Dual-language Learners' Questions and Teacher Responses in Shared Reading in Preschool

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Abstract

The current study used sequential analysis to examine dual-language learners' (DLLs) questions and their relations to teacher responses in the context of small-group shared reading in preschool. Participants were 235 DLLs aged 3–5 years and 60 lead teachers from multiethnic preschool classrooms in Norway. Results showed that across four different books, children most often asked information-seeking questions (61–79%). Furthermore, children asked comprehension- and explanation-seeking questions more often than factseeking ones. Sequential analysis showed that the quality of teacher responses was highly dependent on the type of questions DLLs asked: preschool teachers consistently offered more extended and explanatory responses to DLLs' comprehension- and explanation-seeking questions, compared to other types of questions. Our results suggest that in this way, children actively influence the extended talk they are exposed to during shared reading. Moreover, their questions offer possibilities for further back-and-forth exchanges about topics meaningful to DLLs.

Keywords Dual-language learners · Children's questions · Shared reading · Preschoolers · Interactions

Introduction

According to the sociocultural perspective, interaction between adults and children is viewed as a central vehicle for knowledge transmission and children's language acquisition (Vygotsky, 1978). Consistent with this perspective, it is in everyday interactions between children and more experienced adults that learning takes place—both about and through language. Although children need knowledgeable adults to have meaningful interactions with them, they do not necessarily wait for information to be handed to them. During their early years, children ask many questions about all kinds of things, soliciting information that allows them to learn about the world around them. Children's current knowledge status and possible misunderstandings can emerge through questions and, in this way, assist adults in inviting children to participate in their zones of proximal development, a crucial term in sociocultural theory identified by the difference in the competence children may manifest in interaction with more competent and supportive others versus the competence they demonstrate individually (Vygotsky, 1978).

In early education settings worldwide, the language that a growing number of children speak at home differs from the language they use and learn at preschool. Thus, for dual-language learners (DLLs), the preschool classroom is an important context for language and literacy development in their second language (L2). Evidence shows that extended talk with teachers is an important element of the preschool language-learning environment (Grøver Aukrust & Rydland, 2011; Dickinson & Porche, 2011; Gonzalez et al., 2014). This type of interaction goes beyond here and now, facilitates back-and-forth exchanges, and provides rich opportunities for children's own language usage (Galloway & Lesaux, 2017). Specifically, interactions during shared reading offer such opportunities and, in this way, support children's development of their first language (L1) and L2 skills (Fitton et al., 2018).

Shared Reading with DLLs

Research shows that teachers should consistently provide young DLLs with language-rich input and support opportunities for outputs in the process of L2 acquisition (Galloway & Lesaux, 2017). However, in the preschool context,

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such opportunities for participation in interactions may be infrequent. Choi et al. (2023) showed that DLLs received less adult talk than monolinguals during a typical preschool day. Researchers argue that DLLs' engagement is associated with teachers' use of responsive and elaborative language (Rojas et al., 2020) and that DLLs' interaction participation can be effectively facilitated in small-group settings (Kane et al., 2023).

Shared reading is widely recognized as an effective practice for strengthening language and literacy development in DLLs (Shanahan & Lonigan, 2010). It is a particularly appealing approach, as it gives DLLs opportunities to participate in language-rich interactions with teachers and peers, as well as wide possibilities for adaptability to the specific language needs, preferences, and communication styles of participating adults and children (Fitton et al., 2018). This adaptability makes shared reading suitable for young DLLs with a variety of linguistic backgrounds and home literacy environments. There is evidence that shared reading needs to be regular to contribute to building language and reading comprehension skills (Justice et al., 2005; Mol et al., 2009). Extended and engaged conversations, in which teachers can expand children's language and conceptual knowledge, tend to occur when children have heard the book multiple times and become more familiar with the plot and the characters (Grifenhagen et al., 2017).

However, researchers have pointed out that for such interactions to occur and to benefit young DLLs in their L2 learning, adults need to encourage their questions and respond to them in meaningful ways that expand their vocabulary knowledge and build upon their interest domains (Barnes & Dickinson, 2017; Barnes et al., 2017). Furthermore, researchers are increasingly paying attention to young DLLs' own participation in teacher–child interactions, as children's own language usage (output) is important both for the development of their L2 skills over time and later reading achievement (Bohman et al., 2010; Dickinson et al., 2008).

Given the possibilities for extended engaged interaction afforded by the context of shared reading in small groups, it is important to know more about the ways in which young DLLs can engage and actively participate in such interactions. DLLs' questions can provide evidence of their engagement during shared reading and give teachers information about how to support language learning in this context.

Seeking Information Through Questions

During their preschool years, children actively use questions as tools to achieve various goals. For instance, children can use questions to get attention or continue interaction, but most often, they use questions to gather specific information. Chouinard (2007) found that although a small percentage of children's questions to their parents were requests for

attention, permission, or help, 70% of young children's questions sought information. A large body of current research shows that when children ask questions, they legitimately seek information. Questions are viewed as representations of children's curiosity about the world (Simon, 2001) and their innate "theory drive" (Gopnik, 1998), which results in active efforts to get assistance as they develop knowledge about particular domains (Tizard et al., 1983).

Children's requests for information in response to uncertainty start from the earliest requests for facts, such as labels or other factual details ("what," "where," and "who" questions). Near the age of 2, children increasingly start asking for explanations ("why," "when," and "how" questions). This shift in children's information-seeking corresponds with the development of their mastery of the syntax of questions; according to Ronfard et al. (2018), this developmental sequence applies to children learning L2.

Research on 3- to 5-year-olds regarding their question-asking has revealed increased development in preschoolers' abilities to seek information in response to uncertainty, as well as in their metacognitive and comprehension monitoring skills. Preschoolers have an increased ability to monitor their knowledge and understanding and extend their question-asking about things of interest to them (Coughlin et al., 2015; Wellman, 2020). Question initiation occurs when children realize that they lack knowledge or when they experience inconsistencies and contradictions in their own understanding.

Previous studies have tended to differentiate between two major types of information-seeking questions: fact-based questions, which ask for an isolated piece of information, and explanatory questions, which ask for an extensive response containing an explanation of the relation between objects or events (Gauvain et al., 2013; Kurkul & Corriveau, 2018; Ronfard et al., 2018). This division builds on the assumption that a knowledge structure requires two types of information: facts about a given concept, category, or domain and explanatory information that organizes these facts within the concept, category, or domain (Chouinard, 2007). For example, when adults learn about a given topic, their questions tend to change from "shallow" (fact-oriented) to "deep" (explanatory; Graesser & Olde, 2003). This shift indicates that learning is taking place and that the individual is building knowledge. Similarly, children's information-seeking questions indicate the same shift in learning processes. Evidence shows that over time and during a particular exchange, the focus of children's questions tends to shift from collecting isolated facts about the topic to asking explanatory questions that relate isolated facts to one another and unify the knowledge structure (Chouinard, 2007).

During the course of children's development, the content of their questions shifts in ways that reflect their knowledge building. To some extent, children can craft questions to

gather specific kinds of information. For example, children ask more questions about group membership when they ask questions about animals (Greif et al., 2006). However, although children can verbalize their questions, they are not always able to word them effectively enough to get the information they want. This may be particularly challenging for young DLLs with limited levels of L2 proficiency.

Adults' Responses to Children's Questions

Children's questions have the potential to provide adults with useful information about how they can support children's learning processes. However, previous research has suggested that responses tend to vary in complexity and informativeness. In naturalistic and experimental studies of children's questions to their parents, Chouinard (2007) demonstrated that parents' responses were mostly informative but varied by the child's age. She argued that response variability could be caused by parental perceptions of children's current abilities and conceptual development. At the same time, there is compelling evidence that parental responses to questions relate to family socioeconomic status (SES) and that differences in parental language are associated with children's language growth (Hart & Risley, 1995; Tizard et al., 1983).

Adults' answers to children's questions often contain elaborate and complex explanations. However, this does not happen every time and it may have different reasons. Adults may not always know how to answer; they may have other agendas and just not answer, or some of their answers can be ineffective and contain circular logic (e.g., "It is like this because it is"). Experimental studies have shown that when children ask explanatory questions, they prefer to get noncircular responses that include explanatory information (Kurkul & Corriveau, 2018). When adults fail to provide explanatory information, children continue to request it (Frazier et al., 2009). Children not only seem to prefer getting explanatory information in response to their queries but also appear to learn and remember the explanatory information they get better than they recall the non-explanations (Frazier et al., 2016).

Thus, there is evidence showing that asking questions and receiving answers aids children's learning. Motivated by others' questions or by a dissatisfactory response, children can also generate their own explanations that lead to deeper comprehension and scaffold further learning (Wellman, 2020).

Most studies on child questions and adult answers reported above were conducted in the context of parent–child conversations, and much less is known about children's question-asking in preschool. Tizard et al. (1983) reported that children ask significantly fewer questions in preschool than their parents at home. Furthermore, children's

question-asking rates are largely influenced by conversational environments in primary school classrooms (Ronfard et al., 2018). In addition, there is variability in how teachers respond to preschoolers' questions. Other studies report that the ways of responding may be influenced by teachers' classroom goals and demands, as well as their beliefs about knowledge construction (Haber et al., 2021). Sometimes, adults simply do not have enough background knowledge to answer children's complex or difficult questions (Kurkul et al., 2022; Sak, 2020). Nevertheless, researchers argue that children's experiences with conversational environments that support question-asking lead to more questions both at home and school (Tizard et al., 1983).

Despite the large body of research on individuals' question-asking, there is a need for more research on question-asking in social conversations and more knowledge about conversational back-and-forth exchanges that can foster children's learning (Ronfard et al., 2018). Evidence has shown that social settings in which children learn and produce language are important and have a significant influence on this developmental process (Hart & Risley, 1995; Tizard et al., 1983). Thus, there is a need to know more about how social conversations in different meaningful everyday contexts can shape preschoolers' questions and what kinds of teacher responses the questions can elicit.

One such context is shared reading, and to our knowledge, only a few studies have investigated preschoolers' questions in this context. For example, Yaden et al. (1989) classified preschoolers' literacy-related questions during shared reading with parents, while Anderson et al. (2012) examined the frequency and type of parents' and children's questions and their relation to children's early literacy knowledge. Anderson et al. (2012) found that 65% of all questions (parental and child questions combined) included the immediate tasks of identifying and recognizing information in the texts or illustrations. In comparison, 35% of the questions included the tasks of expanding and extending the text or illustrations.

Previous research on children's question-asking has mostly been conducted with monolingual preschoolers in the context of family conversations. However, these dyadic conversations appear to be markedly different from those that take place in a multiparty preschool classroom setting (Kurkul et al., 2022).

Some studies have previously explored preschoolers' difficult questions (Sak, 2020; also referred to as "big questions," reflecting the informants' difficulty giving specific satisfying answers to such questions), including questions about life (Samuelsson et al., 2000) in the preschool context and questions about science during nature walks (Skalstad & Munkebye, 2021). However, we found no mention in the previous literature on questions that DLLs pose to their teachers during repeated shared reading. Given that linguistically complex and extended teacher–child conversations tend to

be infrequent in preschool classrooms (see Grifenhagen et al., 2017 for the discussion), it is plausible that regular reading of high-quality books can offer repeated opportunities for engaged conversations with DLLs and responsive comments from teachers. To the best of our knowledge, no previous studies have examined both young DLLs' questions and the responses they elicit in small-group conversations during shared reading in preschool. This study sought to address this gap, as DLLs' questions can provide unique opportunities to engage children in extended talk about topics in the book they genuinely care about and seek more information about.

The Present Study

This study sought to investigate the questions young DLLs ask and the responses they receive in the context of shared reading in small groups in preschool. Furthermore, we were interested in variations in the type and frequency of child questions during the shared reading of four different books (narrative and expository). The following research questions guided this study: (a) What types of questions do children ask during shared reading and with what frequency? (b) To what extent does the quality of teacher responses depend on the type of questions children ask?
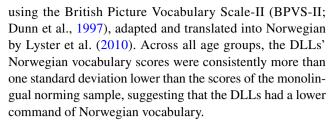
Method

Participants

The participants included 60 preschool teachers and 235 DLLs (53.2% girls). The participants were recruited from highly multiethnic preschools in the larger Oslo area. An offer to participate in a randomized controlled intervention study addressing language support for DLLs was sent to center leaders in multiethnic city districts and municipalities. The preschools volunteered to participate, and the lead teachers offered informed consent. Children were identified as bilingual by their parents, both of whom spoke a non-Scandinavian language at home. The participants in the present study were the teachers and children in the intervention group (for more information, see Grøver et al., 2020).

The Sample

In our sample, children spoke a variety of first languages at home: Albanian (4.7%), Arabic (10.2%), Bosnian (2.6%), Polish (11.5%), Russian (0.4%), Somalian (14.0%), Sorani Kurdish (5.5%), Tamil (7.2%), Turkish (4.7%), Urdu (20.4%), and Vietnamese (3.4%). However, 15.3% spoke other first languages. In the fall of the preschool year, we assessed the children's receptive vocabulary in Norwegian using the British Picture Vocabulary Scale-II (BPVS-II; Dunn et al., 1997), adapted and translated into Norwegian by Lyster et al. (2010). Across all age groups, the DLLs' Norwegian vocabulary scores were consistently more than one standard deviation lower than the scores of the monolingual norming sample, suggesting that the DLLs had a lower command of Norwegian vocabulary.

The great majority of the classrooms served children ranging in age from 3 to 5 years. Children's ages in the fall of the preschool year ranged from 33.13 to 69.05 months ($M = 53.96$, $SD = 9.49$). Most children had entered preschool between the ages of 2 and 3 years (average age in months at preschool entry, $M = 26.18$; $SD = 20.48$). All the children were born in Norway, while 87% of their mothers and 80% of their fathers had been born outside Norway.

The preschool teachers in this study were mostly female (93%). The majority (70%) had a degree in early childhood teacher education, while 26% were in the process of acquiring an early childhood education degree or had other relevant educational backgrounds. More than half (52%) reported 6 or more years of experience as lead teachers. Most of the teachers (63%) had worked for three or more years in the same preschool. Two-thirds of the teachers reported having identified a current curricular priority area in the national framework plan, and of these, 88% reported that they specifically prioritized the learning area of "Communication, language, and text" this year.

Procedure

As part of the larger study, the participating preschool teachers shared 15 books with the children. The books were introduced in four thematically defined units during one preschool year. The researchers selected these high-quality children's books in consultation with librarians. The selected books were appealing to children, had captivating illustrations, and were suitable for stimulating content-rich discussions between teachers and young children. We asked the teachers to invite the children to participate in discussions of the books' themes and encourage the children's reasoning around them, to conduct three shared reading sessions of each book per week, and to audiotape the last (third) session of every book they read. This allowed both teachers and children an opportunity to familiarize themselves with the books before they audiotaped the reading.

The present study involved analysis of audiotaped teacher–child interactions during shared reading of four different books submitted by teachers at four timepoints through the preschool year. The shared reading sessions were conducted in small groups of one lead teacher and one–seven DLLs (M = 3.89). The same lead teacher read the books with the children each time, with the exception of one classroom in which the shared reading sessions were

carried out by a teacher assistant. The books were new to the preschools and were selected because we had the most recordings available for them. We did not intend to compare different books but wanted the analysis to include questions children asked when reading the books representing different genres of child literature. The books belonged to narrative, informational, and informational narrative genres; each book belonged to one of the four thematical units (for a detailed introduction to the books, see supplementary material). The sample included only preschool classrooms ($N = 60$), for which audiotapes of reading sessions were available. This resulted in a dataset of 192 recorded reading sessions divided among 60 classrooms, with up to four data points per classroom. Occasionally, teachers could not make the recording; therefore, we had fewer than four data points (recorded shared reading sessions) for some of the classrooms. In total, we had 1 data point for 5 classrooms, 2 data points for 8 classrooms, 3 data points for 17 classrooms, and 4 data points for 30 classrooms. Each book was handed out to all classrooms simultaneously, and the shared reading recordings were picked up at about the same time. All the participating classrooms shared the books in the same sequence and read them simultaneously: two books were read during the fall term and two during the spring term. The readings of the target books were separated from each other for several weeks.

Coding

Each book-sharing session was fully transcribed using the conventions of the Codes for the Human Analysis of Language (CHAT) of the Child Language Data Exchange System (MacWhinney, 2000). Transcription started from the first utterance, when the participants directed their attention to the book, and ended when they completed the reading. In accordance with the CHAT guidelines, the speech flow in each transcript of the book-sharing session was broken into single utterances that served as units of analysis. Utterances were separated based on pauses, intonation, and turn-taking. In the audiotaped recordings, we were unable to distinguish individual child speakers with sufficient reliability. Thus, individual child speakers were not identified in the data material.

A total of 192 transcripts were searched to highlight all the child utterances that included any type of question form (including phrases related to yes/no questions) and teacher answers (or lack of answers) present in the extratextual talk. All the child-initiated questions were first categorized as either information-seeking (of various types, as noted below) or non-information-seeking (coded as "other"). Each child-initiated question was considered to start a new exchange consisting of two components: the child's question and the teacher's response. Next, we used mutually exclusive sets of codes (see Table 1 and 2) to categorize each type of information-seeking question and the teacher's response during the exchange.

Child Questions

To analyze the child questions in the data material, we employed the categorization used in previous studies (Chouinard, 2007; Ronfard et al., 2018; Wellman, 2020) and

Table 1 Codes for question types

Code for question type	Definition	Examples
Information-seeking questions		
Fact-seeking	Seeks identification, recalls characters, objects, locations; concrete factual information about properties or activities of objects/characters, print or illustration (mostly *what, where, who* questions)	*Look, what is he doing?* *Who is that?* *But what does it say here?*
Comprehension-seeking	Seeks to improve comprehension or bring additional clarity about some ambiguous or implicit aspects of the narrative or illustrations, as well as general world knowledge. These questions are often related to characters, their behavior or internal states, events, properties, objects, and world/social knowledge	*Is he the mean one?* *Are they afraid?* *Are there camels in Africa?* *Can you live in a circus?*
Explanation-seeking	Seeks information on how things/events relate, asks for explanation of meaning of the concepts, seek conclusions, associations of objects/events/themes in the book with real-life experiences	*What is a herd?* *Why is he dangerous?* *But a tree is not a person. How can you be friends with it?*
Non-information-seeking/other questions		
Other	Seeks attention Seeks permission Asks adult/child to take action Seeks to clarify what the adult/child just said (e.g., by repeating the whole or parts of the adult's utterance in question form) Unable to determine	*Can you turn the page?* *Can I read now?* *What did you say?* *Are we done with the book now?*

Table 2 Codes for response types

Response type	Definition	Examples
Information offered	Teacher provides a brief response with requested information	Question: *What was that?* Answer: *It is snowing, yes* Question: *Who is this here?* Answer: *It is such a staircase they climb on*
Explanation offered	Teacher provides an explanation or gives more information than requested	Question: *Which friend?* Answer: *Him, maybe. He looks like somebody who is standing and waiting for a hug. And he looks like someone who wants to give one, too*
Information not offered	Teacher responds, but does not provide information or turns the question to the child(ren)	Question: *Why do they have different shoes?* Answer: *I don't know.* [OR] *Why do you think?*
No response	Teacher does not respond, or a response is provided by another child instead	Question: *Why is he moving out there?* Answer: *Peace is to wish for something*

developed it further to fit the shared reading context. Thus, each information-seeking question was assigned to one of three categories based on the type of information sought (see Table 1 for more information on coding definitions and examples). A question was coded as *fact-seeking* when it asked for an isolated and concrete piece of information and could be answered with a brief response (e.g., "What was that?"). A question was coded *comprehension-seeking* when it asked for additional clarity or sought to improve comprehension of some text-related aspects or general world knowledge (e.g., "Is she angry?"). Finally, a question was coded *explanation-seeking* when a child sought an understanding of how things relate or asked for an explanation, requiring a more extensive response (e.g., "Why is he dangerous?"). All other questions (attention-seeking, action-seeking, permission-seeking, etc.) were coded into a joint "other" category.

Teacher Responses

Similar to previous research, all teacher responses were coded across four categories (Chouinard, 2007; Kurkul & Corriveau, 2018). This comprehensive, mutually exclusive list of categories was developed to demonstrate the full range of responses children received during shared reading (for an overview with definitions and examples, see Table 2). Categories included (a) information offered, (b) explanation offered, (c) information not offered, and (d) not answered.

Reliability

The development of the codes was discussed in several rounds with the co-authors and the research group. First, to test the codes and detect possible disagreements, the first author and an independent researcher familiar with child language research jointly ascribed the codes to a set of training transcripts. All disagreements were resolved through discussion and re-analysis until consensus between the two raters was achieved. Second, inter-rater agreement was established using a new sample of 20% of the transcripts. The first author and the co-coder used two transcript samples to assess reliability separately for the sets of child and teacher codes. We developed the teacher response codes only after the inter-rater agreement for the child question codes had been established, and coding of the data with this set of codes had been completed. For the child codes, overall agreement resulted in a Cohen's kappa of 0.87; for the teacher codes, Cohen's kappa was 0.89. Both indicated good reliability. The final coding of the remaining transcripts was conducted by the first author.

Data Analysis

We addressed the research questions with the help of sequential analysis (Bakeman, 2011), using Generalized Sequential Carrier (GSEQ 5.1). This software makes it possible to quantify interactional patterns in children's questions and teacher responses and, using contingency tables, calculate patterns in the association rates between them.

To answer the first research question, we used descriptive statistics and calculated the frequencies of all types of children's questions and teacher responses. To answer the second research question regarding the extent to which the quality of teacher responses depended on the type of children's questions, the children's question codes were inserted as given events and teacher response codes as target events. All sequential tests were run in the GSEQ program using lag 1 sequential transitions.

We used the following parameters for the analysis: (a) the observed frequencies of all types of children's questions and teacher responses, meaning the frequency of a certain type of response (target event) following a certain type of question (given event), (b) the conditional probability, a certain type of question is followed by a certain type of response, (c) the adjusted residuals, the extent to which an observed joint frequency differs from what is expected by chance and indicated by Allison–Liker's adjusted *z*-scores (Allison &

Liker, 1982), and (d) the magnitude of the sequential associations, indicated by Yule's Q effect sizes, ranging from − 1 to + 1, with 0 indicating no effect (Yoder & Feurer, 2000).

Results

An average shared reading session lasted for approximately 16 min, but the reading time varied substantially during the sessions ($M = 15.63$, $SD = 6.44$, range 4.42–44.19). In addition, the descriptive results showed considerable variability in the total amount of child and teacher talk that occurred across the reading sessions. The children's total number of utterances ranged from 8 to 342 utterances per session, while the teachers' total number ranged from 16 to 559 utterances per session, including reading utterances.

Children's Questions

Overall, the children asked 1,422 questions during 192 small-group shared reading sessions. Approximately one-tenth ($n = 21$) of the reading sessions did not contain any child questions, while in the rest of the sessions, the number of children's questions ranged from 1 to 38 per session. Overall, the total number of children's questions was moderately associated with the length of the reading sessions (*Lost and Found*: $r = 0.27$, $p < 0.01$; *The Peace Book*: $r = 0.48$, $p < 0.01$; *Envious Magda*: $r = 0.50$, $p < 0.01$; *My Life in the Wild: Elephant*: $r = 0.40$, $p < 0.01$). As indicated in Table 3, 74% of the children's questions were information-seeking, with non-information-seeking questions accounting for 26% of all the questions children asked. Specifically, the share of information-seeking questions accounted for 6.88% of all

children's utterances for the first narrative book, *Lost and Found*, 3.80% in the informational *The Peace Book*, 7.92% in the second narrative book, *Envious Magda,* and 9.63% in the informational narrative *My Life in the Wild: Elephant*. Thus, across all four books, young DLLs consistently asked many information-seeking questions.

What Types of Questions Do Children Ask During Shared Reading, and with what Frequency?

First, we investigated the kinds of questions young DLLs posed in the context of small-group shared reading of books in different genres. Interestingly, across all reading sessions, the children asked substantially fewer fact-seeking questions than comprehension- or explanation-seeking. As presented in Table 3, the most frequently asked questions were comprehension-seeking, closely followed by explanation-seeking and non-information-seeking questions.

Table 4 displays the variations in the average numbers of different types of questions asked when sharing narrative, informational, and informational narrative books. On average, children asked more comprehension-seeking than other types of questions during shared reading of *Lost and Found* ($M = 2.20$) and *Envious Magda* ($M = 2.44$), both of which were narrative books. During shared reading of the informational narrative *My Life in the Wild: Elephant,* children posed more comprehension-seeking questions ($M = 3.49$) than when reading the other books but also almost as many questions seeking explanations ($M = 3.45$). At the same time, as indicated in Table 4, the children posed considerably fewer comprehension-seeking questions ($M = 1.17$) when reading the informational *The Peace Book*.

Table 3 Child question types divided among the books

Book	N reading sessions	Question type			Non-information-seeking (other)	Total questions	Total child talk	Relative percent
		Information-seeking						
		Fact-seeking	Comprehension-seeking	Explanation-seeking				
Narrative *Lost and Found*	53	79 (22%)	97 (27%)	79 (22%)	110 (30%)	365 (100%)	5425	6.7
Informational *The Peace Book*	43	50 (20%)	41 (17%)	58 (24%)	95 (39%)	244 (100%)	6424	3.8
Narrative *Envious Magda*	49	77 (25%)	88 (29%)	78 (25%)	53 (21%)	306 (100%)	3862	7.9
Informational narrative *My Life in the Wild: Elephant*	47	75 (15%)	164 (32%)	162 (32%)	106 (21%)	507 (100%)	5264	9.6
Total all reading sessions	192	281 (20%)	390 (27%)	377 (27%)	374 (26%)	1422 (100%)	20,975	6.8

Table 4 Total numbers (mean, *SD*, and range) of the types of questions children asked during shared book reading

Book		Information-seeking questions			Non-information-seeking questions	All questions
		Fact-seeking	Comprehension-seeking	Explanation-seeking		
Narrative *Lost and Found*	Mean	1.80	**2.20**	1.80	2.48	**8.30**
	SD	2.72	2.73	2.48	2.63	**7.85**
	Range	0–12	0–12	0–10	0–11	**1–38**
Informational *The Peace Book*	Mean	1.43	**1.17**	1.66	2.71	**6.97**
	SD	1.74	1.85	3.07	2.04	**6.85**
	Range	0–6	0–8	0–17	0–9	**1–37**
Narrative *Envious Magda*	Mean	2.14	**2.44**	2.17	1.75	**8.50**
	SD	3.10	3.74	2.73	1.68	**8.50**
	Range	0–14	0–21	0–10	0–5	**1–37**
Informational narrative *My Life in the Wild: Elephant*	Mean	1.60	**3.49**	**3.45**	2.26	**10.79**
	SD	1.70	3.83	3.53	2.00	**8.10**
	Range	0–6	0–21	0–15	0–6	**1–35**

Bold text highlights the means discussed

To what Extent does the Quality of Teacher Responses Depend on the Type of Questions Children Ask?

Second, we explored the quality of teachers' responses to children's questions by ascribing them to one of the four mutually exclusive categories we established (see above). Overall, to 1,422 questions children asked, teachers provided 1,177 responses, suggesting that children received a teacher response to 82.7% of their questions. Generally, the teachers were responsive to the children's questions, and this tendency applied across and within books.

Furthermore, about half of the teachers' responses offered informative, on-topic responses to the questions the children asked ($N = 720$). Specifically, teachers provided brief informative responses ($n = 412$) to children's questions slightly more often than they provided extended explanatory responses ($n = 308$). Overall, children were more likely to receive an informative response to their questions than not.

As presented in Table 5, children's fact-seeking questions were most frequently followed by brief informative teacher responses (52%). Similarly, when children asked comprehension-seeking questions, teachers often responded with brief informative responses (42%) and less

frequently with explanations (18%). Furthermore, children's explanation-seeking questions were most frequently followed by teacher responses with explanations (51%) and rarely by other types of responses or non-informative responses.

The omnibus chi-square test was conducted to examine relations between children's questions and teachers' responses, and the results were significant, $\chi^2(df) = 558.08(9)$, $p = <0.01$. To questions seeking basic facts, teachers' responses were significantly more likely to response with brief informative response ($z = 9.42$; $Q = 0.56$; $p < 0.01$) than with explanations ($z = -5.28$; $Q = -0.49$; $p < 0.01$). At the same time, teachers were significantly more likely to respond to questions seeking comprehension with brief informative responses ($z = 6.39$; $Q = 0.38$; $p < 0.01$) than any other response type. In contrast, teachers were very likely to follow up explanation-seeking questions with extended or explanatory responses ($z = 16.06$; $Q = 0.78$; $p < 0.01$), and highly unlikely to respond to these questions without offering information ($z = -7.39$; $Q = -0.50$; $p < 0.01$) or by offering brief responses ($z = -4.03$; $Q = -0.28$; $p < 0.01$). This seems likely because explanation-seeking questions, by their own

Table 5 Observed frequencies (and conditional probabilities) for children's questions and teacher responses

Children's questions	Teachers' responses			
	Information offered	Explanation offered	Information not offered	No response
Fact-seeking	145 (52%)	28 (10%)	46 (16%)	60 (22%)
Comprehension-seeking	162 (42%)	71 (18%)	107 (27%)	50 (13%)
Explanation-seeking	79 (21%)	192 (51%)	64 (17%)	42 (11%)

Data are pooled across all the reading sessions

nature, require more elaborated, extended responses or explanations rather than brief or uninformative responses.

To test the generalizability of the patterns in the sequential associations between children's questions and the quality of teacher responses, we conducted separate sequential analyses for each book. As presented in Table 6, when examined separately with sequential analyses pooling sessions within each book, the teachers followed the same response pattern. Generally, the high positive Yule's Q values for all four books suggest that fact- and comprehension-seeking questions were more likely to receive brief informational responses. At the same time, high negative Yule's Q values across all other types of responses suggest that teachers were unlikely to provide explanations or non-informational responses to child fact-seeking questions. Most notably, in all four books, the very high positive Yule's Q values for explanation-seeking questions and teacher responses with explanations indicate that these questions were consistently very likely to be followed by teacher responses with explanations. Additionally, the very high negative Yule's Q values for all four books indicate that explanation-seeking questions inhibited uninformative responses across them (see Table 6).

Discussion

This study addressed the existing gap in the research on young DLLs' questions in the context of shared reading in preschool and provided several important insights. The results expand the findings of previous research on children's questions by demonstrating that DLLs regularly and consistently asked information-seeking questions during the shared reading of four different books. Moreover, the results show that the quality of preschool teachers' responses was strongly dependent on the type of question DLLs asked.

Children's Questions

The results show large variations in the total numbers and types of questions asked by DLLs during shared reading sessions of the four books in different classrooms. On average, across all reading sessions, the young DLLs asked a mean of 8.81 questions related to the book at hand. The findings reported in previous studies on children's questions tend to vary. For example, Anderson et al. (2012) documented that preschoolers asked an average of 3.4 questions overall in

Table 6 Strength of sequential associations between children's questions and teachers' responses: adjusted residuals/mean Yule's Q

Children's questions	Teachers' responses			
	Answered, information offered	Answered with explanation	Responded, information not offered	No response
Lost and Found				
Fact-seeking	**6.03*/0.66****	− 1.55/− 0.30	**− 4.04*/− 0.53**	0.09/0.01
Comprehension-seeking	1.83/0.24	− 2.09/− 0.37	− 0.53/− 0.06	0.64/0.09
Explanation-seeking	− 1.71/− 0.28	**8.48*/0.83**	**− 3.60*/− 0.47**	− 1.53/− 0.25
The Peace Book				
Fact-seeking	**4.88*/0.65**	− 1.44/− 0.34	− 2.25/− 0.41	− 1.45/− 0.29
Comprehension-seeking	**2.44*/0.40**	− 1.32/− 0.35	− 1.39/− 0.27	0.10/0.02
Explanation-seeking	− 1.47/− 0.26	**7.34*/0.85**	− 2.29/− 0.39	− 2.40− 0.47
Envious Magda				
Fact-seeking	**4.87*/0.57**	− 2.75*/− 0.51	− 4.00*/− 0.63	1.52/0.25
Comprehension-seeking	**3.09*/0.38**	− 0.80/− 0.13	− 0.77/− 0.11	− 2.28/− 0.44
Explanation-seeking	**− 2.60*/− 0.36**	**6.06*/0.70**	− 2.31/− 0.36	− 0.36/− 0.07
Elephant				
Fact-seeking	**3.31*/0.40**	− 3.78− 0.60	− 2.40/− 0.36	4.06*/0.54
Comprehension-seeking	**4.84*/0.45**	− 1.06/− 0.11	− 1.89/− 0.20	− 2.71*/− 0.44
Explanation-seeking	**− 2.53*/− 0.27**	**9.53*/0.75**	**− 5.55*/− 0.60**	− 2.06/− 0.33
All books				
Fact-seeking	**9.42*/0.56**	**− 5.28*/− 0.49**	− 6.27− 0.48	2.21/0.18
Comprehension-seeking	**6.39*/0.38**	− 1.97/− 0.15	− 2.37/− 0.15	− 2.61*/0.22
Explanation-seeking	**− 4.03*/− 0.28**	**16.06*/0.78**	**− 7.39*/− 0.50**	**− 3.56*/− 0.31**

Bold text highlights the means discussed

*$p < 0.01$

**Strength of association ranges from − 1 to + 1, where 0 indicates no effect

information books and 3 questions in narrative books during dyadic shared reading with their parents. It should be noted that the nature of dyadic exchanges in the home setting tends to differ greatly from that taking place in different contexts of the preschool classrooms. For instance, more children participated in small-group shared reading sessions. Thus, we do not have the possibility of comparing the number of questions DLLs asked in our data to those of other studies. However, our results show that in small groups with their peers, children asked questions regularly and consistently across different books, time periods, and classrooms.

The present study shows that across all four books, the children actively participated in the process of shared reading and consistently asked mostly information-seeking questions related to the books (74% of all questions). This is similar to other studies showing that between 72 and 85% of the questions preschoolers asked their parents in everyday conversations were information-seeking (Chouinard, 2007; Kurkul & Corriveau, 2018). Also, in a study of outdoor and science activities, most of the questions preschoolers posed to their teachers were information-seeking (Skalstad & Munkebye, 2021; Thulin, 2010). At the same time, recent results of Kurkul et al. (2022) show that preschoolers in low- and mid-SES classrooms posed 55% non-information-seeking questions to their preschool teachers during free play, meal, and instruction time. The authors proposed that the large proportion of non-information-seeking questions in their study was characteristic of the preschool context in which children often ask for permission for actions. However, in the context of small-group shared reading, the children in our study most often asked questions to get information relevant to book reading.

One of the major results of this study is that when children asked information-seeking questions, they sought better comprehension or explanations more often than basic facts. Notably, previous studies on children's question-asking reported that preschoolers and schoolchildren mainly asked fact-seeking questions (Anderson et al., 2012; Chouinard, 2007; Kurkul & Corriveau, 2018; Skalstad & Munkebye, 2021; Thulin, 2010).

Specifically, the ratios of comprehension- (e.g., "Is she upset?") and explanation-seeking questions (e.g., "What do they do with elephants that die?") were particularly high during shared reading of the narrative *Envious Magda* and the informational narrative *My Life in the Wild: Elephant*. During shared reading of these books, children asked fewer fact-seeking questions (e.g., "What is it called?"). Since the books differed in terms of genre, topics, and illustration style, we cannot know the reason why question rates differed. Note that these books were read during the spring term and thus later than the two other books. Therefore, the higher number of comprehension- and explanation-seeking questions also likely reflected the process of children

becoming more developmentally mature and more effective in their information-gathering and question-asking.

Moreover, it is plausible that the young DLLs in this study became increasingly accustomed to the context of shared reading in small groups after repeated reading of the books. Indeed, previous research has shown that as a book becomes more familiar through repeated reading, children's involvement in the discourse increases (Schapira et al., 2021). Furthermore, other researchers have shown that familiarity with the subject matter facilitates children's question-asking about it (van Zee et al., 2001). Therefore, we can expect that with repeated readings, children were becoming more used to expressing their curiosity and asking deeper questions. For example, Thulin (2010) found that the number of questions preschoolers asked about a given knowledge domain during science activities increased over time. She concluded that children needed both time and place to become more capable of asking questions about a certain knowledge domain.

Furthermore, previous researchers have shown that as preschool children get older and more experienced, their general ability to ask questions increases (Skalstad & Munkebye, 2021), as do their requests for explanations (Hickling & Wellman, 2001). However, researchers have also registered a significant decline in the number of questions children ask as soon as they enter formal education (Engel, 2011; Tizard et al., 1983). Thus, the preschool years seem to play a particularly important role in children's question-asking process (Haber et al., 2021).

Teachers' Responses

Another significant finding in this study was that the quality of teacher responses provided in the context of shared reading depended heavily on the type of questions the children asked. Specifically, preschool teachers consistently offered more extended and explanatory responses to DLLs' comprehension- and explanation-seeking questions compared to other types of questions. This finding is consistent with the sociocultural perspective on learning, meaning that teachers responded to children's questions and offered them the information and knowledge necessary for comprehension. This finding is also in line with Kurkul et al. (2022), who documented that teachers in low- and mid-SES classrooms typically respond with explanations to preschoolers' explanation-seeking questions. These findings are important, given that previous research has also shown that teachers tend to answer preschoolers' questions less frequently than parents (Tizard et al., 1983) or provide mostly inadequate responses to difficult questions (Sak, 2020). Teacher responses have the potential to create unique learning opportunities for DLLs, stimulate their curiosity, and engage them in extended talk about book topics that they genuinely care

about. High-quality teacher explanations prolong the conversation and facilitate further knowledge seeking in a child (Frazier et al., 2009). However, when teachers turn the question back or respond with "What do you think?", the conversation tends to shut down or change direction (Thulin, 2010). Similarly, when teachers do not provide explanations, children either make their own explanations or re-ask the initial question (Frazier et al., 2009).

Children's questions are useful not only because they allow teachers to provide much-needed information to children. Additionally, when children ask questions, they appear genuinely interested in obtaining the information they seek and getting it exactly when they can use it the most. Children tend to ask questions when they encounter that their knowledge about the topic is insufficient to obtain the knowledge they are missing (Wellman, 2020). However, their questions are not only essential for them as a source of acquiring new knowledge but are also useful for integrating children's existing knowledge and experience with that of others (Nelson et al., 2004; Riihela, 1996). Questions can enable teachers' scaffolding in the area of children's interest, and in this way, teachers can help children build knowledge within their zones of proximal development. For example, children's questions about a story can help them build more coherent narratives about it, which is considered crucial for future success in school (Silva et al., 2014).

Limiting Conditions and Conclusion

The study included features that limited the conclusions that could be drawn. First, the analyses focused on child-initiated questions and the quality of teacher responses (or the absence thereof). In the analyses, we did not examine how the children followed up on the teacher's responses. Thus, we know little about the DLLs' further involvement in extended talk about topics initiated by their questions. Moreover, as we were unable to differentiate between individual child contributions in the data, we could not examine whether the children were satisfied with the content of the teacher responses. Therefore, without knowing the effects of teachers' responses on children, it is impossible to evaluate the appropriateness of these responses. Future work could further examine the content of teacher responses and the way individual children follow up on the responses they receive. Additionally, more work is needed to examine the relationship between DLLs' question-asking in preschool and the development of their language proficiency. For instance, in their recent study on Chinese-Norwegian preschoolers' question-asking to their parents during dinnertime, Yang et al. (under review) found that preschoolers' wh-questions predicted their receptive vocabulary growth over one year.

Second, as mentioned above, the variability in the frequencies and types of questions children asked during the

shared reading of different books may have occurred for several reasons. Note that the classrooms in our study shared the books at different timepoints during the course of the preschool year. In addition, we did not assess other factors that may have influenced the discourse of shared reading interaction, such as teacher reading and classroom talk styles or utterances preceding the questions. Future studies should further examine DLLs' questions across different preschool settings.

Nevertheless, this study expands the research on children's questions by examining the patterns in DLLs' questions and teacher responses during shared reading and highlighting an important mechanism for DLLs' comprehension and learning in this context. The present findings contribute to a more nuanced view of preschoolers' question-asking in their everyday social contexts, as well as to more knowledge about the possibilities for meaningful conversational back-and-forth exchanges that can support DLLs' language-learning opportunities in preschool. Specifically, the study results suggest that repeated small-group shared reading of a selection of high-quality books can provide time, a recognizable structure, and a motivating context that facilitates children's curiosity. Thus, this context appears to stimulate children to ask many questions and, in this way, provides rich possibilities for teachers to involve them in further extended talk about the book, as well as more complex explanatory structures and discourse patterns. As argued by Grifenhagen et al. (2017), for such interactions to occur and be beneficial for DLLs, shared reading needs to be regular and involve high-quality books with interesting plots and characters, as well as varied vocabulary. This also applies to shared reading of non-narrative books with clear, high-quality illustrations about topics that appeal to preschool children. We suggest that with repeated readings in small groups, children will have the opportunity and time to ask questions about basic information and, with informative responses from teachers, to ask deeper questions about more implicit topics in books. The present findings call attention to the importance of shared reading with DLLs and careful text selection for shared reading in preschool. We will therefore highlight the importance of paying close attention to what kinds of questions different books and their features may facilitate, as well as seeking knowledge to answer children's questions about relevant topics in books.

Declarations

Conflict of interest We report no potential conflict of interests arisen by our research.

Informed Consent Written informed consent was obtained from the parents.

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