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Teacher–Child Interactions During Toy Play and Book Sharing

Hanne Røe-Indregård ^a, Ellen Irén Brinchmann^a, Veslemøy Rydland^b, Meredith L. Rowe^c, Bente E. Hagtvet^a, and Imac M. Zambrana^a

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ABSTRACT

Research Findings: Although it is well documented that toy play and book sharing shape communication between adults and children in different ways, relatively few studies have compared teacher – child interactions in the two activities. The aim of this observational study was to describe and compare the conversational functions of teachers’ and children’s interactional contributions during book sharing and toy play. Examining dyads of five- to six-year-old children ($N = 38$) and their preschool teachers in the two activities, we found that the teachers produced significantly higher proportions of questions during toy play and higher proportions of statements during book sharing and that their questions tended to be more advanced (i.e. inferential) during book sharing compared to toy play. Moreover, sequential analyses of the immediate dependencies between the teachers’ and children’s contributions revealed that the teachers’ statements were more likely to follow the children’s questions during toy play than during book sharing, which may suggest more “back-and-forth” communication during play. *Practice or Policy:* The study findings indicate that toy play and book sharing provide children with complementary communication experiences and that the choice of activity may shape their opportunities to engage in educational dialogs.

Introduction

Toy play and book sharing are among the most studied activities in the early childhood years within the field of language development. An extensive body of work, including research on dyadic and small-group interactions at home and in preschools, has relied heavily on language experiences during these activities to describe and predict children’s language development (e.g., Grøver et al., 2020; Luo et al., 2022). Despite the widespread study of these contexts and the recognition that language learning is shaped by different contexts (e.g., Hadley et al., 2022), relatively few studies have compared teacher – child communication during book sharing and play in the preschool years. The aim of this study is to contribute to the literature by examining and comparing real-time conversations in Norwegian teacher – child dyads involving five- to six-year-old children during book sharing and toy play. This knowledge can deepen our understanding of the potential influence of specific activities on adult – child communication. It can also be of *practical* and *methodological* importance because of its potential to shed light on how different educational activities may provide opportunities for language learning in preschool settings as well as inform intervention studies aiming to provide certain types of input.

We investigated dyadic teacher – child interactions during a semi-structured toy play and book sharing activity. This allowed for a focused examination of the interactions, which may provide important

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information about the qualities of teacher – child communication (Dickinson, 2006). Our main focus is on pragmatic aspects of teacher and child conversational behaviors. In the following sections, we outline the rationale for this particular focus and present previous work on adult – child communication during book sharing and toy play. Finally, we present some characteristics of policy and practice in the Norwegian daycare tradition as we believe that the “mutual structuring” that contributes to shaping interactions must be considered in relation to the specific culture under study (Rogoff, 2003).

Pragmatics within a Socio-Interactional Framework

Pragmatics, as defined here, refer to *the function of input* or how something is said and include conversational behaviors that enable communicative intents and facilitate the use of linguistic forms (Ninio & Snow, 1996). Thus, pragmatics are a cornerstone within a socio-interactional learning perspective where children’s engagement with more competent partners who “scaffold” their participation is considered an important vehicle driving development (Bruner, 1981; Rogoff, 2003; Vygotsky & Cole, 1978). One way for adults to support children’s participation in a conversation is by producing *statements*, such as when describing, explaining, or labeling entities. Another way is by asking *questions*. Adults may use statements to provide information to the conversation and scaffold children’s participation through responsive talk that builds on something the child has uttered or focused on (Melzi et al., 2011). Adults’ use of questions, however, may be particularly effective for eliciting responses from children as children have been found to respond more frequently and contingently to teachers’ questions than to their statements (Meacham et al., 2014; Tompkins et al., 2017). Nevertheless, both questions and statements may introduce children to new topics and elaborate conversational topics over several utterances and turns, thereby facilitating their participation in sustained conversations that may benefit their language development (Cabell et al., 2015; Dickinson, 2001; Duncan et al., 2020; Hirsh-Pasek et al., 2015a; Leech & Rowe, 2021; Romeo et al., 2018, 2021; Zimmerman et al., 2009).

A central facet of a socio-interactional learning perspective is that learning occurs within the *zone of proximal development*, which is where children engage in more complex thinking when interacting with a more competent partner (Rogoff, 2003; Vygotsky & Cole, 1978). In the late preschool years, certain types of questions may be especially effective for engaging children in more challenging conversations that also stimulate their language learning – that is, invitations to produce “inference, analyze information, discuss vocabulary or make predictions” (Massey et al., 2008, p. 349), also referred to as inferential questions (Tompkins et al., 2013, 2017; Zucker et al., 2010). In contrast to literal questions offering concrete choices that are often briefly answered (e.g., “What is that?”), inferential questions may generate longer responses from children (e.g., Deshmukh et al., 2019; Zucker et al., 2010). This is important because children’s production of longer utterances may present a more complete portrayal of their language abilities and provide teachers with more conversational content to build on, thereby contributing to “a richer language-environment from which the children can learn more advanced language forms” (deRivera et al., 2005, p. 22). At the same time, for children to experience conversations within their zone of proximal development and acquire flexible and versatile language proficiencies, various inputs are needed. Consistent with this line of reasoning is that a focus on input *quality*, rather than quantity, may generate more fine-grained information about the features of adult – child interactions (e.g., Rowe, 2012).

Cross-Contextual Variations in Interactional Contributions

In line with a functional view on language learning is that communicative goals vary with participants, purposes, and places (Hadley et al., 2022). Concerning places or activities, an extensive body of research has suggested that both play and book sharing are language-abundant activities. For example, teacher – child communication during play may facilitate inferential conversations (Tompkins et al., 2013), prompt teachers’ use of language-eliciting questions (Meacham et al., 2014), and encourage

children's active participation in the learning process (Weisberg et al., 2013). Similar characteristics have been highlighted in relation to book sharing (Deshmukh et al., 2019; Dickinson & Smith, 1994; Dickinson et al., 2012; Zucker et al., 2010). However, cross-contextual work on teacher – child communication in the two activities are suggesting some differences with regards to conversational features.

For example, Girolametto et al. (2000) examined daycare teachers' use of questions during book sharing and dough play with toddlers and preschoolers. They found that the teachers used more conversational questions during the dough play activity (e.g., conversational yes/no questions and wh-questions), which was associated with an *increase* in the children's participation. During book sharing, however, the teachers provided more response control (e.g., commands and test questions), which was associated with a *decrease* in the children's participation. These results were found for both toddlers and preschoolers, suggesting that the variations were a function of the pragmatic context rather than the children's ages and, presumably language skills (Girolametto et al., 2000).

Relatedly, Hadley and Dickinson (2019) examined cues for word learning in adult – child interactions during an intervention that explicitly taught small groups of preschool children new vocabulary during shared book reading and guided play. They found that the adults' responsive interactions, such as providing definitions to the children's questions or comments, were a positive predictor of the children's vocabulary growth in both activities. However, while book sharing only predicted the children's receptive vocabulary, guided play predicted both receptive and expressive vocabulary, and responsive interactions during play were both the strongest and most broad-ranging predictor of the children's overall vocabulary growth. As a meaningful activity for the children, play may have triggered their active engagement (Hirsh-Pasek et al., 2009, 2015b), potentially explaining the positive association between their participation in play and expressive vocabulary gains (Hadley & Dickinson, 2019). This interpretation can be substantiated by Toub et al. (2018), who found that book reading followed by adult-supported play was associated with greater gains in children's expressive vocabulary than book reading followed by adult-supported picture card conversations.

To the best of our knowledge, only one study has compared teachers' use of questions and statements during book sharing and play (i.e., Gest et al., 2006). It revealed that there were no differences in the teachers' production of questions and statements in the two activities, as indicated by rates of contributions per minute. In the present study, however, we investigate proportions rather than rates of contributions per minute as they provide information about the relative proportions of a certain contribution (e.g., questions) in relation to other contributions (e.g., statements) in the two activities. Moreover, because the production of interactional contributions is a result of the bidirectional dynamics of both teachers' and children's contributions (Justice et al., 2013), there is a need to also examine the *children's* contributions in the two activities. Here, we extend the work of Gest et al. (2006) by examining both teachers' and children's interactional contributions.

Furthermore, it could be informative to go beyond a mere focus of the overall number of interactional contributions when investigating adult – child conversations. Using correlational (i.e., comparison of proportions) and sequential analytical approaches, Luo and Tamis-LeMonda (2017) examined the reciprocity between maternal questions and child contributions during book sharing in four groups of mothers and four-year-old children. A comparison of the mean level of proportions revealed differences between the mothers' use of questions and the children's use of statements in the four groups. However, an investigation of the immediate mother to child and child to mother responses revealed that the patterns of associations were rather similar across the groups. For example, the children of mothers who asked proportionally more of a certain question were as likely to respond to their mothers' questions as those from the groups in which the mothers asked proportionally fewer of the same questions. Building on this work, we examine both the teacher and child contributions overall and moment-to-moment with the aim of better capturing the dynamics of the toy play and book sharing conversations.

Adults' interactional contributions may also facilitate the use of different linguistic forms, which have been found to vary across book sharing and play. For example, adults have been found to

produce more complex grammatical constructions during book sharing than during toy play (Noble et al., 2018). Given that even books with very little text have been found to generate significantly more complex adult constructions than toy play (Noble et al., 2018), these findings could possibly imply that book illustrations facilitate the use of more complex language constructions, for example, by prompting conversations aimed at making connections and drawing inferences. Based on this, one may expect a “feedback loop” whereby children also make use of more complex grammatical constructions during book sharing. Following this argumentation, children’s responses to teachers’ literal and inferential questions may be more complex during book sharing than during play.

Taken together, previous work suggests some similarities between book sharing and play when it comes to language-facilitating features (e.g., Tompkins et al., 2013; Zucker et al., 2010). Nevertheless, cross-contextual work implies that book sharing may elicit more complex talk (Noble et al., 2018), whereas play may generate more active involvement by the child (Hadley & Dickinson, 2019). With regard to interactional contributions previous work has primarily been concerned with teachers’ questions during the two activities (Deshmukh et al., 2019; Girolametto et al., 2000; Tompkins et al., 2013; Zucker et al., 2010). However, other contributions, such as statements, is also worth studying (Luo & Tamis-LeMonda, 2017; Melzi et al., 2011). Here, we build on previous work (i.e., Gest et al., 2006) by examining various interactional contributions during book sharing and toy play.

Norwegian Daycare Policy and Practice as a Backdrop

In this study, we focus on Norwegian teacher – child interactions. Following a theoretical tradition that highlights “cultural variation in goals of development” (e.g., Rogoff et al., 1993, p. 9), we consider this specific culture under study to be an important backdrop that can add to our understanding of qualitative features in teacher – child communication.

Day care in Norway is not mandatory, but children can attend daycare centers from the age of one to five or six years – until the start of primary school. There is no kindergarten year in Norway, but children are typically organized into two age groups: toddler groups with one- to three-year-olds and preschool groups with three- to five-year-olds. In the preschool group, there should be a maximum of six children per adult (Regjeringen.no, 2020). All daycare centers in Norway are partly or completely publicly funded with subsidized deductible fees (Regjeringen.no, 2014). Therefore, enrollment is high, with 97% of three- to five-year-old children attending (Statistics Norway, 2022a). In contrast to other comparable countries, such as the US and Canada, Norwegian day care does not have a prescribed curriculum but a framework plan providing guidelines for the content, tasks, and values at the national level (Norwegian Directorate for Education and Training, 2017). This provides Norwegian daycare teachers with great flexibility in organizing their everyday practices, which typically comprise informal learning activities, such as mealtimes, free play, circle-time, and outdoor play (Hagen, 2018). Importantly, these activities are associated with various group sizes. For example, music gatherings, which typically occur during circle time, involve many children, while play activities more typically involve one to three children (Kallestad & Odegaard, 2013). Thus, to the extent that Norwegian preschool staff participate in children’s play (Løndal & Greve, 2015), dyadic interplays can also occur.

A pillar characterizing Norwegian day care is the strong emphasis on child centeredness (Kristjansson, 2006) or children’s right to participate in and experience democratic relations (Bae, 2009). These cultural specifications may impact how teachers and children together structure the activities that children take part in. That is, Norwegian teachers emphasize the importance of learning to use language as a social tool (Sheridan & Gjems, 2017) and staff in Norwegian daycare centers have been found to score relatively high on sensitive responsiveness and respect for child autonomy but relatively low on educational interactions, such as verbal communication and developmental stimulation (Baustad & Bjørnstad, 2020).

The Present Study

In the present study, we aim to contribute to the existing body of knowledge about the similarities and differences in teacher – child communication during toy play and book sharing. Overall, we analyze the conversational functions of teacher – child interactional contributions in these activities and the extent to which teachers produce literal and inferential questions in them. On a moment-to-moment level, we use sequential analysis to examine the contingency between the child and teacher and teacher and child contributions in the two activities.

The following research questions guided our study: 1) What are the differences and similarities in the teachers' and children's interactional contributions during book sharing and toy play? 2) To what extent are children's contributions contingent upon teachers' contributions during book sharing and toy play? 3) To what extent are teachers' contributions contingent upon children's contributions during book sharing and toy play?

Method

Participants

A total of 38 teacher – child dyads participated in this study. They were part of a larger study on educational dialogs in Norwegian preschools approved by the Norwegian Center for Research Data. Their participation was confirmed after acquiring informed consent from the teachers and the children's parents, and they could withdraw their participation and request that their data be deleted at any time.

The inclusion criteria for all the children were that they attended their last year in preschool and that they did not have known developmental delays, learning difficulties, or impairments. At the time of observation, the children (N boys = 13) ranged between 59 and 72 months ($M = 65.36$, $SD = 4.26$), and all the participating children had attended Norwegian preschools for at least one year. The parents of eight children (21%) were of an immigrant Pakistani background, whose mother tongues were Urdu or Punjabi. In Norwegian preschools, 18% of children speak a minority language (Utdanningsdirektoratet, 2019), and Pakistani immigrants comprise one of the largest immigrant groups in Norway (Statistics Norway, 2022b). Of the 87% of parents who reported their educational level, 71% of the children's mothers and 58% of their fathers had received at least three years of university or university college education. The remaining 29% of mothers and 42% of fathers had received three years or fewer of high school education.

Procedure

With the aim of illuminating patterns of naturally occurring interactions during toy play and book sharing activities, the teacher – child dyads were filmed in a separate room in their preschool. The teachers were told that the purpose was to observe their usual practice. Before the book sharing activity, the participants were given the following instruction: "Here is a book that you can read and talk about." They were then provided with the picture book *Building a New House* (Scarry, 1979), which is a book about the home-building process. The reader follows the boy who lives next door and who is very excited about who will move into the new house. The book has a narrative text connected to detailed illustrations and introduces a relatively high number of infrequent words.

The toy play activity was introduced in a similar manner by the following instruction: "Here are some toys that you can talk about and play with." The participants were then provided with a toy suitcase containing animal figures (i.e., farm and wild forest animals) and scenery elements (i.e., trees and fences). To keep the order of activities consistent across the participants, the book sharing activity was introduced before the toy play activity. The participants were not given time restrictions for their interactions.

In the present study, we relied on a seven-minute segment (beginning after 30 seconds of interaction) from each activity. However, for videos that were less than seven minutes in length (13%), we relied on the entire interaction. The selection of a seven-minute representative sample is consistent with that of other studies investigating adult – child interactions for similar purposes (e.g., Luo & Tamis-LeMonda, 2017).

Transcription

The teacher and child interactional contributions, including verbal and non-verbal communication, were transcribed using the Computerized Language ANalysis (CLAN) program (MacWhinney, 2000). Their verbal communication comprised utterances segmented into communication units (C-units), which were defined as one main clause with its modifiers (e.g., “if there is something red, the bull gets really angry”). The utterances that lacked a clausal structure, such as sentence fragments, were counted as separate C-units when the intonation of the utterance indicated that a complete thought had been expressed. In cases where a non-verbal response was provided instead of a verbal response (e.g., the teacher asks, “Should we take this out?” and the child answers by nodding), they were included as independent communicative contributions. In addition, we included non-verbal communication in the form of simple events (e.g., when the interlocutors moaned) and more complex local events to provide complementary information about the interactional context. All transcripts were verified for accuracy by a second trained transcriber.

Coding and Measures

Teacher and Child Interactional Contributions

The coding of the teacher and child interactional contributions was inspired by the work on the function of communication by Melzi et al. (2011). We distinguished between child and teacher contributions as *questions* (i.e., utterances intended to elicit talk from the partner), *statements* (i.e., utterances providing information for the conversation), *talk* with the primary purpose of *maintaining the conversational flow*, and *talk* with the primary purpose of *regulating behaviors*. In addition, we included the category of *other*, which comprised communicative contributions delivered through non-verbal actions (e.g., nodding, pointing), sounds (including onomatopoeias), singing, and unintelligible utterances. The definitions and examples of the contributions coded within the specific categories are presented in Table 1.

The first author coded all the transcripts, and 20% of the transcripts were independently coded by the second author to ensure reliability. Coder agreement, as indicated by Cohen’s kappa, ranged between .80 and .91 in book sharing and .82 and .90 in toy play.

Literal and Inferential Questions

The teachers’ questions were coded as inferential or literal. Inferential questions included utterances inviting the children to produce an “inference, analyze information, discuss vocabulary or make predictions” (Massey et al., 2008, p. 349) (e.g., “What is a sewer?” “Why do you need to close the fence when you bring the cow in?”). Literal questions comprised invitations to engage in concrete talk, such as labeling and describing (e.g., “What color is that?” and “What is happening in this picture?”). For this distinction, a research assistant coded 18% of the transcripts and the first author 62%. The remaining 20% were independently coded by both coders, with a coder agreement of 94%. All disagreements were discussed and resolved.

Child Responses to Adults’ Questions

Finally, we identified the child statements that immediately followed the teachers’ questions (i.e., category 2 in Table 1). To capture the length of their responses in each activity, we used CLAN to calculate the mean length of the children’s utterances in words.

Table 1. Definitions and examples of teacher and child interactional contributions.

Category	Definition	Examples	Codes
1) Questions	Utterances eliciting information by “demanding” a response from the partner	What do you think about that? Do you know what being “lonely” is? That is a . . .	CQ TQ
2) Statements	Utterances that give information	That is a rabbit. All the mice got an idea.	CS TS
3) Conversational talk	Utterances with the primary purpose of maintaining the conversational flow, which do not add new content (Melzi et al., 2011)	Yes, that is true.	CC TC
4) Behavior regulating talk	Utterances with the primary focus of regulating child behaviors	Look! Do not do it.	CB TB
5) Other contributions	Other communicative contributions divided into nonverbal and verbal turns		CO TO

Analytic Strategy

To answer our first research question about the *similarities and differences in teacher and child interactional contributions* during toy play and book sharing, we calculated descriptive statistics and paired sample *t*-tests comparing the teachers’ and children’s use of questions and statements and the length of the children’s responses to the teachers’ questions in the two activities. To compare the interactional contributions across the dyads and activities, we converted the frequency scores of the teachers’ and children’s respective codes into proportions. Each teacher and child code served as the numerator and their total communicative contributions as the denominator (e.g., teacher questions/teacher total contributions). For the book sharing session, we presented two statistics for the teachers: one for all talk during book sharing (i.e., book text read verbatim and extratextual talk) and one only including their extratextual talk. The latter was used for the *t*-test, where we compared their interactional contributions in the two activities.

To answer our second and third research questions about *the extent to which the children’s contributions were contingent upon the teachers’ contributions and vice versa*, we conducted a sequential analysis – an analytical approach designed to detect temporal associations and patterns within observational data (Bakeman & Quera, 2011). To conduct the sequential analysis, the coded transcripts were prepared in the format of the Sequential Data Interchange Standard (SDIS). This yielded a single-code event SDIS file, which contained the codes listed as they occurred (Bakeman & Quera, 2011). Thus, if the child responded to a teacher question with a statement and then a question, followed by a confirmation from the teacher (e.g., Teacher: “What is that?” Child: “A pig.” Child: “Should it stand there?” Teacher: “Yes.”), then the codes in the SDIS file would be as follows: TQ – CS – CQ – TC (see Table 1 for a description of the codes). The SDIS file was then analyzed with the Generalized Sequential Querier (GSEQ; Bakeman & Quera, 1995) program. Using the GSEQ program, we examined the extent to which a certain type of teacher/child contribution (i.e., *given* event) was followed by a certain child/teacher contribution (i.e., *target* event), for example, whether a child statement or any other child contribution (i.e., target event) followed a teacher question (i.e., given event).

Because the sequential analysis focused on the ongoing pattern of interaction, we also included codes for the text passages (i.e., one or more utterances from the text) during book sharing as these were considered an integral part of the conversations. For example, a child might respond directly to what the teacher has read. The teacher may read, “*Mørtelen skulle holde mursteinene sammen*” (“The mortar was meant to hold the bricks together”), and the child may respond, “*Hvorfor det?*” (“Why?”). However, each text passage was given only one code. Thus, if the teacher read a text segment that included several utterances, only one code was provided (i.e., the code that represented the last utterance of the text segment).

For the sequential analysis, we computed the Pearson chi-square test to examine the likelihood that the observed distribution occurred by chance. This was followed by a computation of the adjusted residual, which indicated the extent to which an observed joint frequency differed from chance. Adjusted residuals greater than chance indicated that the relations between a given and target events were positive or more likely to occur. If the adjusted residual was less than chance, the associations were negative and less likely to occur (Bakeman & Quera, 2011). To compute the strength of the sequential associations, we calculated Yule's *Q* using the GSEQ program. Yule's *Q* is "a straightforward algebraic transformation of the odds ratio" (Bakeman & Quera, 2011, p. 114) and the recommended measure of effect size for descriptive and analytic purposes. Like the correlation coefficient, it varies from -1 to $+1$ (Bakeman & Quera, 2011), with benchmarks for small (.20), moderate (.43), and large (.60) associations (Yoder et al., 2018).

Results

Descriptive statistics of the teachers' interactional contributions during book sharing and toy play are presented in Table 2. Both questions and statements comprised a substantial part of the teachers' contributions to the two activities, and on average, these contributions constituted more than half of their talk in both activities. Proportions of the teachers' conversational talk comprised a large part of their utterances in both activities, although mostly during toy play, with an average of 40% of their talk.

The teachers contributed mainly with verbal talk, which is evident from the small proportion of non-verbal contributions in the other category. They also produced low percentages of behavior-regulating talk, indicating that they infrequently regulated the children's behavior in these activities. On average, the proportion of teacher questions coded as inferential was low. However, the variation in the teachers' use of inferential questions was large, both during toy play and book sharing.

The paired sample *t*-test comparing the proportions of teacher questions and statements in the two activities revealed significant differences. More specifically, the teachers were inclined to question children more often during toy play and produce statements more often during book sharing.

Table 2. Teachers' interactional contributions during book sharing and toy play.

Category	Teachers' Contributions			Paired sample <i>t</i> -test ^a <i>t</i> (<i>d</i>)
	Book Sharing <i>including text</i>	Book Sharing <i>excluding text</i>	Toy Play	
	M (<i>SD</i>) Range	M (<i>SD</i>) Range	M (<i>SD</i>) Range	
Total Contributions	116.76 (25.91) 35–166	106.82 (26.54) 24–152	119.87 (28.24) 49–182	–
1) % Questions	.17 (.09) .05–.45	.19 (.09) .05–.45	.22 (.09) .07–.44	–2.156* (–.350)
% Inferential ^b	.14 (.14) .00–.58	.14 (.14) .00–.58	.08 (.13) .00–.67	2.102* (.341)
2) % Statements	.45 (.13) .19–.80	.40 (.13) .16–.74	.32 (.12) .12–.58	3.808** (.618)
3) % Conversational Talk	.33 (.11) .09–.54	.36 (.11) .13–.58	.40 (.10) .14–.64	–
4) % Behavior Regulating Talk	.03 (.03) .00–.10	.03 (.03) .00–.12	.03 (.02) .00–.08	–
5) % Other Contributions	.02 (.01) .00–.04	.02 (.01) .00–.05	.05 (.03) .00–.13	–
% Non-verbal ^c	.20 (.33) .00–1.0	.20 (.33) .00–1.0	.12 (.20) .00–1.0	–

* $p < .05$, ** $p < .01$; ^aThe paired sample *t*-test compares toy play with book sharing, excluding text; ^bThe percentage of questions considered inferential; ^cThe percentage of other contributions considered non-verbal; percentage *d* = Cohen's *d*; percentage may not add up to 100 due to round up.

Significant differences were also found for the proportions of inferential questions from the teachers, which were somewhat higher during book sharing compared to toy play.

Descriptive statistics of the children's interactional contributions are displayed in Table 3. In contrast to the teachers, the children kept their questions at a minimal level in both activities, but in line with the teachers, statements and conversational talk constituted a major part of their utterances. Behavior-regulating talk among the children was negligible, but non-verbal contributions comprised half of the children's other contributions during toy play and a major part of their other contributions during book sharing.

Similar to the teachers, individual variations among the children were large. For example, one child contributed with 72% statements during toy play, while another produced 20% questions in the same activity. To account for the possibility that the same children contributed with both questions and statements, we examined the correlations between the children's questions and statements in the book sharing and toy play activities. The results from the correlational analysis revealed no significant overlap between the children's use of questions and statements during book sharing ($r = .247, p = .135$) or toy play ($r = -.054, p = .746$), suggesting that in some dyads, the children mostly provided information relating to the interaction, while in other dyads, they requested more information from their teachers.

A paired sample *t*-test comparing the children's statements and questions during toy play and book sharing indicated no significant differences between the two activities. However, the children's use of statements approached significance and revealed that they tended to produce more statements during toy play than during book sharing ($t(37) = -1.961, p = .057$).

The results from the paired sample *t*-test comparing the length of the children's statements in response to the teachers' questions revealed that there were no differences in the length of their responses during book sharing and toy play (Table 3). We also intended to compare the length of the children's statements in response to the teachers' inferential and literal questions in the two activities, but because of the small number of child statements in response to the teachers' inferential questions, we considered the data inappropriate for the purpose of splitting up for comparison. However, a comparison of the children's statements in response to the teachers' inferential and literal questions

Table 3. Children's interactional contributions during book sharing and toy play.

Category	Children's Contributions		Paired sample <i>t</i> -test <i>t</i> (<i>d</i>)
	Book Sharing M (SD) Range	Toy Play M (SD) Range	
Total Contributions	58.63 (25.91) 6–115	83.42 (23.51) 33–132	–
1) % Questions	.05 (.05) .00–.17	.03 (.04) .00–.20	1.453 (.236)
2) % Statements	.44 (.16) .00–.69	.49 (.14) .00–.72	–1.961 (.318)
3) % Conversational Talk	.28 (.15) .00–.70	.23 (.10) .00–.38	–
4) % Behavior Regulating Talk	.00 (.00) .00–.00	.01 (.02) .00–.08	–
5) % Other Contributions	.21 (.25) .01–1.0	.24 (.19) .03–1.0	–
% Non-verbal ^a	.75 (.28) .13–1.0	.51 (.29) .00–1.0	–
MLU Child Response ^b	3.41 (1.54) 1.0–6.33	3.25 (1.40) 1.0–7.0	.152 (–.026)

^aPercentage of other contributions considered non-verbal; ^bChildren's responses to teachers' questions; MLU = mean length of utterance in words; percentage may not add up to 100 due to round up.

across the two activities combined revealed that the children produced longer utterances in response to the teacher's inferential questions ($M = 4.25$, $SD = 2.3$) compared to their literal questions ($M = 3.07$, $SD = 1.20$, $t(27) = 2.557$, $p = .017$).

Dependencies between Teachers' and Children's Interactional Contributions

A sequential analysis was conducted to investigate the extent to which the children's contributions were contingent on the teachers' contributions and vice versa. An examination of all contributions revealed that the majority of the contingencies lacked normality. To make the variables more robust, we reduced the children's and teachers' contributions to three categories: 1) questions, 2) statements, and 3) non-providing contributions (i.e., merging categories 3–5, Table 1). This enabled an examination of the dependencies between more expansive contributions (i.e., questions or statements) and less expansive contributions (i.e., non-providing contributions) in the two activities.

Table 4 displays the adjusted residuals and Yule's Q of pooled data for the children's responses to the teachers' contributions during toy play and book sharing, and Table 5 shows the data for the teacher's responses to the children's contributions.

Most relations were positive, albeit with some exceptions. Most notably, the children were more likely to respond to the teachers' questions with statements and less likely to follow up on the teachers' statements with statements.

The magnitude of the associations between the teachers' contributions as given events and the children's contributions as target events varied from small (.20) to substantial (.60), and the magnitude of teacher-to-child associations was similar across the two activities. The only exception was that non-

Table 4. Adjusted residual and Yule's Q for children's responses to teachers' contributions during toy play and book sharing.

	Adjusted Residual (Yule's Q)		
	Child Questions	Child Statements	Child Non-Providing
Toy Play			
Teacher Questions	0.81 (.11) ^a	14.32** (.47)	17.94** (.56)
Teacher Statements	2.18* (.23) ^a	-3.14** (-.12)	12.82** (.39)
Teacher Non-Providing	-0.35 (-.04) ^a	2.76** (.09)	2.64 ** (.08)
Book Sharing			
Teacher Questions	-0.05 (-.01) ^a	15.75** (.56)	21.67** (.68)
Teacher Statements	2.97** (.26) ^a	-7.03** (-.27)	9.62** (.32)
Teacher Non-Providing	1.72 (.16) ^a	2.09* (.08)	-3.16** (-.13)

Toy play chi-square ($df = 1296.17(9)$), $p \leq .01$; book sharing chi-square ($df = 1272.39(9)$), $p \leq .01$; ^aadjusted residuals did not meet the assumption of normal distribution; * $p < .05$, ** $p < .01$.

Table 5. Adjusted residual and Yule's Q for teachers' responses to children's contributions during toy play and book sharing.

	Adjusted Residual (Yule's Q)		
	Teacher Questions	Teacher Statements	Teacher Non-Providing
Toy Play			
Child Questions	-1.78 (-.31) ^a	3.05** (.30)	4.18** (.37)
Child Statements	-2.55** (-.12)	-8.94** (-.36)	28.04** (.66)
Child Non-Providing	6.79** (.26)	4.97** (.17)	8.59** (.26)
Book Reading			
Child Questions	-2.77** (-.54) ^a	-0.16 (-.02)	8.12** (.59)
Child Statements	-1.68 (-.09)	-13.24** (-.54)	30.85** (.76)
Child Non-Providing	4.57** (.21)	2.30* (.08)	6.75** (.24)

Toy play chi-square ($df = 1373.25(9)$), $p \leq .01$; book reading chi-square ($df = 1391.78(9)$); ^aadjusted residuals did not meet the assumption of normal distribution; $p \leq .01$; * $p < .05$, ** $p < .01$.

providing talk from teachers was more likely to be followed by non-providing talk from children during toy play but less likely to be followed by child non-providing talk during book sharing.

As for the teachers, the patterns of interactions were highly similar with the children's contributions as given events and the teachers' contributions as target events (i.e., teachers' responses to children) (Table 5). Also, child statements were less likely to be followed by teacher statements, suggesting that statements are inefficient at eliciting immediate statements from both child and adult interlocutors.

However, the magnitude of the association between the children's questions and the teacher's statements was stronger during toy play than during book sharing, which may imply more balanced turn-taking patterns during toy play than during book sharing.

Discussion

We examined Norwegian teacher – child dyads during book sharing and toy play with the aim of deepening our understanding of the extent to which the two activities differ in shaping teacher and child communicative behaviors during real-time conversations. Overall, we found that the teachers produced higher proportions of statements and higher proportions of inferential questions during book sharing but higher proportions of questions during toy play. Conversely, for the children, there was a non-significant trend toward higher proportions of statements during toy play than during book sharing. There were notable similarities in the contingency between the child and teacher contributions in the two activities. However, the likelihood of a teacher statement following a child question was greater during toy play. Below, we discuss our findings with reference to previous research and focus on potential implications.

The finding that the teachers produced more statements during book sharing and questioned the children more often during toy play contradicts that of a previous study by Gest et al. (2006), which found no differences in teachers' use of statements and questions during free play and book reading. One possible explanation for the dissimilar result may relate to the fact that Gest et al. (2006) compared the rates of teachers' statements and questions per minute and not in terms of proportions, which was what we did here. By comparing proportions, we aimed to capture the interlocutors' use of distinct contributions, such as questions relative to other contributions, for example, statements. This is important from a developmental perspective because the quality of the talk that children are exposed to, relative to the quantity of talk, has been found to play an important role in their language development (e.g., Rowe, 2012).

Another element that may have contributed to the conflicting results is that Gest et al. (2006) focused on teacher – child group interactions during a regular preschool day, while our focus was on dyadic interactions during semi-structured activities. Previous work comparing adult – child communication during structured play interactions and naturalistic routines found that the language used by adults was more linguistically dense during structured play (Tamis-LeMonda et al., 2017). It may be that similar tendencies apply to questions and statements, in that, communicative interactions become more varied across activities when teachers interact with fewer children.

However, a previous study by Melzi et al. (2011), which compared the functions of mothers' interactional contributions with their children during book sharing and family reminiscing interactions, reported similar findings to ours. The mothers in their study requested information from their children more often during family reminiscing sessions and provided information more often during book sharing. The differences were interpreted as depending on who held expertise in each activity. While the book sharing activity demands narrative and literacy competence that must be brought to the children via cultural tools and “adult expertise” that facilitates children's participation, family reminiscing can be considered more child-driven (Melzi et al., 2011). Similarly, it may be that toy play, which can be considered more child-driven (Weisberg et al., 2013), stimulated the teachers to query the children about play-related actions or intentions and that book sharing facilitated the teachers' use of statements or talk that provided information for the interaction.

These findings are of importance from a language learning perspective because adults' use of questions may stimulate children's *active* engagement. That is, children's language development seems to benefit from teacher's encouraging behaviors that follows children's lead (Hadley & Dickinson, 2019; Hadley et al., 2022; Hirsh-Pasek et al., 2009; Weisberg et al., 2013). However, it is important to emphasize that the tendency for children to produce higher proportions of statements during play than during book sharing was non-significant, and the relative proportions of statements during book sharing and toy play indicate that both activities allowed the children to contribute to the interaction. Another crucial point is that play with constrained learning goals (e.g., introducing new vocabulary) is found to be more fruitful for vocabulary learning than free play (Toub et al., 2018). Although the current play activity did not have explicit learning goals, the fact that the teachers asked more questions and that the children tended to produce more statements during play highlighting the overall potent nature of play in facilitating children's active participation (Hirsh-Pasek et al., 2009; Weisberg et al., 2013).

Questions from teachers inviting children to produce an "inference, analyze information, discuss vocabulary or make predictions" (Massey et al., 2008, p. 349) occurred infrequently in both activities and to a lesser extent during toy play. Indeed, the relative proportions of the teachers' inferential questions were much lower in this study than in previous work conducted in the US (Tompkins et al., 2013; Zucker et al., 2010). One possible explanation for the divergent findings may relate to differences between the Norwegian and US preschool traditions. In Norwegian preschools, there is a strong emphasis on following children's lead (e.g., Bae, 2009), and informal learning and free play are highly valued (e.g., Hagen, 2018). It may be that Norwegian preschool teachers were more oriented toward the children's interests and engagement instead of challenging the children through complex input. This interpretation is in harmony with that of an interview-based study on Norwegian and Swedish teachers about language learning in preschools (Sheridan & Gjems, 2017). It revealed that in the participants' talk about everyday conversations in preschools, none of them mentioned language-facilitating features such as "open-ended questions, prolonging a conversational theme, or supporting children in uttering a thought, feeling, idea or point of view" (p. 356). Also, research conducted in Norwegian daycare centers has reported higher scores on features of interactions related to sensitive responsiveness and respect for child autonomy than those related to verbal communication and developmental stimulation among preschool staff (Baustad & Bjørnstad, 2020). The findings reported here substantiate those of the above studies, in that, inferential question asking seems to be a scarce practice in Norwegian teacher – child interactions.

However, children learn best when they are provided with input in their proximal zone of development (Vygotsky & Cole, 1978), and asking many inferential questions is not necessarily the answer to developmentally appropriate input. Indeed, Hadley and Dickinson (2019) found that interactions where children were asked to synthesize or analyze word meanings were negatively related to children's word learning. This could indicate that the questions disturbed the meaning content for the children and the topic continuation of the conversation, thereby decreasing the children's participation and learning outcomes (Girolametto et al., 2000; Hadley & Dickinson, 2019). At the same time, analytic talk in dialogic interactions where both teachers and children are actively engaged has been found to be strongly related to children's vocabulary development (Dickinson & Smith, 1994). Given that the children's responses to the teachers' inferential questions tended to be longer than their responses to the literal questions, the findings from the present study suggest that the children had the potential to benefit from these questions (deRivera et al., 2005). Consequently, it is interesting to note that intervention studies conducted in Norwegian preschools show the promising effects of implementing such language-facilitating questions (Grøver et al., 2020; Hagen et al., 2017; Rogde et al., 2016), suggesting that teachers' use of more "advanced" input features are malleable even in the highly "child-centered" Norwegian preschool tradition.

At the moment-to-moment level, the teachers' questions were more likely to elicit statement responses from the children, while their statements were less likely to be followed by such child responses. These findings held true for both activities, underlining the effective role of teachers'

questions as conversation-eliciting contributions, as documented in previous work (Meacham et al., 2014; Tompkins et al., 2017). The likelihood of the teachers' statements following the children's questions was stronger during toy play than during book sharing, and could indicate that the teachers' and children's turn-taking patterns were more balanced during toy play than during book sharing.

The findings from the sequential analysis were somewhat divergent from likely expectations from the comparison of interactional contributions in the two activities. Thus, despite the fact that there were no significant differences in the proportions of the children's questions in the two activities, and that teachers produced significantly higher proportions of statements during book sharing, the likelihood of a teacher statement following a child question was stronger during toy play compared to book sharing. Divergent findings were also documented in a study by Luo and Tamis-LeMonda (2017), which revealed group differences in mothers' use of questions and children's use of statements, as examined by the mean levels of proportions, but a high degree of similarity following an investigation of the immediate associations between mother-to-child and child-to-mother responses. The present study adds to the literature by showing that the similarities and differences in the proportions of conversational contributions during book sharing and toy play do not necessarily reflect the dynamics of a conversation on a moment-to-moment level.

To sum up, the findings reported here give support to the increasing number of intervention studies that are embedded in book sharing *and* play (Hadley & Dickinson, 2019; Toub et al., 2018). We found the book sharing interactions to be more challenging – as the teachers provided more informational input and made use of more inferential questions – and toy play to be more interactive and child-led. This could indicate that combining adult – child interactions during book sharing and play have the potential to provide children with more varied input.

Limitations and Future Directions

In this study, we focused specifically on dyadic teacher – child conversations. These interactions are not necessarily representative of how a teacher might act in a classroom with larger or smaller groups of children. Indeed, with respect to adult – child communication conducted in classrooms and at home (i.e., Gest et al., 2006; Melzi et al., 2011), the findings from the current study arguably imply that teacher – child communication is more similar to parent – child communication when the structure of the interactions is more similar. However, the distinctive teacher – child relationship is still expected to affect their interactions, given that the role of teachers, as professional educators, may serve other purposes than that of parents, as primary caregivers.

Moreover, the contextual factors of the activities under study must be considered when interpreting our results. For example, the participants were not introduced to the book before the actual observation, and it may be that a familiar book would have compared differently to toy play. This hypothesis has been substantiated by Schapira et al. (2021), who found that children were more dialogically involved in the second reading of a book compared to the first reading. Similarly, the parents in their study used more utterances related to socio-emotional aspects and fewer utterances related to actions and events during the second reading of the book (Schapira et al., 2021). In line with these findings, we cannot preclude that the children in our study would also have contributed more during the book sharing activity and that the teachers would have asked more inferential questions had the book been familiar to them. Future research could, therefore, examine the extent to which teachers' and children's interactional contributions vary across more familiar or repeated book sharing and toy play activities.

Finally, the activities were introduced in a fixed order, and we cannot exclude the possibility that this impacted our results. For example, the interlocutors might have been more inclined to make use of inferential questions during book sharing as this activity was introduced first. Relatedly, they may have felt more “warmed-up” and confident to interact during toy play. Therefore, future research with counterbalanced ordering is needed to replicate our findings.

Conclusion

We examined teachers and five- to six-year-old children from Norwegian preschools during toy play and book sharing. Comparisons of the teacher – child interactions in the two activities revealed small *but notable* differences. Toy play promoted the children’s participation in “back-and-forth” communication, and the book sharing sessions were more challenging in the sense that the teachers provided more informational input and made use of more inferential questions. These findings indicate that the features of the activities provided varying pragmatic language experiences for the children and, as such, made a difference in the quality of the educational dialogs between the children and their teachers.

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