



Dialogic classroom talk in early childhood education: The effect on language skills and social competence

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ABSTRACT

The first purpose of the present study was to examine the effect of dialogic classroom talk on children's language skills (i.e. oral communicative competence and receptive vocabulary knowledge). The second purpose was to examine the effect of this type of classroom talk on children's social competence (i.e. theory of mind and social acceptance). A total of 17 teachers and 311 children (aged 4–7 years) participated in this study. Eight teachers participated in an 8-week intervention directed at dialogic classroom talk. Multilevel analyses revealed that the intervention had a significant effect on children's oral communicative competence. No significant effects were found on children's receptive vocabulary knowledge, theory of mind, and social acceptance. The results of this study indicate that dialogic classroom talk is beneficial for children's oral communicative competence. Further research is required in order to investigate how dialogic classroom talk might affect receptive vocabulary knowledge and social competence as well.

1. Introduction

In most early childhood classrooms, a considerable amount of time is spent on classroom talk. Previous research has provided some support for a positive effect of classroom talk on children's (content) learning and development (see for example, Mercer & Dawes, 2014; Muhonen, Pakarinen, Poikkeus, Lerkkanen, & Rasku-Puttonen, 2018; Sedova et al., 2019). However, quantitative studies into the effect of classroom talk on young children's language skills remain scarce (Van der Veen, de Mey, van Kruistum, & van Oers, 2017). In addition, as studies into the effect of classroom talk tend to focus on outcomes concerning subject knowledge or reasoning skills, much is unknown about the potentials of classroom talk for other aspects of children's development. It is therefore important to further examine how classroom talk can support children's learning and development. The present study specifically investigated the effect of dialogic classroom talk on children's language skills and social competence in early childhood education.

1.1. Dialogic classroom talk

Although engaging children in classroom talk and interaction is generally beneficial for children's development (for a review, see García-Carrión & Villardón-Gallego, 2016), not every type of classroom

talk is equally effective. In investigating classroom talk, one can place classroom talk on a continuum from monologic to dialogic (Al-Adeimi & O'Connor, 2021; Michaels & O'Connor, 2015; Van der Veen, Dobber, & van Oers, 2018). Monologic classroom talk is characterized by a large amount of teacher talk and a focus on the reproduction of factual knowledge (Van der Veen et al., 2018). It often entails a dominance of the initiation, response, and evaluation (IRE) sequence, in which the teacher asks a closed question, a child provides a short response, and the teacher evaluates the response (often in terms of right or wrong; Al-Adeimi & O'Connor, 2021; Mehan & Cazden, 2015). In contrast, in dialogic classroom talk children actively participate and are positioned as thinkers. In these types of conversations, children are encouraged to share their ideas, reflect on their own and others' contributions, and make an effort to understand one another (Mehan & Cazden, 2015; Van der Veen et al., 2017, 2018).

1.2. Language skills

Several studies have indicated that, compared to monologic classroom talk, dialogic classroom talk is especially effective for promoting children's language skills (Alexander, 2018; Van der Veen, de Mey, et al., 2017). For example, it has been shown that engaging children (aged 4–7) in dialogic classroom talk supports their oral communicative

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competence (Van der Veen, de Mey, et al., 2017). Oral communicative competence is the ability to use language effectively and appropriately in social situations (Hymes, 1972; also see Savignon, 2017). The finding that dialogic classroom talk promotes this ability can be explained by the fact that this type of classroom talk provides children opportunities to actively use language which is, in turn, known to be beneficial for their language development (Hindman, Wasik, & Bradley, 2019; Van der Veen, Michaels, Dobber, van Kruistum, & van Oers, 2021). However, research into the effect of dialogic classroom talk on oral communicative competence in the context of early childhood education remains scarce (Sedova et al., 2019; Van der Veen, de Mey, et al., 2017). Therefore, in this study we aimed to increase the evidence-base on the effectiveness of dialogic classroom talk for supporting young children's language skills.

Besides oral communicative competence, previous research has also examined the effect of dialogic talk on receptive vocabulary knowledge (i.e. understanding words that are heard or read; Vatalaro, McDonald Culp, Hahs-Vaughn, & Barnes, 2018). A review of Wasik, Hindman, and Snell (2016), for example, has shown that extra textual talk during shared book reading is positively related to vocabulary gains. This finding can be explained by the fact that engaging children in discussions provides them explicit opportunities to use words (Wasik et al., 2016). In fact, it has been shown that children should not simply hear words, but also need to use them to communicate ideas and receive feedback (Tamis-LeMonda, Kuchirko, & Song, 2014). However, prior research into the effect of dialogic talk on receptive vocabulary knowledge has primarily focussed on the context of shared book reading (Cabell et al., 2019; Hindman et al., 2019; Walsh & Hodge, 2018). As a result, it remains largely unknown whether this effect also exists outside this specific context. In the present study we examined if dialogic talk contributes to young children's receptive vocabulary knowledge within the context of whole-group classroom conversations.

1.3. Social competence

In addition to the effect of dialogic classroom talk on language skills (i.e. oral communicative competence and receptive vocabulary knowledge), the present study also investigated the effect of this type of classroom talk on children's social competence. Social competence refers to the ability to effectively engage in social interactions with others (Junge, Valkenburg, Deković; Rose-Krasnor, 1997; Veiga et al., 2017). Developing social competence is important for children's future functioning (Jones, Greenberg, & Crowley, 2015; Veiga et al., 2017). Specifically, in the study of Jones et al., significant associations have been found between social-emotional skills in kindergarten and young adult outcomes across multiple domains of employment, criminal activity, substance use, and mental health. Moreover, studies within the school context have indicated that social competence is related to students' motivation and academic achievement (Magelinskaitė, Kepalaitė, & Rabiner, Godwin, & Dodge, 2016). Because of the significance of social competence, it is important to support its development, preferably from an early age on.

Social competence can be studied empirically at two levels: the skills level and the index level (Rose-Krasnor, 1997; also see Junge, Valkenburg, Deković, & Branje, 2020). The skills level consists of the underlying skills of social competence, such as perspective taking (Veríssimo, Santos, Fernandes, Shin, & Vaughn, 2014; Yager & Iarocci, 2013). The index level refers to real-life summary indices of social competence (Rose-Krasnor, 1997). In the present study, both levels were taken into account by focussing on theory of mind (skills level) and social acceptance (index level). Theory of mind is a key aspect of social competence and refers to the understanding that others can hold different beliefs or opinions from themselves (Wellman, 1992; Wellman, Fang, & Peterson, 2011). Social acceptance indicates the extent to which a child is accepted by peers and is a close proxy for social competence (Rabiner et al., 2016; Rose-Krasnor, 1997).

Dialogic classroom talk might be an effective means to promote

social competence (i.e. theory of mind and social acceptance in the context of the current study). Specifically, it has been suggested that the exchange of views that takes place in dialogue with others contributes to children's understanding that one has a subjective view of the world and that this view may not be shared by others (i.e. their theory of mind; Mori & Cigala, 2016). Moreover, in dialogic classroom talk children are collaboratively sharing ideas and knowledge instead of competing with each other (Van der Veen, de Mey, et al., 2017). As such, dialogic classroom talk might contribute to a classroom climate that supports equity and access to academic learning (Van der Veen, de Mey, et al., 2017). Because it has been demonstrated that supportive classroom climates protect children against peer rejection (Barth, Dunlap, Dane, Lochman, & Wells, 2004; Kiuru et al., 2012), it might be expected that engaging children in dialogic classroom talk - and thereby indirectly working on a supportive classroom climate - improves the extent to which children are accepted by peers.

There is some empirical evidence for the conjecture that dialogic classroom talk promotes children's social competence. That is, previous research has shown a positive association between engaging children in dialogic practices and children's social competence (Barbarin & Jean-Baptiste, 2013). This research was focused, however, on parent-child talk instead of classroom conversations. Yet in the context of early childhood education, research has shown that children's oral communicative competence is positively related to their theory of mind and the extent to which they are accepted by peers (e.g. (Brock, Kim, Kelly, Mashburn, & Grissmer, 2019; Van der Wilt, Van der Veen, Van Kruistum, & Van Oers, 2018a; 2018b). Because previous research has indicated that dialogic classroom talk promotes oral communicative competence (Van der Veen, de Mey, et al., 2017) and oral communicative competence has been found to be related to social competence (i.e. to theory of mind and social acceptance; e.g. Brock et al., 2019; Van der Wilt et al., 2018a; 2018b), dialogic classroom talk might also affect children's social competence. However, there is a lack of empirical evidence for such an effect. It remains therefore unknown whether dialogic classroom talk might not only affect children's language skills, but their social competence as well.

1.4. The current study

The current study had two main purposes. The first purpose was to examine the effect of dialogic classroom talk on children's language skills by investigating their oral communicative competence and receptive vocabulary knowledge. The second purpose was to examine the effect of dialogic classroom talk on children's social competence by investigating the effect of this type of classroom talk on two aspects of social competence: theory of mind (skills level) and social acceptance (index level). As previous research has demonstrated that differences in language skills and/or social competence are depending on age (e.g. Van der Wilt et al., 2018a; 2018b), gender (Camodeca, Caravita, & Coppola, 2015), and home language (Calvo & Bialystok, 2014), the possible effects of these variables were taken into account as well.

2. Method

2.1. Participants

Seventeen early childhood teachers (of eight schools) and their $N = 311$ pupils participated in the current study. With this sample, the power is at least 0.80 to ascertain small effects in a multilevel model in which pupils are nested in classes. Specifically, an a priori power analysis for multilevel modelling (see Hox, Moerbeek, & van de Schoot, 2018) revealed that an effective sample size of 290 pupils was needed to ascertain a small effect with a power of 0.82, based on an average class size of 20 and an intraclass correlation of 0.10.

Teachers were randomly assigned to the intervention ($n = 8$) or control group ($n = 9$). The average age of teachers was 45.25 years (SD

= 11.08); sixteen teachers were female and one was male. On average, teachers had 18.50 years of teaching experience ($SD = 12.12$). During the course of the study, teachers worked in early childhood classrooms at Dutch primary schools in the Netherlands. The number of children in each class ranged from 12 to 29 ($M = 18.29, SD = 4.47$). Participating children were aged between 3.9 and 7.0 years ($M = 5.09, SD = 0.66$) and there were somewhat more girls ($n = 173$) than boys. Most children were born in the Netherlands (91.3%). Other countries of birth were in Europe (1.3%), Asia (1.0%), Africa (0.6%), South America (0.6%), and North America (0.3%). For 83.9 percent of the children, Dutch was the main language spoken at home. Other home languages were English (1.3%), Arabic (1.0%), Aramaic (1.0%), Kurdish (0.67%), and other non-Western (5.5%) and Western (1.6%) languages. Parents' educational levels were low (7.4%), average (45.7%), or high (40.5%).

2.2. Procedure

Participating teachers were asked to orchestrate eight whole-group classroom conversations on the theme 'This is my house' (see Table 1). This theme was selected because children have some knowledge about it, it does not require much preparation for teachers, and it is not already part of the common programs used in Dutch early childhood classrooms. A description of each conversation was provided through a teacher manual and had the following structure: (1) introduction to the main topic (e.g. references to literature and video clips), (2) suggestions for introducing the topic (e.g. the conversation on the kitchen started with showing a coffee machine), (3) suggestions for stimulating children to talk about their own experiences (e.g. 'Who has ever made coffee? How did you do it?'), (4) suggestions for stimulating children to discuss differences between their experiences (e.g. 'How come you did it differently?') and (5) suggestions for ending the conversation (e.g. 'What have we learned?'). All classroom conversations were videotaped by the teachers. In this article, we will not focus on these videos, but rather report on child outcomes.

As previously mentioned, teachers either participated in the intervention or control group. Teachers in the control group did not participate in any professional development activities and only used the teacher manual in preparing and orchestrating the eight classroom conversations. Teachers in the intervention group received the same manual, but also participated in a professional development program (PDP) on dialogic classroom talk (for details, see Van der Veen, van der Wilt, et al., 2017). This PDP has been designed and evaluated in close collaboration with four early childhood teachers (Van der Veen et al., 2021). Our PDP consisted of a two to 3 h workshop in which the theory of dialogic classroom talk was discussed, video clips of classroom talk were analysed, and teachers received a manual with several dialogic talk tools (see Appendix). These talk tools (also referred to as talk moves; cf. Michaels & O'Connor, 2015) are based on the extensive research of O'Connor and Michaels (2019), show many similarities with the talk moves used in other studies (e.g. Howe, Hennessy, Mercer, Vrikki, & Wheatley, 2019), and have been empirically tested in previous studies (Van der Veen, de Mey, et al., 2017; in press). Besides the workshop, teachers in the intervention group received four coaching sessions to support them in using the dialogic talk tools. During these coaching sessions, a teacher educator specialised in supporting early childhood teachers observed and videotaped the teacher's classroom conversations. Afterwards, the teacher educator and the teacher reflected on this conversation by watching and discussing episodes from the video recording.

To evaluate intervention fidelity, all videotapes of the final classroom conversations were viewed, transcribed and coded. We counted how often teachers used one of the dialogic talk tools (see Appendix for an overview of the talk tools). After controlling for differences in the length of conversations, the frequency of the use of dialogic talk tools was compared between the intervention and control group. An independent-samples *t*-test indicated that teachers in the intervention

Table 1
Overview of the study design.

Condition	pre-tests		week								post-tests		
	day 1	day 2	workshop	conversation 1	conversation 2	conversation 3	conversation 4	conversation 5	conversation 6	conversation 7	conversation 8	day 1	day 2
Intervention condition	oral communicative competence	social acceptance	model2talk	classroom conversation 1 'My house'	classroom conversation 2 'My dream house'	classroom conversation 3 'Building a house'	classroom conversation 4 'My bedroom'	classroom conversation 5 'My living room'	classroom conversation 6 'The garden'	classroom conversation 7 'My bathroom'	classroom conversation 8 'My kitchen'	oral communicative competence	social acceptance
Control condition	day 1 oral communicative competence	day 2 receptive vocabulary knowledge theory of mind		classroom conversation 1 'My house'	classroom conversation 2 'My dream house'	classroom conversation 3 'Building a house'	classroom conversation 4 'My bedroom'	classroom conversation 5 'My living room'	classroom conversation 6 'The garden'	classroom conversation 7 'My bathroom'	classroom conversation 8 'My kitchen'	day 1 oral communicative competence	day 2 receptive vocabulary knowledge theory of mind

group used significantly more dialogic talk tools ($M = 17.80$, $SD = 7.98$) compared to teachers in the control group ($M = 7.38$, $SD = 2.00$), $t(4.32) = -2.87$, $p = .042$. The mean number of times teachers used each talk tool are reported in Table 2.

2.3. Measures

Before and after the eight-week period of weekly classroom conversations, several tests were individually administered by trained test assistants. Test administrations took place in a quiet room at children's own school and were divided over two days (see Table 1).

2.3.1. Oral communicative competence

To measure children's oral communicative competence, the subscale Communicative Functions of the Nijmegen Test for Pragmatics was used (Embrechts, Mugge, & Van Bon, 2005). This scale measures the extent to which a child is able to use language for different purposes (e.g. to provide information) and consists of 22 items. In the present study, the reliability of Communicative Functions was high (Cronbach's alpha coefficient of 0.86). During the administration, the test assistant told a story about two children, called Peter and Lotje, who live in a house with multiple rooms in which they encounter various social situations (e.g. in the kitchen, where Dad asks Peter what he wants to drink). The story was supported by large colour pictures which displayed the situations. During storytelling, a response of the child was elicited through each item. For example, one item goes as follows: 'Lotje has a party hat whereas Peter has a pirate's hat. Lotje rather wants to have the pirate's hat, but Peter does not want to give his hat to Lotje. What should Peter and Lotje do?' In this case, the child was required to use language in order to provide a suggestion. Test administrations took approximately 10 min and were audio recorded and scored afterwards. Children's responses were dichotomously scored: 1 for a correct answer (e.g. in case of the previous example: 'Maybe they could alternate') and 0 for an incorrect answer (e.g. 'Peter has a pirate's hat'). In order to assess children's level of oral communicative competence, the number of correct items was computed.

2.3.2. Receptive vocabulary knowledge

Children's receptive vocabulary knowledge was assessed using the Dutch version of the Peabody Picture Vocabulary Test, third edition (Schlichting, 2005). This is a standardized test designed to measure receptive vocabulary (Dunn & Dunn, 1997). The complete test contains 17 sets of 12 items. In this study, based on children's age three sets (i.e. 5, 6, and 7) consisting of 36 items (increasing in difficulty) were selected (for the rationale behind this approach, see Mulder, Hoofs, Verhagen, Van der Veen, & Leseman, 2014). The reliability of these sets was high (Cronbach's alpha of .82). During the test administration, the child was shown four large black-and-white line drawings. With each item, the test assistant read a word aloud and asked the child to indicate which of the four pictures represented the word in question best. For example, one item goes as follows: 'Could you point to the picture of a person who is laughing?' In this case, the child could choose between pictures of a person who is crying, who is drinking tea, who is looking shocked, and

who is laughing. The child responded by pointing to one of the pictures and the test assistant recorded each response directly on the administration form. Test administrations took approximately 5 min. A total score was computed by subtracting the number of errors from the total number of items.

2.3.3. Theory of mind

To assess children's theory of mind, two tasks were administered: the Sally-Ann-task and the Diverse-Desires-task (Broekhof et al., 2015). The Sally-Ann-task is designed to assess children's false-beliefs (Baron-Cohen, Leslie, & Frith, 1999; also see; Broekhof et al., 2015). During its administration, the child was told a story about two girls, called Sally and Ann. The story goes as follows: Sally puts her ball in the basket and when she leaves, Ann takes the ball out of the basket and puts the ball in the box. When Sally comes back, she wants to play with her ball. Then the test assistant asked the child: Where will Sally look for her ball? To check whether the child understood the story and remembered it correctly, two additional questions were asked: Where is the ball now? And where did Sally put here ball before she left? The child's responses to the three questions were scored with 1 (correct answer) or 0 (incorrect answer).

The Diverse-Desires-task aims to measure if children understand that people can have different desires regarding the same matter (Broekhof et al., 2015). During the administration of the task, children were shown large colour pictures of a boy called Bart. On the first picture, Bart was sitting at a table with a candy bar on one side and a sandwich on the other side. Children were first asked which type of food they preferred. Next, children were told that Bart preferred the same type of food. Children were then asked which type of food Bart would pick if he could choose one. On the second picture, Bart was sitting at a table with a piece of cake on the one side and a carrot on the other side. Again, children were first asked which type of food they preferred, but this time they were told that Bart preferred the other type of food. Children were then asked which type of food Bart would pick: the piece of cake or the carrot. Each time, two questions were asked to check if children understood the story and remembered it correctly: Does Bart like the first type of food (i.e. candy bar/piece of cake)? And does Bart like the second type of food (i.e. sandwich/carrot)? A correct response was scored with 1 and an incorrect response was scored with 0. A total score on theory of mind was calculated by summing the total number of correct answers on the Sally-Ann-task and the Diverse-Desires-task.

2.3.4. Social acceptance

Peer nominations were used to measure the extent to which children were accepted by their peers (Coie, Dodge, & Copotelli, 1982; also see; Rubin, Bukowski, & Bowker, 2015). The use of peer nominations is common in research into social competence and requires participants to name peers they like and dislike (e.g. Little, Swangler, & Akin-Little, 2015; Rabiner et al., 2016; Rose-Krasnor, 1997; Shaffer, Burt, Obradović, Herbers, & Masten, 2009). A major strength of using peer nominations is that they reflect peers' judgements of a child, which is known to be related to a child's social competence as observed by trained researchers (e.g. Camodeca et al., 2015; Rose-Krasnor, 1997).

Table 2
Number of Times Teachers used the Dialogic Talk Tools during the Final Classroom Conversation.

	Mean (SD)		Differences between conditions (t)
	Intervention group	Control group	
1. Share, expand, clarify	8.63 (3.91)	5.11 (2.24)	-9.38***
2. Listen to one another	3.36 (2.24)	0.00 (0.00)	-19.55***
3. Reasoning	2.70 (2.09)	0.72 (1.12)	-10.12***
4. Think with others	0.97 (0.74)	0.61 (0.72)	-3.88***
5. Metacommunication	3.34 (2.40)	1.14 (1.04)	-10.36***
Total	19.00 (7.31)	7.31 (1.80)	-22.25***

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

Previous researchers have therefore noted that social competence is best assessed by incorporating the extent to which a child is accepted by peers (Rose-Krasnor, 1997; Shaffer et al., 2009). In the current study, the child was first shown a picture of all classmates. Next, two questions were asked: With whom do you like to play (positive nomination)? And with whom do you not like to play (negative nomination)? In answering these questions, the child could name a minimum of one and a maximum of ten classmates. Test administrations took approximately 3 min. Most children received two to five positive nominations (57.5%) and zero to three negative nominations (63.4%). In order to assess children's level of social acceptance, the number of times they were positively and negatively nominated by their peers was counted separately. This resulted in positive and negative nomination scores. In order to control for differences in class sizes, the positive and negative nomination scores were standardized within class (i.e. converted to z-scores). Finally, children's level of social acceptance was calculated by subtracting the standardized negative nomination scores from the standardized positive nomination scores.

2.4. Data-analysis

2.4.1. Missing data

Data were analysed using the Statistical Package for Social Scientists (SPSS, version 26). There were multiple missing data points on pre- and post-tests of the main variables. Percentages of missing data ranged from 2.3% to 7.8% on the pre-tests and from 1.0% to 16.75% on the post-tests. Missing values on the post-tests were partly caused by lacking data on communicative competence for two classes, due to technical problems with audio recording. These classes were not included in the analysis on oral communicative competence. Remaining missing values were imputed using the commonly used Expectation-Maximization (EM) method in SPSS after finding no statistically reliable deviation from randomness (Little's MCAR test $\chi^2(16) = 14.34, p = .573$ on pre-tests and $\chi^2(14) = 20.86, p = .105$ on post-tests). The imputed dataset was used in subsequent analyses.

2.4.2. Data-analysis plan

The data of the present study were hierarchically structured: Scores on the main variables were nested within children (level 1, $N = 311$), who were nested within classes (level 2, $N = 17$). Therefore, multilevel modelling was applied. For this purpose, linear mixed model analyses with maximum likelihood (ML) estimations were carried out following the procedures of Snijders and Bosker (2004). For each main variable, seven multilevel models were applied in which parameters were added systematically. Model 1 was the basic null (or intercept only) model which only accounted for random error (S^2_e) and random effects of classes (S^2_c). Scores on the main variables were allowed to vary between children and between classes. Next, three control variables were added as fixed effects: age (Model 2), gender (Model 3), and home language (Model 4). In Model 5, children's pre-test scores on the main variables were added as a fixed effect. Finally, in Model 6, condition (i.e. intervention versus control group) was added to investigate the effect of the intervention. Models were compared using the log likelihood ratio tests for model improvement (alpha of 0.05). Effect sizes were calculated by Cohen's f^2 (cf. Lorah, 2018), which accounts for variance that is explained at level 1 (children) and level 2 (classes), and is therefore an adequate estimate for the effect size in a multilevel model. In addition, we estimated for each dependent variable the proportion of variance explained by all the predictors in the final model (see Hox et al., 2018; Lorah, 2018).

3. Results

3.1. Preliminary analyses

The descriptive statistics of the pre- and post-test of the main

variables are provided in Table 3. Children's pre-test scores on receptive vocabulary knowledge significantly differed between conditions: Children in the control group scored higher compared to children in the intervention group. There were no significant differences in children's pre-test scores on oral communicative competence, theory of mind, and social acceptance between the intervention and control group (see Table 3). Table 4 shows the intercorrelations for the four main variables in both the intervention and control group.

3.2. Multilevel analyses

Table 5 shows the results of the fit and comparison of the planned models for oral communicative competence, as well as the parameter estimates for each model. Model 6 with condition as fixed factor fitted the data best. This indicates that, after controlling for age (Model 2), gender (Model 3), home language (Model 4), and pre-test scores (Model 5), there was a significant effect of the intervention on children's oral communicative competence (Model 6). Post-test scores on oral communicative competence of children in the intervention group were higher compared to those of children in the control group (see Fig. 1). Specifically, the oral communicative competence of children in the intervention group improved with 1.14 points compared to children in the control group ($SE = 0.35, t = 3.25, p < .01$), while generalizing over children and classes. This is a small to medium effect (Cohen's $f^2 = 0.04$). We also tested an additional model, in which we allowed the effect of the intervention to vary between classes. Adding this random slopes effect did not improve the fit of the model (Model 7 versus Model 6, $\chi^2(1) = 0, p = 1$), indicating that the effect of the intervention on oral communicative competence was not dependent on class. Together, the predictors in the final model explained 53% of the total variance in scores, in which half of the variance at the level of children was explained ($R^2_1 = 0.50$) and almost all the variance at the class level ($R^2_2 = 0.97$).

For receptive vocabulary knowledge (Table 6), theory of mind (Table 7), and social acceptance (Table 8), the model that includes the pre-test scores (Model 5) fitted the data best. This indicates that, after controlling for age (Model 2), gender (Model 3), and home language (Model 4), there was a significant effect of the pre-test scores on the post-test scores of receptive vocabulary knowledge, theory of mind, and social acceptance. Adding the effect of the intervention (Model 6) did not improve the fit of the models, indicating that there was no significant effect of the intervention on receptive vocabulary knowledge, theory of mind, and social acceptance. For receptive vocabulary knowledge, the predictors in the final model explained 67% of the total variance in scores, with more than half of the variance explained at the level of children ($R^2_1 = 0.61$) and almost all of the variance explained at the class level ($R^2_2 = 0.99$). For theory of mind and social acceptance, the scores varied only at the level of the children. The predictors in the final model explained 16% of the variance in scores for theory of mind scores, and 35% of the variance in social acceptance scores.

4. Discussion

The purpose of the current study was to investigate the effect of an intervention directed at dialogic classroom talk on young children's language skills and social competence. Outcomes of multi-level analyses revealed that our intervention had a positive effect on children's oral communicative competence, but not on their receptive vocabulary knowledge, theory of mind, and social acceptance.

4.1. Language skills

The outcome that dialogic classroom talk positively influenced children's oral communicative competence replicates the findings of a previous study by Van der Veen, van der Wilt, van Kruistum, van Oers, and Michaels (2017). In the current study, the same professional

Table 3
Descriptive statistics and differences between conditions for the main variables.

	Mean (SD)			Differences between conditions (t)
	Total	Intervention group	Control group	
Oral communicative Competence				
Pre-test	13.71 (4.73)	13.54 (4.52)	13.83 (4.88)	-0.49
Post-test	15.76 (3.92)	16.32 (3.70)	15.38 (4.02)	
Receptive vocabulary knowledge				
Pre-test	22.09 (5.88)	21.08 (5.99)	22.51 (5.87)	-2.12*
Post-test	24.28 (5.94)	23.29 (5.69)	24.40 (6.25)	
Theory of mind				
Pre-test	7.26 (1.25)	7.13 (1.34)	7.34 (1.20)	-1.49
Post-test	7.58 (1.28)	7.63 (1.15)	7.60 (1.33)	
Social acceptance				
Pre-test	.08 (1.50)	.12 (1.53)	.05 (1.54)	0.36
Post-test	.14 (1.50)	.13 (1.58)	.14 (1.41)	

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

Table 4
Intercorrelations for main variables disaggregated by condition.

Variable	Oral communicative competence	Receptive vocabulary knowledge	Theory of mind	Social acceptance
Oral communicative competence	-	.67***	.13	.27**
Receptive vocabulary knowledge	.69***	-	.19*	.21*
Theory of mind	.33***	.39***	-	.07
Social acceptance	.21**	.24**	.17*	-

Note. The results for the intervention group ($n = 143$) are shown above the diagonal. The results for the control group ($n = 168$) are shown below the diagonal.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

development program (including the same set of talk tools) and instrument to measure oral communicative competence was used as in the study of Van der Veen et al. Furthermore, sample characteristics, such as mean age of participating teachers (45.25 vs. 43.7 years), their years of teaching experience (18.50 vs. 15.6 years), mean age of participating children (5.09 vs. 5.0 years), and children’s home language (83.9% vs. 80.8% spoke Dutch as a first language), of the current study and the study of Van der Veen et al. show many similarities. The most important differences between the studies concern the theme of the classroom conversations (i.e. ‘This is my house’ in the current study vs. ‘What is that animal?’ in Van der Veen et al.) and the duration of the intervention

Table 5
Parameter estimates and goodness of fit for planned multilevel models of oral communicative competence.

Effect	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Fixed effects						
Intercept	15.68*** (0.34)	2.31 (1.73)	3.04 (1.86)	4.68* (1.87)	4.60** (1.51)	4.40** (1.43)
Control variables						
Age		0.22*** (0.03)	0.22*** (0.03)	0.20*** (0.03)	0.07** (0.03)	0.07** (0.02)
Gender (1 = girl)			-0.45 (0.43)	-0.61 (0.43)	-0.23 (0.34)	-0.21 (0.34)
Dutch as home language				-0.04* (0.02)	0.01 (0.02)	0.01 (0.02)
Pre-test scores					0.51*** (0.04)	0.51*** (0.04)
Intervention						1.12** (0.35)
Random effects						
Variance components						
Level 1 (children)	14.30 (1.24)	11.85 (1.06)	11.79 (1.05)	11.54 (1.05)	7.13 (0.65)	7.12 (0.65)
Level 2 (classes)	0.97 (0.64)	0.39 (0.40)	0.39 (0.39)	0.30 (0.37)	0.34 (0.29)	0.03 (0.17)
Goodness of fit						
-2Loglikelihood	1546.16	1424.65	1423.51	1368.70	1247.72	1239.86
ΔX^2		115.34***	1.14	54.11***	123.64***	8.48**
Δdf		1	1	1	1	1

Note. Standard errors are in parentheses. All p values in this table are two-tailed.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

(8 weekly whole-group classroom conversations in the current study vs. 6 weekly whole-group classroom conversations in Van der Veen et al.). The fact that dialogic classroom talk proved to be effective in promoting children’s oral communicative competence in both studies indicates that it is likely that this finding can be generalized to the larger population and it strengthens the evidence for the effectiveness of dialogic classroom talk. Furthermore, replication of this finding contributes to building a cumulative knowledge base and supports teachers in implementing evidence-informed approaches in their classroom practice (Chhin, Taylor, & Wei, 2018; Tincani & Travers, 2019).

However, in contrast to oral communicative competence, our

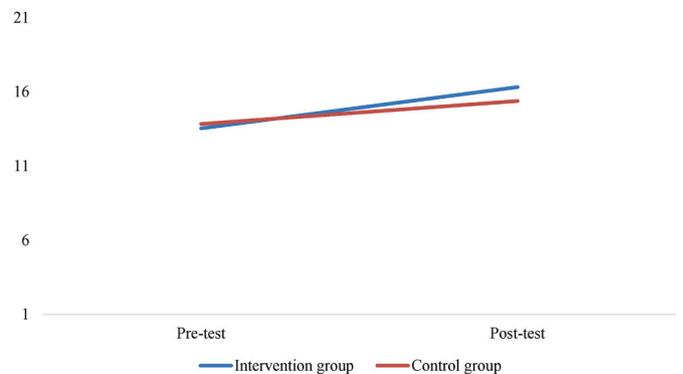


Fig. 1. Mean scores on oral communicative competence on pre- and post-test for the intervention and control group.

Table 6
Parameter estimates and goodness of fit for planned multilevel models of receptive vocabulary knowledge.

Effect	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Fixed effects						
Intercept	23.64*** (0.65)	-3.88 (2.23)	-4.72* (2.40)	-3.25 (2.43)	-0.55 (1.77)	-0.54 (1.81)
Control variables						
Age		0.46*** (0.04)	0.46*** (0.04)	0.45*** (0.04)	0.17*** (0.03)	0.17*** (0.03)
Gender (1 = girl)			0.51 (0.46)	0.34 (0.55)	0.10 (0.41)	0.10 (0.41)
Dutch as home language				-0.09*** (0.03)	-0.01 (0.02)	-0.01 (0.02)
Pre-test scores						
Intervention					0.46*** (0.04)	0.65*** (0.04)
Random effects						
Variance components						
Level 1 (children)	30.80 (2.54)	21.48 (1.82)	21.42 (1.81)	20.78 (1.79)	11.99 (1.04)	11.99 (1.04)
Level 2 (classes)	5.46 (2.50)	0.65 (0.65)	0.65 (0.65)	0.66 (0.65)	0.06 (0.33)	0.06 (0.33)
Goodness of fit						
-2Loglikelihood	1972.85	1755.04	1754.16	1692.43	1528.75	1528.75
ΔX^2		217.81***	0.88	61.73***	163.68***	0
Δdf		1	1	1	1	1

Note. Standard errors are in parentheses. All *p* values in this table are two-tailed.
p* ≤ .05. *p* ≤ .01. ****p* ≤ .001.

Table 7
Parameter estimates and goodness of fit for planned multilevel models of theory of mind.

Effect	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Fixed effects						
Intercept	7.61*** (0.07)	6.35*** (0.55)	6.56*** (0.60)	6.73*** (0.62)	5.06*** (0.63)	5.04*** (0.64)
Control variables						
Age		0.02* (0.01)	0.02* (0.01)	0.02* (0.01)	0.01 (0.01)	0.00 (0.01)
Gender (1 = girl)			-0.12 (0.14)	-0.16 (0.15)	-0.15 (0.14)	-0.15 (0.14)
Dutch as home language				-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)
Pre-test scores						
Intervention					0.38*** (0.06)	0.38*** (0.06)
Random effects						
Variance components						
Level 1 (children)	1.55 (0.12)	1.52 (0.13)	1.52 (0.13)	1.52 (0.13)	1.31 (0.11)	1.31 (0.11)
Level 2 (classes)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Goodness of fit						
-2Loglikelihood	1018.65	964.59	963.85	933.82	892.17	892.15
ΔX^2		54.06***	0.74	30.03***	41.65***	0.02
Δdf		1	1	1	1	1

Note. Standard errors are in parentheses. All *p* values in this table are two-tailed.
p* ≤ .05. *p* ≤ .01. ****p* ≤ .001.

Table 8
Parameter estimates and goodness of fit for planned multilevel models of social acceptance.

Effect	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Fixed effects						
Intercept	0.13 (0.08)	-2.24*** (0.65)	-1.08 (0.69)	-0.88 (0.70)	-0.37 (0.60)	-0.34 (0.62)
Control variables						
Age		0.04 (0.01)	0.04*** (0.01)	0.04*** (0.01)	0.02* (0.01)	0.02* (0.01)
Gender (1 = girl)			-0.69*** (0.16)	-0.77*** (0.16)	-0.47** (0.15)	-0.47** (0.15)
Dutch as home language				-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)
Pre-test scores						
Intervention					0.48*** (0.05)	0.48*** (0.05)
Random effects						
Variance components						
Level 1 (children)	2.21 (0.18)	2.10 (0.17)	1.99 (0.16)	1.94 (0.16)	1.44 (0.12)	1.44 (0.12)
Level 2 (classes)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Goodness of fit						
-2Loglikelihood	1129.27	1059.92	1043.04	1005.05	918.44	918.38
ΔX^2		69.35***	16.88***	37.99***	86.61***	0.06
Δdf		1	1	1	1	1

Note. Standard errors are in parentheses. All *p* values in this table are two-tailed.
p* ≤ .05. *p* ≤ .01. ****p* ≤ .001.

intervention on dialogic classroom talk did not significantly affect children’s receptive vocabulary knowledge. This finding is not in line with previous studies (Cabell et al., 2019; Hindman et al., 2019; Walsh & Hodge, 2018). Differences in outcomes could be explained by the fact

that previous research focused on dialogic talk in the context of shared book reading. That is, shared book reading is centred around books, which usually contain words children have not yet encountered (Walsh & Hodge, 2018; Wasik et al., 2016). Moreover, conversations within the

context of shared book reading tend to focus on the meaning of unfamiliar words and are thereby explicitly directed at promoting children's vocabulary (Hindman et al., 2019; Walsh & Hodge, 2018; Wasik et al., 2016). In the present study, teachers did not frequently nor explicitly pay attention to the meaning of words during classroom conversations. This might explain why our intervention did not affect children's receptive vocabulary knowledge.

4.2. Social competence

Similar to receptive vocabulary knowledge, our intervention did not have a significant effect on children's social competence (i.e. theory of mind and social acceptance). This finding could be due to the fact that the classroom conversations were focused on the theme 'This is my house'. Previous research into theory of mind, for example, has shown that classroom conversations that were explicitly focused on topics related to theory of mind (e.g. others' point of view) positively affected children's theory of mind, whereas classroom conversations that were focused on random topics (e.g. physical events) did not (Bianco & Lecce, 2016; Lecce, Bianco, Devine, Hughes, & Banerjee, 2014). This could indicate that, in order to support children's social competence through dialogic classroom talk, the content of the classroom conversations needs to be focused on topics related to social competence. The fact that this was not the case in the current study might explain why our intervention did not promote children's social competence.

Another explanation for the finding that engaging children in dialogic classroom talk did not affect their social competence could be the relatively short duration of the study. That is, it is expected that engaging children in dialogic classroom talk contributes to a supportive classroom climate, which is known to protect children against peer rejection (Barth et al., 2004; Kiuru et al., 2012). However, building such a classroom climate can be difficult and requires time (e.g. Thomas, Bierman, Powers, & Conduct Problems Prevention Research Group, 2011). The eight classroom conversations in the present study simply might not have been enough to build a classroom climate that improves children's social acceptance. Besides, the finding of previous studies that (a) dialogic classroom talk supports oral communicative competence (Van der Veen, de Mey, et al., 2017) and (b) oral communicative competence is related to (aspects of) social competence (e.g. Van der Wilt et al., 2018a; 2018b) might indicate that dialogic classroom talk affects children's social competence indirectly, through oral communicative competence. As we only measured the effect of dialogic classroom talk right after the intervention, the possible delayed effect on social competence might not have been visible yet. This could explain why in the current study no effect was found of dialogic classroom talk on social competence.

4.3. Limitations

Although the present study provided interesting findings that advance our current understanding of the effectiveness of dialogic classroom talk for children's learning and development, there were also several limitations. A first limitation is that the present study's sample consisted of many children with highly educated parents. In fact, approximately 40% of children's parents were highly educated whereas only 30% of the Dutch population is highly educated (Central Bureau for Statistics, 2018). Future research into the effect of dialogic classroom talk should include children with a variety of backgrounds, in order to investigate whether dialogic classroom talk is equally effective for all children.

Second, the effect of dialogic classroom talk was only measured directly after the end of the intervention. As a result, it remains unknown whether dialogic classroom talk also has a long-term effect on children's oral communicative competence. In addition, due to the short duration of our study, it is unclear whether dialogic classroom talk has a delayed effect on social acceptance, through the improvement of the classroom

climate and/or children's oral communicative competence. Hence, future studies should include a follow-up test, or use a longitudinal design in which classrooms are followed for a longer period of time. These studies might support our understanding of the long-term effects of dialogic classroom talk on children's language skills and social competence.

Finally, although traditional false-belief tasks such as the Sally-Ann Task are frequently used in research into social competence, these types of tasks have also been criticized, because multiple skills (such as language skills) are required in order to successfully complete such tasks (Scott & Baillargeon, 2017). In addition, given the complexity of the construct of social competence, future research should use additional measures by including, for example, observations of children's behaviour in social situations.

4.4. Conclusion

To conclude, the aim of the present study was to assess whether dialogic classroom talk is a productive context that supports children's language skills and their social competence. Findings indicated that dialogic classroom talk did not significantly affect children's receptive vocabulary and social competence. If dialogic classroom talk is to be effective for receptive vocabulary knowledge and social competence, it might be necessary to study the implementation of dialogic classroom talk over a longer period of time or focus the classroom conversations more explicitly on vocabulary teaching and themes related to social competence. Interestingly, our study did find a positive and small to medium effect of dialogic classroom talk on children's oral communicative competence. Outcomes of the current study confirmed that supporting teachers in implementing dialogic classroom talk is an effective means to promote children's ability to communicate with others. Teachers who aim to promote their pupils' oral communicative competence are therefore advised to engage children in dialogic classroom talk.

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CRedit authorship contribution statement

Femke van der Wilt: Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing – original draft, Writing – review & editing, Visualization, Supervision. **Renske Bouwer:** Methodology, Formal analysis, Writing – review & editing, Visualization. **Chiel van der Veen:** Conceptualization, Resources, Writing – review & editing, Supervision, Project administration, Funding acquisition.

Declaration of competing interest

None.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.learninstruc.2021.101522>.

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