The relation between the questions teachers ask and children's language competence

Femke van der Wilt a, Chiel van der Veen a and Sarah Michaels b

aDepartment of Educational and Family Studies, Vrije Universiteit Amsterdam, Amsterdam, Netherlands; bDepartment of Education, Clark University, Worcester, MA, USA

ABSTRACT

In the present study, it was hypothesized that the proportion of open questions teachers ask during shared book reading would be directly and indirectly (through class aggregated mean length of utterance) related to children's vocabulary and would be directly and indirectly (through class aggregated mean length of children's utterance and vocabulary) related to children's narrative competence. A total of 7 early childhood teachers and 176 pupils participated in this study. Outcomes of mediation analyses revealed that the proportion of open questions was positively related to class aggregated mean length of children's utterance and vocabulary and negatively related to narrative competence. In addition, the proportion of open questions was indirectly and positively related to children's narrative competence, through class aggregated mean length of children's utterance. The results of this study indicate that the type of questions teachers ask during shared book reading is related to children's language competence.

Introduction

Children's level of language competence during early childhood is one of the most important predictors of their later success in learning to read (Dickinson et al., 2010; Whitehurst & Lonigan, 1998). Moreover, well-developed language skills support children's social development, because it enables children to express their thoughts and emotions (Bulotsky-Shearer et al., 2012; Yew & O’Kearney, 2017). Research has shown that children with a high level of language competence are more often accepted by their peers (e.g., Van der Wilt et al., 2018a, 2018b). In addition, it has been demonstrated that differences in children's levels of language competence start to increase during the preschool years (Cabell et al., 2013; Chatterji, 2006). In order to give children equal chances to develop sufficient language competence that allow them to participate in social interactions, it is crucial to promote children's language development at a young age (Cabell et al., 2019).

Shared book reading supports children's language development

Research has shown that shared book reading, during which teachers read aloud to their pupils and ask them questions before, during, and after reading the book, provides ample opportunities for children's language learning (Marulis & Neuman, 2010; Mol et al., 2008; Piasta et al., 2012; Wasik et al., 2016; Zucker et al., 2013). For example, a study by Zucker et al. (2013) showed that extratextual talk during shared book reading in preschool is associated with children's vocabulary skills in kindergarten. Hence, shared book reading in early childhood education can be considered an activity that might reduce possible language differences between children that are caused by differences in home language environment and/or differences in the frequency of high-quality social interactions children participate in.

There are, however, different approaches in shared book reading (e.g., Van der Wilt et al., 2019) that might differ in the extent to which they support children's language competence. The effect of shared book reading in fact largely depends on the quality of the discussions before, during, and after reading the book (Cabell et al., 2019; Gonzalez et al., 2010; Mol et al., 2009; Teale, 2003; Wasik et al., 2006, 2016). In other words, many of the learning opportunities during shared book reading are due to interactive dialogues between teachers and children (Deshmukh et al., 2019). This could be explained by the fact that conversations during shared book reading provide children with the opportunity to hear and use new words, and to receive feedback while doing so (Hindman et al., 2019; Snow & Beals, 2006). Interactive techniques encouraging children to participate in the conversations during shared book reading

CONTACT Femke van der Wilt fm.vander.wilt@vu.nl Department of Educational and Family Studies, Vrije Universiteit Amsterdam, Van der Boechorststraat 7, 1081 BT Amsterdam, the Netherlands.

© 2022 The Author(s). Published with license by Taylor & Francis Group, LLC.

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.
have shown to positively affect children's language competence (Deshmukh et al., 2019; Hargrave & Sénéchal, 2000; Walsh & Blewitt, 2006).

The relation between the type of questions teachers ask and children's language competence

An important aspect of the discussions during shared book reading includes teachers' use of different types of questions (Hindman et al., 2019; Teale, 2003; Walsh & Hodge, 2018). Although teachers' comments (e.g., topic-continuing comments, new information/explication, or answers to children's questions) during shared book reading are valuable (Barnes et al., 2017), teachers' questions open-up the conversations, and it is through these questions that a verbal response from children is initially elicited (Deshmukh et al., 2019).

Providing a verbal response to teachers' questions allows children to practice their language skills by verbalizing their ideas (e.g., Deshmukh et al., 2019; Justice et al., 2002), and to receive feedback on their utterances from the teacher or their peers. In investigating the type of questions teachers ask during shared book reading, many researchers have made a distinction between open and closed questions (e.g., Deshmukh et al., 2019).

Open questions are questions that generally elicit multiple-word responses (Hindman et al., 2019; Worley, 2015) and allow for a number of different answers (Lee et al., 2012). On the other hand, closed questions are often referred to as yes/no or test questions. In general, closed questions elicit a single word response and only one answer is correct (Lee et al., 2012; Walsh & Hodge, 2018; Wasik et al., 2006; Wasik & Bond, 2001). Although closed questions generally limit children's language use (De Rivera et al., 2005), they do elicit the use of specific target words (Hindman et al., 2019). However, research into the effect of open versus closed questions has shown that open questions appear to be more strongly related to gains in children's vocabulary (both receptive vocabulary and expressive vocabulary; e.g., Dickinson & Tabors, 2001; Rowe et al., 2017; Wasik et al., 2006; Wasik et al., 2016; Zucker et al., 2010; for a review, see Walsh & Hodge, 2018).

The possible role of mean length of utterance

Although previous research has shown that the type of questions teachers ask during shared book reading is related to children's vocabulary (e.g., Dickinson & Tabors, 2001; Rowe et al., 2017), some questions remain unanswered. Specifically, it remains unclear exactly how the type of questions teachers ask during shared book reading are related to children's vocabulary. One possible explanation can be found in the length and complexity of children's utterances. In fact, previous studies have demonstrated that the type of questions teachers ask during shared book reading affects the length and extensiveness of children's responses (Deshmukh et al., 2019; Hindman et al., 2019). Providing an extensive response has, in turn, been found to positively affect children's vocabulary, because it allows children to practice their use of words (Hindman et al., 2019). Furthermore, in a recent study (Van der Veen, Michaels, Dobber, Van Kruistum, & Van Oers, 2021), it has been shown that children's level of oral communication (an aspect of language competence) was higher in classrooms in which children were encouraged to actively contribute to classroom discussions. In their study, the extent to which children contributed to classroom conversations was measured using a classroom aggregated mean length of utterance. This class aggregated mean length of children's utterance can be considered a proxy of the dialogic nature of classroom talk. In other words, in classes with a high aggregated mean length of utterance children have more opportunities to talk and think together, which is supported through a teacher asking open questions, and using dialogic scaffolds. Together, previous studies could indicate that the type of questions teachers ask during shared book reading does not (only) directly affect children's vocabulary, but might (also) indirectly affect it, through (the class aggregated) children's mean length of utterance.

Narrative competence as an aspect of language competence

Besides further research into how the type of questions teachers ask during shared book reading is related to children's vocabulary, it is also important to note that previous research has primarily focused on children's receptive or expressive vocabulary (for a review, see Walsh & Hodge, 2018). Language competence is, however, a broad concept that entails multiple sub-skills (Conti-Ramsden & Durkin, 2012; Walsh & Hodge, 2018). In order to draw conclusions about how shared book reading supports children's language competence, it is important to go beyond merely measuring children's vocabulary and to take additional components of language competence into account. The present study, therefore, included children's narrative competence. Narrative competence is the ability to tell a story that is structured and coherent (Pinto et al., 2017; Zanchi & Zampini, 2020). To be able to do so, children need to integrate linguistic, cognitive, and social skills (Pinto et al., 2017; Zanchi & Zampini, 2020).

Previous research has provided evidence for the fact that there might be a relation between the type of questions teachers ask during shared book reading and children's narrative competence. That is, a study by Gámez et al. (2017) involving 21 kindergarten classrooms showed that teachers' extratextual talk during shared book reading predicted Spanish-speaking English learners' narrative production. Besides, Gámez and colleagues (2017) showed that teachers' interactive style (e.g., asking for word definitions)
influenced children’s narrative production, specifically the structure of the story they were asked to tell. In addition, a previous study into different approaches to shared book reading indicated that shared book reading was positively related to gains in children’s narrative competence (Wilt, Boerma, Van Oers, & Van der Veen, 2019). Outcomes of these studies are in line with a study on parent-child shared book reading by Lever and Sénéchal (2011). In their intervention study, they showed that parents’ shared book reading supported children’s narrative knowledge (i.e., story structure) and expressive vocabulary. Interestingly, Lever and Sénéchal compared children in a dialogic reading condition in which parents used elaborative questioning techniques (i.e., asking wh- and open-ended questions) with children in the alternative treatment group (receiving a phoneme awareness program). Results indicated that parents’ use of elaborating questioning techniques within the context of shared book reading made a difference: Children in the dialogic reading condition outperformed children in the comparison condition on narrative structure and expressive vocabulary.

The aforementioned studies suggest that shared book reading does not only affect children’s vocabulary, but their narrative competence as well (Gámez et al., 2017; Van der Wilt et al., 2019). Besides, elaborative questioning techniques seem to support children’s narrative knowledge in the context of parent-child shared book reading (Lever & Sénéchal, 2011). But does the type of questions teachers ask during shared book reading in the context of early childhood education also affect children’s narrative competence? In the present study, we investigated whether the proportion of open questions teachers ask during shared book reading is related to children’s narrative competence.

**Indirect relations between teachers’ type of questions and children’s narrative competence**

Besides a direct relation, there might also be an indirect relation between the type of questions teachers ask during shared book reading and children’s narrative competence. Again, children’s length of utterances – measured as their mean length of utterance aggregated for each classroom – might play a role in this case. As previously mentioned, it has already been shown that the type of questions teachers ask during shared book reading is related to the length of children’s responses (Deshmukh et al., 2019; Hindman et al., 2019). In addition, previous research has indicated that children’s mean length of utterance is not only related to their vocabulary, but also to their narrative competence (e.g., Zanchi & Zampini, 2020). This could indicate that children’s mean length of utterance – in the context of our study the classroom aggregated mean length of children’s utterance – (partly) mediates the relation between the type of questions teachers ask during shared book reading and children’s narrative competence. That is, teachers’ use of open questions might encourage children to give more complex and longer responses which might, in turn, improve their narrative competence.

In addition to children’s mean length of utterance, their vocabulary might also (partly) mediate the relation between the type of questions teachers ask during shared book reading and children’s narrative competence. As previously stated, there is clear research evidence showing a relation between the type of questions teachers ask during shared book reading and children’s vocabulary. In addition, previous studies have shown a relation between children’s vocabulary and their narrative competence. Together, these results might suggest that the type of questions teachers ask during shared book reading is indirectly related to children’s narrative competence, both through mean length of utterance (aggregated on classroom level) and through their vocabulary. This would result in the hypothesized model shown in Figure 1. To the best of our knowledge, no previous research exists in which this model has been tested.

**The current study**

In summary, the present study investigated the relations between the type of questions teachers ask (i.e., the proportion of open questions) during shared book reading and children’s vocabulary, narrative competence and the class aggregated mean length of utterance. It was hypothesized that the proportion of open questions teachers ask during shared book reading would be both directly (path b) as well as indirectly (i.e., through the class aggregated mean length of utterance; path a and path c) related to children’s vocabulary. In addition, the hypothesis was that the proportion
of open questions teachers ask during shared book reading would be both directly (path d) as well as indirectly (i.e., through the class aggregated mean length of utterance and through their vocabulary; path b and path f) related to children's narrative competence.

**Method**

**Data collection**

In each class, the current study was conducted over a period of three weeks (see Table 1 for an overview). In the first week, teachers were informed about the study and parents were asked for informed consent. In the second week, shared reading sessions of teachers were videotaped. Each teacher was asked to choose a narrative picture book and read it to his or her pupils in the way they would normally do. In the third week, two language tests were administered to assess children's language competence. These tests were administered in a fixed order: First the test measuring children's narrative competence (approximately ten minutes) and then the test measuring children's vocabulary competence (approximately five minutes).

**Participants**

In the present study, which was part of a larger study on different approaches of shared book reading in early childhood education, \(N=7\) teachers (\(n=6\) females) and their \(N=176\) pupils (\(n=89\) girls) participated. Participating teachers taught in Dutch early childhood classrooms throughout the Netherlands. In the Netherlands, early childhood classrooms are part of primary school and consist of the first and second grade, which are often mixed into one classroom (containing children aged 4-6 years). Class sizes ranged from 21 to 28 children (\(M = 25.14, SD = 2.10\)). Children were aged between 49 and 84 months (\(M = 63.95, SD = 7.70\)). For 72.2% of the children, additional background information was available. That is, the Netherlands was the country of birth for 69.9% of the children (other countries of birth were Aruba, Kenya, Norway, South Africa, and Thailand), Dutch was the main language for 66.5% of the children (other home language combinations of Dutch with English, Aramaic, Arabic, Assyrian, and Turkish), and parents' education levels were low (4.0%), average (30.7%), or high (36.4%).

**Measures**

**Teachers' type of questions**

Participating teachers were asked to orchestrate a shared book reading activity that was representative of their usual practice. The books teachers read differed from one another (they were asked to select a book themselves), but were all of the narrative genre. Teachers scored the representativeness of the activity on a five-point-scale (0 = not representative, 5 = very representative). Scores ranged from 4 to 5 with an average of 4.30 (SD = 0.52). The shared book reading activities were videotaped and transcribed in order to code the type of questions teachers asked during shared book reading. Transcripts were imported in Atlas.ti version 1.0.50. Each turn was first coded as a child turn or a teacher turn. The type of questions teachers asked were then coded using the three categories of questions of the Low Inference Discourse Observation Instrument (LIDO; O'Connor et al., 2015; see Table 2): (1) open questions, (2) semi-open questions, and (3) closed questions. Teacher turns that did not comply with one of these three LIDO categories were not coded. Interrater reliability of the LIDO was attained through independent scoring by a second rater of 10% of the coded teacher turns. A moderate reliability was found with a Cohen's Kappa of 0.72 (Landis & Koch, 1977; McHugh, 2012).

In order to obtain a total score representing the type of questions, for each teacher the number of semi-open questions and closed questions (s)he asked were first summed. These two types of questions were combined into one score, because the videos of the shared book reading activities showed that both type of questions provided children with little opportunity for elaborated responses. In contrast, open questions invited children to participate in the conversation and allowed them to talk extensively. After summing the number of semi-open questions and closed questions, we calculated how many open questions teachers asked relatively to the number of semi-open and closed questions they asked. That is, the total number of open questions each teacher asked was divided by the total number of questions (s)he asked. This resulted in a proportion score, indicating the proportion open questions.

**Class aggregated mean length of children's utterances**

For each shared book reading activity, mean length of utterance was calculated by counting the number of words...
Children used per turn. Because of children’s privacy, it was impossible to link each utterance to a specific child. Therefore, an aggregated mean length of utterance was calculated per class. A class aggregated mean length of children’s utterance has been used in previous studies (e.g., van der Veen et al., 2021) and can be considered a proxy of dialogic nature of classroom talk.

Children’s vocabulary
Children’s vocabulary was measured with the Thematic Vocabulary Assessment Test (Adan-Dirks, 2012; Van der Veen et al., 2016). In the present study, a list of twenty words was selected from two picture books: ‘The Black Rabbit’ (Leathers, 2013) and ‘The Competition of the Tortoise and the Hare’ (Visser & Meirink, 2017). These picture books were used as part of an intervention study that started after the current study. Children were asked to verbally explain the meaning of the selected twenty words (e.g., ‘What does a stopwatch mean?’). The responses of each child were dichotomously scored: 1 point was assigned to a correct explanation (e.g., ‘A kind of clock you use to keep time’) whereas 0 points were assigned to an incorrect explanation (e.g., ‘That you need to stop’). In order to measure children’s individual level of vocabulary, the scores were computed which provided a total score that could range from 0 to 20. The reliability of this test was moderate (Cronbach’s Alpha of 0.66).

Children’s narrative competence
The narrative competence of children was assessed with the subscale Narrative Task of the standardized Cito Language Test for All Children (Verhoeven & Vermeer, 2006). This test is used to measure the extent to which children are able to tell a coherent story. During the administration of the test, children were presented with a series of pictures and were asked to tell a story that would suit the pictures. Children’s stories were scored using 16 items that represent the different events of the story (e.g., ‘The balloon flies away’) and the relation between these events. Items were dichotomously scored: 1 point was assigned to a correct response (‘The child fell down and then let go of the balloon’); zero points to an incorrect response (‘Someone took the balloon and the child fell’). Scores were computed to obtain a total score for each child. Total scores could range from 0 to 16. In the current study, with a Cronbach's Alpha of 0.69 the reliability of the test was found to be moderate.

Procedure
The current study was approved by the Permanent Committee of Science and Ethics of the Faculty of Behavioral and Movements Science of the Vrije Universiteit Amsterdam. Prior to the study, teachers were informed about its purpose and procedures during a two-hour meeting. In addition, pupils’ parents were informed about the purpose and procedures of the study, and asked for active consent. Children without consent did not participate and parents were given the opportunity to withdraw their child from the study at any time. Test administrations were individually administered by a trained test assistant in a quiet room within the children’s school. Test administrations were audio-taped so they could be scored afterwards.

Data-analysis
Structural equation modeling
Structural Equation Modeling (SEM) was used to test the relations between teachers’ type of questions, class aggregated mean length of utterances, and children’s vocabulary and narrative competence. Indirect and direct paths were constructed following the procedure of Rosseel (2012). The hypothesized model (Figure 1) was analyzed in R (R Core Team, 2014), using maximum likelihood estimation. We used the following indices to evaluate overall model fit: (a) comparative fit index (CFI), where values of .90 indicate adequate fit, (b) root mean square error (RMSEA), for which good model fit is indicated by values of .05 or lower, (c) Chi-squared value ($X^2$), and (d) Tucker-Lewis index (TLI), where values of >.90 indicate adequate fit.

Data cleaning and missing data procedures
The data were thoroughly screened before conducting statistical analyses to ensure the accuracy of the data file. With regard to the data on vocabulary, 13.84% of the values were missing. In addition, 12.82% of the values on narrative competence were missing. Missing data were imputed for both vocabulary and narrative competence after finding no statistically significant deviation from randomness (Little’s MCAR test, $X^2(194) = 213.67, p = .159$ and Little’s MCAR test, $X^2(71) = 55.00, p = .920$, respectively). The imputed dataset was used in subsequent analyses. Shapiro Wilks Normality tests were performed to check normality assumptions. Outcomes showed that the data on vocabulary and narrative competence were not normally distributed. However, a visual inspection of Q-Q plots indicated that our data followed a normal distribution. As it is uncertain whether the assumption of normality was met, outcomes of our analyses should be carefully interpreted. Finally, although our data were nested (e.g., children within classes), the number of groups (both on the class level and the school level) was small (Hox et al., 2018). It was therefore not possible to perform multilevel analyses.

Results
Descriptive statistics
In Table 3, the means and standard deviations for each main variable are displayed. Although proportion scores for the type of questions teachers asked during shared book reading were used in subsequent analyses, unstandardized scores are provided to facilitate the interpretation of the mean scores.
Structural equation modeling

The model fit of the hypothesized model (Figure 1) was evaluated. Overall fit was good, CFI = 1.00, RMSEA = 0.00 (90% confidence interval [CI] [0.00, 0.00]), X²(6) = 157.82, p < .001, TLI = 1.00. Results of the analysis, testing the hypothesized model, are displayed in Table 4 and Figure 2. Findings indicated that the type of questions teachers ask were significantly related to class aggregated mean length of utterance (path a = 9.25), vocabulary (path b = 7.02, and narrative competence (path c = −9.69): A high proportion of open questions was related to a high class aggregated mean length of utterance, a high level of vocabulary, but a low level of narrative competence. No relation was found between class aggregated mean length of utterance and vocabulary (path d = −0.23). Finally, narrative competence was both related to class aggregated mean length of utterance (path e = 0.76) and vocabulary (path f = 0.38): A high class aggregated mean length of utterance and a high level of vocabulary were related to a high level of narrative competence.

Besides these direct paths, there was also one significant indirect path. Specifically, the indirect effect from teachers’ type of questions to children’s narrative competence, through class aggregated mean length of utterance was significant, βstandardized = 7.07, SE = 2.73, p < .010. However, the other indirect effects were not significant. That is, the indirect effect from teachers type of questions to children’s vocabulary, through class aggregated mean length of utterance was βstandardized = −2.16, SE = 2.64, p < .414; the indirect effect from class aggregated mean length of utterance to children’s narrative competence, through children’s vocabulary was βstandardized = −0.09, SE = 0.11, p < .419; the indirect effect from teachers’ type of questions to children’s narrative competence, through children’s vocabulary was βstandardized = 2.68, SE = 1.51, p < .076; and the indirect effect of teachers’
type of questions to children's narrative competence, through
class aggregated mean length of utterance and through
children's vocabulary was $\beta_{\text{standardized}} = -0.82$, $SE = 1.02$, $p < .420$.

Effect sizes were calculated for each outcome variable: (1)
for class aggregated mean length of utterance, $R^2 = 0.51$, (2)
for children's vocabulary, $R^2 = 0.02$, and (3) for children's
narrative competence, $R^2 = 0.148$ (which corresponds to medium,
small, and small effect sizes, respectively, Cohen, 1992).

**Discussion**

The purpose of the present study was to investigate the relations
between the type of questions teachers ask during shared book reading activities, children's vocabulary, their narrative
competence, and a class aggregated mean length of utterance.
It was hypothesized that the proportion of open questions
teachers asked during shared book reading would be both
directly as well as indirectly (i.e., through class aggregated
mean length of utterance and vocabulary) related to children's vocabulary. In
addition, the hypothesis was that the proportion of open questions teachers ask during shared book reading would be
both directly as well as indirectly (i.e., through aggregated
mean length of utterance and vocabulary) related to
children's narrative competence. Outcomes of the present
study were partly in line with these hypotheses. That is,
findings indicated that there were direct relations between
the proportion of open questions teachers ask during shared book reading, class aggregated mean length of utterance, vocabulary, and narrative competence. However, no direct
relation was found between the mean length of utterance and vocabulary. Regarding indirect relations, the proportion of
open questions teachers asked during shared book reading
appeared to be indirectly related to narrative competence
through class aggregated mean length of utterance, but not
through vocabulary, nor through mean length of utterance
and vocabulary simultaneously. The latter finding can be
explained by the non-significant relation between class aggregated
mean length of utterance and vocabulary.

**Positive relation between teachers’ open questions and
mean length of utterance and vocabulary**

The finding that asking relatively many open questions during
shared book reading was positively related to mean length
of utterance and vocabulary is in line with previous research
(Deshmukh et al., 2019; Dickinson & Tabors, 2001; Gámez
et al., 2017; Hindman et al., 2019; Rowe et al., 2017; Van
der Wilt et al., 2019; Wasik et al., 2006; 2016; Zucker et al.,
2010). The positive relation between the proportion of open
questions teachers ask during shared book reading and a class
aggregated mean length of children's utterance can be
explained by the observation that children generally talked
during shared book reading after the teacher had asked a question, and open questions tended to elicit longer responses
compared to semi-open questions and closed questions.

The positive relation that was found between the proportion
of open questions teachers ask during shared book
reading and children's vocabulary is in line with interven-
tional research showing the effect of shared book reading on
children's vocabulary (e.g., Wasik et al., 2006; Zucker
et al., 2010; for a review, see Wasik et al., 2016). This finding
can also be explained by the fact that open questions allow
for a more elaborate response: Compared to semi-open and
closed questions, open questions are expected to provide
children with the opportunity to use a higher number of
words (Lee et al., 2012; Walsh & Hodge, 2018; Zucker et al.,
2010). In addition, research on dialogic classroom talk has
shown that encouraging children to share their ideas by
using dialogic talk moves (such as open questions or elabora-
tions) results in longer and more complex responses (van
der Veen et al., 2021). Finally, within the context of shared
book reading, the words children use are also likely to be
relatively new words derived from the book that is being
read (Wasik et al., 2016). This can explain the positive
relation between the proportion of open questions teachers
asked during shared book reading and children's vocabulary.

**Negative relation between teachers’ open questions and
narrative competence**

Although positive relations were found between teachers' use
of open questions during shared book reading, the class
aggregated mean length of utterance and vocabulary, this
was not the case with regard to narrative competence. Specifically,
the proportion of open questions was negatively related to
narrative competence. This indicates that a high number of
open questions (relative to the number of semi-open and
closed questions) was associated with a low level of narrative
competence. How can this finding be explained?

Vygotsky’s cultural-historical theory, especially his ideas
on the zone of proximal development, might provide valu-
able insights in this regard. According to this theory, teach-
ers' educational instruction should slightly exceed children's
current level of development (Van Oers, 2012; see also
Vygotsky, 1978). Teachers should challenge their pupils, but
not too much (Van Oers, 2012; Walsh & Hodge, 2018). If
the type of questions teachers ask during shared book read-
ing are too easy, children may feel bored and disengaged,
but if the type of questions are too difficult, children may
feel anxious and frustrated (Walsh & Hodge, 2018).

Regarding the present study’s findings on narrative compet-
tence, this might indicate that the level of cognitive demand
in open questions might have been too far beyond children’s
current development. Our analyses might indicate that open
questions are valuable with regard to mean length of utter-
ance (i.e., on the level of classes) and vocabulary, but a
balance between some degree of teacher steering and allow-
ing some space for children to elaborate is most suitable to
promote young children's narrative competence.

**No relation between mean length of utterance and
vocabulary**

The non-significant relation between mean length of utter-
ance and vocabulary is not in line with findings of
previous research in which such a relation was found (e.g., Hindman et al., 2019). Differences in findings could be explained by methodological differences. For example, in the study of Hindman et al., vocabulary was measured by using the Peabody Picture Vocabulary Test (Dunn & Dunn, 1997), which measures children's receptive vocabulary, whereas the present study assessed children's productive vocabulary using a relatively new instrument. Besides, in the study of Hindman et al., individual scores for mean length of utterances were used, whereas in our study we aggregated children's mean length of utterances on the classroom level. Further research is required in order to investigate how these methodological differences might have resulted in different outcomes. In contrast to the relation between mean length of utterance and vocabulary, the relations between mean length of utterance and narrative competence and between vocabulary and narrative competence were significant and positive. These outcomes are in line with prior studies (e.g., Deshmukh et al., 2019; Hindman et al., 2019; Van der Wilt et al., 2019), indicating that the length of children's utterances during shared book reading and a high level of vocabulary are related to their ability to tell a coherent story. These findings should be carefully interpreted, as our study used an aggregated measure of mean length of utterances. This classroom measure reflects how much space children were given to talk, where a high class aggregated mean length of utterances is indicative of a classroom in which children were encouraged to talk and think together (cf., van der Veen et al., 2021).

**Significant indirect relation between teachers’ open questions and narrative competence**

The significant finding regarding the indirect relation between the proportion of open questions teachers pose and children's narrative competence (through class aggregated mean length of utterance) provides insight into the mechanism of how the type of questions teachers ask during shared book reading are related to narrative competence. As expected, mean length of utterance seems to play a role in this relation. This finding indicates that there are both direct as well as indirect relations between the type of questions teachers ask during shared book reading and children's narrative competence. In the present study, the direct relation between the proportion of open questions and narrative competence was negative, whereas the indirect relation between the two variables (through mean length of utterance) was positive. Nonetheless, the positive indirect relation indicates that open questions are a means to increase children's talk, which is reflected by our class aggregated measure of children's mean length of utterance. On the long run, encouraging children to talk more might also support their narrative competence. The positive indirect relations between the type of questions teachers ask during shared book reading and children's narrative competence clearly shows that the relation between shared book reading and language competence is complex.

**Limitations**

Although the present study has provided new insights into the relation between the type of questions teachers ask during shared book reading and children's language competence, the study did suffer from several limitations. First, due to the cross-sectional design of the study, no conclusions can be drawn regarding the direction of the relations between the variables. In fact, although it is assumed that the proportion of open questions teachers ask during shared book reading affects the class aggregated mean length of utterance and children's language competence (both vocabulary and narrative competence), it could also be the other way around. However, the large number of intervention studies showing the effect of shared book reading on children's language ability indicate that it is more likely that teachers who pose a large proportion of open questions during shared book reading will support children's discursive participation (in this study measured by a class aggregated mean length of utterance), vocabulary, and narrative competence.

Second, although the present study included children's narrative competence and thereby added to previous research that mainly focused on children's vocabulary, the concept of language competence concerns more than a combination of vocabulary and narrative competence. Moreover, the assumption of language tests is generally that language competence is a fixed and innate ability, thereby ignoring the fact that children's language acquisition is highly influenced by their language experiences (Van der Wilt et al., 2019). In addition, the use of monolingual language tests (as were used in the present study) has been challenged, because they might be biased toward certain populations (Hoff, 2013). Future studies should include additional aspects of children's language competence in order to gain more insight in the broad range of sub-skills that constitute children's language competence, and should adopt a more socially oriented conception of language (e.g., by combining standardized tests with observations of children's language learning experiences, Hoff & Tian, 2005; also see Van der Wilt et al., 2019). In addition, we argue that more research is needed on how to value children's prior language experiences when assessing their language competence.

Finally, the three type of questions that were taken into account in this study (i.e., open, semi-open, and closed questions) allowed for separate analyses and thereby provided insight into the different relationships between these types of questions and children's language competence. There are, however, more fine-grained distinctions between the type of questions teachers ask. In the study of Deshmukh et al. (2019), for example, seven type of questions were taken into account, allowing the researchers to disentangle the differential effects of these type of questions on children's responses. Besides, in the present study, no distinction was made between initiating questions (or framing questions) and follow up questions (questions that are a direct response to what a child has just said; Alexander, 2018; Michaels & O'Connor, 2015; O’Connor & Michaels, 2019). These type of questions might have different
implications for children’s responses, but were not taken into account. However, although in future studies, it might be interesting to include more fine-grained categories of questions and to distinguish between initiating questions and follow-up questions, the present study provided new insights in how the most commonly made distinction between type of questions might be related to children’s language competence.

Implications

Together with the outcomes of previous studies, the findings of the present study indicate that the type of questions teachers ask during shared book reading is related to children’s language competence. More specifically, asking open questions seem to encourage children to give more lengthy responses, which is related to their vocabulary. Our finding that the proportion of open questions is negatively related to children’s narrative competence might indicate that teachers should refrain from asking open questions. Of course, it is not that simple. The type of questions teachers should ask during shared book reading depends on the purpose of the book reading activity, background knowledge and language competence of the participating children, and where in the conversation a question or extending move appears (Michaels & O’Connor, 2015; O’Connor & Michaels, 2019; Reese & Cox, 1999; Strasser et al., 2013; Walsh & Hodge, 2018). Teachers might therefore be encouraged to alternate between the type of questions they ask, or the kind of extending moves they use to follow-up on children’s responses. However, because previous research has shown that early childhood teachers tend to primarily ask closed questions (Beck & McKeown, 2001; Deshmukh et al., 2019; Dickinson & Tabors, 2001; Hindman et al., 2019), based on the outcomes of the current study, teachers are encouraged to specifically include open questions in their interactional techniques. Previous research has shown that supporting teachers in questioning behaviors can assist teachers in developing a wider and more effective range of questioning techniques (Hargrave & Sénéchal, 2000; Lee et al., 2012; Milburn et al., 2014; Wasik et al., 2006). Furthermore, teachers should learn to adapt their questioning techniques to the language competence and the prior-knowledge of their pupils.

Conclusion

To conclude, the findings of the present study showed that the proportion of open questions teachers ask during shared book reading is not only related to children’s vocabulary, but to their narrative competence as well. In addition, outcomes regarding indirect relations provided insight into how the type of questions teachers ask during shared book reading are related to children’s language competence (i.e., through class aggregated mean length of utterance). Based on the results of the current study, we suggest that future research in the area of shared book reading should focus on two aspects. First, more knowledge is needed on how teachers can adapt their questioning techniques to both individual and group differences in children’s language competence. Second, it is important to gain more insight into how open or initiating questions versus extending or follow-up moves support children’s language use. Based on the outcomes of our study, we encourage early childhood teachers to pose open questions during shared book reading in order to open-up the conversation and encourage children to talk more.

Funding

This work was supported by Nationaal Regieorgaan Onderwijsonderzoek (NRO) [filenumber 40.5.18500.023].

ORCID

Femke van der Wilt http://orcid.org/0000-0003-3016-6653
Chiel van der Veen http://orcid.org/0000-0002-7517-4764
Sarah Michaels http://orcid.org/0000-0002-4799-2583

References

Adan-Dirks, R. (2012). Assessing vocabulary development. In B. van Oers (Ed), Developmental education for young children: Concept practice and implementation (pp. 87–104). Springer.
Alexander, R. (2018). Developing dialogic teaching: Genesis, process, trial. Research Papers in Education, 33(5), 561–598. https://doi.org/10.1080/02671522.2018.1481140
Barnes, E. M., Dickinson, D. K., & Grifenhagen, J. F. (2017). The role of teachers’ comments during book reading in children’s vocabulary growth. Journal of Educational Research, 110(S), 1–13. https://doi.org/10.1080/00220671.2015.1134422
Beck, I. L., & McKeown, M. G. (2001). Text talk: Capturing the benefits of read-aloud experiences for young children. The Reading Teacher, 55, 10–20.
Bulotsky-Shaffer, R. J., Bell, E., & Dominguez, X. (2012). Latent profiles of problem behavior within learning, peer, and teacher contexts: Identifying subgroups of children at academic risk across the preschool year. Journal of School Psychology, 50(6), 775–789. https://doi.org/10.1016/j.jsp.2012.08.001
Cabell, S. Q., Justice, L. M., Logan, J. A. R., & Konold, T. R. (2013). Emergent literacy profiles among prekindergarten children from low-SES backgrounds: Longitudinal considerations. Early Childhood Research Quarterly, 28(3), 608–620. https://doi.org/10.1016/j.ecresq.2013.03.007
Cabell, S. Q., Zucker, T. A., DeCoster, J., Melo, C., Forston, L., & Hamre, B. (2019). Prekindergarten interactive book reading quality and children’s language and literacy development: Classroom organization as a moderator. Early Education and Development, 30(1), 1–18. https://doi.org/10.1080/10409289.2018.1514845
Chatterji, M. (2006). Reading achievement gaps, correlates, and moderators of early reading achievement: Evidence from the early childhood longitudinal study (ECLS) kindergarten to first grade sample. Journal of Educational Psychology, 98(3), 489–507. https://doi.org/10.1037/0022-0663.98.3.489
Cohen, J. (1992). Quantitative methods in psychology: A power primer. Psychological Bulletin, 112(1), 155–159. https://doi.org/10.1037/0033-2909.112.1.155
Conti-Ramsden, G., & Durkin, K. (2012). Language development and assessment in the preschool period. Neuropsychology Review, 22(4), 384–401. https://doi.org/10.1007/s11065-012-9208-z
Deshmukh, R. S., Zucker, T. A., Tambyraja, S. R., Pentimonti, J. M., Bowles, R. P., & Justice, L. M. (2019). Teachers’ use of questions during shared book reading: Relations to child responses. Early
null
of oral communicative competence? Social Development, 00, 1–15. https://doi.org/10.1111/sode.12316
Van Oers, E. (2012). Evaluation of learning and development. In B. van Oers, Developmental education for young children: Concept, practice, and implementation (pp. 223–238). Springer.
Verhoeven, L., & Vermeer, A. (2006). Verantwoording Taaltoets Alle Kinderen (TAK) [justification language test for all children]. Centraal Instituut voor Toetsontwikkeling.
Visser, R., & Meirink, T. (2017). De wedstrijd van schildpad en haas. [The competition of tortoise and hare]. Book2download.
Vygotsky, L. S. (1978). Mind in society. The development of higher psychological processes. Harvard University Press.
Walsh, B. A., & Blewitt, P. (2006). The effect of questioning style during storybook reading on novel vocabulary acquisition of preschoolers. Early Childhood Education Journal, 33(4), 273–287. https://doi.org/10.1007/s10643-005-0052-0
Walsh, R. L., & Hodge, K. A. (2018). Are we asking the right questions? An analysis of research on the effect of teachers’ questioning on children’s language during shared book reading with young children. Journal of Early Childhood Literacy, 18(2), 264–294. https://doi.org/10.1177/1468798416659124
Wasik, B. A., & Bond, M. A. (2001). Beyond the pages of a book: Interactive book reading and language development in preschool classrooms. Journal of Educational Psychology, 93(2), 243–250. https://doi.org/10.1037/0022-0663.93.2.243
Wasik, B. A., Bond, M. A., & Hindman, A. H. (2006). The effects of a language and literacy intervention on Head Start children and teachers. Journal of Educational Psychology, 98(1), 63–74. https://doi.org/10.1037/0022-0663.98.1.63
Wasik, B. A., Hindman, A. H., & Snell, E. K. (2016). Book reading and vocabulary development: A systematic review. Early Childhood Research Quarterly, 37, 39–57. https://doi.org/10.1016/j.ecresq.2016.04.003
Whitehurst, G. J., & Lonigan, C. J. (1998). Child development and emergent literacy. Child Development, 69(3), 848–872. doi:10.1111/cdev.1998.69.issue-3
Worley, P. (2015). Open thinking, closed questioning: Two kinds of open and closed questions. Journal of Philosophy in Schools, 2(2), 17–29. https://doi.org/10.21913/JPS.v2i2.1269
Yew, S. G. K., & O’Kearney, R. (2017). Language difficulty at school entry and the trajectories of hyperactivity-inattention problems from ages 4 to 11: Evidence from a population-representative cohort study. Journal of Abnormal Child Psychology, 45(6), 1105–1118. https://doi.org/10.1007/s10802-016-0241-x
Zanchi, P., & Zampini, L. (2020). The narrative competence task: A standardized test to assess children’s narrative skills. European Journal of Psychological Assessment, Advance online publication. https://doi.org/10.1027/1015-5759/a000569
Zucker, T. A., Cabell, S. Q., Justice, L. M., Pentimonti, J. M., & Kaderavek, J. N. (2013). The role of frequent, interactive prekindergarten shared reading in the longitudinal development of language and literacy skills. Developmental Psychology, 49(8), 1425–1439. https://doi.org/10.1037/a0030347
Zucker, T. A., Justice, L. M., Piasta, S. B., & Kaderavek, J. N. (2010). Preschool teachers’ literal and inferential questions and children’s responses during whole-class shared reading. Early Childhood Research Quarterly, 25(1), 65–83. https://doi.org/10.1016/j.ecresq.2009.07.001