree of affection of the symptoms, can be a difficulty in the planning of strategies to teach reading skills to population. Benitez, Gomes, Bondioli and Domeniconi (2017) indicated that characteristics such as age, drug treatment, intellectual quotient, receptive vocabulary of students with ASD and intellectual disability are important. However, the authors emphasize that this information can be considered generalist, that is, it does not identify basic skills, especially of academic repertoires, to direct the elaboration of teaching planning by the teacher. The authors further emphasize the importance of recording behaviors that may be considered prerequisites for the study, such as sitting in a chair, maintaining eye contact, and following an instruction presented by an adult. Thus, given the variability of behaviors that may justify the motives that lead some students to perform well in the taught skills (and others do not), the search for information that describes students' repertoires becomes of utmost importance for teaching planning.

As indicated by Costa, Schmidt, Domeniconi and Souza (2013), some factors such as the modality of the stimuli used, the number of comparisons in each attempt, the order in which the relations are taught and the structure in which the stimuli are organized, are relevant variables in the results in teaching procedures and equivalence tests. The authors emphasized that studies that are interested in investigating basic and application questions should consider specific characteristics of the target population, the contingencies of teaching and the evaluation of repertoires taught.

Future studies should seek to minimize the limitations of the present study, in order to increase the number of participants; to use the same structure used in teaching and also in the test; conduct evaluations employing intermittent reinforcement; expand the evaluation of other behavioral repertoires; to use the multimodel procedure with children with autism not exposed to TEACCH. Finally, we highlight the selection of words to be taught. In this research, the words were previously selected by the researcher, without consulting the context of the student. Thus, future research should select habitual words or items of interest of the participant, as in the study conducted by Gomes (2008).

References

Associação Americana de Psiquiatria (2014). *DSM-V-TR: Manual diagnóstico e estatístico de transtornos mentais*. Porto Alegre: Artmed.

Benitez, P., Gomes, M. L. C., Bondioli, R., & Domeniconi, C. (2017). Mapeamento das estratégias inclusivas para estudantes com deficiência intelectual e autismo. *Psicologia em Estudo*, *22*(1), 81-93. doi: 10.4025/psicolestud.v22i1.34674.

Calado, J. I. F., Assis, G. J. A., Barboza, A. A., & Barros, R. S. (2018). Emergência de relações auditivo-visuais via treino por CRMTS para crianças com TEA. *Acta Comportamentalia*, 26(3), 347-362.

Costa, A. R. A., Schmidt, A., Domeniconi, C., & Souza, D. G. de. (2013). Emparelhamento com o modelo simultâneo e atrasado: Implicações para a demonstração de equivalência de estímulos por crianças. *Temas em Psicologia*, 21(2), 469-482. doi: 10.9788/TP2013.2-13.

Cozby, P. C. (2009). *Métodos de Pesquisa em Ciências do Comportamento* (P. I. C. Gomide, E. Otta, & J. de O. Siqueira, Transl.). São Paulo: Atlas.

Cruz, K. R. S., & Melo, R. M. (2018). Identity matching-to-sample and ASD: Effect of pairs of identical stimuli as a consequence for correct matching. *Trends in Psychology/Temas em Psicologia*, 26(2), 687-701. doi: 10.9788/TP2018.2-06En.

Dube, W. V., & McIlvane, W. J. (1999). Reduction of stimulus overselectivity with nonverbal differential observing responses. *Journal of Applied Behavior Analysis*, 32, 25-33. doi: 10.1901/jaba.1999.32-25.

Fonseca, M. L. (1997) *Diagnóstico de repertórios iniciais de leitura e escrita: Uma análise baseada na concepção de relações de equivalência* (Master's thesis). Universidade Federal de São Carlos, São Carlos, SP, Brazil.

Gomes, C. G. S. (2008). *Desempenhos emergentes e leitura funcional em crianças com transtornos do espectro autístico* (Master's thesis). Universidade Federal de São Carlos, São Carlos, SP, Brazil.

Gomes, C. G. S. (2011). *Aprendizagem relacional, comportamento simbólico e ensino de leitura a pessoas com transtornos do espectro do autismo* (Doctoral dissertation). Universidade Federal de São Carlos, São Carlos, SP, Brazil.

Gomes, C. G. S., & Souza, D. G. de (2008). Desempenho de pessoas com autismo em tarefas de emparelhamento com o modelo por identidade: Efeitos da organização dos estímulos. *Psicologia: Reflexão e Crítica*, 21(3), 418-429. doi: http://dx.doi.org/10.1590/S0102-79722008000300010.

Gomes, C. G. S., & Souza, D. G. de (2016). Ensino de sílabas simples, leitura combinatória e leitura com compreensão para aprendizes com autismo. *Revista Brasileira de Educação Especial*, 22(2), 233-252. doi: http://dx.doi.org/10.1590/S1413-65382216000200007.

Gomes, C. G. S., Carvalho, B. S. S., & Souza, D. G. de (2014). Aspectos relevantes do ensino de leitura para pessoas com Transtornos do Espectro do Autismo. In C. Vichi, E. Huziwara, H. Said, & L. Postalli (Orgs.), *Comportamento em Foco 3* (pp. 59-68). São Paulo: Associação Brasileira de Psicologia e Medicina Comportamental - ABPMC.

Gomes, C. G. S., Hanna, E. S., & Souza, D. G. de (2015). Ensino de relações entre figuras e palavras impressas com emparelhamento multimodelo a crianças com autismo. *Revista Brasileira de Análise do Comportamento*, Belém, 11(1), 24-36. doi: http://dx.doi.org/10.18542/rebac.v11i1.1975.

Gomes, C. G. S., Varella, A. A. B., & Souza, D. G. de (2010). Equivalência de estímulos e autismo: Uma revisão de estudos empíricos. *Psicologia: Teoria e Pesquisa*, 26(4), 729-737.

Hora, C. L. da, & Benvenuti, M. F. (2007). Controle restrito em uma tarefa de matching-to-sample com estímulos compostos: Avaliação do desempenho de uma criança diagnosticada com autismo. *Revista Brasileira de Análise do Comportamento,* 3(1), 29-45. doi: http://dx.doi.org/10.18542/rebac.v3i1.822.

Kerr, N., Meyerson, L., & Flora, J. (1977). The measurement of motor, visual and auditory discrimination skills. *Rehabilitation Psychology*, 24, 127-131. doi: 10.1037/h0090912.

Nunes, L. R. O. P., & Walter, C. C. F. (2014). Pesquisa Experimental em Educação Especial. In L. R. O. P. Nunes (Org.), *Novas trilhas no modo de fazer pesquisa em Educação Especial* (pp. 27-52). São Carlos: Marquezine e Manzini: ABPEE.

Paixão, G. M., & Assis, G. J. A. (2018). Efeitos do ensino via CRMTS sobre leitura e construção de sentenças para crianças com autismo. *Interação em Psicologia*, 22(1), 77-88. doi: http://dx.doi.org/10.5380/psi.v22i1.51327.

Pereira, A., Riesgo, R. S., & Wagner, M. B. (2008). Autismo infantil: Tradução e validação da Childhood Autism Rating Scale para uso no Brasil. *Jornal de Pediatria*, 84(6), 487-494. doi: 10.2223/JPED.1828.

Rose, J. C. C. de (1993). Classes de estímulos: Implicações para uma análise comportamental da cognição. *Psicologia: Teoria e Pesquisa*, 9(2), 283-303.

Rose, J. C. C. de (2005). Análise comportamental da aprendizagem de leitura e escrita. *Revista Brasileira de Análise do Comportamento*, 1, 29-50.

Rose, J. C. C. de, Souza, D. G. de, & Hanna, E. S. (1996). Teaching reading and spelling: Exclusion and stimulus equivalence. *Journal of Applied Behavior Analysis,* 29(4), 451-469. doi: 10.1901/jaba.1996.29-451.

Schopler, E., Reichler, R., & Renner, B. R. (1988). *The Childhood Autism Rating Scale* (CARS). Los Angeles, CA: Western Psychological Services.

Sidman, M. (1994). *Stimulus equivalence and behavior: A research history*. Boston: Authors Cooperative.

Sidman, M., & Tailby, W. (1982). Conditional discrimination vs. matching to sample: An expansion of the testing paradigm. *Journal of the Experimental Analysis of Behavior*, 37, 5-22. doi: 10.1901/jeab.1982.37-5.

Skinner, B. F. (1957). *Verbal behavior*. Engelwood Cliffs, NJ: Prentice Hall.

Souza, D. G. de, & Rose, J. C. C. de (2006). Desenvolvendo programas individualizados para o ensino de leitura. *Acta Comportamentalia*, 14(1), 77-98.

Varella, A. A. B., Souza, D. G. de, & Williams, W. L. (2017). O teste ABLA e suas implicações para o ensino de pessoas com autismo e distúrbios do desenvolvimento. *Acta Comportamentalia*, 25(1), 41-56.

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