Do It Together: Joint Book Reading Behaviors of Parent and Children with and without a Developmental Language Disorder

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July 16, 2021

Abstract

Interactive joint book reading (JBR) is an important activity to promote language development of preschoolers. This could be even more important for preschoolers with a Developmental Language Disorder (DLD). Therefore, the current study examined whether parents of preschoolers with DLD use the same JBR behaviors as parents of preschoolers without DLD and whether parent self-assessment relates to the researchers' observations. A group of parent-child dyads with DLD and a group without DLD were videotaped during JBR, and parent and child behaviors were coded according to an observation tool. Parents filled out a questionnaire about the same observed JBR behaviors. No differences were found in JBR behaviors between the two groups according to both the researchers' observations and self-assessment. The measurements of the parent JBR behaviors highly correlated between the researchers' observations and parent self-assessment for both groups. This report can be used to develop new interventions to promote interactive JBR behaviors for parents of children with DLD.

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Most children develop language spontaneously and learn to talk quickly without many problems. Even if they encounter some difficulties, such as a visual disability, they seem to be able to learn language sufficiently. For children with Developmental Language Disorder (DLD) this is different, as they have difficulties in producing and/or understanding language without a clear explainable cause (Bishop, 2006). These language problems, however, cannot be explained by neurological damage, hearing problems or intellectual disabilities (Leonard, 2014). More precisely, these children score below average on language performance, but have an average degree on non-verbal intelligence and nonlinguistic aspects of development (Bishop, 2006). In literature, DLD is also referred as a Specific Language Impairment (SLI) or Language Impairment (LI). DLD has a prevalence of around 7 % of the population and is one of the most frequent developmental disorders (Leonard, 2014). It is important to identify children with DLD as early as possible to prevent learning and developmental difficulties (Clegg et al., 2005; Noordzij, 2019; Stanton-Chapman et al., 2002), which can develop due to language deficits.

Parents have a crucial role in stimulating a child's language development both for children with and without DLD. This accounts especially for pre-school children, since they spend most of their time with their parents and are exposed to their parents' language input. However, not only the amount of parent-child interaction is important for language development, it also depends on parents' responsiveness to the child's language initiatives. Parents' responsiveness is seen as a predictor for the child's pragmatic understanding and their expansion in vocabulary (Tamis-LeMonda et al., 2014). Besides, more conversational turns between parent and child during speech, independent from the amount of words parents used and their SES, were related to more connectivity in the brain's region which are essential for language development (Romeo et al., 2018). Therefore, it is especially important to talk *with* a child instead of only to talk *to* a child. Children in this study of Romeo et al. (2018) had the age of four to six years old. This in line with the results of the meta-analyses done by Roberts & Kaisers (2011), who found that stimulating turn-taking and parents' responsiveness in parent-implemented language interventions was positively related to language outcome of children with DLD between 18 and 60 months old. Furthermore, preschoolers are at the age of which learning language is seen as critical, also known as the critical or sensitive period of language learning. This period is from birth until about seven years. During this period the brain develops the basic functional system in which learning languages is most optimal (Lanting et al., 2018; Newport, 2006). Hence, it makes it harder to learn language after this age. Altogether, this makes that parents have a crucial role in stimulating child's language development at early age.

Parents and children can engage in several activities to promote language development, e.g. reading a story book. Joint book reading (JBR) with young children is seen as an effective way to stimulate language and emergent literacy development (DeTemple & Snow, 2003) by using more complex language compared to normal communication, expanding the child's vocabulary. Multiple components of JBR are important. First, the frequency of JBR since it is related to children's language and cognition outcomes (Raikes et al., 2006; Richman & Colombo, 2007; Sénéchal & Young, 2008). Children who had been read to more often showed higher language skills. Secondly, children also profit more from JBR when it is interactive; if the child is actively participating in book reading (Mol et al., 2008). Parent behavior can stimulate children's participation in book reading (Trivette et al., 2010). Strategies that showed to be effective in engaging the child's participation include relating the story to the child's prior experiences, giving positive feedback during JBR, expanding on the child's language and comments, asking open-ended questions and following the child's interest. Children as active participator during JBR were positively related to early expressive language development (Trivette et al., 2010). A meta-analysis of Mol et al. (2008) showed that interactive reading was significantly increasing children's vocabulary in comparison to 'normal' non-interactive JBR. This effect size was especially seen in children's expressive vocabulary and was stronger for younger children (around two and three years old) than older children (Mol et al., 2008). Thus, interactive JBR is a dialogue instead of a monologue, in which turn-taking is a characteristic.

Interactive reading is seen as an important activity for stimulating a child's early language development, which can be even more important for children with DLD according to their language deficits. Storkel et al. (2019) demonstrated promising results on obtaining new vocabulary for kindergarten children (age range 5;0-6;2) with DLD using interactive JBR. These children attained therapy from mostly graduated speech therapy students. However, the results were only short-term, the new words were significantly forgotten as soon as the interactive reading therapy ended. Additionally, children with DLD needed three times more repetitions of interactive reading to learn new words compared to the normal population (Storkel et al., as cited in Storkel et al., 2019). This shows the importance of consistently and frequently applying interactive JBR for children with DLD. For parents this can be more appropriate than speech therapists, since most parents are already consistently doing JBR in their daily routine (Duursma, 2011). Research on whether parents of children with DLD use interactive strategies during JBR and whether their strategies differ from parents of children without DLD is limited. The child-parent interaction has already been studied during play. (Vigil et al., 2005) This study showed that parents of children with DLD were less responsive to what the child says and have less turn taking in the conversation. Research also showed that preschoolers with DLD have less conversational activities with their parents than preschoolers without DLD (Hammer et al., 2001). Moreover, interactive reading behaviors have been studied in children with hearing loss (HL), who also often experience language delay (DesJardin et al, 2017). One longitudinal study showed that

parents of children with HL showed less literacy strategies, engagement and interactive behaviors during JBR than parents of children with normal hearing (NH) at the age of 36 months. Besides, children with NH applied more guided reading behaviors, as they pointed more at pictures and had more pleasure in JBR. These interactive JBR behaviors were also related to the child's language outcome, which shows the importance of applying it (DesJardin et al., 2017).

For parents of children with DLD interactive JBR might be more challenging due to the language deficits. In addition, interactive reading may be determined by behavior of both adults and the child (Chapman, 2000). Moschovaki et al. (2007) found a bi-directional relationship between teachers who applied JBR with affective aspects and the children who were affective responsive to that. For example, personal engagement from the teacher as well as voice intonations was followed by children's personal involvement comments. However, children's behavior also stimulated the teachers affective responses, such as children using paralinguistic cues and personal engagement prompted the teacher's to commented with more personal remarks. This study focusses on the interaction between teachers and kindergarten children in the first place, but it could also be that this bi-directional relationship also applies for parent-child interactions while JBR. Therefore, parent JBR behaviors may also dependent on the child's JBR behaviors. Tannock and Giralametto (as cited in Vigil et al., 2005) also suggested this bi-directional relationship, in which the toddler's DLD influences the parents' responses and vice versa. For children with DLD it could be harder to react during JBR due to language deficits, which makes parents lack their reaction or trying to compensate for the child's language output. This could make them more directive. This can explain the findings of Vigil et al. (2005) in which parents of children with DLD showed less responsiveness and turn-taking actions during play. Besides, turn-taking actions between parents and children turned out to be important for the brain development in language areas (Romeo et al., 2018). For this reason, this current study focused on both child and parent behaviors during JBR, because both are important for JBR to be interactive. Eventually, insights in these behaviors can be used for developing an intervention.

JBR behaviors can be investigated by an assessment of professionals, but this could also be done by parents themselves. Self-assessment of parents would be more time and cost efficient (Dale, 1991). Furthermore, self-assessment is also seen as a valid tool for measuring language and illiteracy development (Boudreau, 2005). However, this study also showed that parent self-assessment on child JBR behavior was not related to the narrative skills of the child. Despite this, parent self-assessment for JBR behaviors could still be valid if the professional and parents measure the same behaviors, which was not the case in the study of Boudreau (2005).

Altogether, this led to the following research questions:

1. Do child and parent JBR behaviors differ between parents of children with DLD from parents of children without DLD?

2. What is the concurrent validity between parent self-assessment of interactive reading behavior and researchers' observations on this for children with and without DLD?

Based on the studies mentioned earlier, it is expected that parents and their children with DLD show less interactive JBR behaviors than parents and their children without DLD. In addition, the relation between parent self-assessment and the researcher's observations on interactive JBR behaviors will be included as explorative factors, since information in the literature to support an expectation is lacking.

Methods

Design

This study was performed to explore the parent and child behaviors during JBR of parents of children with and without DLD. For this design, ethical approval was obtained by the Student Ethics Review & Registration Board of Utrecht University (21-1757).

Participants

The participants of this study were parents and their preschoolers with DLD and parents and typical developing (TD) preschoolers in the Dutch population. The participating children were between 29 and 48 months old. The children with DLD participated in the early intervention program of the NSDSK and the TD group is obtained from regular day-care centers. The first group consisted of 11 parent-child dyads with children with DLD. One participant was excluded, because of speaking a non-Dutch language during the video recording, which could not be coded. Eight mothers and two fathers participated in the remaining ten parent-child pairs. The TD group consisted of 19 parent-child pairs, but after leaving one participant out because of language scores comparable to the DLD group, 18 parent-child remained (17 mothers and 1 father). Children with DLD were included in the study when they were diagnosed with DLD. The children of the TD group were included when the child was not diagnosed with DLD, the best language of the child was Dutch and the child has not received speech therapy in the past. Table 1 shows the characteristics of the sample of this study.

Both did not differ on gender, frequency of JBR, SES of the parent, and the outcomes of all the language tests (p>0.05). The age in months of the TD children was significantly lower than compared to the children with a DLD (t (26) = 2.378, $p < .05$).

Table 1

Characteristics of the participants

	DLD (n = 10)	TD (n = 18)	Test statistics	*p*-value
Gender			$\chi^2 (1) = .324$	.569
Boys	5 (50%)	7 (38.89%)		
Girls	5 (50%)	11 (61.11%)		
Age in months			$t (26) = 2.378$	.025
Mean	44.90*	39.72		
SD	1.52	6.74		
Range	42 – 47	29 – 48		
Frequency of JBR[a]			$\chi^2 (2) = 1.565$	.457
Mean	4.20	4.50		
SD	.789	.618		
Range	3 – 5	3 – 5		
SES of the parent involved in JBR[b]			$\chi^2 (4) = 1.867$	.760
Mean	6.20	5.89		
SD	.789	1.37		
Range	5 - 7	2 - 7		
Language comprehension child			$t (26) = .754$	.458
Mean	103.00	107.60		
SD	15.60	15.41		
Range	82 – 130	70 – 138		
Sentence production			$t (26) = -1.819$	.080
Mean	89.5	100.94		
SD	14.10	16.85		
Range	73 – 112	77 – 137		

Note. JBR, Joint Book Reading, DLD, Developmental Language Disorder, TD, Typical Developing, SES, Socioeconomic Status. [a] Based on quantity of parents reading their child, classified in five levels (1=almost never, 2=once a week, 3=a few times a week, 4=once a day, multiple times a day) [b] Based on educational attainment, classified in seven levels (1=primary education, 2=pre-vocational secondary education, 3=senior general secondary education, 4=pre-university education, 5=secondary vocational education, 6=higher professional education, 7=university education).

* p < .05. **p < .01. ***p < .001.

Procedure

Participants were informed by an information letter prior to the research. Participants gave permission for the research and internal use of the video recordings by informed consent. During the data collection, parents first participated in a joint game setting with their child, which was recorded, as part of a larger research. After the joint game setting, parents were instructed to read to their child as they would normally do. All participants read from the same book title (*'So tired, but yet wide awake'* (translation: *'Zó moe, maar toch klaarwakker'*)) to prevent results being influenced by the book's content. This book is relatively unknown, so it was expected it was the first time reading the book for all parents. After reading, children language production and comprehension was tested by the TD group because the language scores of the children with DLD are already known. In the end, parents had to answer a questionnaire about their reading habits. The recording of the group of parents of children with DLD were made at the treatment locations of NSDSK, which the children visited three times per week. The recordings of the TD group were made at the day care of the children or at their homes. For both groups of children, the research was performed at familiar places and in a private room.

Instruments

JBR Behaviors.

To measure the JBR behaviors during the video recordings, the observation tool Responsive Adult-Child Engagement During Joint Book Reading (RACED-JBR) scale of DesJardin et al. (2014) was used. This scale was chosen as it had already been used to measure JBR behaviors of parent-child dyads's with HL (instead of DLD) (DesJardin et al., 2014). Besides, it gave an clear overview of important interactive JBR strategies for children with low language abilities. The parent and child items about whether they were pointing to words or letters during JBR (parent item B3 belonging to *literacy strategies* and child item C1 belonging to *guided reading*) were left out of the RACED-JBR, because these were not visible in the video recordings. Therefore, the RACED-JBR consisted of 5 different categories and corresponding items: (a) adult and child *engagement* (six adult behaviors and five child behaviors), (b) adult *literacy strategies* (three adult behaviors), (c) adult teacher *techniques* (five adult behaviors), (d) adult and child *interactive reading* (five adult behaviors and seven child behaviors), and (e) child *guided reading* (four child behaviors). Examples of *engagement* during JBR are the parent making continued effort to engage the child in story/interaction or the child being visually attentive. *Literacy strategies* are observed if the parent points to pictures in the book and asks questions about the book's content. *Teacher techniques* are more about whether the parent relates contents of the book to prior experiences and defines new vocabulary. Examples of *interactive reading* are the parent following the child's lead and let the child hold the book and the child offering spontaneous ideas about the story or asks questions about the story or related topics. *Guided reading* is

for example about if the child points to pictures or repeats words with or after the adult speaks them (see the appendix for an overview of the RACED-JBR).

The child and parent behaviors of the RACED-JBR were rated on a Likert-type scale with the score 0 "no evidence" (in the video recording no evidence was found of the child or parent behavior), 1 "infrequently" (the behavior was seen one time during the interaction), 2 "some of the time" (two or three times during the interaction) and 3 "most of the time" (the child or parent behavior was present four or more times in the video recording). To calculate the interrater reliability 8 video recordings (28.57% of the total video recordings) were coded independently by a second researcher. The intraclass correlation (ICC) was used to measure the similarity of the ratings of the two researchers. The agreement between the researchers was good (ICC = .827) (Gisev et al., 2013).

Parents also completed a questionnaire about background information of the participant, their reading habits, frequency of JBR and comparable JBR-behaviors as the RACED-JBR measures. Four questions in the questionnaire focused on parent JBR behavior, which were also observed in the RACED-JBR. The first question was: *Do you use different voices while reading?* which was related to the category *Parent Engagement* item A3 (Utilizes emotional language and intonation for child). The second question was: *Do you point to pictures while reading?* which was related to the category *Parent Literacy Strategies* item B1 (Points to/labels pictures/objects in the book). *Do you ask questions about the books content while reading?* was also related to *Parent Literacy Strategies* item B2 (Poses and solicits questions about the book's content). The fourth question is: *Do you link the story to your child's own experiences?* This questions was related to the category *Parent Teacher Techniques* item C1 (Relates content of book to prior experience). The parents could have answered on a five-point Likert scale with the answer options *never* (1), *rarely* (2), *occasionally* (3), *a few times per story* (4) and *very often during a story* (5). This differed from the fourth-point Likert scale of the RACED-JBR. That is why the answer options of the four parent JBR questions were rescaled in which *never* (1) was changed in the *no evidence-score* of the RACED-JBR (0), *rarely* (2) turned into *infrequently* (1), both *occasionally* (3) and *a few times per story* (4) were changed in *some of the time* (2) and *very often during a story* (5) was changed in *most of the time* (3). It was chosen to let the 2 and 3 scores of the questionnaire fall under the 1 score of the RACED-JBR, because this one was coded when it was seen two or three times in the video-recording.

Language tests.

The "Schlichting Receptive Language Test" (SRLT) was used to review the receptive language ability of the children who participated in this study (Schlichting & Lutje Spelberg, 2010b). In the SRLT children had to point at the correct picture that depicted the object, such as "where is the car?". They also had to accomplish specific tasks, for example "put the monkey on the house. The SRLT has 86 items in total which were scored with a '1' if the preschooler responded correctly and

with a '0' if the answer was incorrect. So, the range of the total score is 0–86. The test was aborted if the child incorrectly answered 5 consecutive items. The internal consistency of the SRLT is 0.93 (lambda-2) (Schlichting & Lutje Spelberg, 2010b).

The "Schlichting Expressive Language Test" (SELT) was assessed to obtain the child's expressive language ability (Schlichting & Lutje Spelberg, 2010a). In this study, only syntax of the SELT was assessed. For this test children had to imitate and complete 40 sentences. These sentences become more grammatical complex per item. In the SELT items were scored with a score of '1' if the child answered correctly and '0' by an incorrect answer (range of the total score was from 0 to 40). The test was stopped after answering five incorrect items consecutive. The internal consistency of the SELT is 0.90 (Schlichting & Lutje Spelberg, 2010a).

Statistical Analyses

IBM SPSS Statistics 27 was used for the statistical analyses. A Multivariate Analyses of Variances (MANOVA) was used to compare the groups of parents of children with DLD and TD in JBR behaviors (1). In the first MANOVA the two groups, preschoolers with a DLD and TD preschoolers were *independent* variables; *dependent* variables consisted of the subcategories of the RACED-JBR for both parents and children and also the total parent and child scores. Another MANOVA was performed in which again the groups were the *independent* variable and the four parent JBR behaviors from the questionnaire were the *dependent* variables. A Multivariate Analysis of Covariance (MANCOVA) was performed with the age of the children as covariate since this was significantly different. The effect size of the multivariate design was measured with eta-squared (η^2), in which the value .01 is a small effect size, .06 is a medium effect size and .14 is a large effect size (Cohen, 1998).

Pearson correlational analyses were completed to address the issue of validity of parent reports of interactive reading behavior and observations of interactive reading behavior (2). The variables of the questionnaire were related to the variables of the observations from the groups separately. Correlation coefficients (r) of $\leq$ .35 represent a weak correlation, whereas .36 to .73 represent a moderate correlation and .68 to 1.0 are considered to be a high correlation (Taylor, 1990).

A power analysis was used to examine the required sample size needed; it showed that 64 parent-child dyads per group are needed for a power of .80 and alpha .05 (n = 128 in total). Due to the COVID-19 restrictions the sample size was 29 parent-child dyads in total, which makes the study underpowered. This was similar for the normality assumption of MANOVA, which was not achieved. However, despite this small sample size and the unachieved assumption the study was still proceeded because of educational purposes.

Results

The Kolmogorov-Smirnov statistics and boxplots demonstrated that the assumption normality of the dependent variables for the MANOVA-analyses was not achieved, but the assumption of homogeneity of variances was accomplished.

A MANOVA was performed to compare the DLD and TD groups on parent and child JBR behaviors according to the RACED-JBR, which is demonstrated in Table 2; no significant differences emerged between the two groups. Since there were significant differences in age between the groups, analyses were also performed with age as a covariate. The results remained the same.

Table 2

Summary Scores from the Responsive Adult-Child Engagement During Joint Book Reading scale

Subscale	DLD (n = 10) M (SD)	TD (n = 18) M (SD)	F scores	P values	η^2
Parent					
Engagement	11.40 (1.07)	11.67 (2,20)	.129	.723	.01
Literacy strategies	7.30 (1.49)	7.11 (1.94)	.071	.792	.00
Teacher techniques	2.10 (1.45)	1.50 (1.76)	.843	.367	.03
Interactive reading	10.30 (2.26)	8.83 (2.20)	2.796	.107	.10
Total behaviors	31.00 (4,95)	29.11 (5.63)	.869	.360	.03
Child					
Engagement	13.50 (1.08)	12.72 (1.32)	2.521	.124	.09
Interactive reading	5.10 (2.08)	5.11 (2.17)	.000	.990	.00
Guided reading	9.30 (2.06)	8.22 (2.16)	1.656	.209	.06
Total behaviors	27.90 (4.53)	26.06 (4.04)	1.231	.277	.05

Note. JBR, Joint Book Reading, DLD, Developmental Language Disorder, TD, Typical Developing

The results of the MANOVA concerning the questionnaire showed that parent JBR behaviors of the DLD and TD group also did not differed from each other, as demonstrated in table 3. The analysis was also performed with 'age' of the children as covariate due to the age differences between the groups. The results remained the same.

Table 3

Summary Scores from the Parent JBR Behaviors of the Questionnaire

Parent JBR behaviors	DLD (n = 10) M (SD)	TD (n = 18) M (SD)	*F* scores	*P* values	η^2
Utilizes different voices	4.20 (.70)	4.33 (.84)	.114	.666	.01
Solicits questions	3.40 (.70)	3.78 (.81)	1.538	.226	.06
Points to pictures	4.60 (.52)	4.56 (.71)	.030	.863	.00
Relates to prior experiences	2.90 (.57)	3.33 (.69)	2.879	.102	.10

Note. JBR, Joint Book Reading, DLD, Developmental Language Disorder, TD, Typical Developing

Pearson correlational analyses were completed to address the issue of validity of parent reports of interactive reading behavior and observations of interactive reading behavior. For the children with DLD, results revealed significant and high correlations between parent report and observations for soliciting questions ($r = .704$, $p = .023$), utilizing different voices and intonation ($r = .873$, $p = .001$), relating to prior experiences ($r = .836$, $p = .003$) and pointing to pictures ($r = 1.00$, $p < .001$). For children without DLD, results also revealed significant high correlation between the two measurements for soliciting questions ($r = .832$, $p < .001$), utilizing different voices and intonations ($r = .913$, $p < .001$), relating to prior experiences ($r = .707$, $p = .001$) and pointing to pictures ($r = .918$, $p < .001$).

Discussion

Parents applying interactive JBR is seen as an important activity for preschooler's language development. This is expected to be especially helpful for children with a DLD due to their language difficulties. Insights in JBR behaviors of parents of children with DLD can contribute to developing an intervention to make JBR more interactive. Therefore, the current study studied parent and child JBR behaviors and examined whether it differed between parents of children with DLD and children without DLD. These JBR behaviors were observed according to the RACED-JBR and parents filled in a questionnaire with questions about comparable JBR behaviors.

From the preliminary results, the current study showed that parents of children with DLD applied similar JBR behaviors compared to parents of children without DLD according to researchers observations and parent self-assessment. This is, however, not in line with the expectations as interactive reading was expected to be more challenging for parents of children with DLD. Previous research in children with hearing loss (HL) found mixed results. In some aspect no differences were

found between the groups and in some other aspects children with HL scored even higher (DesJardin et al., 2014). This could be explained as parents of children with DLD use the same amount of strategies as TD because they are aware of their children's language deficits. Besides, these children with DLD are participating in an early intervention program for DLD. So, it could be that parents of children with DLD are more trained in promoting their child's language. That is why these parents are probably more aware and actively stimulating their children's language development despite the challenge of applying interactive JBR behaviors. Another explanation for the similar JBR behaviors between the groups could be the higher age of the DLD group compared to the TD group. From literature it is known that language abilities of children with DLD are at the same level for what fits to younger TD children (Leonard et al., 1982). It could be that no differences emerged in this study because the language abilities between the two groups are comparable due to the age differences. It would be interesting if further research would also include TD children with similar chronological age and age of language development as the children with DLD. In this way, it can be confirmed whether parents apply JBR behaviors comparable to parents of younger children because they adapt the behaviors to the language level of their children with DLD or whether parents miss opportunities to challenge their children by applying more JBR behaviors.

The preliminary results also demonstrated that parent self-report correlated highly with the researcher's observations on the parent JBR behaviors. As mentioned before, Boudreau (2005) showed that parents could be reliable sources for measuring their children's language and illiteracy abilities, but that this not applied for the reading behaviors compared to the child narrative skills. In the current study, the parent JBR behaviors were examined and were compared to questions focusing on those same behaviors. There were no expectations, because this study examined the reading behavior differently from Boudreau (2005) which made literature lacking to support an expectation. The high correlations could be explained by the focus on comparable behaviors in the two measurements of our study, whereas in the study of Boudreau (2005) it were two different measurements (children's reading behavior compared to children's narrative skills) which were compared. Besides, our study focused on the correlations of parent JBR behaviors and not on children. Thus, parent report can provide useful information on parent JBR behaviors. This is valuable for clinical practice because parent self-assessment is more time and cost efficient compared to the researchers' observations (Dale, 1991).

The current study gives insight in the parent and child JBR behaviors of parents of children with and without DLD. Despite no differences were found between the two groups, it is known that parents, in general, are not naturally applying interactive reading behaviors (Mol et al., 2008). For this reason, training parents with an intervention for interactive JBR would be important for both groups. The current preliminary results implicate that both children with DLD as TD children perform low on *interactive reading strategies* during JBR. The maximum score of this strategy was 21, while children

from both groups had a mean score of around 5 (DLD M = 5.10; TD M = 5.11). Similarly, parents from both groups scored around 2 points on *teacher techniques* (DLD M = 2.10; TD M = 1.50) on a maximum score of 15 points. This study showed that it is important to train parents to stimulate on these specific strategies to make JBR more interactive and to increase the verbal strategies of the children. This accounts for both groups, although it would be even more important for the DLD group to imply these strategies in an intervention. Since the more interactive behavior a child shows, during reading as well as play, the more language development can be promoted. For children with DLD it is already known that parents are less interactive during play (Vigil et al., 2005).

A limitation of this study is the small sample size. As mentioned in the method section this study is unpowered. Besides, the assumption normality of the dependent variables for the MANOVA-analyses was not achieved. Accordingly, conclusions drawn from this study may not be reliable and therefore the results of this study should be interpreted carefully. For this reason, the results are referred to as preliminary results. Another limitation is the representation of the JBR behaviors from the questionnaire compared to the behaviors measured with the RACED-JBR. Only four items from the questionnaire about the parent JBR behaviors were useable for the analysis. The subcategory *Interactive Reading Strategies* from the RACED-JBR is not represented in the questionnaire and from the other subcategories only one or two items are covered in the questionnaire. The RACED-JBR, however, consists of three till six items per category, which make the questionnaire not representative. Additionally, the child JBR behaviors are not covered in the questionnaire at all.

Future research should extend the questionnaire to include more JBR behaviors to draw a more substantiated conclusion on the second research question and to assess whether parent self-assessment is a valid tool for all JBR behaviors. To support this, future research should also observe parents reading to their children with different books at different moments. Parents take the general child and parent JBR behaviors into account when answering the questionnaire and also include the context, which is more comprehension information (Diamond & Squires, 1993). The researcher, on the other hand, sees the child only at one moment. Therefore, the researchers' observations will be comparable to the questionnaire when the data is collected over a larger time period. For answering the first research question future research should also expand on the RACED-JBR. Although, measuring JBR behaviors and interactive JBR strategies, which are important for interactive JBR (Trivette et al., 2010), the RACED-JBR measurements are superficial. For example, it focusses on whether parents are asking questions during JBR, but it does not include the quality of these questions (open-ended or closed questions). Therefore, the amount of JBR behaviors and whether parents and children had a dialogue during JBR were examined, but not on which 'level' the interactive JBR was. It could also be that parents were more directive, which was expected according the bi-directional relationship (Tannock and Giralametto as cited in Vigil et al., 2005) although this study is not targeting this. The study of DesJardin et al. (2014) focused on the quality of speech of parents in addition to the JBR

behaviors on the HL population. Future research on children with DLD should also take this into account.

A practical suggestion from this study would be to train parents of children with DLD to promote interactive JBR for stimulating the child's language development by developing an intervention. As mentioned earlier, the implications of this study are that an intervention should stimulate the child *interactive reading strategies* and parent *teacher techniques* because both group scored low on these. Besides, there are already many existing interventions to promote interactive JBR such as *BookStart* (translation: *BoekStart* (Stichting Lezen, n.d.)) and *ReadExpress* (translation: *VoorleesExpress* (Bibliotheek Bollenstreek, n.d.) but these all target populations of children with normal language development. Existing interventions should be adapted to the needs of children with DLD. For example, children with DLD need more time to process and more repetitions (Storkel et al., 2019). Additionally, parents of children with DLD seemed teachable in interactive reading behaviors, as one study showed that parents of preschoolers with DLD had more pro-active children during JBR after finishing an interactive reading program (Complete Reading Cycle) (Crowe et al., 2004). The same applies for an interactive reading intervention developed for the HL population (Dirks & Wauters, 2018), which showed to be effective for stimulating the interactive JBR behaviors. This shows the importance of adapting interactive reading interventions for this population.

To conclude, no differences were found in the child and parent JBR behaviors between parent-child dyads with and without DLD. Besides, parents appeared to be capable of providing valid estimations of their JBR behaviors. Hence, asking parents about their JBR behaviors is useful for practice. This study also showed that some parent and child JBR strategies were not frequently used during JBR for both groups. Therefore, an intervention needs to be developed which offers these JBR strategies. For children with DLD this is expected to be even more important and therefore interventions also need to be adapted to fit for these children. This can be used to improve interaction between parents and their children during JBR, because in order to promote language development they have to "do it together".

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Appendix

The Responsive Adult–Child Engagement During JBR (RACED-JBR) Scale

PARENT/CAREGIVER BEHAVIORS		CHILD BEHAVIORS	
A. Engagement		**A. Engagement**	
1. Sustains interest and attention through nonverbal behaviors (e.g., eye contact, facial expressions, laughing, touch).		Seeks and maintains physical proximity.	
2. Provides positive verbal feedback (e.g., "Good job!" "You did it!" "You're right!").		Visually attentive (e.g., looking at the book or the parent).	
3. Utilizes emotional language and intonation for child (e.g., "There's Spot—Hi Spot!").		Listens to the story (e.g., is quiet when adult is speaking) and sustains interest/engagement.	
4. Makes continued efforts to engage child in story/interaction if initial attempt does not work.		Appears "settled" for the interaction (e.g., does not wander around the room).	
5. Attempts to promote and maintain close proximity to child (e.g., child on lap, child close by, parent attempts to move toward the child).		Holds the book and/or turns the pages on own (e.g., treats book nicely, turns pages carefully).	
6. Monitors child's comprehension by looking at child's behaviors (e.g., facial expressions, child movements) and modifying interaction accordingly (e.g., repeating words, re-engaging child as needed).			
B. Literacy Strategies		**B. Interactive Reading**	
1. Points to/labels pictures/objects in the book.		Responds (verbally or nonverbally) to questions about the book.	
2. Poses and solicits questions about the book's content (e.g., to enhance text or expand topic).		Attempts to relate the book's content to personal experiences or previous books.	
3. Points to words/letters/sentences while reading.		Offers spontaneous ideas about the story or related topics.	
4. Refers to characters or setting.		Poses questions about the story and related topics.	
		Refers to characters or setting.	
		Recalls information from earlier in the story.	
		Makes predictions about what will happen next.	
C. Teacher Techniques		**C. Guided Reading**	
1. Relates content of book to prior experience (e.g., "Look, there's a doggie just like our dog, Otis").		Points to words while parent is reading.	
2. Elaborates on child ideas.		Points to/comments on pictures and labels objects and/or identifies words.	

3. Defines new vocabulary.		Repeats words/phases with or after the adult speaks them (e.g., imitations).	
4. Solicits predictions.		Displays positive nonverbal feedback/reactions (e.g., laughing, smiling).	
5. Reviews beginning, middle, and end of book.		Displays overall enjoyment of storybook interaction.	

PARENT/CAREGIVER BEHAVIORS

D. Interactive Reading	
1. Gives child opportunity to hold the book and turn the pages.	
2. Responds to child's vocalizations or answers child's questions.	
3. Follows child's lead (e.g., allows child to make choices).	
4. Utilizes appropriate speed and volume of speech.	
5. Allows time for child to process, observe, or respond (e.g., does not talk continuously to fill up silence, but rather allows pauses).	
Parent Total Scores A_____ B_____ C _____ D_____ Total_____	

Scoring:

0 = No evidence was found in the video recording

1 = The behavior was seen one time in the video recording

2 = The behavior was seen two or three times in the video recording

3 = The behaviors was seen four or more times in the video recording