

A Descriptive Literature Review: Dialogic Reading for Preschoolers

The positive effects of dialogic reading on young children's development

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Abstract: Dialogic Reading (DR) is an evidence-based intervention that can actively engage children in dialogues and has beneficial impact on children's language development. This review aims to draw a general landscape of DR, including the origin, implementation methods, and effects on children's development. This review will also present the significant research results from recent DR studies. Discussions about DR, e.g., technology-enhanced DR and DR research fidelity, are given. This review might contribute to building public understanding and awareness of utilizing DR in various contexts to maximize its positive effects on young children's development.

Keywords: dialogic reading; preschoolers; active participation; interactive shared-book reading; language development; emergent literacy; child literacy; teacher and parent training; technology-enhanced dialogic reading.

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1 Introduction

Early childhood is vital for children's language development and other building blocks towards cognitive growth. Language acts as an instrument of thinking and learning (Vygotsky, Cole, John-Steiner, Scribner, & Souberman, 1978). It forms the basis for social interaction and affects essential aspects of cognitive development. Children's early language learning is prime in Early Childhood Education and Care (ECEC) and Pre-primary Education (PPE).

Children need sufficient interactions with peers, parents, and adults in different situations to support their learning and development, and one vital element of interaction is language proficiency, which children use at home, in schools, and in various communities (MacLeod, Meziane, & Pesco, 2020). Children's oral communications with others require comprehension skills and specific linguistic abilities. Children need to acquire the necessary decoding skills to find the links between letters and sounds, and then they decode fluently among individual words (Zevenbergen & Whitehurst, 2003). Completing an effective dialogue requires the child to understand the sentence's meaning through active listening. Listening comprehension requires the children to process the words' pronunciation, tone, and meaning. Effective communication sets children to think, reason, respond, and express. Adequate oral vocabulary helps the child understand the relationships among printed words, pronunciation, and meaning, thus supporting the child in building print vocabulary. Oral vocabulary skill is a precondition for children's later reading skills (Morgan & Meier, 2008), and preschool is a vital time for children to accumulate vocabulary and develop language skills (Jones, McDonnell, Johnston, Blue, & Tolbert, 2023). Those skills contribute to later reading comprehension, child literacy, and academic and social competence. Oral language is an important social skill for children and has a positive impact on their school readiness, social adjustment, and academic success (Chen & Shire, 2011). Children who are competent in socializing with others tend to perform better than kids who lack social skills (Chen & Shire, 2011).

Preschool children with poor oral language skills are less competent in their writing-related skills (Puranik & Lonigan, 2015). Poor oral language skills have a positive and long-lasting effect on children's poor behaviors as the children age (Morgan & Meier, 2008). Lack of language proficiency prevents children from interacting with others efficiently in all situations (MacLeod, Meziane, & Pesco, 2020), which might lead to

social skill problems. Those children tend to avoid social interactions with peers and withdraw from conversations due to their poor language skills. These social encounters might lead to later behavioral problems. Meanwhile, reading proficiency is one predictive of later academic achievement; children with difficulty in learning to read might have poor academic outcomes; one reason might be that children with disabilities participate less in shared reading, which requires sufficient language and social communication (Jones, McDonnell, Johnston, Blue, & Tolbert, 2023). Poor oral language skills might be one reason for children's reading and behavioral deficits (Morgan & Meier, 2008).

Storybook reading activities have positive effects on children's language development and are supported by correlational, experimental, and intervention studies (Hargrave & Sénéchal, 2000). Shared book-reading activities create opportunities for children to learn new words. Hargrave and Sénéchal (2000) summarized that children who were non-readers learned new words from listening to a read story twice without explanations of word meanings; adults' instructive explanation benefited children's language abilities so children gained a greater vocabulary; children who answered questions about the target words could use these words more than children who listened about the words that were merely pointed and repeated by adults. Children's active participation in the story enhances children's language learning. Children's reading exposure frequency from 0 to 3 years old was significantly associated with teacher's ratings of oral language skills at the age of 5 and reading comprehension at the age of 7 (Wells, 1985). Shared book reading that enhances the knowledge needed for text comprehension is significant for children to acquire decoding skills and should be supported and enhanced during school years (Zevenbergen & Whitehurst, 2003).

Given the significance of children's language proficiency and interactive communication with others, one method called Dialogic Reading (DR) has been proven a practical approach to promoting children's language development and facilitating adequate conversations between adults and children. Dialogic reading is a home-based picture book reading intervention that can actively engage young children in dialogues (Whitehurst et al., 1988; Pillinger & Vardy, 2022; Whitehurst et al., 1994; Justice & Pullen, 2003; Arnold, Lonigan, Whitehurst, & Epstein, 1994; Valdez-Menchaca & Whitehurst, 1992). Research has provided neurobiological evidence that neural circuits activate and support language processing through DR intervention (Farah et al., 2019). Children increased emergent literacy skills when parents adopted DR strategies (LaCour, McDonald,

Tissington, & Thomason, 2013). DR positively influences children's print concepts, parent-child reading behaviors, and parent's attitudes towards joint reading (Pillinger & Wood, 2014). DR also positively affects children's reading enjoyment, reading motivation, parent-child attachment, parental confidence, and parental stress, and follow-up studies also confirms DR's long-term impact on children's language gains and parental behaviors (Pillinger & Vardy, 2022).

DR serves as an evidence-based approach to engaging young children in reciprocal back-and-forth dialogues regarding the picture book (Justice & Pullen, 2003; Pillinger & Vardy, 2022), which facilitates effective communication of the child to others and promotes children's pragmatic language. Pragmatic language refers to the ability to maintain talks with others, keep the same levels with others during communications, and make expressions understandable to others (Norris, 1995). Children can be positively impacted even though there is limited and inconsistent implementation of DR strategies (Towson, Macy, Abarca, Myers, & FitzPatrick, 2023). DR challenges the traditional ways of reading activities that often require the listeners to stay quiet and listen carefully, while DR is communicative and demanding. A wide range of studies and research have been conducted to explore the relationships between DR and children's development over time, for example, from the earlier study in examining shared picture book reading's influence in accelerating children's language development (Whitehurst et al., 1988), to the recent study examining the effects of DR elements on children's language development (Dong, Chow, Mo, Miao, & Zheng, 2024). This review will summarize and classify such research results. The concerns and future trends of DR will also be discussed.

2 Dialogic Reading

2.1 Defining dialogic reading

DR is a home-based intervention and an approach for educators and caretakers to read picture books to young children. It was first described, designed, and developed by Whitehurst and his associates (Whitehurst et al., 1988; Pillinger & Vardy, 2022; Whitehurst et al., 1994; Justice & Pullen, 2003; Arnold, Lonigan, Whitehurst, & Epstein, 1994; Valdez-Menchaca & Whitehurst, 1992). DR is an evidence-based intervention that promotes children's active participation in picture-book reading interactions (Justice & Pullen, 2003; Pillinger & Vardy, 2022). In contrast to the traditional way of directly reading to children and putting children in a more passive position, DR encourages children to be active participators and storytellers; adults and children have back-and-forth dialogues regarding the picture book; DR especially promotes more demanding and complicated answers and expressions from young children (Whitehurst et al., 1988; Whitehurst et al., 1994; Pillinger & Vardy, 2022). DR is based on the theory that speaking practices, receiving feedback, and scaffolding child-adult interactions in shared book reading facilitate children's language development (Zevenbergen & Whitehurst, 2003; Whitehurst et al., 1988). Although it was first designed as a home-based intervention, it has been used in various settings, including ECEC centers and health centers. Not only that, DR was proven successful in promoting positive outcomes in children among low-income families and children at risk and with disabilities, including autism spectrum disorder, language delays or impairments, developmental delays, and attention deficit hyperactivity disorder (ADHD) (Jones, McDonnell, Johnston, Blue, & Tolbert, 2023).

2.2 Dialogic reading principles

Whitehurst et al. (1988) designed this intervention based on three principles:

- a) to use evocative strategies to promote the participation of the child to talk about the reading materials, e.g., asking open-ended questions to young children: "What is the boy doing?", "What happened?" rather than yes-no questions: "Is the boy crying?" or merely focus on the names of the objects (Wells, 1985): "What's that?".
- b) to give young children informative, extended, and remedial feedback, e.g., expanding other relative information and word forms.

- c) to be familiar with the progressive change of the child's developmental abilities (developmentally appropriate); for example, a child can name the objects before the adult utters the connections among objects in the picture book.

DR principles underline that children benefit from actively responding to picture books with an adult pushing the child through questions, extending to answers, and responding to children's interests and abilities (Lepola, Kajamies, Laakkonen, & Collins, 2023), which is in line with Vygotsky's theory that children develop through social learning with a more knowledgeable person (Vygotsky, Cole, John-Steiner, Scribner, & Souberman, 1978). Thus, the learners gradually take the responsibility of learning from the teacher to themselves (Kajamies A. , 2017; Kajamies A. L., 2019). In book reading activities, providing children with opportunities to talk and reason is an important element to support children's story comprehension (Lepola, Kajamies, Laakkonen, & Collins, 2023).

Other scholars added more details to DR model, e.g., building on children's answers to expand and giving positive feedback, such as encouraging, praising, and following children's interests (Justice & Pullen, 2003). Based on Vygotsky's (1978) theory of proximal development, caretakers and educators provide optimal scaffolding by asking challenging questions and expanding the standards of children's utterance over time (Zevenbergen & Whitehurst, 2003). It is important to give constructive and sensitive responses to children's "incorrect answers", for example, "Yes, this one somehow looks like a horse, but we call it a donkey". The emphasis should be paid to children's efforts in telling the story. It is also essential to add specifications to some words, for example, "Yes, it is a dog. We call this type of dog Beagle. Can you say beagle?" (Zevenbergen & Whitehurst, 2003).

2.3 Dialogic reading strategies

In a study, researchers defined DR itself as a reading strategy (Susan & Donna, 2014). However, two well-known techniques, **PEER** (Prompt the child to answer questions; Evaluate the answers; Expand the answers; Repeat the answers) and **CROWD** (Completion of blank questions; Recall the story details; Open-ended questions to the plot; WH questions to the plot; Distancing to connect to children's own lives), are used to implement DR. Table 1 demonstrate specific examples of the two techniques. Caregivers and ECEC educators are trained to use prompts and questioning strategies to guide the picture book reading and the dialogues. The two techniques have been opted to facilitate

children's active participation. These techniques expand children's vocabulary, comprehension, and linguistic expression skills (Justice & Pullen, 2003; Senechal, 2006). The PEER technique reminds the adults of the sequence of procedures: first, adults ask the group or the child a question from the book; then, they evaluate the correctness of the answer to expand the correct answer or to correct the not-so-accurate answer; last they invite children to repeat the correct answers (Morgan & Meier, 2008). The CROWD technique aims to remind adults of the prompts to ask open-ended questions, and there is no fixed sequence; it also seeks to engage children more in participating by using new words, phrases, and expressive language; adults can give feedback and evaluate children's oral language skills (Morgan & Meier, 2008). Zevenbergen and Whitehurst (2003) categorized DR techniques for children from 2-3 years old and children from 4- 5 years old as better suited to the needs of different age groups.

As a simple example of PEER and CROWD techniques (Morgan & Meier, 2008), a traditional teacher might ask the children "What's this?", the child says "Look, it's a truck", and then the adult replies "Yes, that's right". If teachers use the techniques, they might say, "Yes, it is a truck, a big red fire truck. I know it is a fire truck because it has flashing lights, hoses, and a ladder on it. Could you please tell me again what it is?", and the child says "It is a big red fire truck." The teacher asks questions, introduces new vocabularies that expand the children's word learning and their listening comprehension, and invites children to repeat and practice. After several times re-reading the storybook, teachers need to give children opportunities to retell the story in their own words and continue using the PEER and CROWD techniques. An example of a picture book used in DR is "*Read Together, Talk Together,*" from story kits published by Pearson Education Inc. 2004 and recommended by Morgan and Meier (Morgan & Meier, 2008).

Table 1
Dialogic Reading Techniques

PEER Strategies	Implementation	Example	Objectives
Prompt	Prompt the child to name the objects or ask questions about the characters and events in the book.	"What is this animal?"	Increase attention. Engage the child in the story reading. Increase knowledge of the plot. Increase book-specific vocabulary.
Evaluate	Evaluate children's answers and add additional information to	"Yes, it is right; we call this color brown." "Yes, it is a truck, a big red fire truck."	Give positive feedback on children's answers.

	expand children's vocabularies.	"What does a fire truck do in the city?"	Encourage children to add more information.
Expand	Repeat, expand the children's answers, and add new words and information.	"Yes, it is a bird. It is called an albatross. Can you say albatross?"	Encourage children to say a little more than they would typically say.
Repeat	Encourage the children to repeat the response and new words.	"Yes, it is a bird called albatross. It is big! Can you say a big albatross?" "Can you say that again? How do we call this animal?"	Increase vocabulary. Encourage children to use language.
CROWD Strategies	Implementation	Example	Objectives
Completing prompts	Ask fill-in-the-blank questions to complete a word or a phrase.	"When it rains, we will take our ____ (umbrella)?" "Daniel does not like eating apples, but Lily doesn't like eating ____ (grape)?"	Increase children's listening comprehension and use of language.
Recall prompts	Ask questions to make the child recall the details of the characters and events in the story.	"Who was with Daniel when it was raining?" "What did Lily do when she didn't want to eat grapes?"	Engage children in the story reading. Increase recall of details.
Open-ended prompts	Invite children to describe and talk about the book.	"Can you tell me what is going on?"	Opportunity for children to use the language.
WH-prompts	Point to the picture in the book and ask children What, where, and why questions.	"What color is the apple?" "What is the name of the fruit?" "What is its flavor?" "What does this tool do in the room?"	Help build vocabulary.
Distance prompts	Ask questions to link the book plot to children's own lives.	"I heard that you also went to Egypt last summer. Where did you go? Tell me about your journey." "Have you eaten apples and grapes at home? When? What fruits do you eat at home?" "What fruits do you like and what you don't like?"	Opportunity for children to use language. Help the children make connections between stories and their own lives.

Table 1 (adapted from Morgan & Meier, 2008; Blom-Hoffman, O'Neil-Pirozzi, & Cutting, 2006))

3 The Positive Effects of Dialogic Reading on Young Children's Development

3.1 The positive effects of dialogic reading on children's language development

Language plays a vital role in children's development. DR was proven effective especially in enhancing children's language skills (Arnold, Lonigan, Whitehurst, & Epstein, 1994; Valdez-Menchaca & Whitehurst, 1992; Whitehurst et al., 1988). Language is composed of phonology, semantics, syntax, and pragmatics. Language development refers to the higher level of cognitive skills, such as oral abilities to communicate with others (Kelley, Rudd, Naglieri, & Goldstein, 2011). Infants start to babble in the early stages of their lives. Infants and young children usually learn to understand sounds and speech before developing their expressive language (Kelley, Rudd, Naglieri, & Goldstein, 2011). They learn to speak in various social contexts, while DR creates an advantageous environment. DR creates opportunities for children to express their ideas and thoughts about the picture book, builds on children's current language ability, and extends their vocabularies by asking structured "WH" questions; therefore, children are guided on how to comprehend a new word and how to use that word to make new sentences (Hargrave & Sénéchal, 2000). A report by What Works Clearinghouse (WWC) reviewed five studies on DR, and the result shows that DR has positive effects on children's oral language abilities (WWC, 2007). Throughout the past forty years, a number of research studies have examined the effects of DR on children's language development, and positive results have been found as showed in the following paragraphs.

There were significant effects on children's spontaneous utterances under DR intervention (Valdez-Menchaca & Whitehurst, 1992). Parent training with a modified DR program improved the target expressive vocabularies of children (Knauer, Jakiela, Ozier, Aboud, & Fernald, 2020). DR has the most immediate and robust effect on children's learning about identification of target words in a comparison study (Coogle, Parsons, Croix, & Ottley, 2020). A recent study showed that children in the PEER reading strategy group outperformed the PMF (Prompts with minimal feedback) and control group in terms of receptive vocabulary, character reading, listening comprehension, expressive vocabulary, and reading interest (Dong, Chow, Mo, Miao, & Zheng, 2024). Children of the parents who received DR training presented more verbal interactions and shared more

in the reading compared to the traditional reading group (Brannon & Dauksas, 2012). In addition, parents' use of DR strategies is significantly correlated to children's extratextual talk (Olszewski & Hood, 2023). Children demonstrated gains in comprehension and oral skills with the DR approach adopted by their parents (Olszewski & Cullen-Conway, 2021). DR intervention produced significantly better narratives of children on measures of structure and context than alternative groups, and children's fictional narrative construction knowledge can be enhanced and learned from interactive book reading (Lever & Sénéchal, 2011). A development for DR called DR for Comprehension, which focuses on the structure and meaning of story events, can support children's retelling skills about plot sequence, organization, and coherence of the story (da Nóbrega Rogoski & Pfeiffer Flores, 2021).

A study examining the listening comprehension of children during a two-semester-long DR program highlights the importance of children's active participation in the reading to story comprehension, which underpins the child-mediated factor in children's narrative comprehension (Lepola, Kajamies, Laakkonen, & Collins, 2023). In addition, the result suggests that children's cognitive engagement and verbal participation are vital mediators for listening comprehension development. The more open-ended questions and closed questions the teacher asks, the more responses there are from children, regardless of individual differences. Listening comprehension is associated with the time that children talk, the scope of opportunities, and the amount of time for children to participate. As a result, teachers' open-ended questions indirectly contribute to children's listening comprehension. Open-ended and cognitively demanding questions facilitate multi-turn dialogues and ensure more opportunities for children to give inferential and literal responses. Still, contingent scaffolding is needed to promote children's language learning. Similarly, a quasi-experimental study suggests that children's active participation where children are encouraged to discuss and talk can enhance their language use (van Druten-Frietman, Strating, Denessen, & Verhoeven, 2016). This study uses an intervention that integrates DR and literacy activities. The result shows that DR is effective in supporting children to gain expressive language. The authors also suggest that this intervention can be utilized for underprivileged families to improve their children's language skills so their children can have an optimal start for elementary education.

Another study used a modified DR reading program to adjust the content and strategies to younger children (Brenda, Corinne, Jamie, Kandace, & Debora, 2024). Brenda (2024)

and colleagues focus on children under 3 years of age. Rather than teaching younger children to read and retell the story, the program aims to provide more opportunities for infants and younger children to initiate communication. The result shows that children's engagement increases, and parents also have substantial gains in dialogic book reading. Brenda (2024) and others reviewed from relative studies and they summarized that DR is an evidence-based, high-quality approach that engages children ranging from preschool to school age in participating in the reading. The age at which children are read books influences children's later language development, and the frequency of shared book reading during the first year of life can predict children's later expressive vocabulary during the second year and beyond. The quantity and quality of shared-book reading activities activate children's brain regions that support language development, emergent literacy, social and emotional development, and semantic processing. Moreover, broader benefits of shared-book reading include attention enhancement, preliteracy, and school readiness. The authors called for parents to start shared-book reading with infants as early as possible to promote healthy development.

Jones (2023) and his colleagues also modified the traditional DR in their study and mainly focused on one of the prompts: asking open-ended questions (Jones, McDonnell, Johnston, Blue, & Tolbert, 2023). Mean Length of Utterance (MLU), or "the average length of utterance based on a count of the number of individual morphemes in each utterance" can be used to measure children's language development. A typically developing child can speak six or more-word utterances. Their result showed that 2 of the three children increased their MLU along with the implementation periods. 2 parents in the study from low socioeconomic status enjoyed using DR strategies with their children. They gave positive feedback to the DR intervention, and all three parents can maintain and generalize DR reading strategies with both familiar and unfamiliar books. The authors suggest that other modifications might be needed for DR to address children with behavioral challenges. Though it is small sample size, the result is supporting DR's positive effects on children's oral abilities.

Importantly, DR benefits children with delayed language development. A DR study shows that there are considerable vocabulary gains and especially gains on children's expressive vocabulary (Hargrave & Sénéchal, 2000). The study aims to examine the relationship between DR and children's vocabulary among preschool children who have a limited vocabulary. Compared to regular book reading, children become active

participants in the shared-book reading with new words in print and illustrations. In another study, expressive language gains were also observed in children with moderate to severely impaired expressive language abilities after DR interventions (Ramsey, Bellom-Rohrbacher, & Saenz, 2021). Children with significant developmental disabilities scored higher on their receptive and expressive language, including target words and additional words in the picture books after 6-week DR interventions compared to the typical storybook reading group (Towson, Gallagher, & Bingham, 2016). DR also contributed significantly to the expressive language development of preschool children from underprivileged backgrounds (Asrifan, Setiawan, Ping, Syamdianita, & Nurchalis, 2022). An effective DR protocol to teach vocabulary, called RECALL (Reading to Engage Children with Autism in Language and Learning), which combines DR and other additional evidence-based approaches (intentional pause and questioning sequence), can be utilized mainly in inclusive preschool classrooms (Nunes, Whalon, Jackson, Intepe-Tingir, & Garris, 2022).

3.2 The positive effects of dialogic reading on child literacy

According to Cabell and Fazal (2009), children's earliest encounters with literacy are traditionally conceptualized as reading readiness. However, this has been replaced by the statement that children develop emergent writing and oral abilities before formal reading instructions. This developing emergent writing and oral abilities are known as emergent literacy. Emergent literacy consists of abilities, knowledge, and attitudes that are developmental prerequisites for children to form conventional reading and writing; for example, such skills include the ability to recognize letters, phonemic awareness, print awareness, and oral language skills (Zevenbergen & Whitehurst, 2003). Emergent literacy does not set boundaries between prereading and reading, stating that children learn to read in the early stage of their lives and make accomplishments before formal instruction. Moreover, emergent literacy involves reading, writing, and oral language in an interconnected way in various social contexts. Scholars also suggest not simply defining learning to read as formal reading and writing but other forms, such as drawing to present certain meanings, should be considered, and learning to read should be viewed as a complex social and cultural process (Bloome & Kim, 2016). Emergent literacy precedes early literacy, and finally, it comes to literacy skills. Research studies concluded 5 key predictors of literacy skills: phonological awareness; print awareness; alphabet knowledge; emergent writing; and oral language (inferential language and vocabulary).

Expressive language, phonemic awareness, letter knowledge, familiarity with print concepts, vocabulary, and decontextualized language skills are important components of reading competence (Zevenbergen & Whitehurst, 2003).

DR has been proven to have proximal effects on improving emergent and early literacy skills, such as vocabulary (Hargrave & Sénéchal, 2000), comprehension (Zevenbergen & Whitehurst, 2003; Pillinger & Wood, 2014), and use of print concepts in written language development (Piasta, 2012). A relatively brief 6-week-long intervention with DR strategies can create maintained improvements in both proximal and distal early language and literacy skills of preschoolers and parental reading behaviors (Dicataldo, Rowe, & Roch, 2022). DR serves as a well-validated approach to boost children's vocabulary growth and, in turn, later achievement in reading and other academic skills. A number of research studies examining the relationships between DR and literacy skills have been conducted throughout the past and recent years, and positive effects were found as showed in the following paragraphs.

Young children's abilities to match the sounds can significantly improve after a 12-week-long DR intervention using community-based participatory research (Holt & Asagbra, 2021). Mothers who received a 30-minute video training about DR strategies became more flexible and talked more extra-textually with their children, and both mothers and children increased the number of utterances; the intervention promoted a number of interactivities among children and their mothers (Zhao, Luo, Zhou, Zhong, & Lai, 2021). Sénéchal's (2006) study found that parent tutoring and children's storybook exposures are related to certain literacy skills, such as alphabet knowledge, vocabulary, reading fluency, comprehension, attitudes toward reading, and reading for pleasure frequency (Sénéchal, 2006). A 20-week-long study testing children's early language and literacy skills after a preschool-home partnership intervention using DR showed that children gained substantially with regards to receptive vocabulary, expressive vocabulary, print awareness, and taxonomy (ability to categorize objects into their superordinate groups) (Kim & Riley, 2021). An intervention consisting of DR and a sound and letter awareness program had a great impact on the writing skills and print concept comprehension of children in Head Start; gains obtained in the intervention were maintained through the kindergarten year; children scored higher in language ability test, sounds and letters, and writing at the end of the kindergarten year than children in the control group (Whitehurst et al., 1994).

A comparison study in Australia showed that both DR positively impacted children's literacy skills relating to expressive language, rhyme, and print concept understanding (Susan & Donna, 2014). Children got higher reading scores than children who were rarely exposed to reading activities at home, and children scored less than children who were read more regularly (the turning point: four times a week) (Stevenson, 1990). Parent tutoring about literacy at kindergarten stages directly predicted later reading fluency, and storybook reading exposures predicted kindergarten vocabulary and later reading pleasure frequency (Senechal, 2006). The DR approach was used in studies that examined children's comprehension. One of the studies found that there was an early emergence of inferential comprehension in children around three years old (Filiatrault-Veilleux, Bouchard, Trudeau, & Desmarais, 2016). The age between three and six is vital for children to develop comprehension ability that lays a foundation for later reading comprehension. Filiatrault (2016) and others also suggest that using interactive media is promising in measuring children's comprehension. DR is promising in supporting preschoolers' inferential skills and literal narrative comprehension, and children's vocabulary depth and breadth are positively affected (Grolig, Cohrdes, Tiffin-Richards, & Schroeder, 2020).

3.3 The positive effects of dialogic reading on ASD children and ESL young learners

DR can be used to support children with Autistic Spectrum Disorder (ASD). A study using designed and modified DR prompts for ASD children showed that nine children increased their verbal participation in the book redesign sessions by mainly responding to the prompting questions, and the target vocabularies also increased (Fleury & Schwartz, 2017). Another study has the same result that DR book reading increased three ASD boys' verbal participation and reading duration with printed books (Fleury, Miramontez, Hudson, & Schwartz, 2014). ASD children became more responsive, and the frequency of interactions increased after the intervention that employed DR principles (Müller, de Paula Nunes, & Schmidt, 2023). Two seven-year-old ASD children under DR intervention increased their independent answers to WH questions; they were highly engaged in the tasks; DR can better engage children in the conversations during reading (Queiroz, Guevara, de Souza, & Flores, 2020). A systematic review of nine experimental studies examining the effects of DR on ASD children found that all studies presented moderate to strong quality evidence and DR can increase ASD children's responses

(Alharbi, Terlektsi, & Kossyvaki, 2023). These results strongly suggest that DR is a promising and beneficial approach to supporting ASD children's language development by engaging them in verbal participations.

DR also positively influences the second-language learning of multi-linguistic children in diverse classrooms where they are exposed to a different language learning environment. The following research results present the empirical evidence of DR's beneficial impact on ESL (English as a Second Language) young learners. A recent study shows that DR has an apparent effect on children's oral language (additional language learners); it acts as a medium to foster language development; the most distinct language effect is found on vocabulary depth (target words) (Riad, Westling Allodi, Siljehag, & Bölte, 2024). Children in the DR technique group responded to questions with more complex syntactic structures in a study examining the effects of DR using picture books with EMPATHICS elements on young second language (English) learners (Hui, Chow, Chan, & Leung, 2020). EMPATHICS is an acronym of Emotion and Empathy, Meaning and Motivation, Perseverance, Agency and Autonomy, Time, Habits of Mind, Intelligences, Character Strengths, and Self Factors. A case study using an adapted DR intervention showed that the four Latino preschool-age children who were at risk of English language delays improved their oral language and vocabulary, and they improved their retelling of stories (Correa, Lo, Godfrey-Hurrell, Swart, & Baker, 2015). Children acquired more vocabularies from the pre-test to the post-test when their English language learning parents applied DR strategies; they also sustained attention much more (Brannon & Dauksas, 2012).

3.4 The positive effects of dialogic reading on various developmental areas

3.4.1 Enhancing social and emotional development in children through dialogic reading

In a study, DR with visible thinking routines was used to develop children's emotional intelligence (Xu, 2023). The result showed that children's emotion recognition, expression, regulation, and empathy developed. These are key components of emotional intelligence that is vital for children's social and emotional development. In another study, children's expressive and receptive emotion vocabulary knowledge increased after using DR techniques and direct instruction of emotion words (Kogan, 2024). Children's social

skills of sharing, helping, cooperation, empathy, and friendship increased. The result also showed that DR had a positive effect on children's engagement and children's vocabulary scores. Interactive shared reading can support children's social and emotional development (Kerigan & Çelebi Öncü, 2022). In addition, preschool children's perspective-taking skills were increased after the DR intervention (Yurdakul, Beyazit, & Ayhan, 2023). These children were exposed to the character's emotional and mental states, which indirectly embedded them with social experiences. The above research results propose widening the use of DR in preschool settings to support children's social and emotional development.

3.4.2 Promoting early mathematical and cognitive development through dialogic reading

A recent study found that DR with designed patterning content picture book (e.g. stripes or color patterns) effectively stimulated children to learn repeating patterning skills, which support children in acquiring configuration knowledge; patterning skill is a significant part of mathematical knowledge (Wijns, Purpura, Torbeyns, & Kendeou, 2023). Preschool children's category naming skills in the DR group scored significantly higher than the control group (Yüzbaşıoğlu & Akyol, 2022). A DR intervention that targeted asking mathematical questions to children showed that both children's mathematical language and mathematical knowledge improved (Purpura, Napoli, Wehrspann, & Gold, 2017).

Moreover, DR is related to improved executive functions and language scores of children in the DR group compared to screen-based storytelling (Twait, Farah, Shamir, & Horowitz - Kraus, 2019). A modified DR intervention called QQQ (Quincey Quokka's Quest) is validated and feasible to empower executive functions in preschool children (Ruffini et al., 2021). QQQ is a picture book with illustrations to facilitate executive function activities in shared book reading frameworks. Children's cognitive, emotional, and behavioral profiles with regard to memory and recovery domains, comprehensive and expressive language, and recognition and expressions of emotions can be enhanced through DR (Vargas-García, Delgado-Reyes, Sánchez-López, Aguirre-Aldana, & Agudelo-Hernández, 2020).

3.4.3 Enhancing parent-child interaction and reading engagement through dialogic reading

Pre-kindergarten children's attitudes towards and interests in storybook reading were improved through DR (LaCour, McDonald, Tissington, & Thomason, 2013). Parent's attitudes toward joint reading can also be improved via DR interventions (Pillinger & Wood, 2014). Moreover, DR positively affects children's reading enjoyment and reading motivation (Pillinger & Vardy, 2022). Dialogic literary gatherings (DLGs), in which children are read classic literature, rich egalitarian dialogues happen, and all contributions are valued, can facilitate high-quality interactions between adults and children and among children themselves; it can also be used to promote children's self-regulation and prosocial behaviors (Girbés Peco, Tellado, López De Aguilera Jaussi, & Botton, 2024).

In addition, DR intervention projects improved parent-child relationships (Ganotice, Downing, Mak, Chan, & Lee, 2017). Parents' confidence in reading was improved when parents attended DR workshops (LaCour, McDonald, Tissington, & Thomason, 2013; Pillinger & Vardy, 2022). DR positively impacts parent-child reading behaviors (Pillinger & Wood, 2014). DR can promote parent-child attachment, reduce parental stress, and follow-up studies also confirm DR's long-term impact on parental behaviors (Pillinger & Vardy, 2022). DR parental training with culturally and linguistically picture books increased children's reading frequency, improved child-parent reading quality, and the illiterate caregivers appeared to benefit the most in engaging their children in reading and promoting children's expressive language (Knauer, Jakiela, Ozier, Aboud, & Fernald, 2020). A study using a novel parent behavior training via DR found that the training significantly improved parenting behaviors and child-positive outcomes (Chacko, Fabiano, Doctoroff, & Fortson, 2018). Additionally, the result reported that fathers gained more discipline and children gained more psychological growth. Parents had less negative parenting (critical statements) but more positive parenting (praise and affection) with their children.

4 Dialogic Reading Training and Technology-enhanced Dialogic Reading

4.1 Training parents and educators in dialogic reading: approaches, challenges, and strategies

Parents and educators are trained to use DR by attending parental meetings organized by universities or care centers and from audiotapes or videotapes (Whitehurst et al., 1988; Whitehurst et al, 1994a; Whitehurst et al., 1994b). Adults learn dialogic techniques better when they see how other adults demonstrate and model the strategies in practice (Zevenbergen & Whitehurst, 2003). A trainer might also have role play with trained adults to better acquire DR techniques. Olszewski and Cullen-Conway (2021) summarized from 30 DR intervention studies that DR training including discussions, handouts, videos, role play, and live feedback, significantly increased use of DR, improved parental confidence in reading, and engaged children more in book reading (Olszewski & Cullen-Conway, 2021). An investigation on the acceptability of DR video training to parents and pediatric social workers in community health centers showed that DR video training got positive reviews from the caretakers, (Blom-Hoffman, O'neil-Pirozzi, & Cutting, 2006), and the authors suggest school psychologists can take the role to disseminate the use of DR among parents, educators, and other caregivers.

For example, in Olszewski's and Cullen-Conway's (2021) DR study, the DR training program contains 27 instructional videos from a famous social platform (Twitter). The videos cover three domains: aspects of vocabulary, comprehension questions, and print awareness. In each week of 9 weeks, three videos demonstrating reading and questioning strategies in the three domains will be sent to parents. The instructional video in social media is similar to what Zevenbergen and Whitehurst (2003) mentioned in parental training in using videotapes. Parents acquired increased DR reading strategies after the intervention. The study also implies that social media might be viable to change parent-child reading behaviors.

However, there are challenges to implement DR implementation. Firstly, it is difficult to implement small-group dialogic reading in preschool classroom settings, which can yield better results. Secondly, it is rather difficult to ask children open-ended questions in the reading period due to limited time and changing classroom dynamics. Thirdly, parents used few DR strategies to teach vocabulary explicitly, and parents tended to explain more

on tier 1 words rather than tier 2 words (Olszewski & Hood, 2023). Tier 1 words are everyday words that children learn from daily lives, e.g. “eat” and “boy”, while tier 2 words are more informal written language or academic vocabularies, e.g. “formulate” and “explicit”. Tier 2 words are important for academic success. Fourthly, parents might not adhere to DR principles, and working parents might feel incompetent and too tired to apply DR strategies at home. Fifthly, the paraprofessionals in preschools implemented DR with variability (from low to high variance in applying DR strategies) after a singular training and in-text supports (Towson, Green, & Abarca, 2020). Lastly, the picture books being chosen for DR are sometimes too easy with simple texts to expand or too difficult to instruct and stimulate the children’s acquisition of new words. Therefore, the choosing of age-appropriate, development-appropriate, challenge-appropriate, and relatively sophisticated books with plots from a variety of options are needed to better engage children in participation and better use of DR skills (Brenda, Corinne, Jamie, Kandace, & Debora, 2024; Urbani, 2020). Researchers suggest making use of volunteers and calling for extensive training for parents to maximize the benefits of DR successfully (Zevenbergen & Whitehurst, 2003). Other researchers also suggest that teachers and parents may need additional professional DR training and weekly coaching in using DR (Towson, Macy, Abarca, Myers, & FitzPatrick, 2023). Specific parent workshops, training, and coaching programs might have a great potential to equip parents with sufficient skills in supporting their dialogic reading with children, and modification to the intervention and programs might also produce more gains (Brenda, Corinne, Jamie, Kandace, & Debora, 2024). Additional training and DR with necessary contextual modifications and fidelity are needed to achieve DR’s functions in supporting children’s oral language development (Fleury, Dennis, & Williams, 2024; Towson, Green, & Abarca, 2020). Caretakers and educators need to modify DR strategies to meet children’s individual needs and build on their current reading practices to apply DR strategies.

4.2 Exploring the impact of technology and digital media on dialogic reading: opportunities and challenges

A growing number of children are exposed to electronic book reading with the rapid growth of digital devices and electronic book ownership (Munzer, Miller, Weeks, Kaciroti, & Radesky, 2019). Some previous studies stated that children interact less with their parents when reading electronic books. Munzer (2019) and others examined the frequency of verbal and nonverbal interactions between toddlers (age 24 to 36 months)

and parents when reading electronic and print books. They found that parents and toddlers talked less with electronic books and had lower collaboration among them. However, studies have addressed both the benefits and drawbacks of electronic books. Some found that electronic books might promote engagement among children who feel reluctant to read, but some found that children produced fewer narratives and lower accuracy in telling the stories with electronic books. Younger children need more verbal elaboration and scaffolding, such as in-person interactions, since toddlers are easily distracted by electronic books and have more difficulty receiving information from digital media without adult elaboration. Munzer (2019) and others also suggest that promoting the continuing use of print books among toddlers and younger children might be more beneficial in producing more conversations and interactions, and behavioral management might be needed with electronic book reading. In addition, another study shows that DR is related to improved executive functions and language scores with printed books compared to screen-based storytelling (Twait, Farah, Shamir, & Horowitz - Kraus, 2019). On the contrary, a study showed that video stories with parent-led questions using DR strategies promoted children's attention, story comprehension, and vocabulary gains; the study suggests that a well-designed video can be effective in supporting preschooler's learning (Strouse, 2011). These studies pose the question of whether educators should bring electronic books and video stories to preschoolers.

Social media is also widely interweaved in people's lives nowadays. Olszewski and Cullen-Conway (2021) reviewed the literature about social media's effects on behavioral changes; they summarized that social media platform (e.g., Twitter) effectively influence behavioral changes, e.g. positive behavior changes were found in the nutrition behavior social media interventions (Olszewski & Cullen-Conway, 2021). These health interventions include social support, modeling, self-monitoring, goal setting, and feedback. Nevertheless, social media can be used to change parents' attitudes. Their study hypothesized that Social-Media Accompanying Reading Together (SMART), a training program to teach adults how to use DR strategies, will increase parental use of DR and thus improve children's early literacy skills. The changes in proximal measures of decoding and comprehension skills in children and later improvement in distal language and literacy skills were observed. In addition, this study found that children decreased problematic behaviors, and parents demonstrated less reactive parenting styles and less stress.

Social robots are also used in DR studies. Social robots with human-like characteristics (gestures and facial expressions) interact with humans more naturally, and social robots with vocabulary games help children gain new words in both their native and second languages (Kory Westlund et al., 2017). Robots, being more interactive and like social beings, tend to engage children more in interactions because they are seen as tutors, companies, or peers, thus allowing children to learn more complex language skills. Children in those studies trust robots more to acquire new information and recall more of a story when robots convey personal attentions, e.g., using nonverbal expressions and producing immediacy gestures. Robots are also more controllable compared to human actors. Kory's study examined the different outcomes of dialogic reading told by flat (little dynamic change) and expressive (with intonation and emotions) social robots; they found that preschool children reported a similar amount of liking and learning from the two types of robot story-telling activity; but children in the expressive robot group were more concentrated and emotionally engaged, children retold the story with more details, and children responded to robot's questions more actively. Children in the expressive robot group were more likely to recognize the target vocabulary correctly and retold the story more fluently than in the flat robot group. In addition, another study examining the effect of Chatbot DR showed that the Chatbot's support to kindergarten children's reading (story comprehension and vocabulary acquisition) was similar to the human partner; these Chatbot are automatic computation conversation agents who can produce natural dialogues by using AI to process natural language; children's language proficiency moderated Chatbot's effects on story comprehension; chatbot can facilitate dialogic reading, but children's language skills should be taken into consideration when applying Chatbot DR interventions (Cheng et al., 2024). In conclusion, children experience and benefit more from expressive robots than flat robots in these studies, and social robots that consist of rich expressivities can promote more positive learning outcomes. Therefore, it might be promising to integrate technological robots into preschool classrooms, though educators have to consider many other aspects, such as expenditure. Children from the third world country or low socioeconomic backgrounds might not have the access to digital devices. Practitioners need more applications and implementations of technology-enhanced DR. Researchers might need to study the broader elements in the research field of technology-enhanced DR or AI-supported DR. Limitations and potential concerns should also be taken into consideration, such as, excessive time in using digital devices.

5 Discussions

5.1 Dialogic reading research fidelity

Importantly, researchers question the fidelity of DR and its reliabilities. The standards of DR implementation processes vary in DR research. A study aimed to summarize the evidence base of DR studies, such as DR implementations and training procedures (Towson, Fettig, Fleury, & Abarca, 2017). The result showed that there existed wide variance in adherence to DR protocol and none of the reviewed 30 journals reported fidelity of DR training procedures. Evaluating the actual adherence to DR strategies (e.g. use frequency or training type) are needed to translate the evidence-based approach to general practice. Thus, variability and how DR intervention is monitored should be noted in those studies. They suggested that a systematic review of existing DR strategies with careful examination must be encouraged to decide which training practices are necessary for participants. DR interventions can be implemented to have maximum impacts. This aligns with the findings of another systematic review conducted by Pillinger and Vardy (2022). Pillinger and Vardy stated that it must be noted that the research and studies about DR utilized a limited approach to measuring language development. They reminded readers to pay attention to the intervention fidelity of such studies and the lack of control groups. Research can broaden the field in examining DR's effects on language grammar, effect sizes of DR intervention projects, ADHD children, dyslexia children, and male caregivers. Thus, a more robust data set for the efficacy of DR can be created (Towson, Fettig, Fleury, & Abarca, 2017).

5.2 Research gaps in dialogic reading's effects on infants and long-term outcomes

Few DR studies focused on infants and toddlers under 2 years old. Only one study demonstrated what DR practices look like with 12-month-old infants (Chang et al., 2023). The parents used more communicative gestures to cover DR prompts to encourage the baby to talk more about the book. Meanwhile, most studies in this review are weeks long, but long-term and follow-up studies are rare. For example, a year-long study found that children's reading skills were significantly better in their first grade after they experienced DR in kindergarten years than the other group (ERGÜL, AKOĞLU, KARAMAN, & SARICA, 2017). However, the tests were based on children's scores on reading

performance in one minute. One minute might be insufficient to generalize children's overall reading abilities. Even though it is a follow-up study, the time range is relatively short. A longer time range might provide more sufficient evidence of the effects of DR on children's later reading abilities and development. Therefore, the long-term effect of DR over a 2-year-long period might need more empirical evidence.

5.3 Linguistically and multiculturally appropriate dialogic reading

Justice (2004) outlines four types of children who might need intervention in improving their oral language skills, and two of them are: a) children who speak a language other than the dominant curriculum language; b) children who receive insufficient oral and written language input at home (Justice L. M., 2004). Thus, it brings children's multicultural backgrounds, multilingual environments, and home language learning environments to the context of using DR strategies. For example, children from low-income South African communities might not receive enough language input. The home language learning environment is significantly related to preschoolers' oral language development and emergent literacy acquisition, e.g., more vocabulary gains in the children if parents talk and tutor more at home. DR picture books for multicultural children need to be culturally and linguistically inclusive (Koopowitz et al., 2024).

5.4 Inconsistent research results

Regional differences and family backgrounds should be considered when implementing DR. For example, a study conducted in low-income South African communities found no receptive and expressive language gains and no neurocognitive and socio-emotional gains for 3.5-year-old children with a 4-month dialogic book-sharing intervention (Koplowitz et al., 2024). This result is in contrast with many other studies that were conducted in different regions. The result also suggests that there might be a critical period for implementing DR for children. In a study, no improvements in children's initial and independent talks were observed from all 9 ASD children (Fleury & Schwartz, 2017). The impacts of DR on ASD children's initial communications and responses were inconsistent (Alharbi, Terlektsi, & Kossyvaki, 2023). Thus, whether DR can improve the children's initiative to talk can be further discussed and examined. A report reviewed five studies on DR, and they found that DR has no discernible effects on phonological processing (WWC, 2007). As a result, future research addressing such problems is needed.

6 Summary

Dialogic reading is worth adopting in various contexts given the enormous positive effects on children's language development and literacy skills. O'Sullivan (2021) ascertains that the DR approach is reliable, easily adoptable, and flexible, as shown in the case study of 15 London nurseries (O'Sullivan, 2021). O'Sullivan recommends utilizing DR more in nurseries. Dialogic reading creates adequate opportunities for children to learn and use language, in turn supporting children's overall well-being. Parents are highly involved in the home language learning environment and educators in the ECEC and PPE settings; thus, all caretakers from various contexts can make use of dialogic reading to jointly support children's development. Policy makers and related parties can take the role to disseminate dialogic reading. However, researchers are called to pay more attention to DR research fidelity (Towson, Fettig, Fleury, & Abarca, 2017; Pillinger & Vardy, 2022) and its effects on other aspects such as social and emotional development, mathematical development, and psychological development.

This review gives an overall introduction, description, and demonstration of dialogic reading. The reviewed literature covers various regions across the globe, which implies that dialogic reading catches scholars' attention from multiple cultures, and the positive results might be functional to generalize to different settings. However, modifications are needed to address individual and regional differences (Brenda, Corinne, Jamie, Kandace, & Debora, 2024). The challenges, difficulties, and concerns in practically applying dialogic reading are discussed. It also brings discussions about the future trends of dialogic reading, such as social robots. Hopefully, this review can contribute to the public understanding and awareness of using dialogic reading in various settings. However, this review studied a limited amount of research, so the results and conclusions might be limited. The implementation and utilization of dialogic reading also vary in different contexts with nuances and distinctions.

At the end, this review wants to present Plum's argument in 2017 that DR is an assemblage of many elements, such as the pedagogy tools used in the reading activity and the coping with restless babies from the stroller (Plum, 2017). Those should not be separated from the method. DR should not only be considered as a professional method but also a rather complex practice that requires much more work with the children and nursery workers.

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