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Citation

BODERÉ, A., ZENNER, E., VANBUEL, M., CLYCQ, N., & VAN DEN BRANDEN, K. (2023). The effects of overhearing on vocabulary learning in ethnic majority and minority preschool children. *Journal of Child Language,* 1-25. doi:10.1017/S0305000922000769

Author Note

This article is dedicated to Koen Jaspaert, dear colleague and friend. You were involved in this study from the very beginning. You were always there for us to listen to us, to exchange ideas, to discuss our data in detail. You cannot be closer than while finishing this work.

In addition, we wish to thank all children for their enthusiastic participation in the experiments. All parents we wish to thank for their agreement in this study. We thank the directors and teachers for their hospitality and to literally make ‘space’ for our study. In addition, a lot of thanks go to Abderrahman El Aissati (University of Utrecht) for the enriching discussion of the results. We also wish to thank the PhD-colleagues and assistants at KU Leuven for their support. Last but not least, we thank Research Foundation Flanders for the financial support.

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Key words: word learning; overhearing; direct and indirect speech.

Introduction

Vocabulary knowledge is an important predictor of children's language and literacy skills (e.g., Biemiller, 2006; Wright & Cervetti, 2017), and their school achievement in general (e.g. Prevoo et al., 2014; Pulinx, Van Avermaet, & Agirdag, 2017). An increasing number of studies therefore focuses on interventions to enhance vocabulary learning, particularly in ethnic minority children (e.g., Allee-Herndon, Roberts, Clark & Stewart, 2022; Frijns & Van den Branden, 2021). Research has repeatedly shown that reciprocal social interaction effectively enhances vocabulary learning (Marulis & Neuman, 2010; O'Doherty et al., 2011). There is consensus that high-quality interaction that integrates both extensive, enriched input and opportunities for the students to produce extended output, is a key component of effective language and vocabulary instruction (Butler, 2022; Loewen & Sato, 2018; Marulis & Neuman, 2010; O'Doherty et al., 2011).

However, in regular classrooms in preprimary schools, teacher-pupil interaction is often of low quality (Justice et al., 2008). Recent studies revealed that this is especially true for interactions between teachers and ethnic minority pupils with a migrant background: teacher language input is mainly managerial, and dialogues between teachers and those pupils are typically controlled speech-production activities that hardly allow for productive language use by the learners involved (Van Praag, Verhoeven, Stevens, & Van Houtte, 2019; Peleman,

Vandenbroeck & Van Avermaet, 2020). This may partly explain the large differences in educational achievement and language development between ethnic majority and minority children in many countries (Schleicher, 2018; Van Praag, Nouwen, Van Caudenberg, Clycq, & Timmerman, 2018).

The lack of direct teacher-student interaction does not have to preclude lexical gains, however. An increasing number of studies show that children can acquire vocabulary through overhearing linguistic input (e.g., Akhtar, 2005; Boderé & Jaspaert, 2017; O'Doherty et al., 2011). Children learn many words in situations in which they are not directly addressed and in which the speaker does not have the intention to involve them in the conversation. Children also learn much language "in the flow of ongoing social interactions" (Akhtar, Jipson, & Callanan, 2001) by observing and overhearing others.

Initial studies examined vocabulary acquisition through overhearing in a family context. These studies revealed that two-year-old toddlers who get the opportunity to overhear their parents while they use personal pronouns, grasp this particular word type faster than children who are exclusively addressed directly (Oshima-Takane; 1988). Oshima-Takane, Goodz and Deverensky (1996) demonstrated that children who have older siblings learn personal pronouns faster than firstborn children, which suggests that the possibility to overhear conversations has a positive influence on vocabulary growth.

These findings have been complemented by a series of experimental studies in laboratory settings, showing that two-year-old children learn new words equally efficiently in direct interaction as when they get the opportunity to overhear two adults. Toddlers show comprehension of words when the new word is explicitly labeled ("this is a *toma*") (Akhtar et al., 2001), when the word is incorporated in a directive statement ("put the *toma* there") (Akthar, 2005), and when the children play with a distractor toy during the introduction of the new word (Akthar, 2005). In addition, some studies found that children also learn words in

overhearing situations when all linguistic utterances include a new element (Martinez - Sussmann, Akhtar, Diesendruck, & Markson, 2011) and when there is no familiarization phase before the interaction (Gampe, Liebal, & Tomasello, 2012). These studies demonstrate that toddlers are able to learn new words through overhearing in both explicit naming lessons and in more complex contexts. However, it is important to note that these studies were conducted in laboratory settings with one specific type of overhearing situation (this is, overhearing of two adults). As such, the effects of overhearing on vocabulary acquisition may well be overestimated. Additionally, it remains unclear to what extent they also apply to authentic classroom contexts.

In order to address this gap, Boderé and Jaspaert (2017) examined vocabulary learning through addressed speech and overhearing in classroom settings. They pointed out that classrooms, too, can be a potentially interesting environment to examine vocabulary learning through direct and indirect interaction situations. In Western-European preprimary classrooms, children typically perform several activities in smaller groups in different corners of the room. While the teacher is talking to a particular group of children or to another teacher, other children may overhear those conversations. Boderé and Jaspaert (2017) examined how six-year-old Flemish majority children in the final year of preprimary school learn novel words in three different interaction situations: when they are directly addressed by a teacher, when they have the opportunity to overhear a conversation among two teachers and when they have the opportunity to overhear a conversation between a teacher and a group of children (the typical 'classroom interactions'). They found that the children learn novel words equally well when they have the opportunity to overhear conversations among two teachers as in direct interaction with their teacher. However, children learn significantly fewer new words in the overhearing of classroom interactions than in the two other situations. Boderé and Jaspaert (2017, p. 20) argued that effects of classroom socialization might have

played a role in the smaller word learning effects of this overhearing situation. “By repeatedly participating in particular activities, children gradually know how to behave and what they should do in order to be judged as a competent member of the community. (…). Appropriate behavior in normal classroom routines would mean that children are engaged in their own task and not in the task the other children have been given”. It was hypothesized that children’s (tacit) knowledge of classroom routines and assumed appropriate behavior might have inhibited children to learn through overhearing in the classroom.

It is unclear, however, to what extent ethnic minority children gain as much from such overhearing conditions as ethnic majority children. To date, studies have mainly focused on the effects of overhearing on language learning in ethnic majority pupils with a North-American (see, for example, Akhtar, 2005; Akhtar et al., 2001; Floor & Akhtar, 2006) or a Western-European (Gampe et al., 2012; Boderé & Jaspaert, 2017) background. Nevertheless, there are reasons to assume that the effects of learning through overhearing may be different for children belonging to an ethnic minority group (see also Shneidman & Woodward, 2016). For instance, researchers have pointed towards familial and cultural mechanisms which are assumed to differ between Western ethnic majority and non-Western ethnic minority families. They argue that socialization goals are often different, and that there is a stronger focus on raising children towards conformity and obedience in families of e.g., Moroccan origin (De Haan, 2011; Pels & De Haan, 2007). From this, we could argue that (Moroccan) minority children may be less inclined to overhear in educational settings. Consequently, this population may encounter fewer opportunities to acquire vocabulary from it. Other researchers have emphasized the role of social and ethnic identification in second language learning, and the subjective experience of being part of a certain ethnic group (Trofimovich & Turuševa, 2015). Children rely on social cues to determine from whom they learn (Sobel & Finiasz, 2020). Typically, children learn more from people with whom they identify (Kinzler,

Dupoux & Spelke, 2007), or whom they perceive as 'knowledgeable', such as a teacher (Sobel & Finiasz, 2020). Corriveau & Harris (2009) showed, for instance, that preschool children aged three, four and five years old are more likely to request and endorse information from familiar teachers than unfamiliar ones. Corriveau, Kinzler, and Harris (2013) found that three-, four-, and five-year-olds are more inclined to accept novel names provided by speakers with familiar accents over foreign accents. In a similar vein, Chen, Corriveau, and Harris (2013) found that four- to seven-year old European American and Taiwanese children showed a clear preference to learning from informants with the same ethnic background as themselves. Additionally, language acquisition is enhanced when learners hold a favorable view of both their ethnic minority community and the ethnic majority community (Gatbonton & Trofimovich, 2008). In contrast, perceived negative attitudes about their ethnic minority group may hamper second language learning (e.g., Paladino et al., 2007). Since ethnic minority children are often confronted with negative stereotypes about their ethnic group in education (see below), language learning through overhearing in educational settings may be more complicated than for ethnic majority children.

This study examines the impact of addressed speech versus overhearing on the acquisition of novel vocabulary in 6-year-old Flemish majority (n = 53) and Moroccan minority children (n = 79) in Flemish preprimary schools. It focuses on ethnic minority children of Moroccan origin because studies in Flanders (the Dutch-speaking part of the Belgium and the setting for this study) have repeatedly reported a substantial achievement gap between Moroccan ethnic minority children and Flemish majority children: Moroccan minority children need to repeat a year more often than Flemish majority children, they are overrepresented in the vocational tracks of secondary education and very few of them participate in higher education (Baysu & Phalet, 2019; Timmerman, Fadil, Goddeeris, Clycq,

& Ettourki, 2018). It is important to note that the differences in educational performances are probably related to a wide range of factors. For example, studies have shown that individual and socio-demographic factors play a role, such as language proficiency in Dutch (e.g., Frijns & Van den Branden, 2021; Vanbuel, Boderé, Torfs & Jaspaert, 2018) and socioeconomic status (Prevoo et al., 2014). In addition, studies extensively showed that Moroccan minority children are more often victims of prejudice and discrimination in comparison to both native Belgians and those of other ethnic origins (e.g., Baysu & Phalet, 2019; Phalet, Fleischmann & Hillekens, 2018). The more vulnerable societal position of Moroccan minority children may influence their school performances in a negative way (Baysu & Phalet, 2019). The fact that Flemish majority and Moroccan minority children assume different societal positions constitutes an additional reason why it may be interesting to compare language learning in both groups.

Given the educational achievement gap between ethnic majority and ethnic minority children in Flemish schools and the fact that the Moroccan community is the largest non-western ethnic minority group in Belgium (Noppe et al., 2018), it is important to unravel which type of interaction impacts the acquisition of the language of instruction in Moroccan minority children in particular. Three experimental conditions were set up: (1) Addressed Speech, (2) Overhearing Classroom Interactions, and (3) Overhearing Two Adults. In all conditions, children were exposed to a fantasy story that contained 6 novel object words. The main research question guiding this study is:

What are the differences and similarities between Flemish majority and Moroccan minority children with respect to word learning effects in different classroom interaction situations, including addressed speech and overhearing situations?

By including two overhearing conditions, and controlling and accounting for a number of parameters (initial language proficiency in Dutch, socio-economic background, gender, age, older siblings) that are known to affect vocabulary growth (e.g. Oshima-Takane et al., 1996; Prevoo et al., 2014; Vanbuel et al., 2018), the study contributes to the growing research base on language learning through addressed speech and overhearing. In the following paragraphs, we present the design of our study in more detail, presenting the language materials, the experimental set-up, the analysis and results in more detail.

Method

Design

The research question is addressed through a 2x3 experimental between-subject design, enriched with variables targeting a description of the respondents' socio-demographic background and children's initial language proficiency in Dutch. The dependent variable concerns children's acquisition of a set of novel words introduced in storytelling sessions. The key independent variables are the ethnic group to which the child belongs (i.e., Flemish; Moroccan) and interaction condition. Relying on the same methodology and language materials as in Boderé and Jaspaert (2017), three interaction conditions are compared. In Addressed Speech, the story was told directly to the children. In both Overhearing conditions, the children were put to work at a distracting task, such as color a picture or solve a puzzle (see 'Materials' for more information). During the performance of those tasks, they were able to overhear the experimenter telling a story to a research assistant (Overhearing Two Adults) or to the children in the Addressed condition (Overhearing Classroom).

Participants

The 132 participants in our study were recruited between September 2011 and September 2014 in two stages. The population of interest were pupils in the final year of preprimary school in Antwerp, a province situated in Flanders (Belgium) with a high proportion of Moroccan immigrants (Antwerp city, 2020; Schoonvaere, 2014).

In a first stage, schools within the province of Antwerp were contacted randomly. We explained the study, asked if they were willing to participate, and asked for information about their infrastructure. With respect to the latter, it was important for our study that the school was able to provide the necessary space. The school had to be able to free up one separate spare room on the days of the training and two separate spare rooms on the day of the testing. This way, the experiments and tests could be conducted in the same way in the different schools.

In a second stage, we made use of a purposive sample in which the children had to meet a set of criteria to participate in the study. The selection criteria were related to children's ethnic group, their socio-economic status and their initial language proficiency in Dutch. As for children's ethnic group, only ethnic Flemish majority and ethnic Moroccan minority pupils were selected for participation. Children of mixed families (for example, a mother of Flemish and a father of Moroccan origin) were not included in the study. All children were born in Belgium. In addition, the sample consists exclusively of children whose mothers had no degree of higher education. Since this study focuses on the role of minority/majority status, we wanted to minimize the effect of socio-economic status. The choice for lower-SES children is related to the demographic reality in Flanders. Only a small proportion of parents of Moroccan origin have a degree of higher education (Timmerman & al., 2017; Van Praag et al., 2019), which is also reflected in the classrooms of our sample (i.e., none or only one child of Moroccan origin in each classroom had parents with a degree of higher education). Related to the third selection criterion, a Dutch language proficiency

test was used to verify whether the children in our sample would be able to understand the language input provided in the experiment. This also enabled us to include an important predictor of language learning into the analyses rather than a proxy such as home language. One week before the start of the experiments, the TAL-K, a standardized language proficiency test in Dutch for children in the final year of preschool (Cucchiarini & Jaspaert, 1996), was administered. TAL-K is a listening skills test in which children have to select objects in pictures based on information from short stories that a teacher reads aloud (e.g., one of these children is crying – please indicate which child is crying). We have chosen for the TAL-K as a pre-test measurement because it measures receptive language proficiency in Dutch, it is designed for the target age group in our study, and has been validated in both children of Flemish and Moroccan origin. Only children who provided a correct answer for more than 15 out of 30 items, were included in the study.

In total, 36 schools were contacted, of which fourteen schools were willing to participate and met the requirements with respect to infrastructure and population. In total, 216 children were selected for participation. Overall, the combination of the different selection criteria and the fact that there was a relatively high school absence in all children, made the data collection time-consuming. Of the 216 children, 132 met all the criteria set, were present in all four experimental sessions and during the testing procedure. Data from these 132 children were included in the final analyses.

To ensure sufficient statistical power, during the recruiting phase we aimed for a minimum of 50 participants of Flemish origin, minimally 50 participants of Moroccan origin, minimally 40 participants per experimental condition, and minimally 15 when cross-tabulating participants' ethnic origin and experimental condition. We achieved each of these baselines but one: We had only 39 respondents for the experimental condition 'Overhearing Classroom'. Table 1 below summarizes the distribution of ethnic majority and minority

children across experimental conditions. A Chi²-test reveals an equal distribution of ethnic group across the three conditions (χ^2 (2, N = 132) = 3.34, p > 0.05).

Table 1 Participants per experimental condition included in the 2x3-design

	Addressed Speech	**Overhearing Two Adults**	**Overhearing Classroom**
Flemish majority	18	16	19
Moroccan majority	23	36	20

Besides the information gathered to select participants, we also collected information on participants' number of elder siblings, the language they mostly spoke with different members of their social network (more specifically, their parents, siblings and friends) and their gender. Below, we provide the children's characteristics for the core descriptors included in the selection of respondents, which will also feature as covariates in our analyses (see 'Results'), with particular attention to the distribution of respondents across the three experimental conditions:

- *Gender*. More girls (N=77) than boys (N = 55) participated in the study. A Chi²-test reveals an equal distribution of gender across the three conditions (χ^2 (2, N = 132) = 2.47, p > 0.05) and between the majority (Flemish) and minority (Moroccan) group (χ^2 (1, N = 132) = 0.00, p > 0.05).

- *Age in months.* The mean age of the children is 67.05 months (*SD* = 3.4). Kruskall-Wallis reveals no significant difference in the children's age in months across conditions (*M* = 66.98 in Addressed, *M* = 66.21 in Overhearing Classroom, and *M* = 67.75 in Overhearing Two Adults; Kruskal-Wallis $H(2) = 1.39$, $p > 0.05$), nor across the two respondent groups (*M* = 67.09 for the majority (Flemish) group, *M* = 66.95 for the minority (Moroccan) group; Kruskal-Wallis $H(2) = 0.04$, $p > 0.05$).
- *Educational level of the mother*. In line with our selection criteria none of the children's mothers had finished higher education. Yet, we did include further information on the education level of the mothers, opposing those mothers who did not complete secondary education (*N* = 66) with mothers who did complete secondary education (*N* = 66). A Chi²-test reveals an equal distribution of the educational level of the mother across the three conditions (χ^2 (2, *N* = 132) = 4.52, $p > 0.05$). The educational degree did, however, differ in function of the mother's ethnic origin. Mothers of the majority group (Flemish origin) had a degree of higher secondary education significantly more often (*N* = 38 with degree, *N* = 15 without degree) than the mothers of the minority group (Moroccan origin) (*N* = 28 with degree, *N* = 51 without degree) (χ^2 (1, 132) = 12.26, $p < 0.001$; Cramer's *V* = 0.36). This skew reflects broader societal differences currently present between families of Moroccan and Flemish origin (Belfi et al., 2014; Timmerman & al., 2017; Van Praag et al., 2019).
- *Elder siblings*. Elder siblings is a dichotomous categorical variable contrasting children with elder siblings (*N* = 71) and children without elder siblings (*N* = 61). A Chi²-test reveals an equal distribution of respondents with and without elder siblings across the three conditions (χ^2 (2, *N* = 132) = 0.00, $p > 0.05$). The Moroccan ethnic minority children in our sample had significantly more frequently older siblings

(*N*=49 with older siblings, *N*=39 without older siblings) compared to the Flemish majority children (*N*=22 with older siblings, *N*=31 without older siblings; χ^2 (1, 132) = 4.58, $p < 0.03$; Cramer's $V = 0.20$), confirming previous research that finds that families of Moroccan origin are commonly larger compared to families of Flemish origin (Schoonvaere, 2014; Van Bavel & Nomes, 2016).

- *Initial language proficiency in Dutch*. Since Moroccan minority children in our sample spoke additional languages such as French and/or Berber with their parents (19% exclusively Dutch, 30% Dutch combined with another language, 51% exclusively another language), siblings (46% exclusively Dutch, 32% exclusively another language) or friends (11% Dutch and another language, 32% another language exclusively), we decided to include a measure of Dutch language proficiency as a covariate. Initial language proficiency in Dutch was measured by the TAL-K, a standardized language comprehension test in Dutch for children in the final year in preprimary school (Cucchiarini & Jaspaert, 1996). Initial language proficiency in Dutch was a continuous variable with a maximum score of 30 ($M = 25.87$, $SD = 3.4$). The children's mean scores of the initial language proficiency in Dutch in the three conditions did not differ significantly from each another ($M = 25.73$ in Addressed, $M = 26.49$ in Overhearing Classroom, and $M = 25.52$ in Overhearing Two Adults; Kruskal-Wallis $H(2) = 2.30$, $p > 0.05$). The mean score of the children in our final sample is 25.87 ($SD = 3.4$). Flemish majority and Moroccan minority children differed in their initial language proficiency in Dutch, with Flemish majority children scoring on average higher on the TAL-K ($M = 27.06$, SD = 2.82) than the Moroccan minority children ($M = 25.08$, $SD = 3.53$), $F(1, 130) = 11.67$, $p = .001$, partial $\eta^2 = .08$.

Overall, the majority and minority children differ on a number of additional descriptors, viz. the mother's education level, the presence of elder siblings, and initial language proficiency in Dutch. Therefore, we need to account for these variables in the analysis and interpretation of the results.

Materials

Storytelling materials. The same materials and design were used that were developed by Boderé and Jaspaert (2017) in order to measure the novel word learning of six-year-old children in different interaction situations. The children were exposed to a fantasy story that included six novel object words. The story was about princess Praline who discovered a *kameut*, a little man with a tomato head. The other novel object words were *kikoon* (a candy with which the characters could jump high into the air), *piefan* (a weapon with which the kameut could shoot fireballs), *tassat* (a speaking glitter ball that knows the answers to all possible questions), *viddon* (a bird) and *baloep* (a dirty cake made from feathers and frog's eyes). The objects to which the novel object words referred to (see appendix 1), were actively used and supported by the use of stage props during storytelling. All novel object labels had two syllables and consisted of five sounds. They were generated by Wordgen, a computer program that uses lexical databases to generate nonwords that have features of Dutch words (Duyck, Desmet, Verbeke & Brysbaert, 2004). Importantly, we also made sure that the words had no equivalent in French or Moroccan-Arabic and Berber. Since the words were used functionally in the story, they occurred with a natural frequency in the story, ranging from seventeen (*kikoon*) to one hundred twenty (*kameut*, who was one of the main characters in the story). In line with the storyline, there were notable differences in the amount of times each of the novel words were used. Potential effects on the acquisition of the individual novel words will be accounted for in the statistical models by including the novel word itself as a

random variable (see below). The following script excerpt exemplifies how the words were used in the story:

"This *kameut* has a *piefan* on his head, look, all iron spines! (*storyteller points to the object representing the piefan*). Do you know what a *piefan* is for? (*storyteller addresses the children*). The *piefan* is some sort of weapon. With this, the *kameut* can spit tiny fireballs (*makes a corresponding sound: pouf pouf pouf*)."

Distracting task. Children in the overhearing conditions received distracting tasks. The children were instructed to color a picture, solve a puzzle, make a pearl necklace or decorate a picture with wool after having colored it. These tasks represent real-life classroom activities and are based on a short survey during the pilot that asked pre-primary teachers on typical and popular classroom tasks for this age group.

Testing materials. In order to test children's comprehension of the novel object labels, the six objects that referred to the novel object labels were put in random order on a table along with four distracting objects (for example, a little flower girl). An illustration of the distracting objects is found in appendix 1.

Procedure

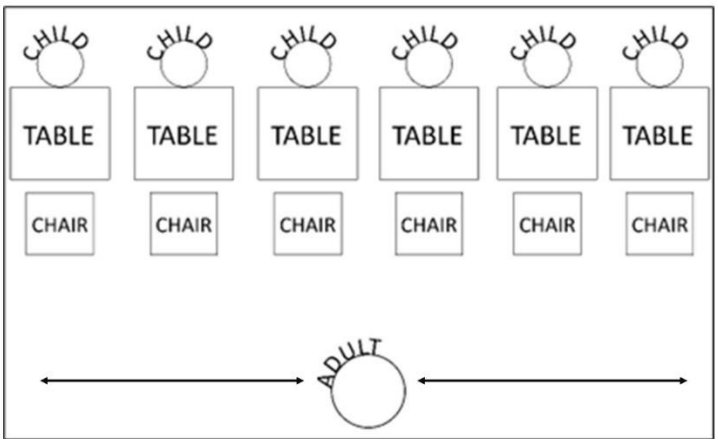
We used the same procedure as in Boderé and Jaspaert (2017). One week before the start of the experiment, all children had to complete the TAL-K, the language proficiency pretest in Dutch (Cucchiarini & Jaspaert, 1996). Children who scored above the set threshold of the TAL-K and met the other requirements were selected for the study. The children were randomly assigned across the three experimental conditions: Addressed Speech ($N = 41$), Overhearing Classroom ($N = 39$) and Overhearing Two Adults ($N = 52$). In every experiment there were in total 12 children present in the classroom. If we did not reach 12 respondents for an experimental group in a certain school because an insufficient number of children fit

the selection criteria, classmates were invited to join in the storytelling sessions. These children were not administered any tests following the storytelling session.

The conditions Addressed Speech and Overhearing Classroom took place at the same moment in the same room. This way, the design of the study corresponds to previous studies in overhearing, in which the experimental conditions Addressed Speech and Overhearing are conducted simultaneously (see, for example, Akhtar 2005; Floor & Akhtar, 2006). One might ask whether children in Overhearing Classroom end up in a similar experimental condition as Addressed Speech, as soon as they spontaneously start to listen to the story. Indeed, children might direct their attention to the conversation when put in an overhearing situation. However, they are still not directly addressed by the speaker, which is the distinctive factor between addressed speech and overhearing conditions in similar studies. In addition, this set-up allows for a natural overhearing setting in classrooms, making this study ecologically valid. On regular school days, children are often involved in 'corner play' in small groups, for example making a puzzle (Dierickx & Koelman, 2021).

Groups of six children each were randomly assigned to Addressed Speech (total N = 41) and Overhearing Classroom (total N = 39). The children in Addressed Speech were sitting in one row on chairs, were invited to listen to the story and were directly addressed during the storytelling sessions. The children in Overhearing Classroom were sitting in one row in desks just behind the children in Addressed Speech (Figure 1). They were occupied with a distracting task (more details follow below) and were able (but crucially not instructed) to overhear. In contrast with the children in the Addressed Speech condition, children in the Overhearing conditions were not involved as interlocutors in the storytelling sessions. During storytelling, the experimenter moved back and forth, so that all children had equal chances to watch the experimenter (see figure 1 below).

Figure 1 Experimental setup Addressed Speech and Overhearing Classroom



In the experimental condition Overhearing Two Adults all 12 children present in the room were sitting in one row in desks (total $N = 52$). The children were occupied with the same distracting tasks as in Overhearing Classroom. The experimenter and a research assistant helped the children for a while. Then, the experimenter started telling the story to the assistant. The assistant behaved as an active listener who asked questions or gave comments (see Appendix 2). In all experimental conditions, the storyteller manipulated the objects in the same way. Below, more details about the storytelling and testing procedure are given.

In order to make sure that the children were sufficiently exposed to the novel words in order to learn them, the story was divided into four storytelling sessions of twenty minutes each. The sessions were conducted on two consecutive days, always before and after the children's morning break. The same female experimenter conducted all experimental sessions. Before classes started, a separate classroom was reorganized as a laboratory room. The desks and chairs were always positioned in the same way. The experimenter put the stage-props on fixed locations in the room following a plan. Some stage-props (like all the objects representing the novel words) were hidden under a sheet so the children did not see them when they entered the room. Just after the first class started, the experimenter, a female

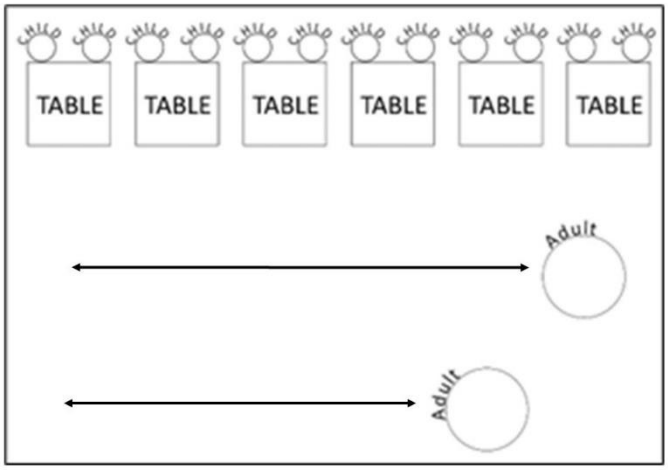
ethnic majority Flemish speaker with a teaching certificate and teaching experience, went to the regular classroom of the children. She introduced herself as a new teacher who was going to perform nice activities with the children. Then, she guided the children to the room in which the experimental sessions were going to take place.

Addressed and overhearing classroom condition: The children in the Addressed condition were given a seat in the first row. The children in the Overhearing Classroom were given a seat in the second row. The experimenter told them that the children in the first row were going to listen to a story, and the children in the second row were going to perform a task. She explained the task for the children in the Overhearing Classroom first. All tasks were identical for each group. In addition, these tasks were given in identical order. The children were asked to color a picture (session 1), solve a puzzle (session 2) and construct a pearl necklace (session 3). In the fourth session the children were asked to first color a picture, and then decorate it with wool. After the instruction was given, the children could start their task. The experimenter helped the children for a few minutes, and then addressed the children in the first row. She stated: "Now I would like to tell you a story. Do you feel like listening to the story?" After confirmation the experimenter started telling the story. During storytelling, she constantly made eye contact with the children in Addressed Speech in order to assure that joint attention was established during the whole session. However, she avoided making eye contact with the children in the Overhearing Classroom and did not involve them in the storytelling event. The children in the Addressed and Overhearing Classroom condition were treated differently when they were distracted from their task. When the children in Addressed Speech were distracted, for example, because they were curious about what their peers were doing behind them, the experimenter encouraged them to look in front of them and to continue listening to the story. When the children in Overhearing Classroom were distracted from their task, however, no attempts were made to bring them

back to focus on their task. Indeed, it was exactly the aim of this study to examine how children make use of and learn from overhearing opportunities spontaneously (see also Boderé & Jaspaert, 2017). When the children in Overhearing Classroom needed help, the experimenter paused the story and briefly assisted them, after which she immediately continued storytelling.

Overhearing two adults condition: The set-up of this experimental condition is presented in figure 2 below. In this condition, the experimenter, a researcher assistant and twelve children were present in the classroom. The twelve children were sitting in one row on desks and were assigned to the same distracting task as the children in Overhearing Classroom. Similar to Addressed Speech and Overhearing Classroom, the adults continuously walked from the left to the right side and back during storytelling, so all children had equal opportunities to watch and overhear the story.

Figure 2 Experimental setup Overhearing Two Adults



At the beginning of the experimental session, the experimenter and assistant both helped the children with their tasks for some minutes. Then, the experimenter addressed the assistant and said that she wanted to tell her a story that she heard the day before. During storytelling, the experimenter made eye contact with the assistant exclusively and avoided eye contact

with the children. The objects to which the novel object labels referred to were shown to the assistant, who behaved as an active listener, and within sight of the children (see Appendix 2). If the experimenters were interrupted by the children, they briefly helped the children. As soon as the children were able to work further autonomously, they were told that the two adults needed to continue their conversation. After the storytelling sessions were finished, the experimenters directed their attention to the children in the overhearing conditions. They commented on their tasks, gave feedback and helped the children until the class was finished.

Testing procedure: The comprehension test was administered by another female experimenter who also introduced herself as a teacher to the children. She did not know in which experimental condition (Addressed Speech, Overhearing Classroom or Overhearing Two Adults) the children were during the storytelling sessions. The test always took place on the day immediately after the last day of the storytelling. The experimenter guided the children one by one to a separate classroom in which the six target objects and four distracting objects were placed on a table in a random order. She told the child that they were going to play a game. The exact instruction to the game was as follows: "Several objects are lying on the table. I am going to ask you to show me some objects. But some objects that I will name, are not on the table. Then you just have to say that the object is not here". The aspect of objects that were not on the table was added to make the task more difficult and to avoid guesswork. After the general instruction the experimenter asked: "Can you show me the [target object]?" Alternating with the six target objects, she also asked for four objects that were not used in the story, and functioned as distractors. Three 'objects' had a novel object label that was not used in the story. The fourth distracting object was 'toothpaste', an object label commonly known by six-year-old children. Throughout the comprehension task, the experimenter took care not to have any reactions that could influence children's choices. She made all requests with the same intonation and did not look at the objects until a

particular one was chosen. After each pointing action, she nodded quickly and immediately proceeded to the next item. After the session the children received a small gift for participating in the game.

Analysis and Results

Table 2 below provides an explorative analysis of the relationship between the dependent predictor and the core predictors 'ethnic group (Moroccan minority or Flemish majority)' and 'experimental condition'. The dependent variable in the study was the number of correct/incorrect responses on the test for novel words. Response was treated as a dichotomous variable, contrasting a correct answer to the novel word test with a false answer to the novel word test. The variable is measured at the level of the individual novel word. To arrive at Table 2, we aggregated over the individual novel words for each participant, calculating the number of correct items. Since there are six novel object words, the maximum score is six.

Table 2 Descriptive Analyses for Aggregated Word Comprehension Scores

	Addressed Speech	**Overhearing Two Adults**	**Overhearing Classroom**
Flemish majority	$M = 5.00$, $SD = 1.08$	$M = 5.31$, $SD = .95$	$M = 4.47$, $SD = 1.35$
Moroccan minority	$M = 4.83$, $SD = 1.53$	$M = 2.39$, $SD = 1.73$	$M = 3.30$, $SD = 1.63$

The descriptive analysis of the interaction between the independent variable 'ethnic origin' and 'interaction situation' reveals the following pattern: in Overhearing Two Adults Flemish majority children learn most novel words ($M = 5.31$, $SD = .95$), then in Addressed

Speech (M = 5.00, SD = 1.08) and finally in Overhearing Classroom (M = 4.47, SD = 1.35). In Moroccan minority children a different order emerges: they learn most novel words in Addressed Speech (M = 4.83, SD = 1.53), then in Overhearing Classroom (M = 3.30, SD = 1.63) and finally in Overhearing Two Adults (M = 2.39, SD = 1.73). In order to adequately assess the significance of the trends (i.e., differential effect of overhearing according to ethnic origin) revealed in Table 2, we need to proceed to a multilevel regression analysis.

Multilevel analysis is the most appropriate method, because of the hierarchical structure of the data. Participants are subject to tests for several individual words, leading to repeated measures for each individual and for each novel word. Additionally, the participants are nested in different schools, introducing another source of variation. In the regression analysis, the dependent variable (comprehension of the novel word) is treated as a dichotomous categorical variable contrasting correct and false answers to the word comprehension test.

Relying on forward bootstrapping techniques relying on AIC and deviance, we built the mixed effect model starting from the random intercepts for 'word', 'participant' and 'school' (with 'participant' nested in 'school'), the independent variables 'interaction situation' and 'ethnic majority/minority group' and the covariates 'gender', 'age in months', 'educational level of the mother', 'elder siblings' and 'initial language proficiency in Dutch'. We also included all potential two-way interactions in the model selection procedure, aiming for the best-fitting model that captures most of the variation without overfitting. The analysis showed that neither 'having elder siblings' nor 'educational level of the mother' had a significant effect on the comprehension of the novel word when taking the other parameters into account. The independent variable 'interaction situation', the interaction effect between 'ethnic group' and 'interaction situation', and the covariates 'gender' and 'initial language

proficiency in Dutch' did contribute significantly to the regression model. No other interaction effects reached significance.

Only significant parameters were included in the model reported in Table 3 and Table 4, to avoid overfitting. Ethnic group itself did not have a significant main effect, but because of the significance of the interaction effect, it was important to keep the main effect in the model as well. As a sanity check, we additionally built a model including all covariates as main effects, also those that do not reach significance. This model, which can be found in Appendix 3, reveals no notable differences in the estimates for the significant predictors compared to the model presented in Table 3 and Table 4.

The conditional R^2 value of the mixed model, a value which represents the amount of variation explained by both fixed and random effects, is 0.49. The marginal R^2 value, representing the amount of variation explained by the fixed effects only, is 0.32. The C-value for the mixed effect model is 0.88, which means that the model has predictive power. The amount of correct predictions made by the model is 82% (compared to a baseline of 66%). We based these predictions on the model's estimated probabilities for each individual observation. The estimate concerns a value between 0 (incorrect answer estimated) and 1 (correct answer estimated). We used a cut-off of 0.5 to make a binary distinction between answers estimated as correct (>= 0.5) and answers estimated as incorrect (<0.5). We then cross-tabulated the estimates with the actual observations. The same procedure was followed for the estimates produced by a model that only includes the random effects, to establish a baseline, which produces correct estimates in 66% of the cases. Also, we witnessed a decrease in the standard deviation around the random effects compared to a null model that included only the random effects and none of the fixed effects (Baayen, 2012).

Table 3 Fixed Effects Estimates for the Mixed Effects Model

(Signif. codes: 0 '*' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1)**

	Estimate	Std. Error	Z value	Pr(>|z|)	
(Intercept)	-3.21	1.11	-2.88	0.004	**
Initial language proficiency in Dutch	0.22	0.04	5.70	<0.00001	***
Condition: overhearing Classroom (compared to reference level 'Addressed Speech')	-1.03	0.48	-2.17	0.03	*
Condition: overhearing Two Adults (compared to reference level 'Addressed Speech')	0.13	0.58	0.23	0.82	
Ethnic group: Moroccan minority (compared to reference level 'Flemish')	0.18	0.51	0.35	0.72	
Gender: Girl (compared to reference level 'Boys')	-0.82	0.25	-3.26	0.001	**
Condition(overhearing Classroom)*Group(Moroccan)	-0.95	0.62	-1.53	0.13	
Condition(overhearing Two Adults)*Group(Moroccan)	-2.72	0.70	-3.87	0.0001	***

Table 3 above presents the estimates for the fixed effects included in the model. The first five rows present the main effects, ranked according to their relative importance in an ANOVA. The last two rows present the interaction effect of 'ethnic group' and 'interaction situation'. For the random effects included in the model, we report variance and standard deviation in Table 4 below.

Table 4 Variance and Standard Deviation for the Random Effects Included in the Mixed Model

	Variance	**StDev**
school	0.105	0.324
respondent nested in school	0.603	0.777

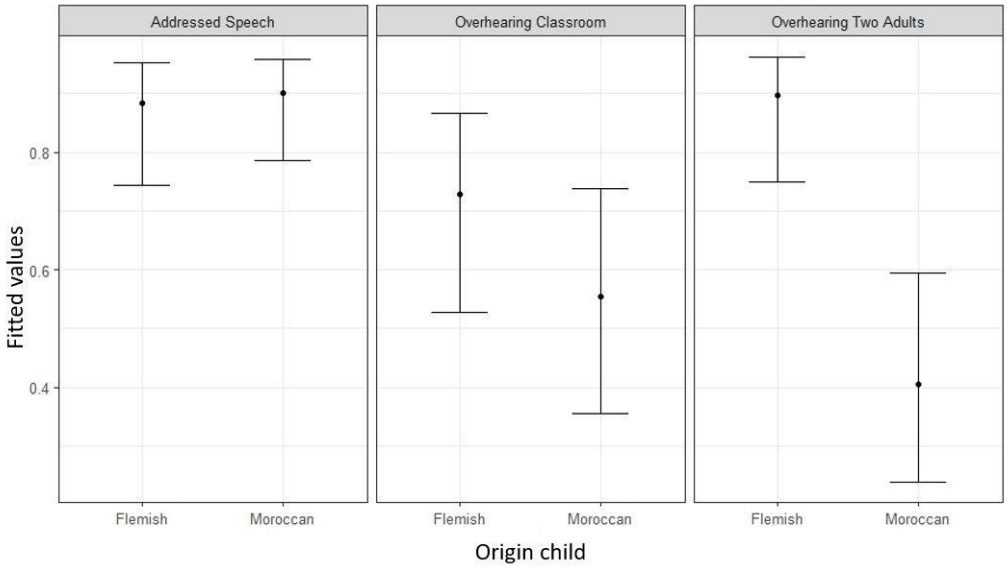
novel word	0.479	0.692

Interpreting the results of the mixed-effect model

The second and final column of Table 3 contain the most important information for interpreting the model. The second column shows the estimates, which capture the regression coefficients for the fixed effects on the logit scale. The categorical variables (all variables except initial language proficiency) are compared with the intercept that captures one of the levels of the categorical variable. The level that is compared to the intercept is written between brackets for the main effects. A negative estimate means that there is less chance of having an item on the comprehension test correct than in the intercept. A positive estimate means that there is more chance of having an item correct than in the intercept. The final column indicates the significance of the pattern.

Table 3 contains the crucial information to addressing our research question. Turning first to the independent variables relevant to answering our research question, interaction situation and ethnic group, we find a significant interaction between 'ethnic group' and 'overhearing two adults vs. addressed speech', though note that the interaction between 'ethnic group' and 'overhearing classroom condition' vs. 'addressed speech' was not statistically significant in the model. Because interaction effects in mixed models are more easily interpretable by means of visual information, we discuss the effects based on Figure 3 below, which represents the interaction plots derived from the fitted probabilities of the model.

Figure 3 Visualization of the Interaction between Experimental Condition and Ethnic Origin Based on Fitted Values



As can be seen in Figure 3 above, in the condition Addressed Speech Flemish majority and Moroccan minority children have equal chances of having an item correct on the comprehension test. In the condition Overhearing Classroom Moroccan minority children have less chance of having an item correct on the comprehension test, although this difference is not statistically significant. In the condition Overhearing Two Adults minority children have significantly less chance of having an item correct on the comprehension test compared to Flemish majority children.

Scrutinizing the effect of significant covariates, the model reveals significant contributions of the variables ‘initial language proficiency in Dutch’ and ‘gender’. The former even constitutes the strongest parameter in the model, viz. the variable with the largest individual contribution to lowering the model’s deviance. The higher the children’s initial language proficiency, the greater their chance of having an item correct on the comprehension test. This parameter does not significantly interact with experimental condition. The odds ratio for initial language proficiency is 1.25 (calculated by exponentiating 0.22, the regression coefficient for the covariate 'Initial language proficiency’), which means that per additional mark on the test for initial language

proficiency, children have a 1.22 higher chance of having an item correct on the comprehension test. Second, Table 3 shows that girls have less chance of having an item correct on the comprehension test than boys. The odds ratio is .44 (calculated by exponentiating –0.82, the regression coefficient for the covariate 'Gender'), so girls have approximately half the chance of boys for having an item correct.

Discussion

In this study, we examined the effects of addressed speech and overhearing on vocabulary learning in 6-year-old children of ethnic majority (Flemish origin) and minority (Moroccan origin) children in kindergarten. Previous studies have shown that young children are able to learn novel words by overhearing two adult speakers equally well as by being addressed themselves as an interlocutor (e.g., Boderé & Jaspaert, 2017). However, to date, most studies that examined the effects of addressed speech and overhearing have focused on ethnic majority children. Since socialization goals may be different, and social identification and perceived attitudes towards one's ethnic identity may vary between ethnic majority and ethnic minority children, which may influence language learning (Trofimovich & Turuseva, 2015; Shneidman & Woodward, 2016), it is important to examine whether the reported effects of overhearing also apply to ethnic minority children. In addition, most available studies on overhearing took place in the family or in the laboratory context. By conducting the study in an authentic classroom environment, this study may also contribute to efforts of both educators, scholars, and policy makers to bridge the educational achievement gap that exists between ethnic majority and minority children in schools (Schleicher, 2018).

Six novel words that referred to novel objects were included in a fantasy story that was specifically developed for 6-year-olds. Children were either directly addressed by a

teacher-researcher during the storytelling sessions, or were able to overhear the story told by two teachers-researchers or to classmates. The results show that both Flemish majority and Moroccan minority children had the highest chance of learning novel words in the Addressed Speech condition, followed by the Overhearing Two Adults and the Overhearing Classroom condition. Differences in novel word learning between children in the Addressed Speech and Overhearing Two Adults condition are not significant, neither are the differences between children in either Overhearing condition. However, children do learn significantly fewer novel words when they overhear a classroom conversation compared to when they are directly addressed by the teacher. This outcome was also found in Boderé & Jaspaert (2017), who hypothesized that children's socialization into classroom routines and assumed appropriate behavior might have inhibited children to learn through overhearing in the classroom. Additionally, this finding confirms the large body of vocabulary research that emphasizes that vocabulary instruction is most beneficial when children are addressed directly (e.g., Butler, 2022; Marulis & Neuman, 2010; O'Doherty et al., 2011).

Yet, the results also reveal differential learning effects between ethnic minority and majority children in the overhearing conditions. When addressed directly, majority and minority children have equal chances to learn a novel word. When they unexpectedly get the opportunity to follow a conversation that is directed at their peers, Moroccan minority children have a slightly smaller chance of learning a novel word than Flemish majority children, but the difference is not statistically significant. However, in overhearing two adults, Moroccan minority children have a significantly smaller chance of learning a novel word than Flemish majority children.

An intuitive explanation for this differential effect of the overhearing condition would be to refer to children's different initial language proficiency in Dutch, since studies repeatedly highlight the language achievement gap between ethnic majority and minority

children (e.g., Pulinx et al., 2017) and overhearing is a cognitively complex process (Hendrickson et al., 2021). Indeed, initial Dutch proficiency turns out to be an important predictor in our analyses. However, this hypothesis does not seem to hold as our study does take initial language proficiency into account as a covariate in the model. Moreover, we need to emphasize that the difference in novel word comprehension scores between children of both ethnic groups was not significant in the Overhearing Classroom condition. If initial language proficiency in Dutch played an additional role in the extent to which children learn novel words through overhearing, that effect would also be apparent in the Overhearing Classroom condition.

Two other hypotheses seem plausible. A first hypothesis could be that the observed results are related to differences in sensitivity to the authority of the teachers. In the Overhearing Two Adults condition Moroccan minority children might have been more sensitive to the authority of the teachers than the children of Flemish origin. Their heightened sensitivity could emerge from differential parental socialization goals in Flemish majority and Moroccan minority families. Some research on recently migrated parents shows that Moroccan origin parents tend to stress conformity and obedience more than parents of Western-European origin (De Haan, 2011; Pels & Haan, 2007). Consequently, the Moroccan minority children may have wanted to comply with the task that they got from the adults more strictly in the Overhearing Two Adults condition. The Flemish majority children, in contrast, possibly behaved more freely in this condition and listened more to what the adults were saying to each other, and therefore picked up more new words in this condition. However, it is unclear to what extent the findings from the available studies can be extrapolated to the families of the children in our study. All children were born in Flanders, so some parents may have already been of the second or third generation. This may imply that parents themselves have already navigated Flemish society and the education system at

first hand, making the hypothesis of different socialization goals and practices perhaps less convincing.

Additionally, children's previous classroom experiences may have influenced their behavior. Flemish schools typically have a strict Dutch-only policy, which results in a classroom environment that is restrictive towards the speech behavior of ethnic minority children (Peleman et al., 2020; Pulinx et al., 2017). As a consequence, the Moroccan minority children in our sample may not have dared to deviate from their task because they feared sanctions. However, these hypotheses do not entirely explain why the Overhearing Classroom condition was not differentially effective with respect to ethnic group.

A second and likely more plausible hypothesis to explain these results in the Overhearing Two Adults condition is related to social identification with the storyteller, and the perceived knowledgeability of the storytellers. In the current study all storytelling sessions were conducted by a female Flemish majority researcher who introduced herself as a new teacher at school. As a result, the teacher's ethnic group was representative for most teachers in Flemish education (Flemish Government, 2021), and learning processes occurring in the classroom closely resembled learning processes in 'real' classrooms. The addressee in the Overhearing Two Adults condition was also an ethnic majority female adult ('teacher').

Previous experimental studies have dealt with the extent to which learning processes of children are influenced by social information, such as ethnic group or social status of the informant (e.g., Kinzler et al., 2007). Children are selective regarding the person from whom they learn. Typically, they learn from someone, preferably an adult, who they perceive as knowledgeable, or with whom they can identify themselves. Yet, when both characteristics clash (i.e., when a knowledgeable person is not part of one's social in-group), children are found to be less inclined to learn from this person (Sobel & Finiasz, 2020). In the current

study the majority children shared at least one important social feature with both conversation partners in the Overhearing Two Adults condition: that is, their ethnic group. So, majority children may have been better able to socially identify with the adults than minority children. They may have felt more involved and, hence, more inclined to overhear as a result. Consequently, children might have learned more novel words that are used in those conversations. For minority children, in contrast, there was potentially a double gap between them and the conversation partners in the Overhearing Two Adults condition: that is, the difference in both age and ethnic group, which may have made them less inclined to overhear.

The fact that we did not find differences in the Overhearing Classroom condition between majority and minority children regarding the extent to which they learned novel words, supports our idea that social identification and knowledgeability might play a role in learning through overhearing. In Overhearing Classroom, the conversations were addressed to both majority and minority children. Thus, in that condition both majority and minority children shared at least two important social characteristics with the addressees: that is, their age and their ethnic group. In addition, studies have indicated that an adult is considered a more reliable source of information or knowledge than children (Sobel & Finiasz, 2020). As such, all children may have relied to a similar extent on the adult as a source of information – regardless of social ingroup or other cues. Consequently, children had equal chances to learn a novel word in that condition.

Despite the differential effects of the Overhearing Adults condition on vocabulary learning in majority and minority children, it is equally important to note that children of both groups learned equally well in the two other conditions. It shows that – despite the strong educational inequalities between these groups of children – minority children learn equally well in at least two out of three conditions in our study. An explanation for the similar effects

might lie in the similarity in socio-economic background of the children, making the impact of this background variable - which is an important predictor of performance in the Flemish education system (Van Praag et al., 2009) – negligible.

Of course, there are limitations to this study that require follow-up. A first limitation is related to the small sample sizes across conditions and ethnic group. Lower statistical power makes it difficult to detect smaller effects (e.g., the differential impact of both Overhearing conditions). Another limitation is that we knew very little about the children's home environment, or their usual classroom behavior. For one, we had no direct information available about children's degree of sensitivity to authority, or their involvement in the classroom activities. We do have good reasons to assume that the activities were interesting for the children, since they were chosen in consultation with experienced preprimary school teachers in ethnic diverse schools. The results of Boderé & Jaspaert (2017) confirm this idea. They conducted a qualitative study of children's attention management (mean age 6 years old) with the coloring activity as distracting task. Two independent raters noted that children of Flemish origin in the Overhearing Classroom condition hardly seemed to be involved in the storytelling event. Many children were painting diligently throughout the whole storytelling session and their eye gaze was almost exclusively directed to the painting. In order to fully establish whether this aspect plays a role in word learning through overhearing, more detailed information is needed on both factors (e.g., by examining attention management during the performance of all distraction tasks, and parenting style by means of a survey). Future studies could also look into the effects of the topic of the conversation in which the novel words are embedded. In this study, we used a story that was specifically designed for preprimary children. It would be interesting to investigate whether similar effects occur in other real-life settings.

Additionally, follow-up research is needed to unravel the effect of social identification on language learning in overhearing situations. Future studies could examine whether social identification indeed plays a role in overhearing by differentiating the ethnic group of the storytellers. Although only 5% in Flemish preprimary education has an ethnic minority background (Flemish Government, 2021), research indicates that students obtain significantly better achievement scores for reading if their teacher has the same ethnic background (Egalite et al., 2015). Furthermore, future research could investigate whether the same differences in word learning occur in a group of children of another ethnic group. Moroccan minority children are (together with Turkish minority children) often victim of negative stereotyping in Western-Europe (e.g., Baysu & Phalet, 2019; Phalet et al., 2018). Research has shown that negative stereotyping has an influence on social identification (Fleischmann & Phalet, 2017), so negative stereotyping may (indirectly) also have an impact on the word learning results of children of Moroccan origin. A replication of the study in children who are less negatively stereotyped in Flanders, such as children of Polish, Italian or Chinese origin, might help to explore this hypothesis (for the different societal position of children of those minority groups in Flanders versus children of Moroccan origin, see, for example, Hesters, 2012).

Despite these limitations and the need for further research, this study does contribute to the growing research base on overhearing by showing that vocabulary learning in overhearing situations does not necessarily yield the same results in children from majority and minority groups, especially in the condition of Overhearing Two Adults. An important pedagogic implication can be derived from these results. Children learn significantly more words when they are addressed directly than when they have the opportunity to overhear conversations among a teacher and a group of children. This raises the question whether it is useful for teachers to purposefully expose children to indirect language input to facilitate language learning. If possible, we believe that direct interaction should be prioritized.

However, due to practical reasons it is not always possible to involve all children simultaneously in direct, qualitative interactions in authentic classrooms. Based on the results of our study, we believe that the exposure to indirect language input in the classroom may be important, especially in the case of larger class groups. Our suggestion for classroom practice would therefore be to open up more intensive language activities for all children by organizing them purposefully in the center of the classroom, so that the other children (occupied with other activities that allow for diverted attention, e.g., arts) have the opportunity to overhear. Even if children learn significantly fewer new words than through direct language input, the results of this study shows that children's vocabulary also expands in the Overhearing Classroom situation.

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Appendix 1: Target objects and novel object labels

distractor

distractor

distractor

female kameut

male kameut

distractor

tassat

baloep

kikoon

piefan

viddon

Appendix 2: Excerpt from the story in the different experimental conditions

Addressed Speech and Overhearing Classroom
Hi all. I would like to tell you a story I experienced yesterday. Do you feel like listening to it? (…) Okay, I will tell you. The story is about a country with many beautiful castles. In one of the castles, the largest and most beautiful one, there is living a princess: princess Little Praline. This princess is always very sweet, but there is one task she really dislikes, this is making *baloop*. Do you know what this is, *baloop*? (…) Well, *baloop* is a large cake. But not an ordinary cake, it is a very dirty, gruesome cake.
Overhearing Two Adults
- Mary, could I please interrupt you for a second. I would like to tell you a story I experienced yesterday. Do you feel like listening to it? • Yes, surely I do. What is the story about? - The story is about a country with many beautiful castles. In one of the castles, the largest and most beautiful one, there is living a princess. • Who is the princess who lives there? - The princess is called Little Praline and she is always very sweet. But there is one task she really dislikes, this is making *baloop*. • What is this, *baloop*? - Well, *baloop* is a large cake. But not an ordinary cake, it is a very dirty, gruesome cake.
Note: The original novel word in Dutch 'baloep' is modified and adapted to English ('baloop') in order to promote readability.

Appendix 3: Fitted model including covariates

	Estimate	Std. Error	Z value	Pr(>|z|)	
(Intercept)	-2.71	1.45	-1.88	0.06	.
Initial language proficiency in Dutch	0.25	0.04	5.68	<0.00001	***
Condition: overhearing Classroom	-1.06	0.48	-2.24	0.03	*
(compared to reference level 'Addressed Speech')					
Condition: overhearing Two Adults	0.12	0.58	0.20	0.84	
(compared to reference level 'Addressed Speech')					
Group: Moroccan minority	0.22	0.52	0.43	0.67	
(compared to reference level 'Flemish')					
Gender: Girl	-0.76	0.25	-2.97	0.003	**
(compared to reference level 'Boys')					
Age in months	**-0.02**	**0.02**	**-1.17**	**0.24**	
Siblings: Has no elder Sibling	**0.33**	**0.25**	**1.33**	**0.18**	
(compared to reference level 'Has elder siblings')					
Education level mother – Lower	**0.12**	**0.28**	**0.45**	**0.65**	
(compared to reference level 'Higher')					
Condition(overhearing Classroom)*Group(Moroccan)	-0.91	0.63	-1.43	0.15	
Condition(overhearing Two Adults)*Group(Moroccan)	-2.65	0.71	-3.76	0.0002	***

	Variance	**StDev**
school	0.085	0.292
respondent nested in school	0.541	0.736
novel word	0.468	0.684