Research Articles // Artículos de investigación

Theoretical and Review Articles // Artículos teóricos y de revisión

Notes and Editorial Information // Avisos e información editorial

ISSN 1577-7057

Volume 20, number 1 October 1, 2020
Volumen 20, número 1 1 Octubre, 2020

ISSN: 1577-7057

IJP&PT

International Journal of Psychology & Psychological Therapy

https://www.ijpsy.com

IJP&PT

International Journal of Psychology & Psyhological Therapy

International Journal of Psychology & Psychological Therapy is a four-monthly interdisciplinary publication open to publish original articles, reviews of one or more area(s), theoretical reviews, or methodological issues, and series of interest to some of the Psychology areas. The journal is published for the *Asociación de Análisis del Comportamiento* (AAC) and MICPSY, and indexed and/or abstracted in **Cabell's Directory**, **Clarivate Analytics (*Emerging Sources Citation Index*)**, **Catálogo Latindex**, **ClinPSYC** (American Psychological Association), **DIALNET**, **Academic Search Premier** (**EBSCO Publishing Inc**.), **Google Scholar Metrics**, **IN-RECS** (*Index of Impact of the Social Sciences Spanish Journals*), **ISOC** (CINDOC, CSIC), **Journal Scholar Metrics**, **MIAR**, **ProQuest PRISMA**, **PSICODOC** (*Colegio Oficial de Psicólogos*), **Psychological Abstracts**, **PsycINFO**, **RedALyC**, **SCOPUS**.

International Journal of Psychology & Psychological Therapy es una publicación interdisciplinar cuatrimestral, publicada por la Asociación de Análisis del Comportamiento (AAC), abierta a colaboraciones de carácter empírico y teórico, revisiones, artículos metodológicos y series temáticas de interés en cualquiera de los campos de la Psicología. Es publicada por la *Asociación de Análisis del Comportamiento* (AAC) y MICPSY y está incluida en las bases y plataformas bibliográficas: **Cabell's Directory**, **Clarivate Analytics (*Emerging Sources Citation Index*)**, **Catálogo Latindex**, **ClinPSYC** (American Psychological Association), **DIALNET**, **Academic Search Premier** (**EBSCO Publishing Inc**.), **Google Scholar Metrics**, **IN-RECS** (*Índice de Impacto de Revistas Españolas de Ciencias Sociales*), **ISOC** (CINDOC, CSIC), **Journal Scholar Metrics**, **MIAR**, **ProQuest PRISMA**, **PSICODOC** (*Colegio Oficial de Psicólogos*), **Psychological Abstracts**, **PsycINFO, RedALyC** *(Red de Revistas Científicas de América Latina y El Caribe, España y Portugal),* **SCOPUS**.

International Journal of Psychology and Psychological Therapy, 2020, 20, 1, 47-59
20th ANNIVERSARY EDITION // EDICIÓN XX ANIVERSARIO

Dialogic Reading: Effects on Independent Verbal Responses, Verbal and Non-Verbal Initiations, and Engagement of Children with Autism Spectrum Disorder

Lara Rodrigues Queiroz, Victor Loyola de Souza Guevara
Universidade de Brasília, Brazil
Carlos Barbosa Alves de Souza
Universidade Federal de Pará & Instituto Nacional de Ciência e Tecnologia sobre Comportamento, Cognição e Ensino, Brazil
Eileen Pfeiffer Flores*
King's College London, United Kingdon & Universidade de Brasília, Brazil

Abstract

Dialogic reading (DR) is the shared reading of storybooks, interspersed with dialogues about story and illustrations. Previous findings have indicated that DR can be adapted for children with autism spectrum disorder (ASD) and can improve their engagement in shared reading activities. The present study aimed to investigate how DR with a verbal prompting hierarchy impacted the performance of children with ASD engaged in dialogue about the story. We also measured effects on verbal and non-verbal initiations and on task engagement. We used a single-subject design to test a DR adaptation involving a least-to-most prompting hierarchy with two 7-year-old children with ASD and evaluated the effects on independent verbal responses to questions about the story, verbal and non-verbal initiations, and task engagement. The participants showed an increase of independent verbal answers to WH (Who, What, Where, What) questions about the story, and to the more general "What is happening here?" (WIHH) question. One child showed an increase in verbal initiations. Both children showed high task engagement independently of condition, but with less variability when reading was dialogic. The results of this study support the use of story-based open questions and least-to-most prompting verbal hierarchies for helping children with ASD engage in conversation about the story in shared reading settings.

Key words: autism spectrum disorder, dialogic reading, naturalistic intervention, story comprehension, social communication.

How to cite this paper: Rodrigues-Queiroz L, Souza-Guevara VG, Alves-Souza CB, Pfeiffer-Flores E (2020). Dialogic Reading: Effects on Independent Verbal Responses, Verbal and Non-Verbal Initiations, and Engagement of Children with Autism Spectrum Disorder. *International Journal of Psychology & Psychological Therapy, 20, 1,* 47-59.

Novelty and Significance

What is already known about the topic?

- Shared reading could be considered an emerging intervention for children with autism spectrum disorder.
- An interactive type of shared reading, termed dialogic reading, can be adapted for children with autism spectrum disorder (ASD) and can improve their engagement in shared reading activities.

What this paper adds?

- The use of an explicit prompting hierarchy method is a step toward systematization of scaffolding strategies during shared reading.
- It is possible to use verbal prompts to help children with autism spectrum disorder answer questions about the story during dialogic reading.

The casual daily interactions that occur during childhood are usually sufficient for language development (Zauche, Thul, Mahoney, & Stapel-Wax, 2016). However,

* Correspondence: Eileen Pfeiffer Flores, Universidade de Brasília, Departmento de Processesos Psicologicos Basicos, Instituto de Psicologia ICC SUL, Campus Darcy Ribeiro, Asa Norte 70910900, Brasília DF, Brazil. Email: eileen@unb.br

children with autism spectrum disorder (ASD) may have greater difficulty acquiring language skills without additional support (Greer & Ross, 2008; Rakap & Rakap, 2014). Over the years, researchers have developed naturalistic teaching procedures for children with language delays (Charlop-Christy & Carpenter, 2000; Hart & Risley, 1968, 1974, 1975; Rakap & Rakap, 2014; Schuler, Gonsier-Gerdin, & Wolfberg, 1990). These methods follow three principles: (1) adults and activities follow the child's interests and are part of the child's daily routine; (2) activities foster *joint attention* [understood as a condition in which the child and a partner share a common interest (Bruner, 1975; Dube, MacDonald, Mansfield, Holcomb, & Ahearn, 2004; Mundy, 1995)], speaker alternation in conversation, and vocabulary expansion; and (3) adults are responsive to the child's attempts to communicate (e.g., Rakap & Rakap, 2014).

Shared reading (SR), in which an adult reads aloud to one or more children, is an activity that favours the three principles mentioned above (e.g., Fleury, Herriott-Miramontez, Hudson, & Schwartz, 2014; Whitehurst, Falco, Lonigan, Fischel, DeBaryshe, Valdez Menchaca, & Caulfield, 1988). Recently, Boyle, McNaughton, and Chapin (2019) reviewed the empirical evidence and research quality related to benefits of shared reading with children with ASD in several language and literacy domains. They concluded that shared reading could be considered an emerging intervention for children with ASD, based on small to substantial effects on a variety of participation and language measures.

In an interactive type of shared reading, termed dialogic reading (DR), conversation about the story and illustrations allows the adult to shape, reinforce, and expand new verbal responses while following the child's interest (Hogan, Bridges, Justice, & Cain, 2011; Whitehurst *et alia*, 1988; Whitehurst Epstein, Angell, Payne, Crone, & Fischel, 1994; Whitehurst & Lonigan, 1998; Zevenbergen, Whitehurst, & Zevenbergen, 2003). The DR strategies proposed by Whitehurst and collaborators can be summarized in two acronyms: PEER (prompt, evaluate, expand, repeat) and CROWD (completion, recall, open-ended, WH questions, distancing) (Whitehurst *et alia*, 1988; Whitehurst *et alia*, 1994; Whitehurst & Lonigan, 1998; Zevenbergen, Whitehurst, & Zevenbergen, 2003). There is evidence that DR can promote vocabulary expansion (Opel, Ameer, & Aboud, 2009), emerging literacy abilities (Huebner & Payne, 2010), story retelling (Lever & Sénéchal, 2011), and story comprehension (Flores, Pires, & Souza, 2014; Medeiros & Flores, 2016).

In recent years, studies began to test adaptations of DR to children with ASD (e.g., Fleury *et alia* 2014; Whalon, Hanline, & Davis, 2016; Whalon, Martínez, Shannon, Butcher, & Hanline, 2015). Fleury *et alia* (2014), for example, compared the effects of conventional story reading and DR on task engagement and participation of children with ASD. All children showed higher participation with DR. However, since participation was relatively high throughout the experiment, the specific contribution of DR strategies on engagement was not completely clear.

Whalon, Martínez, Shannon, Butcher, and Hanline (2015) tested the effects of an adapted form of DR, termed RECALL, on accurate answers and initiation frequency among children with ASD. They used a least-to-most prompting hierarchy and visual support to promote joint attention and engagement. Additionally, they adapted the last strategy of the acronym PEER changing it to PEEP (P for praise). Shortly after the introduction of RECALL, the four children showed an increased frequency of accurate answers, followed by a decreased need for prompts and an increase in episodes of joint attention.

In another recent study, Whalon *et alia* (2016) taught the mother of a child with ASD to use RECALL strategies in DR. The intervention increased accurate responses and initiations from the child. However, the authors did not clarify whether the required responses were verbal or could be given merely by pointing.

The studies reviewed so far of DR with children with ASD present some methodological questions. First, in some studies, books were unsystematically repeated in some sessions, which may have affected performance (Fleury *et alia*, 2014; Whalon *et alia*, 2015; Whalon *et alia*, 2016). Second, when prompts included cards with figures that the children were to point at (Whalon *et alia*, 2015; Whalon *et alia*, 2016), the specific role of these visual aids was not separated from general DR strategies. Furthermore, the complexity of pointing responses is different from that of verbal responses, an issue that the authors did not address.

Recently, D'Agostino, Dueñas, and Plavnick (2018) investigated the effect of a shared book intervention on independent verbal initiations and responses of three preschool children with ASD and controlled for repeated books by including generalization probes with new stories. The intervention was successful in establishing verbal initiations during the intervention and generalization probes. However, the intervention did not include the central ingredients of DR (e.g., PEER and PROMPT strategies; cf. Towson, Fettig, Fleury, & Abarca, 2017). Instead, initiations were taught by using physical prompts and tangible and edible reinforcers. The present study, in contrast, investigates if the social interactions put into motion by the DR situation may be sufficient to promote social and verbal engagement of children with ASD. Some of the results from D'Agostino *et alia* (2018) are compatible with this possibility, as one of the children in that study displayed increases in verbal initiations and responses during baseline sessions, i.e., during storytelling but before the tangible and edible reinforcers were introduced.

Guevara, Queiroz, and Flores (2017) conducted a case study to investigate how adapted DR with verbal prompts impacted the engagement and answers to questions about the story of a 5-year-old boy with ASD. The authors included 20 youth literature books, without repetition, and used verbal prompts that required verbal responses. In Step 1, the experimenter used CROWD for each book page, modelling responses when necessary. In Step 2, a request to point was added to facilitate joint attention, and the range of questions was reduced to three types. In Step 3, the experimenters implemented a least-to-most verbal prompting hierarchy. Echolalic answers were replaced by answers about the narrative and verbal initiations. Throughout the sessions, the child became increasingly independent of the prompts and displayed increased task engagement, as in studies using visual prompts (Whalon *et alia*, 2015; Whalon *et alia*, 2016).

Recently, Fleury and Schwartz (2017), like Guevara *et alia* (2017), used verbal prompts in a least-to most prompting hierarchy to help preschool children with ASD to elaborate their answers during DR implemented by para-educators. They tested the effects of the intervention on verbal participation and book-specific vocabulary. Their results showed increased verbal participation during the intervention and clear gains in book vocabulary. The results of verbal participation, however, were confounded by the fact that the measure used by the authors was dependent on the interventionist's behavior. The researchers measured the rate of verbal participation, which increased with the intervention. However, since the rate of questions made by the interventionists also increased during intervention, due to training in dialogic reading, there is no way of knowing whether the children would have participated as much, had they been asked more questions during baseline. The possibility that this may have confounded

results is strengthened by the fact that answers to questions increased at intervention more consistently than initiations. On the other hand, results related to gains in specific book vocabulary were consistent and suggested that DR can engage children with ASD in specific dialogue about the story. In other words, even if changes in the quantity of participation was not evident, there was a significant change in the quality of the interaction.

In the present study, we expanded this notion of book-related dialogue and aimed to investigate how DR with a verbal prompting hierarchy impacted the performance of children with ASD engaged in dialogue about the story. The questions related to characters and story plot and aimed at story comprehension. We also measured effects on verbal and non-verbal initiations and on task engagement.

Method

Participants

Participants were two 7-year-old boys with ASD (fictional names: Saulo and Mateus). They were enrolled in mainstream first and second-year classrooms, respectively, of a state-funded primary school in a large urban centre in Brazil. Students at the school come mainly from low-income families. Inclusion criteria were (1) referral and confirmation of ASD diagnosis from the school's special needs support department; (2) Difficulties with language or social interaction as reported by the special needs support professionals and classroom teachers. Indicators of ASD severity and intelligence quotient scores were not available to the researchers. Saulo had participated in previous research using DR.

Setting and Materials

The experimental sessions were conducted in the school library and lasted 6-11 minutes each. All sessions were filmed using a digital camera on a tripod. We used 30 storybooks (one per session, in random order), which were selected according to recommendations in Bellon, Ogletree, and Harn (2000). All were previously unknown to the children, according to them and to their teachers.

Preparation of story-related questions and prompts

For each book, we prepared one WH question for each event in the plot (e.g., *Little Red Riding Hood's mother asks her to take a basket of fruit to her sick grandmother* counts as one event in the well-known story; *Little Red Riding Hood encounters the wolf in the woods* counts as another event). There were 8-13 events in each story. The WIHH question was always asked at two pre-planned pages of each storybook, corresponding to the climax and the resolution of each story. The experimenter would signal in the general direction of the page and ask "What's happening here?"

For each question, we also prepared a least-to-most verbal prompting hierarchy. Prompts emphasized the story and not just isolated aspects of illustrations. For example, with the question "Who is this?" The prompts targeted an answer giving the character's name (e.g., "It is Little Red Riding Hood") rather than a generic characterization ("It is the girl"). Table 1 presents examples of each level of the least-to-most prompt hierarchy (explained below).

Table 1. Examples of the Least-to-most Vocal Prompting Hierarchy Levels for each Question Type.

Question Type	Level 1 (Restate)	Level 2 (Complete/Scaffold)	Level 3 (Model)
WH	Who is this?	This is Little Red...	This is Little Red Riding Hood.
WIHH	What's happening here?	Who is this? Where is she? Where's she going?	Little Red Riding Hood is going to her grandma's.

Procedure, Design and Data Collection

The institutional ethical review board approved this study and the school agreed to participate and offered a room for experimental sessions. Parents or guardians consented to the children's participation by signing an Informed Consent Form and participating in a short demonstration of what would happen in a typical session. The children's assent was assessed by conducting a demonstrative storytelling session and asking them if they had enjoyed it and if they would like to hear stories again on other days, to which both said yes. Both accepted enthusiastically when invited to hear stories at the beginning of each session and expressed enjoyment during shared reading sessions.

Two experimenters conducted the DR sessions. Both had over a year of experience with DR in various school and community settings. They practiced the specific strategies of this study before each session with the leading researcher by (1) reading the book together and reviewing story plot and scripted questions, and (2) role-playing. Small sticky notes were used as reminders of the questions to be asked on each page.

We used a multiple-baseline across-participant design, with three conditions: Baseline (BL), Training 1, and Training 2. In the BL condition, the experimenter asked the planned questions without prompts. In case the child answered any of the questions accurately during baseline, the experimenter praised the child and repeated her answer in a confirmatory tone. However, no prompt or cues were offered. The decision to deliver reinforcement for adequate verbalizations during baseline was taken to avoid extinction of verbal participation.

If, already during baseline, the answers were accurate for at least 80% of the questions during three consecutive sessions, or during six non-consecutive sessions, the child moved directly to Training 2 (as in the case of Mateus). Otherwise, we checked for stability of performance by visual inspection (Lane & Gast, 2014) and moved on to Training 1 (as in the case of Saulo). We had planned to accept as stability variation of correct answers of up to approximately 30% around the median of the points at baseline, with a margin for at most one outlier. If variation was very large, we had planned to look for possible intervening variables (this was not necessary). Saulo started Training 1 at Session 7, started Training 2 at Session 27, and completed a total of 30 sessions. Mateus started Training 2 at Session 10 and completed a total of 16 sessions.

During Training 1, the least-to-most prompting hierarchy was used whenever necessary for WH questions (WIHH questions were still asked as in the BL condition but no prompting was given). Accurate answers were reinforced and expanded, with emphasis on the story (e.g., "It is a house" would be expanded to "Yes, it's Fiddler Pig's house!" rather than to "Yes, it's a yellow house!").

During Training 2, prompting was applied to WIHH questions as well. Table 2 describes the scoring scheme used as a basis for the choice of prompts for WIHH questions. Score 0, 1 or 2 answers would be followed up by relevant WH questions to help the child reach Score 3. The experimenter would model an accurate answer

Table 2. Score Attribution-WIHH Question.

Score 0	The child does not answer or says something unrelated to the story.
Score 1	The child accurately names or describes something from another part of the story
Score 2	The child correctly names or describes something on the page but omits the central situation or the most relevant point.
Score 3	Child names or describes the most relevant aspect of the scene as it relates to the story.

whenever the WH questions were insufficient to help the child reach Score 3. The criteria for completing Training 2 were accurate answers to at least 80% of the WH questions, along with performance scores of 2 or 3 for WIHH questions, during three consecutive sessions or six non-consecutive sessions.

Participants' task engagement was recorded under all conditions (BL, Training 1 and 2) using 10-second momentary time sampling. Task engagement was defined as the child sitting with his body oriented towards the book or the reader, and his eyes directed to the book or the reader.

For Interobserver Agreement (IOA) two independent observers scored the participants' responses in a sample of 14 sessions (13.8%). On a trial-by-trial basis, the number of agreements was divided by agreements plus disagreements and multiplied by100. Average IOA was 99% for WH questions, 93% for WIHH questions and 100% for verbal and non-verbal initiations.

For Procedural Integrity a second observer collected data for 22% of the sessions in BL, Training 1, and Training 2. On a trial-by-trial basis, we scored whether the experimenter implemented the procedure as planned, i.e., asked all scripted questions, did not prompt answers during BL and followed prompt hierarchies during intervention. A *Procedural Integrity Index* was calculated by summing the agreements, dividing the sum by the total number of trials, and converting this result to a percentage -yielding a value of 100% for all implemented procedures.

RESULTS

Figure 1 shows the percentages of independent answers (without prompts), and each prompt type, for WH questions in the BL, Training 1, and Training 2 conditions for Saulo, and in the BL and Training 2 conditions for Mateus.

The percentage of independent answers given by Saulo in answer to WH questions during BL was consistently between 54-63%. Upon the introduction of Training 1, the percentage of independent answers increased but still showed considerable variability. At the 21st session, performance reached higher levels (84-91%) and showed a more regular increase thereafter. During Training 2, independent answers to WH questions remained high, varying between 90% and 100%. The most frequent prompt used with Saulo was prompting him to complete an utterance, which the experimenter used in 18 of the 20 sessions during Training 1. Restating the question was useful on only four occasions. Modelling an accurate answer was necessary on only seven occasions and never after the 23rd session. The need for prompts decreased throughout the sessions during Training 1. During Training 2, prompting was only necessary on two occasions.

Mateus gave a high percentage (75-100%) of independent answers to WH questions, starting with the BL condition. His performance met the criteria to move directly from BL to Training 2. Throughout the intervention, he showed a decreased need for prompts for WIHH questions, although his performance had already started at high values (80-

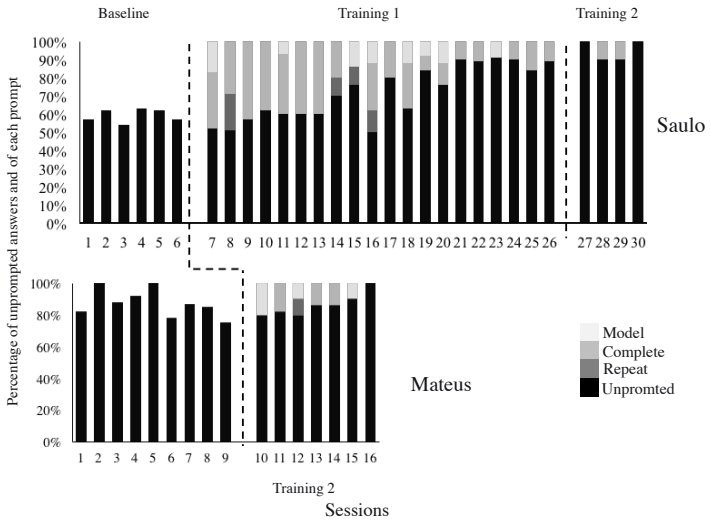

Figure 1. Percentage of unprompted answers and of each prompt type, for WH questions.

100%). Mateus needed Level 2 (complete prompts) and Level 3 (Model) three times each. Restating the question was sufficient on only one occasion.

As described, WIHH questions were always asked at two points in each story: climax and closure. Figure 2 shows the participants' scores (cf. Table 2) and the level of prompting hierarchy needed for the first and second WIHH questions, per session.

In the BL condition, among twelve opportunities to answer the WIHH questions, Saulo had a score of 0 for half of them. At one opportunity, his score was 1, at another

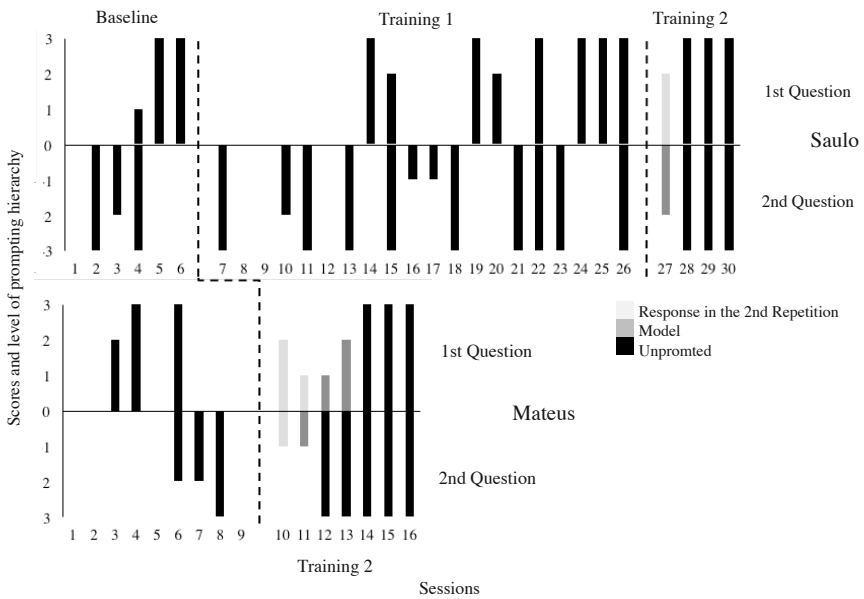

Figure 2. Scores and level of prompting hierarchy used in the first and second WIHH question.

opportunity, his score was 2, and at four opportunities, he obtained the maximum score of 3. During Training 1, his performance was very similar. Among 40 opportunities to answer, his score was 0 for half of them. At five opportunities, his score was 1 or 2, and at 15 opportunities, he obtained a score of 3. In the first session of Training 2, Saulo obtained a score of 2 at two opportunities to answer WIHH questions. Scaffolding [Term derived from the concept of the Zone of Proximal Development (Vygotsky, 1978), used to indicate an aid that an adult (or a more experienced person) offers to a child to help them perform a task that they would not be able to do alone (Smit, Eerde, & Bakker, 2012)] with relevant WH answers did not produce an accurate answer at this point, and it was necessary to model an accurate answer. The second time a WIHH question was asked, follow-up questions helped him achieve a Score 3 answer. During the last three sessions, Saulo answered WIHH questions independently, obtaining a score of 3 for all of them without requiring prompts, thus meeting the closing criteria.

In the BL condition, Mateus obtained a score of 0 in twelve of 18 opportunities. In three opportunities, he obtained a score of 1 or 2, and he obtained a score of 3 in only three opportunities. In the first session of Training 2, Mateus obtained scores of 2 and 1 for the first and second WIHH questions, respectively. Following up with relevant WH questions did not produce adequate answers, and it was necessary to model an accurate answer. In the following session, he again needed a model of an accurate answer for the first WIHH question, but for the second question. In the third session of Training 2, he needed the same prompt type in the first question but gave an independent answer meriting a score of 3 for the second question. The same occurred in the first attempt of the next session but starting at a higher score; from that point on, he only gave score three independent answers, meeting the closing criterium.

Figure 3 shows the frequency of Saulo's and Mateus' verbal and non-verbal initiations throughout the sessions under all conditions.

Throughout all conditions, Saulo initiated context-pertinent verbal and non-verbal interactions with the experimenter, using naming, comments, and questions. The

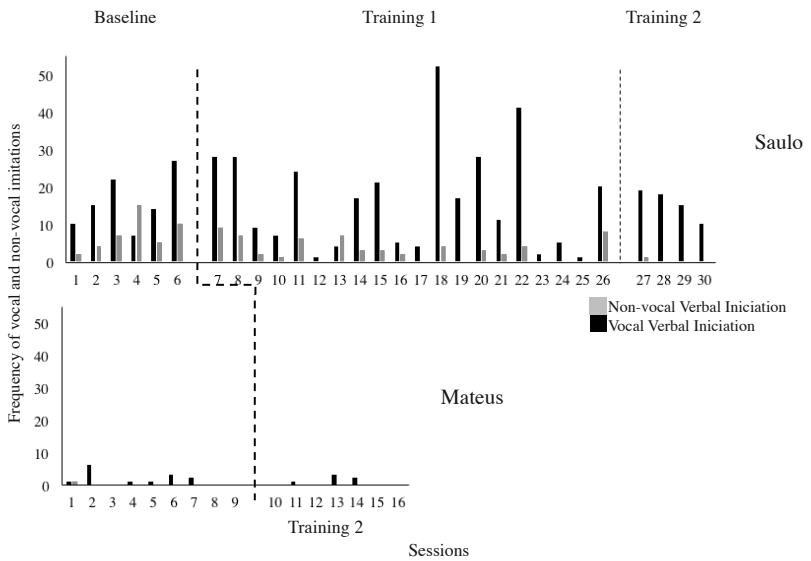

Figure 3. Frequency of vocal and non-vocal iniciations under all conditions.

verbal initiations were much more frequent than the non-verbal ones, which became less common at the end of the experiment. There was considerable variability in the frequency of verbal initiations that were unrelated to the experimental conditions (between 1 and 54 verbal initiations). During the intervention phase, Saulo's verbal initiations included questions, like the ones asked by the experimenter, e.g., he would look at the experimenter, point at a character in the illustrations and ask "What's she doing?" This form of initiation had not happened before the intervention.

Compared to Saulo, Mateus initiated with fewer verbal interactions (maximum of six). In seven sessions, he did not initiate any interaction. He had only one instance of non-verbal initiation in Session 1.

Figure 4 shows the percentage of task engagement of the participants throughout the sessions under all conditions.

During the BL condition, Saulo's percentage of task engagement varied between 79% and 96%. From the first to the 11th session of Training 1, Saulo's percentage of task engagement varied considerably, between 56% and 96%. From the 12th session to the last session, Saulo began to show high and stable task engagement, varying only between 95% and 100%, which continued during Training 2 (90-100%).

Mateus' engagement was very high and consistent during BL and Training 2, varying between 82-100% throughout the sessions. Although the engagement values were already high at BL, there was a slight upward trend throughout the sessions and a decrease of variability during the last sessions of Training 2.

At the end of the experiment, the first author held a meeting with each teacher and another meeting with each child's family, to verify aspects of social validity. Participants discussed results and possible future interventions, focusing on both school skills and possible DR implementation. The researcher conducted a practical demonstration of DR and offered to conduct DR workshops with the families.

The teachers reported that the children's participation in the research sessions was positive after observing significant improvement in their naming repertoire, verbal

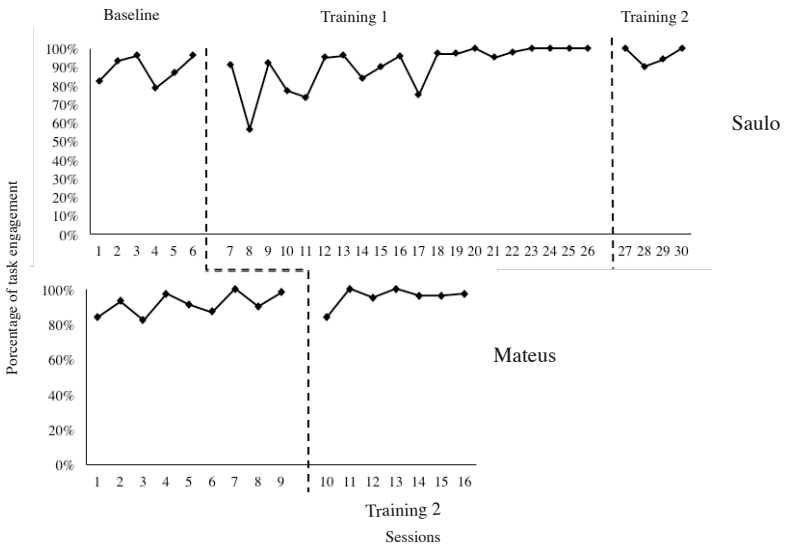

Figure 4. Porcentage of task engagement throughout the sessions under all conditions.

initiations, and engagement in school activities. One of the teachers was willing to implement DR in the classroom with assistance from an experimenter. The participants' parents reported having noticed changes in their children's interest in listening to stories, questioning more about the world, and sharing what they saw around them.

Discussion

The results of this study indicate that an adaptation of DR, using questions and prompting strategies based on story plot, can help children with ASD engage in shared reading and improve their answers to simple questions about story events.

Both children showed improvements in their answers to WH and WIHH questions about stories. As well as a potential tool for engaging children with ASD in shared reading situations, these new skills may be relevant in other contexts as well. Children and adults are routinely expected to be able to respond to questions about things, people and events around them. Thus, the skills acquired during shared reading may help children answer this type of question in other contexts, something to be researched in future studies.

Learning to answer varied questions may have functioned as a behavioral cusp (Rosales Ruiz & Baer, 1997), that is, as a skill that boosts the development of other skills. The newly acquired fluency in answering WH questions may have contributed to the sudden and rapid improvement in Saulo's performance during Training 2, in comparison with the gradual improvement during Training 1. The use of a different book in each session may also have contributed to this result by fostering generalization.

Mateus demonstrated skills related to "talking about the stories", but not in the context of a conversation. In the first sessions of Training 2 with WIHH questions, he talked about several parts of the story, but with no regard to the experimenter's question. What Mateus learned was therefore not to talk about the story, which he could already do, but to engage in a verbal exchange about it. Although he still did not initiate many interactions, his descriptions began to be responsive to the experimenter´s questions about the story.

An important factor that may have influenced participants performance was the decision to differentially reinforce appropriate responses at BL This decision was made in order avoid extinction of existing verbal repertoire or even of participation in the activity. However, the decision not to carry out baseline under extinction means that the differential social reinforcement of correct responses, in itself, could have produced improvements in performance. This may have been the case for Saulo's engagement, which showed an upward trend already during baseline. However, the results for accurate responses, for both participants, showed that it was only when the prompting strategy was introduced that autonomous correct answers began to increase, suggesting that differential reinforcement alone was insufficient. This is an interesting result, as it separates the effects of differential reinforcement from the scaffolding. Both are components of dialogic reading, but the results of this study suggest that differential reinforcement alone is not sufficient to establish verbalizations based on plot and that scaffolding played a very important role.

The DR intervention also favored initiations for Saulo. This result corroborates previous studies (Fleury *et alia*, 2014; Krantz & McClannahan, 1993; Weisberg & Jones, 2019; Whalon *et alia*, 2015). Although he had already initiated interactions at BL, the quality of Saulo's initiations changed with intervention, as he began to spontaneously

ask questions about the story or the illustrations to the experimenter. The questions were appropriate to the context and followed by attention to the experimenter´s answers. This result indicates that the experimenter's questions may have served as a model for Saulo's initiations, a hypothesis that needs to be explored in further studies. Differently from the D'Agostino *et alia* (2018) study, this happened without the use of tangible reinforcement, a result which indicates that, in some cases, the dialogic reading situation can be sufficiently motivating in itself.

In contrast to Saulo, however, Mateus rarely initiated interactions, supporting prior reports that children with ASD may have difficulty making verbal initiations (e.g., Krantz & McClannahan, 1993; Weisberg & Jones, 2019). These data may be related to several variables: each child had sessions with a different experimenter; in contrast to Saulo, Mateus was participating in DR research for the first time; and Mateus participated in fewer sessions (16 sessions) than Saulo (30 sessions). These observations suggest that Mateus might have benefited from specific support to stimulate verbal initiations, as described by Whalon *et alia* (2015).

General task engagement also showed a slightly upward trend during DR for both children, although it was already high during BL, supporting previous studies showing that shared reading can be an easy to implement naturalistic activity that can help foster language and social skills in children with ASD (Fleury *et alia*, 2014; Guevara *et alia*, 2017; Whalon *et alia*, 2015; Whalon *et alia*, 2016). The fact that task engagement was already present at BL also helps strengthen conclusions about the specific effects of the intervention on response accuracy.

While previous studies have used visual prompts and the provision of answers by pointing (Fleury *et alia*, 2014; Whalon *et alia*, 2015; Whalon *et alia*, 2016), our present study expands the results of Fleury and Schwartz (2017) in demonstrating that it is possible to use verbal prompts to help children with ASD answer questions about the story during dialogic reading. Visual prompts may lead a conversation to center on illustrations and hinder progress towards plot-based dialogue (of course, this being an issue depends on the objectives of the activity). It may also be more cumbersome for everyday application, as it requires the preparation of tailored visual material for each book. However, as in the case of Mateus, it may be worthwhile to explore this resource for developing abilities that may be difficult for the child. Furthermore, it would be interesting to try using visual prompts and attempt to make a gradual transition to requiring verbal responses.

In the present study, the use of an explicit prompting hierarchy method was also a step toward systematization of scaffolding strategies during shared reading. Scaffolding and expansion are often emphasized as central for child development but defined in a general way (e.g., Smit, Eerde, & Bakker, 2012). Although parents and teachers are often advised to help build and be responsive to children´s verbalizations (e.g., Van de Pol, Volman, & Beishuizen, 2010), this is often taught in a less systematic matter than questioning strategies, even though there is some evidence learning to scaffold and expand are more demanding tasks than other aspects of dialogic reading. Faria and Flores (2018), for example, trained parents to apply DR and reported that it was easier for the parents to learn to formulate open questions than to use appropriate prompts when necessary, a result consistent with their review of previous findings.

This study applied a least-to-most prompting hierarchy. However, other studies have cautioned about the possibility that the child may become dependent on the prompt (Libby, Weiss, Bancroft, & Ahearn, 2008; MacDuff, Krantz, & McClannahan, 2001). We

made this choice because the least-to-most hierarchy was considered more coherent with the DR context, which uses scaffolding to help children reach the expected repertoire, highlighting the importance of the adult's responsiveness [an essential characteristic of scaffolding (alongside vanishing and responsibility transfer), which refers to an adult being sensitive to the children's answers and interests and to their developmental level, and offering contingent consequences moment by moment (Van de Pol, Volman, & Beishuizen, 2010)].

This study did not include a generalization phase with new storytellers or in different settings. Additional studies should also seek to replicate and adapt the procedure with children with different levels of verbal abilities.

The results of this study support the use of story-based open questions and least-to-most prompting verbal hierarchies for helping children with ASD engage in conversation about the story in shared reading settings. More generally, results support previous evidence regarding the benefits of adapted forms of DR for the development of social and communicative skills in children with ASD.

References

Bellon ML, Ogletree BT, & Harn WE (2000). Repeated storybook reading as a language intervention for children with autism: A case study on the application of scaffolding. *Focus on Autism and Other Developmental Disabilities*, *15*, 52-58.

Boyle SA, McNaughton D, & Chapin SE (2019). Effects of shared reading on the early language and literacy skills of children with autism spectrum disorders: A systematic review. *Focus on Autism and Other Developmental Disabilities*. Advance online publication: https://doi.org/10.1177/1088357619838276

Bruner J (1975). From communication to language: A psychological perspective. *Cognition*, *3*, 255-287.

Charlop-Christy MH & Carpenter MH (2000). Modified incidental teaching sessions: A procedure for parents to increase spontaneous speech in their children with autism. *Journal of Positive Behavior Interventions*, *2*, 98-112.

D'Agostino SR, Dueñas AD, & Plavnick JB (2018). Increasing social initiations during shared book reading: An intervention for preschoolers with Autism Spectrum Disorder. *Topics in Early Childhood Special Education*. Advance online publication: https://doi.org/10.1177/0271121418816422

Dube WV, MacDonald RPF, Mansfield RC, Holcomb WL, & Ahearn WH (2004). Toward a behavioral analysis of joint attention. *The Behavior Analyst, 27*, 197-207.

Faria VAL & Flores EP (2018). Conversas ao redor do livro: Treino parental para a leitura dialógica [Talking about storybooks: Parental training for dialogic reading]. *Acta Comportamentalia, 26*, 467-486.

Fleury VP, Herriott-Miramontez S, Hudson RF, & Schwartz IS (2014). Promoting active participation in book reading for preschoolers with Autism Spectrum Disorder: A preliminary study. *Child Language Teaching and Therapy, 30*, 273-288.

Fleury VP & Schwartz IS (2017). A modified dialogic reading intervention for preschool children with autism spectrum disorder. *Topics in Early Childhood Special Education*, *37*, 16-28.

Flores EP, Pires LF, & Souza CBA (2014). Dialogic reading of a novel for children: Effects on text comprehension. *Paidéia, 24*, 243-251.

Greer RD & Ross DE (2008). *Verbal Behavior Analysis: Inducing and expanding new verbal capabilities in children with language delays*. Boston, MA: Allyn & Bacon.

Guevara VLS, Queiroz LR, & Flores EP (2017). Implicações da leitura dialógica em crianças com autismo: um estudo preliminar no contexto escolar [Dialogic reading adapted for a child with autism spectrum disorder: a preliminary study]. *Cadernos de Pós-Graduação em Distúrbios do Desenvolvimento, 17*, 87-99.

Hart BM & Risley TR (1968). Establishing use of descriptive adjectives in the spontaneous speech of disadvantaged preschool children. *Journal of Applied Behavior Analysis*, *1*, 109-120.

Hart BM & Risley TR (1974). Using preschool materials to modify the language of disadvantaged children. *Journal of Applied Behavior Analysis*, *7*, 243-256.

Hart BM & Risley TR (1975). Incidental teaching of language in the preschool. *Journal of Applied Behavior Analysis, 8*, 411-420.

Hogan T, Bridges MS, Justice LM, & Cain K (2011). Increasing higher level language skills to improve reading comprehension. *Focus on Exceptional Children, 44*, 1-20.

Huebner CE & Payne K (2010). Home support for emergent literacy: follow-up of a community-based implementation

of dialogic reading. *Journal of Applied Developmental Psychology 31*, 195-201.
Krantz PJ & McClannahan LE (1993). Teaching children with autism to initiate to peers: Effects of a script-fading procedure. *Journal of Applied Behavior Analysis, 26*, 121-132.
Lane, JD & Gast, DL (2014). Visual analysis in single case experimental design studies: Brief review and guidelines. *Neuropsychological Rehabilitation*, *24,* 445-463.
Lever R & Sénéchal M (2011). Discussing stories: How a dialogic reading intervention improves kindergartners' oral narrative construction. *Journal of Experimental Child Psychology, 108*, 1-24.
Libby ME, Weiss JS, Bancroft S, & Ahearn WH (2008). A comparison of most-to-least and least-to-most prompting on the acquisition of solitary play skills. *Behavior Analysis in Practice, 1*, 37-43.
MacDuff GS, Krantz PJ, & McClannahan LE (2001). Prompts and prompt-fading strategies for people with autism. In C Maurice, G Green, & RM Foxx (Eds.), *Making a difference: Behavioral intervention for autism* (pp. 37-50). Austin, TX: Pro-ed
Medeiros FHD & Flores EP (2016). Compreensão de contos após leitura dialógica com perguntas baseadas em dimensões temáticas da narrativa [Comprehension of stories after dialogic reading with questions based on narrative thematic dimensions]. *Psicologia: Teoria e Pesquisa, 32*, 1-10.
Mundy P (1995) Joint attention and social-emotional approach behavior in children with autism. *Development and Psychopathology, 7*, 63-82.
Opel A, Ameer SS, & Aboud FE (2009). The effect of preschool dialogic reading on vocabulary among rural Bangladeshi children. *International Journal of Educational Research, 48*, 12-20.
Rakap S & Rakap S (2014). Parent-implemented naturalistic language interventions for young children with disabilities: A systematic review of single-subject experimental research studies. *Educational Research Review*, *13*, 35-51.
Rosales Ruiz J & Baer DM (1997). Behavioral cusps: A developmental and pragmatic concept for behavior analysis. *Journal of Applied Behavior Analysis*, *30*, 533–544.
Schuler A, Gonsier-Gerdin J, & Wolfberg P (1990). The efficacy of speech and language intervention: Autism. *Seminars in Speech and Language*, *11*, 242-255.
Smit J, Eerde HAAV, & Bakker A (2012). A conceptualisation of whole-class scaffolding. *British Educational Research Journal*, *39*, 817-834.
Towson JA, Fettig A, Fleury VP, & Abarca DL (2017). Dialogic reading in early childhood settings: A summary of the evidence base. *Topics in Early Childhood Special Education, 37*, 132-146.
Van de Pol J, Volman M, & Beishuizen J (2010). Scaffolding in teacher-student interaction: A decade of research. *Educational Psychology Review*, *22*, 271-296.
Vygotsky LS (1978). *Mind and Society: The development of higher mental processes*. Cambridge, MA: Harvard University Press.
Weisberg HR & Jones EA (2019). Individualizing intervention to teach joint attention, requesting, and social referencing to children with autism. *Behavior Analysis in Practice*, *12*, 105-123.
Whalon K, Martínez JR, Shannon D, Butcher C, & Hanline MF (2015). The impact of reading to engage children with autism in language and learning (RECALL). *Topics in Early Childhood Special Education*, *35*, 102-115.
Whalon K, Hanline MF, & Davis J (2016). Parent Implementation of RECALL: A systematic case study. *Education and Training in Autism and Developmental Disabilities, 51*, 211-220.
Whitehurst GJ, Falco FL, Lonigan CJ, Fischel JE, DeBaryshe BD, Valdez Menchaca MC, & Caulfield M (1988). Accelerating language development through picture book reading. *Developmental Psychology*, *24*, 552-559.
Whitehurst GJ, Epstein JN, Angell AL, Payne AC, Crone DA, & Fischel JE (1994). Outcomes of an emergent literacy intervention in head start. *Journal of Educational Psychology, 86*, 542-555.
Whitehurst GJ & Lonigan CJ (1998). Child development and emergent literacy. *Child Development, 69*, 848-872.
Zauche LH, Thul TA, Mahoney AED, & Stapel-Wax JL (2016). Influence of language nutrition on children's language and cognitive development: An integrated review. *Early Childhood Research Quarterly*, *36*, 318-333.
Zevenbergen AA, Whitehurst GJ, & Zevenbergen JA (2003). Effects of shared-reading intervention on the inclusion of evaluative devices in narratives of children from low-income families. *Journal of Applied Developmental Psychology*, *24*, 1-15

Received, November 29, 2020
Final Acceptance, Decembar 26, 2020