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Abstract

Dialogic reading interventions have been used successfully to increase literacy and language skills, including math language. This study aims to investigate whether a dialogic reading intervention will assist children with spatial and numerical magnitude comparison skills learned through a novel adaptive eBook designed to be read together by parents and children. We propose that a dialogic reading intervention used with an adaptive magnitude comparison eBook will improve children's spatial and numerical magnitude comparison skills and general math skills compared to control groups. Preschool-aged children and their parents (N=27) were randomly assigned to one of three conditions: adaptive magnitude comparison eBooks reading with dialogic reading training, adaptive magnitude comparison eBooks reading without dialogic reading training, or literacy eBook reading. Each group was asked to read their eBooks at home 4 times per week for 2 weeks. Participants were assessed virtually at pre- and post-test on their numerical and spatial magnitude comparison skills and their general math skills.

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University *of* Dayton

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Introduction

As many as four in ten children fail to meet basic math proficiency as they enter the fourth grade (National Assessment of Educational Progress, 2018). Considering that as early as preschool, mathematics and the skills relating to it predict later academic and career success (Clements, Sarama, & Germeroth, 2016; Duncan et al., 2007), there is a need to investigate and improve the way in which children learn and are taught mathematics. Narrowing focus to activities that occur at home around math will allow for a better understanding of the impact of the home environment. The literature makes it abundantly clear that what takes place at home; parenting (NICHD ECCRN, 2006; Parcel & Menaghan, 1990), parental activities (Bradley, 2002), and factors such as socioeconomic status (Bradley, Corwyn, Burchinal, McAdoo, & Coll, 2001; McCall, 1981), are all important to academic success. Combined these factors make up the Home Learning Environment (HLE).

Understanding the HLE in the context of early math skills is even more critical given current pandemic disruptions to children's early learning experiences outside the home. In the current study, we focus on the HLE in the area of children's early magnitude comparison skills. Young children's magnitude comparison skills (in our study, numerical and spatial magnitude comparisons) have been shown to be a significant predictor of their early math achievement (Sheeks, Wang, Bartek, Gunderson, & Fuhs, 2019; Siegler, 2016). Research suggests that young children struggle to compare non-symbolic numerical magnitudes when numerical magnitudes conflict with spatial magnitudes (Clayton & Gilmore, 2015; Fuhs & McNeil, 2013; Liebovich, Katzin, Harzel,

& Henik, 2017). In the current study, we predicted that using dialogic reading (DR) training in the context of adaptive eBooks that focus on both numerical and spatial magnitude comparison skills will be particularly beneficial for children's development of magnitude comparison skills.

Home Learning Environment: Gaps in knowledge and performance of math begin to emerge at a young age, before children enter formal educational settings (Dowker, 2008). Compounding this, children who start behind often stay behind their peers during their time in school. Thus, time spent at home is a significant factor in a child's educational readiness. The home learning environment (HLE) is defined as the availability of items, such as books, the way these items are used, and parental activity (National Research Council, 2008). Existing research suggests that the HLE is an underutilized environment when it comes to math development. Number talk in the home environment is infrequent compared to language centered around literacy (Cannon & Ginsburg, 2008) and is outpaced by language used around literacy as both forms of language increase over time (Gunderson & Levine, 2011). Infrequent math language is often coupled with a lack of understanding when it comes to what level of difficulty is suited to a child's needs. While there is evidence that parents can assess, with relative accuracy, their child's general math proficiency (Lin, Napoli, Schmitt, & Purpura, 2020), parents express concern with their ability to teach their young children math concepts and skills, as well as when to advance their children to more difficult material (Cannon & Ginsburg, 2008).

The HLE has been shown to be an important factor in math achievement. The HLE is strongly correlated with a child's numeracy development as well as their mathematics achievement up to at least age 10 (Mellhuish, Sylva, Sammons, Siraj-

Blatchford, Taggart, Phan, & Malin, 2008). Reading at home coupled with parental expectations are correlated with math achievement (Byrnes & Wasik, 2009; Galindo & Sonnenschein, 2015). Galindo and Sonnenschein (2015) state that a supportive HLE can decrease the gap in achievement between children from low-SES homes and their peers.

Early Math and Language Skills: Language has been shown to play a key role in the development of math related skills. Gunderson & Levine (2011) provide evidence for the importance of math related talk, specifically number talk, showing that when it is present at home it predicts future cardinal-number skills. However, Gunderson and Levine also demonstrate that a diversity of math vocabulary will be needed for success. Children who hear language that is only associated with one subsection of mathematics, such as small number talk (language centered around the numbers 1-3) may fall behind their peers who are presented with a more diverse range of math related vocabulary (Gunderson & Levine, 2011).

The existing literature demonstrates that shared storybook reading is beneficial for bonding between children and their parents (Barratt-Pugh & Rohl, 2015), increasing attention (Lawson, 2012), and cultivating affection for reading later in life (Pillinger & Wood, 2014). Story book reading is also beneficial to vocabulary development and word comprehension (Justice, Meier, & Walpole, 2005; Montag, Jones, & Smith, 2015; Sénéchal & Cornell, 1993) The practice of reading out loud to children has been called one of the most important factors in developing skills needed for reading (Neuman, Copple, & Bredekamp, 2000). The eBooks used in the current study capitalized on the benefits of shared storybook reading and diverse math talk in the unique context of magnitude comparisons.

Caregivers reading number books has been shown to lead to improvements in math language skills (Purpura et al., 2017). Print number books assist in a child's learning by encouraging a focus on numerosity through the encouragement of verbal interactions (Rathe et al., 2018). An additional benefit to focusing on numerosity is that it is correlated to an increase in the quantity of number-based talk throughout the day (Rathe et al., 2018). However, one thing that traditional number books lack is clear guidance for advancing a child to more difficult subjects and on how parents can discuss the material in the books with their child.

Magnitude Discrimination Skills: Adaptive magnitude comparison eBooks may be particularly useful in reducing some of the limitations to traditional number books. Many young children struggle to disentangle numerical and spatial magnitudes (e.g., compare three large elephants to six small mice and determine which has more animals), and their ability to overcome this challenge is related to their early math skills (Clayton & Gilmore, 2015; Fuhs & McNeil, 2013; Yeo, Wilkey, & Price, 2019). As of yet, however, we know little about how to help children overcome spatial magnitude biases and flexibly attend to both spatial and numerical magnitudes when necessary (Leibovich et al., 2017), despite this skill is involved in many of the early math skills children must master (e.g., number line estimation, measurement skills). Current number storybooks are not typically set up to give young children opportunities to overcome challenges to magnitude comparison as they almost always depict homogenous items and offer few opportunities for comparison of either spatial or numerical magnitudes (Ward et al., 2017). We proposed that exposure to opportunities to discriminate between spatial and numerical

magnitudes in the context of adaptive storybook reading will be particularly beneficial for young children's magnitude comparison skills.

Dialogic Reading: One promising way that parents could increase their math talk around numerical and spatial magnitude comparison when engaging in reading number books is by using DR techniques. DR aims to give structure to the activity of reading Whitehurst (1988). It does so by providing parents with suggestions on how to most fully engage learners. Two of the core attributes of a dialogic reading intervention are the CROWD and PEER acronyms (Towson, Gallagher, & Bingham, 2016). CROWD [Completion, Recall, Open-ended questions, Wh-questions (who, what, when, where, and why), and Distancing] and PEER [Prompting, Evaluating, Expanding, and Repeat] (Lonigan & Whitehurst, 1998) are designed to foster deeper understanding through engagement and discussion beyond what appears on the page. This helps direct children to important parts of a story and increases parent-child interaction (Fleury & Schwartz, 2017; Hargrave & Sénéchal, 2000; Strouse, O'Doherty, & Trosseth, 2013). DR has been shown to increase the expressive vocabularies in children (Whitehurst et al. 1988).

There is causal evidence that dialogic reading in the context of parent child shared math storybook reading is linked to improvements in children's math language and overall math skills (Purpura et al., 2017). Purpura and his colleagues found that following an eight-week dialogic reading intervention students in the intervention group outperformed their peers in assessments of both math language and knowledge. There is evidence to suggest that understanding language is a key component to understanding magnitudes (Odic, Pietroski, Hunter, Lidz, & Halberda, 2013). To sum, we proposed that the combination of DR and an adaptive reading experience focused on numerical and

spatial magnitude comparison will help children learn magnitude comparison and more general math skills more readily than reading these same eBooks without DR techniques or reading literacy eBooks.

Current Study: The objective of the current study is to assess whether the HLE can be used more effectively for improving young children's magnitude comparison skills through a DR intervention and reading adaptive magnitude comparison eBooks. The current study included two experimental conditions: a regular reading condition in which parents and their children read adaptive magnitude comparison eBooks, and a DR condition where parents were trained to use principles of DR while reading the adaptive magnitude comparison eBooks. These two experimental conditions were compared to a control condition where parents and children used a PBS educational app instead of our eBook.

Hypotheses

Near Transfer Hypothesis 1: We hypothesize that children in both experimental conditions (adaptive magnitude comparison eBooks, adaptive magnitude comparison eBooks + DR training) will improve their spatial and numerical magnitude comparison skills significantly more than children who read the literacy eBooks.

Near Transfer Hypothesis 2: We hypothesize that children who are in the adaptive magnitude comparison eBooks + DR training condition will improve their spatial and numerical magnitude comparison skills significantly more than children who are in the adaptive magnitude comparison eBooks condition without DR training.

Far Transfer Hypothesis 1: We hypothesize that children in both experimental conditions (adaptive magnitude comparison eBooks, adaptive magnitude comparison eBooks + DR training) will improve their general math skills significantly more than children who read the literacy eBooks.

Far Transfer Hypothesis 2: We hypothesize that children who are in the adaptive magnitude comparison eBooks + DR training condition will improve their general math skills significantly more than children who are in the adaptive magnitude comparison eBooks condition without DR training.

Methods

Participants: Parent-child dyads composed of preschool children ages three to five years old and their parents ($N = 27$) were recruited from multiple preschool programs in the mid-western United States. We used G*power to estimate the sufficient sample size needed to adequately power (.80) our primary ANCOVA analyses. In a previous study of the effect of DR on children's math language and general math skills, researchers found an effect size of .42 for their near transfer effect (math language) and an effect size of .32 for their far transfer effect (general math skills) (Purpura et al., 2017). Based on this prior research, a sample size of 58 would provide sufficient power (.80) for an ANCOVA with three groups and four covariates for a near transfer effect, and a sample size of 98 would provide sufficient power for a far transfer effect. We used the more conservative effect size and plan for a sample size of 98 participants. As of the submission deadline of this thesis, recruitment is ongoing and power for neither the near or far transfer hypotheses

have yet to be met. Therefore, the results should be interpreted as pilot data and should not be used to formally evaluate the effectiveness of the interventions.

Materials and Procedure: Parents/guardians of preschool aged children were recruited through preschools in the area as well as through local parent groups and flyers posted in public spaces such as a pediatrician's office. Participants gave their consent via an electronic consent form and were randomly assigned into the control group or one of the two experimental groups. Regardless of condition, all participants were sent, by email, the pretest survey. Due to the Covid-19 pandemic, all pre-test and post-test measures were administered remotely using Zoom and parent survey measures. Upon completion of the pre-test, participants in the experimental conditions were sent an email link that gave them access to the adaptive magnitude comparison eBooks. Participants in the adaptive magnitude comparison eBooks + DR training experimental condition were also sent the DR materials (see Appendix). Participants in the literacy eBooks control condition were asked to spend time together on the free PBS app Molly of Denali. Regardless of condition, each dyad was asked to read their eBook four times a week for two weeks for a total of eight readings of the book. Once the two-week intervention was over, the parents were sent the post-test zoom link. The post-test materials included those administered at pre-test as well as an additional parent questionnaire.

1) *Child Assessments:*

A. *FAM Task:* The flexible attention to magnitudes (FAM) task is an assessment of a child's ability to flexibly shift between numerical and spatial magnitudes (Sheeks et al., 2019; see https://osf.io/zs8jc/ for FAM task

stimuli). Children are shown two boxes side by side containing a common object (stars) where the numerical and spatial dimensions of the object sets are incongruent. In other words, one side contains a smaller quantity of large stars and the other contains a larger quantity of small stars at an inverse ratio. Children are asked to compare across the boxes in a size, number, and mixed condition. In the size trials, children complete six trials where they are asked to choose the box with larger stars. In the number trials, children complete six trials where they are asked to choose the box with more stars. In the mixed trials, children complete 12 trials where they are asked to choose either the box with larger stars or the box with more stars depending on the color of the boxes. Before each trial set, children are shown a demonstration trial and are given two practice trials with feedback. Whether the children start with the size or number comparison is randomized, but children always complete the mixed trials last. The FAM task has been shown to be a significant predictor of children's growth in math achievement across the preschool year while controlling for their initial math skills, executive functioning skills, and demographic covariates (Sheeks et al., 2019). Given that all trials are incongruent with respect to numerical and spatial magnitudes, the FAM task will also include 3 "check" trials to ensure that what children are learning is not an incorrect strategy of always picking the smaller objects when asked to choose an object set based on numerical magnitudes. These trials will be congruent with respect to numerical and spatial magnitudes such that the object set with more items will also have larger objects. These will be

analyzed separately to check for spatial response biases. If children do not perform significantly above chance on these trials, we will include them as an additional covariate in our model to control for possible spatial response bias.

B. *Questionnaire:* Parents were asked to complete a demographics questionnaire that asks questions about race and educational attainment at post-test. They were also asked about their frequency of eBook reading at home during the study, given that data from the control group app will not be automatically tracked as it involves an external software application.

2) *Experimental Conditions*

A. *Adaptive Magnitude Comparison eBooks:* The adaptive magnitude comparison eBooks app was created by the authors and focuses on children's spatial and numerical magnitude comparison skills. There are three storybooks that children can choose from at each reading session: Zoo Adventure, Sports in the Park, and Playing with Shapes. Each storyline is identical in design and only differs in the objects being compared and narrative introduction.

On each page, children are asked a magnitude comparison question randomly generated from two options: 1) a question asking children to compare spatial magnitudes (e.g., which animals are bigger?) 2) a question asking children to compare numerical magnitudes (e.g., which side has more animals?).

Each book has 15 pages and 15 questions. The eBooks are adaptive and include three levels: easy, medium, and challenging. Children always start

reading at the easy level, and if they answer correctly on 4 out of 5 pages, the stimuli on the next 5 pages change to the medium level. If children get less than 4 out of 5 questions correct on the easy level, they remain at that level for the next 5 pages. The same procedure is then following for moving from the medium to the challenging level. Feedback is automatically provided on each page.

Across all levels, children view two object sets that are incongruent with respect to numerical and spatial magnitudes. The easy level is defined as object sets that contain up to six objects in either object set and the spatial and numerical magnitude ratios are large (all ratios between 3:1 and 2:1). All objects in these sets are homogenous in type (e.g., all zebras, or all baseballs). The medium level can have up to ten objects in each set, and the spatial and numerical magnitude ratios decrease to between 2:1 and 1.7:1. The challenging level can have up to twelve objects in each set, and the spatial and numerical magnitude ratios decrease to between 1.6:1 and 1.3:1. Both the medium and the challenging levels includes objects that are heterogenous in type (e.g., zebras and horses). Please see the Appendix for visual examples of the three eBook levels.

B. *Dialogic Reading Intervention:* Children within the adaptive magnitude comparison eBooks experimental condition will be randomly assigned to either a DR or no DR condition. In the DR condition, two instructional videos will be used to implement the DR intervention. The first will be a seven-minute-long introduction to the core components of DR which includes a

filmed example of a parent and child reading using the intervention techniques (see Appendix). The second will be a shortened version of the first video designed as a refresher for participants (see Appendix). Additionally, there will be an instructional flyer sent to parents as a supplemental aid in learning how to use the DR concepts.

C. *Instructional Video:* This video (Flesch Reading Ease Score: 73.6) is scripted based on a variety of existing instructional videos and the advice of a dialogic reading specialist from a local library.

D. *Review Video:* This video (Flesch Reading Ease Score: 82.1) is a review of the instructional video. This video is approximately two and a half minutes long.

E. *Instructional Flyer:* This flyer is a slightly modified version of the Best Beginnings Alaska instructional worksheet (Headley, 2014).

Design and Analyses

Near Transfer Hypothesis 1: We hypothesize that children in both experimental conditions (adaptive magnitude comparison eBooks, adaptive magnitude comparison eBooks + DR training) will improve their spatial and numerical magnitude comparison skills significantly more than children who read the literacy eBooks.

Near Transfer Hypothesis 2: We hypothesize that children who are in the adaptive magnitude comparison eBooks + DR training condition will improve their spatial and

numerical magnitude comparison skills significantly more than children who are in the adaptive magnitude comparison eBooks condition without DR training.

To test our near transfer hypotheses 1 and 2, we ran an ANCOVA with condition (three groups) as our primary predictor, and children's post-test FAM task performance as our primary outcome measure. We included age, race, and family income as covariates along with pre-test FAM task performance. We report both *p* values as well as effect sizes. We ran planned group comparisons to test our primary hypotheses. The first complex comparison compared both experimental groups against the control group. The second comparison was a pairwise comparison of the DR experimental group compared to the non-DR experimental group. The Bonferonni correction was applied to the two planned comparisons.

Far Transfer Hypothesis 1: We hypothesize that children in both experimental conditions (adaptive magnitude comparison eBooks, adaptive magnitude comparison eBooks + DR training) will improve their general math skills, measured via the Woodcock Johnson number sense, significantly more than children who read the literacy eBooks.

Far Transfer Hypothesis 2: We hypothesize that children who are in the adaptive magnitude comparison eBooks + DR training condition will see improvements in their Woodcock Johnson Number Sense scores significantly more than children who are in the adaptive magnitude comparison eBooks condition without DR training.

To test our far transfer hypotheses 1 and 2, we ran an ANCOVA with condition (three groups) as our primary predictor, and children's post-test Woodcock Johnson Number Sense scores as our primary outcome measure. We included age, race, and family income

as covariates along with pre-test parent-rated math skills. We will report both *p* values as well as effect sizes in our results section of the final paper. Regardless, we will run planned group comparisons to test our primary hypotheses. The first complex comparison compared both of the experimental groups against the control group. The second comparison was a pairwise comparison of the DR experimental group compared to the non-DR experimental group. The Bonferonni correction was applied to our two planned comparisons.

Results

Near Transfer Hypothesis 1: This study predicted that children placed within either of the experimental conditions would demonstrate higher rates of improvement in measures of their spatial and magnitude comparison skills. Post-test performance on the FAM Task for the Control group (M = .722, SD = .249) was compared to both Experimental group 1 (M = .889, SD = .145) and Experimental group 2 (M = .861, SD = .216). Children in the experimental conditions performed better at post test than children in the control group F (1, 26) = 3.884, p = 0.038, with a considerable adjusted effect size, r^2 = .421.

Table 1. FAM Performance

Cases	Sum of Squares	df	Mean Square	F	p
Condition	0.183	2.000	0.091	3.884	0.038
Combined_PostSwitch	0.449	1.000	0.449	19.093	< .001
Education of Parents	0.020	1.000	0.020	0.866	0.363
Child_Age_Start	0.005	1.000	0.005	0.228	0.638
Black	0.047	1.000	0.047	1.984	0.174
Residual	0.470	20.000	0.024		

Note. Type III Sum of Squares. Combined_Postswitch = accuracy for post-switch and mixed FAM trials combined. Education of parents was measured dichotomously as either having completed an undergraduate degree or not.

Near Transfer Hypothesis 2: This study predicted that children in experimental condition 2 would perform better at post-test than children in experimental condition 1 on the FAM task. EX. 1 (M = .889, SD = .145) was compared to EX. 2. (M = .861, SD = .216). There was no significant difference between these two groups (p = .490).

Far Transfer Hypothesis 1: This study predicted that children placed within either experimental condition would show greater levels of improvement on assessment measures of general math ability. Post-test performance on the Woodcock Johnson Number Sense subtest for the Control group (M = 422.200, SD = 27.133) was compared to both Experimental group 1 (M = 441.636, SD = 20.882) and Experimental group 2 (M

= 443.333, *SD* = 14.933). Results are trending toward children in the experimental conditions performed better at post-test than children in the Control condition F (1, 24) = 3.525, p = 0.051, with a moderate adjusted effect size, r^2 = .660.

Table 2. Woodcock Johnson Performance

Cases	Sum of Squares	df	Mean Square	F	p
Condition	1073.264	2.000	536.632	3.525	0.051
W_Score_1	4506.008	1.000	4506.008	29.601	< .001
Child_Age_Start	230.556	1.000	230.556	1.515	0.234
Education of Parents	142.703	1.000	142.703	0.937	0.346
Black	64.816	1.000	64.816	0.426	0.522
Residual	2740.016	18.000	152.223		

Note. Type III Sum of Squares. W_Score_1 = Children's accuracy on the Woodcock Jonshons Number Sense assessment at pre-test. Education of parents was measured dichotomously as either having completed an undergraduate degree or not.

Far Transfer Hypothesis 2: This study predicted that children in the experimental condition 2 would perform better at post-test than children in experimental condition 2 on the WJ NS assessment. Experimental group 1(M = 441.636, *SD* = 20.882) was compared to experimental group 2 (M = 443.333, *SD* = 14.933). There was no significant difference between these two groups (p = 0.536).

Discussion

As of the publishing of this thesis the study has not been completed. Data collection is ongoing and drawing conclusions from the data remains impossible as the number of participants is not large enough for power for either the near or far transfer hypotheses. However, the trends in the data up to this point are promising. In the present study we examined how the use of an adaptive magnitudes eBook would impact children's performance on both assessments of spatial and magnitude knowledge (near transfer hypotheses) and their general math ability (far transfer hypotheses). The effect size for both near transfer hypothesis 1 and far transfer hypothesis 1 indicate that the eBook intervention is accounting for the majority of the variance of measurable differences in children's performance on spatial and magnitude tasks. This trend also holds true for the effect size of the second hypothesis for both near and far transfer, with the effect sizes indicating that the eBook is making a difference in children's performance on a general math skills assessment.

There are several limitations to the current study. First and foremost the practice of online assessment is largely untested and guidelines for the creation of studies that are run entirely virtually are scarce. It is uncertain whether the pre- and post-tests that were conducted are having the same levels of reliability and validity they do during in-person assessments. We also experienced relatively high levels of attrition throughout the course of recruitment. This may be creating a selective bias in the sample that data was collected from. It will be important that we account for missing data by using a statistical method

that does not rely on listwise deletion when we have our full planned sample size. Additionally, this study is unique in the fact that parents were present during the pre- and post-assessments. There is a possibility that parents, having seen the math skills being assessed and their child's performance, will change their behavior and home learning practices to try and target those math skills. It is unknown whether parents having knowledge of the questions being asked will impact our ability to draw conclusions from this data, as it is impossible control for additional practice children received outside of the intervention dosage. However, we identified group differences despite all parents having the knowledge of what the assessments asked. This indicates that while parent knowledge may have some impact, there is still an effect coming from condition seen in the group differences in scores.

We did notice that there is some skewness showing up for a few of the variables. Once data collection is completed, we will pay special attention during analysis to see if the skewness persists.

Further research is needed to explore online assessment as well as recruitment techniques that combat attrition and a parent's ability to muddy the waters of the experimental conditions.

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Appendix

Script for Dialogic Intervention Training

Hello, and welcome to our dialogic reading program. Today we will learn what dialogic reading is, how it will benefit your child, and specific steps you can take to use it in your home. Dialogic reading helps to promote behavior such as labeling pictures, answering questions, and making predictions about a story. It is just like having a back and forth conversation with your child. Dialogic reading encourages your child to think and use their words to talk about the story and illustrations in a picture book. Amazingly, research shows that kids who are read to dialogically develop even better language and pre-reading skills than children who are not challenged with questions while reading.

Let's learn a little more about dialogic reading. The strategies we will talk about in the rest of the video will be aimed at being flexible with your child, asking questions, and giving feedback in a way that will help your child learn. Let's look at a real life example of a parent reading with their child using these techniques. <a clip plays with a parent and child reading dialogically.>

Notice how the parent prompts their child, then evaluates his response which leads to discussion that expands on the child's response. Then she repeats the process. One of the most important parts of this process are the questions you ask your children. The dialogic reading approach has some suggestions for the types of questions to ask.

This structure can be intimidating at first, but there is an easy way to remember some of the types of questions to ask. Together they form the acronym CROWD. CROWD stands for completion - recall - open-ended questions - who what when where

why or Wh questions - and distancing questions. Let's look at each of these question types individually.

Completion prompts simply ask children to complete a sentence that you start. Let's look at an example about children packing to go to the park. If the children are packing to go to a park you could ask your child "Damen is going to ____" and let them answer 'Park.'

Recall prompts are simply questions that ask children to remember what has happened in the story up to this point. An example of a recall prompt is "can you tell me something that Damen has packed in his bag?"

Open ended prompts are questions that ask children to answer a question in their own words and from their own perspective. For example you can ask "tell me what is happening in the story." This question allows your child to answer in a variety of ways, with no one answer being correct. Open ended questions tend to be general, not specific.

Wh- prompts are any question that starts with the words Who, What, When, Where, or why. These are questions that can be used in any situation. Here are a few examples. "Where are the kids?" "What is your favorite animal?" "Why are the kids packing a soccer ball in their bag?"

Distancing prompts are meant to help kids connect what they are reading in a book to their lives. These questions ask children to take something that is happening in the story and bring in their own experiences. Here is an example: "When was the last time that you went to the park? What did you do there?"

These five types of prompts; completion, recall, open-ended, who what when where why, and distancing prompts, are tools that you can use when reading with your

child. However, you do not need to try and use them all at once. If there is a prompt type that you feel most comfortable with, start by using that prompt, and as you gain confidence you can branch out to the other options. The most important thing to remember is to be flexible, ask questions, and give feedback. Be flexible with how your child wants to read. If they want to count out the number of animals on a page, or they love lions and want to spend time on a page with lions on it, take that opportunity to engage with them. Ask questions about anything that your child seems to show an interest in. Or ask questions about things that you think are important to draw your child's attention to them. And lastly, give feedback on their responses. Praise them for correct answers or explain a different way of looking at something if they are struggling with a particular question.

Short refresher Parent Video

Hi. This is a quick video to review the different prompts you can use while reading with your child. Let's go over what CROWD stands for. Completion prompts, recall prompts, open-ended questions, wh- prompts, and Distancing prompts. Now we will go over what each of these prompts is meant to do, and an example of each.

Completion prompts simply ask children to complete a sentence that you start. Let's look at an example about children packing to go to the park. If the children are packing to go to a park you could ask your child "Damen is going to ____" and let them answer 'Park.'

Recall prompts are simply questions that ask children to remember what has happened in the story up to this point. An example of a recall prompt is "can you tell me something that Damen has packed in his bag?"

Open ended prompts are questions that ask children to answer a question in their own words and from their own perspective. For example you can ask "tell me what is happening in the story." This question allows your child to answer in a variety of ways, with no one answer being correct. Open ended questions tend to be general, not specific.

Wh- prompts are any question that starts with the words Who, What, When, Where, or why. These are questions that can be used in any situation. Here are a few examples. "Where are the kids?" "What is your favorite animal?" "Why are the kids packing a soccer ball in their bag?"

Distancing prompts are meant to help kids connect what they are reading in a book to their lives. These questions ask children to take something that is happening in

the story and bring in their own experiences. Here is an example: “When was the last time that you went to the park? What did you do there?”

Remember, you do not have to use every type of prompt when you read. If you are more comfortable with one or two types of questions focus on using them and build up confidence with the others.

Parent Refresher Pamphlet

Dialogic Reading

What is dialogic reading?

In dialogic reading, the adult helps the child, or a small group of children, become the teller(s) of the story.

The adult becomes:

- the listener
- the questioner
- the audience for the child

No one can learn to play the piano just by listening to someone else play.

Likewise, no one can learn to read just by listening to someone else read.

Children learn most from books when they are actively involved.

Why dialogic reading?

- Oral language supports emergent literacy
- Children become more engaged with the book
- Adults can determine if content is understood
- Research indicates effectiveness

P.E.E.R.

The fundamental reading technique in dialogic reading is the PEER sequence. This is a short interaction between a child and the adult. The adult:

- Prompts the child to say something about the book
- Evaluates the child's response
- Expands the child's response by re-phrasing and adding information to it

- Repeats the prompts to find out if the child has learned from the expansion

How to prompt children

There are five types of prompts that are used in dialogic reading to begin PEER sequences. You can remember these prompts with the word CROWD.

- Completion prompts
    - Leave a blank at the end of a sentence and get the child to fill it in. This builds phonemic awareness (hearing the sound of words) as well as expands vocabulary.
- Recall prompts
    - Recall prompts help children in understanding a story and in recalling events. Recall prompts are used not only at the end of a book, but also at the beginnings when a child has read that book before.
- Open-ended prompts
    - These prompts focus on the pictures and overall story in books. For example, you might say, “Tell me what’s happening in this picture,” or “Tell me what’s happening in the story.” Open-ended prompts help children increase their expressive fluency and notice details.
- Wh-prompts
    - These prompts usually begin with what, where, when, why, and how questions. For example, you might say, “What’s the name of this?” while pointing to an object in the book. Wh- questions teach children new vocabulary and prompt thinking about the story.
- Distancing prompts

- These ask children to relate pictures or words in the book they are reading to their own lives. Distancing prompts help children form a bridge between books and the real world. They help with verbal fluency, conversation, and narrative skills. For example, while looking at a book with a picture of animals on a farm, you might say, “Remember when we went to the animal park? Which of these animals did we see there?”