

# Multilingualism, Peer Interactions, and Play

A Multi-Methods Investigation  
in Early Childhood Education and Care  
in the Netherlands

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A Multi-Methods Investigation in Early Childhood Education and Care  
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## **Author contributions**

### **Chapter 1 – Introduction**

Written by Anne-Mieke Thieme with valuable feedback from Sible Andringa, Folkert Kuiken, and Josje Verhagen.

### **Chapter 2 – The effects of foreign language ECEC: A review study**

Chapter 2 is a slightly modified version of a published article: Thieme, A. M. M., Hanekamp, K., Andringa, S., Verhagen, J., & Kuiken, F. (2022). The effects of foreign language programmes in early childhood education and care: A systematic review. *Language, Culture and Curriculum*, 35(3), 334–351. <https://doi.org/10.1080/07908318.2021.1984498>

The review study was designed by Anne-Mieke Thieme, based on an earlier version by Kyra Hanekamp, in collaboration with Sible Andringa, and Folkert Kuiken, and Josje Verhagen. Studies were screened, selected, and analysed by Anne-Mieke Thieme, supervised by Sible Andringa, Folkert Kuiken, and Josje Verhagen. Anne-Mieke Thieme wrote the final version of the manuscript, with valuable feedback provided by Sible Andringa, Folkert Kuiken, and Josje Verhagen, and working from an earlier version that was written by Kyra Hanekamp.

### **Chapter 3 – Teachers’ reported experiences with the peer interactions of emergent multilingual children in ECEC**

Chapter 3 is a slightly modified version of a published article: Thieme, A. M. M., Kuiken, F., Andringa, S., & Verhagen, J. (2025). Teachers’ reported experiences with emergent multilingual children’s peer interactions in early childhood education and care in the Netherlands. *Journal of Research in Childhood Education*, online first. <https://doi.org/10.1080/02568543.2025.2506701>

The study was designed by Anne-Mieke Thieme, in collaboration with Sible Andringa, Folkert Kuiken, and Josje Verhagen. Participants were recruited as part of Project MIND and data was collected by Anne-Mieke Thieme, transcribed by Anne-Mieke Thieme together with research assistants, and coded by Anne-Mieke Thieme. Data analysis was performed by Anne-Mieke Thieme, under supervision of Sible Andringa, Folkert Kuiken, and Josje Verhagen. Anne-Mieke Thieme wrote the manuscript, with valuable feedback provided by Sible Andringa, Folkert Kuiken, and Josje Verhagen.

**Chapter 4 – An observation-based social network study of peer interactions of multilingual toddlers in ECEC**

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The study was designed by Anne-Mieke Thieme, in collaboration with Sible Andringa, Folkert Kuiken, and Josje Verhagen. Data was collected by Anne-Mieke Thieme together with research assistants. Data analysis was performed by Anne-Mieke Thieme, under supervision of Sible Andringa, Folkert Kuiken, and Josje Verhagen. Anne-Mieke Thieme wrote the manuscript, with valuable feedback provided by Sible Andringa, Folkert Kuiken, and Josje Verhagen.

**Chapter 5 – Video observation of the play complexity and social behaviour of multilingual toddlers in ECEC**

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The study was designed by Anne-Mieke Thieme, in collaboration with Sible Andringa, Folkert Kuiken, and Josje Verhagen. Data was collected, transcribed, translated, and coded by Anne-Mieke Thieme together with research assistants. Data analysis was performed by Anne-Mieke Thieme, under supervision of Sible Andringa, Folkert Kuiken, and Josje Verhagen. Anne-Mieke Thieme wrote the manuscript, with valuable feedback provided by Sible Andringa, Folkert Kuiken, and Josje Verhagen.

**Chapter 6 – Discussion**

Written by Anne-Mieke Thieme with valuable feedback from Sible Andringa, Folkert Kuiken, and Josje Verhagen.

## Data availability

### Chapter 2

An overview of the selected studies is available in the supplemental material of the open access article: Thieme, A. M. M., Hanekamp, K., Andringa, S., Verhagen, J., & Kuiken, F. (2022). The effects of foreign language programmes in early childhood education and care: A systematic review. *Language, Culture and Curriculum*, 35(3), 334–351. <https://doi.org/10.1080/07908318.2021.1984498>

### Chapter 3

The materials and data of this study are available through OSF: Thieme, A. M. M., Kuiken, F., Andringa, S. J., & Verhagen, J. (2025). *Teachers' reported experiences with emergent multilingual children's peer interactions in early childhood education and care in the Netherlands*. OSF. <https://doi.org/10.17605/OSF.IO/N6P74>

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The materials and data of this study are available through OSF: Thieme, A. M. M., Verhagen, J., Kuiken, F., & Andringa, S. (2022). *Multilingual children's peer networks in Dutch daycare*. OSF. <https://doi.org/10.17605/OSF.IO/465JT>

### Chapter 5

The materials and data of this study are available through OSF: Thieme, A. M. M., Verhagen, J., Kuiken, F., & Andringa, S. (2025). *Multilingual children's play in Dutch toddler groups: Video observation of their play complexity and social interactions during play*. OSF. <https://doi.org/10.17605/OSF.IO/Q42US>

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## 1. Introduction

“Als je dan heel klein bent en je weet dan: dit zijn [...] de [diverse] mensen die je op je pad gaat tegenkomen en je bent daar al heel rijk mee, ja, ik zie [daar] alleen maar voordeel van.”

“If you are very young and you know: these are the [diverse] people you are going to meet in the future and you already have rich experiences with that, yes, I only see that as an advantage.”

(teacher M, Thieme et al., 2025a)

This dissertation is about multilingualism in early childhood education and care (ECEC) in the Netherlands. Multilingualism in ECEC is an emerging research field (Alstad & Mourão, 2021). There are increasing numbers of multilingual children in ECEC in many Western countries (Alstad & Mourão, 2021; Langeloo et al., 2019; Zheng et al., 2021), and multilingualism is the norm worldwide, which has given rise to many questions, both for theory and practice. These questions concern not only multilingual children’s language development, but also for example their well-being and peer relationships in ECEC. All of these aspects are relevant for harmonious multilingual development (De Houwer, 2015a)<sup>1</sup>. This dissertation contributes to the growing research field of multilingualism in ECEC, and zooms in on multilingual children’s peer interactions and play.

Peer interactions and play contribute to children’s feelings of well-being, and to their linguistic, cognitive, and socioemotional development (Coplan & Arbeau, 2009; Deunk, 2009; De Haan, 2015; Lillard et al., 2013; Quinn et al., 2018). However, there are indications of language-based inequity in peer interactions in ECEC: multilingual children might be excluded more often, have fewer peer interactions, and have fewer opportunities for peer play of high quality, like social pretend play (Arvola et al., 2021; Bernstein, 2018; Dominguez & Trawick-Smith, 2018; Stangeland, 2017). It is unclear which factors explain these findings: is it related to ECEC language proficiency, an inability to use the home language in ECEC, being ‘the odd one out’? It is important to notice that these preliminary findings of language-based inequity should not be interpreted through a deficit lens, as if multilingual children have a deficiency in peer interactions compared to monolingual children. Multilingual children often find themselves in an environment that is oriented towards monolingualism (Palviainen & Curdt-Christiansen, 2022, and see below). Therefore, situational

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<sup>1</sup> Usually referred to as ‘harmonious bilingual development’ (De Houwer, 2015a).

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factors might impact multilingual children's opportunities for peer interactions and play. We used a range of methods in this dissertation to examine multilingual children's peer interactions and play in ECEC in more detail, including teacher surveys, teacher interviews, social network analysis, and video observation. The overarching research question was: How do individual and situational language factors relate to young multilingual children's peer interactions and play in ECEC in the Netherlands?

Our study took place in the Netherlands. The Netherlands is an interesting case when researching multilingualism in ECEC. Many children attend ECEC, 72% of young children under the age of three, which is the highest in Europe (Centraal Bureau voor de Statistiek, 2025), and it is likely that this percentage is even higher for toddlers. Children go to ECEC at a relatively young age, as ECEC in the Netherlands targets children from six weeks up to and including three years of age, after which children go to primary school when they turn four. Earlier studies about multilingualism and peer interactions in ECEC often included older children in the United States (see Chapter 3), and it is an open question to what extent findings in these contexts transfer to the Dutch context, with relatively young children. Furthermore, Dutch ECEC is play-based and children spend a large proportion of the day playing and interacting with each other. As these peer interactions are a primary learning site in ECEC (De Haan, 2015), it is important to research them.

Moreover, the Netherlands is a highly multilingual country: 97% of adults report that they can hold a conversation in at least two languages and 74% report that they can do so in at least three languages, which is amongst the highest in Europe (European Commission, 2024). Two and a half million people in the Netherlands, in a population of almost 18 million, grew up with a different language at home (KNAW, 2018) and there is an increasing number of multilingual children in ECEC (Langeloo et al., 2019; Steffens, 2020). This linguistic diversity makes it interesting and important to research how multilingual children fare when they go to ECEC in the Netherlands. This is especially the case because ECEC policies in the Netherlands are rather monolingual, and there might not always be a lot of support for children's multilingualism. For example, teachers can only use home languages in exceptional cases (MIND Team et al., 2021). Dutch ECEC law does not focus specifically on supporting multilingual children and their home languages (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2024). Moreover, monolingual ECEC was the standard for a long time (MIND Team et al., 2021). At the start of our research, the Dutch ECEC policy was slowly becoming more multilingual. Pedagogical handbooks and (regional) initiatives had already started to focus on multilingual children and their needs in ECEC (d'Haens & Roest, 2021; Singer et al., 2009; Stam et al., 2022). Moreover, the

Dutch Ministry of Social Affairs and Employment was considering the introduction of foreign language ECEC, and commissioned a research project into multilingualism in ECEC, Project MIND. This project inspired the first study of this PhD research.

In the section below, we describe the first study of this dissertation (Chapter 2) in more detail. We introduce the study and discuss some of the results, as these results inspired the other three follow-up studies in this dissertation. In later sections, we explain in brief the contents of the other three studies.

### **1.1 Foreign language ECEC: the role of peer interactions**

As part of Project MIND, we conducted a review study on foreign language ECEC (Chapter 2), which demonstrated the importance of studying multilingual children's peer interactions further. Foreign language ECEC is a form of multilingual ECEC in which exposure is provided to a foreign language, a language that is assumed to be new to the children and not a majority or minority language (Howard et al., 2003). Generally, children in foreign language ECEC are exposed to both the foreign language and the majority language and the aim is that they develop proficiency in both languages (Wipperman et al., 2010). However, an open question was if young children indeed developed multilingual proficiency through foreign language ECEC. Moreover, it was unclear how exposure to an unfamiliar language related to young children's well-being, whether they "feel at ease, act spontaneously, show vitality and self-confidence" (Laevers, 2015, p. 2). We therefore examined the literature on foreign language ECEC. We aimed to examine the effects of foreign language ECEC on language development and well-being, as well as programme-related and child-related factors that might be linked to the outcomes of foreign language ECEC.

One of the results of this review study inspired the other three studies in this dissertation. When surveying the literature, we found that peer interactions play an important role in (multilingual) children's development. We saw that there was a lack of systematic research on multilingualism and peer interactions in very young children (Halle et al., 2014; Washington-Nortey et al., 2022). However, the literature suggested that it was important to look into this topic further, as peer interactions and play are important for children's linguistic, social, and cognitive development (Coplan & Arbeau, 2009). They could be especially helpful for emergent multilingual children (García, 2009), multilingual children who do not speak the ECEC language(s) well yet, to help them feel welcome in a linguistically new environment and aid their socioemotional development (Halle et al., 2014). However, there were indications in the literature that multilingual children might not always have opportunities for high-quality peer interactions in ECEC (Boyd et al., 2017; Cekaite & Evaldsson,

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2017; Dominguez & Trawick-Smith, 2018). Some teachers in the MIND study and in the wider literature also had these concerns (Mansikka et al., 2024; Stam et al., 2022). Therefore, we decided to examine multilingual children's peer interactions and play in more detail in the other studies of this PhD project (Chapters 3, 4, and 5).

### **1.2 Teachers' reported experiences with the peer interactions of multilingual children**

We first wanted to ask teachers more systematically about the concerns they raised, so we decided to conduct a mixed-methods teacher study with surveys and interviews (Chapter 3). Based on earlier literature, we zoomed in on three aspects of peer interactions: social inclusion, peer play quality, and peer group formation. The literature reported that multilingual children might have fewer peer interactions than their monolingual peers, and might be excluded more often during play (Bernstein, 2018; Dominguez & Trawick-Smith, 2018). They might also have fewer opportunities for high quality play, and might show less pretend play than their peers (Arvola et al., 2021; Stangeland, 2017). There were some indications in the literature that multilingual children gravitate towards same-language peers (Feng et al., 2004; Kyratzis et al., 2009; Thompson, 1996), which might aid multilingual children's socio-emotional development and home language development (Halle et al., 2014), although it could be less beneficial for their ECEC language development (Washington-Nortey et al., 2022). In Chapter 3, we therefore examined ECEC teachers' reported experiences with the social inclusion, peer play quality, and peer group formation of emergent multilingual children in ECEC in the Netherlands, and asked them which factors might play a role, using a survey and interviews.

### **1.3 Social networks of multilingual children**

To complement these teacher reports, we conducted observations in 17 toddler groups (for children aged two and three years old) throughout the Netherlands, which were diverse in terms of socioeconomic status and children's language backgrounds. At these toddler groups, we conducted a social network study (Chapter 4) and a video observation study (Chapter 5). The social network study was designed to address in more detail the peer interaction quantity and peer group formation of multilingual children in ECEC. Earlier studies, including the study in Chapter 3, suggested that children's linguistic resources might relate to whom they interact with, and how much they interact with peers (Cekaite & Evaldsson, 2017; Dominguez & Trawick-Smith, 2018; Mansikka et al., 2024; Thieme et al., 2025b). It seemed that children with a multilingual background might be excluded more often and have fewer peer interactions, although it was unclear how this related to children's language background,

ECEC language proficiency, or communicative competence (Cekaite & Evaldsson, 2017; Dominguez & Trawick-Smith, 2018; Mansikka et al., 2024; Thieme et al., 2025b; Van der Wilt, 2018). Children might interact more with peers who are similar in terms of language background, ECEC language proficiency, or communicative competence (Kyratzis, 2010; Mansikka et al., 2024; Thieme et al., 2025b).

In Chapter 4, we therefore explored how children's language background, ECEC language proficiency, and communicative competence related to who children interact with and how much. The latest innovations in social network analysis afforded opportunities to study this in detail. Generalised exponential graph models, for example, allow researchers to examine how various factors, including dyadic factors (whether children are similar to each other), relate to how much children interact and with whom (Cranmer et al., 2020). They also make it possible to control for factors like age, gender, and sociability. Moreover, the use of observation apps enables researchers to base information about peer networks on observations, instead of teacher, child, or parental report (Bokhove, 2018).

#### **1.4 Multilingual children's play quality and social interactions during play using video observation**

We used video observation to explore multilingual children's quality of peer play and social interactions during play in more detail in Chapter 5. We aimed to relate children's play complexity and social interactions during play to children's linguistic resources, as well as nonverbal communication and (home) language use. The literature showed that play contributes to children's development, especially if children engage in more complex and social forms of play, such as pretend play (Cekaite et al., 2014; Kızıldere et al., 2020; Lillard et al., 2013; Quinn et al., 2018; White et al., 2021). Some studies suggested that multilingual children might experience less complex play and play alone more, particularly if they have lower ECEC language proficiency (Arvola et al., 2021; Stangeland, 2017; Syczewska & Licandro, 2021). However, others suggested that multilingual children with low ECEC language proficiency can still engage in complex play and in social play if they communicate nonverbally or are able to use their home languages (Feng et al., 2004; Kyratzis et al., 2009). Video observation could shed more light on these findings, as it makes it possible to code children's play in detail, paying attention to nonverbal communication and (home) language use.

#### **1.5 This dissertation**

The remainder of this dissertation includes the four studies of this PhD research that were described above, as well as a general discussion based on the

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findings of all four studies. Specifically, Chapter 2 contains the review study about foreign language ECEC. Chapter 3 presents the study, based on teacher surveys and interviews, about the peer interactions of multilingual children in ECEC in the Netherlands. Chapter 4 describes the observation-based social network study in linguistically diverse toddler groups in the Netherlands, which examines how language factors relate to who children interact with and how much. Chapter 5 presents the video observation study of the peer play quality and social interactions of multilingual children during play in ECEC. We end this dissertation with Chapter 6, a general discussion of the findings of this PhD research. In this chapter, we synthesise the findings of all four studies and discuss the outcomes. We also describe limitations, suggestions for future research, and practical and theoretical implications, and draw conclusions. At the end of this book, a summary of the dissertation can be found, both in English and in Dutch.

## 2. The effects of foreign language ECEC: A review study<sup>2</sup>

“We really have like ‘one face one language’ so I really have to stick [to it], even though actually my Dutch is very good but I really stick to English and all my Dutch colleagues they only stick to Dutch, and it’s very clear for the children.”

(teacher D in English-Dutch foreign language ECEC, Thieme et al., 2025a)

### 2.1 Introduction

Interest in foreign language learning through early childhood education and care (ECEC) has grown tremendously in many countries (Bergström et al., 2016; Ferjan Ramírez & Kuhl, 2020), perhaps because parents and policymakers think young children can quickly and easily learn a foreign language, which will later benefit them on the job market (Myles, 2017). Parents send their children to a foreign language ECEC centre for part of the week, where teachers provide exposure to a foreign language, a language that is unfamiliar to the children and not a majority or minority language in the larger environment (Howard et al., 2003). However, one might wonder to what extent exposure at an ECEC centre can contribute to learning a foreign language, and whether children’s well-being and development of other languages, such as the first and majority language, are impacted by this foreign language exposure. Moreover, a relevant theoretical and practical question is what type of foreign language ECEC programme is conducive to language learning and well-being. Lastly, the question arises if the outcomes of foreign language ECEC depend on children’s backgrounds, such as socioeconomic status and home language. The goal of the present chapter is therefore to review the effects of foreign language ECEC programmes on young children’s foreign, majority, and first language development and well-being, as well as the roles that programme-related and child-related characteristics play in programme outcomes.

There are various reasons to review language development, well-being, programme-related effects, and child-related effects in foreign language ECEC. The aim of foreign language ECEC is generally to enable children to develop

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<sup>2</sup> This chapter is a slightly modified version of a published article: Thieme, A. M. M., Hanekamp, K., Andringa, S., Verhagen, J., & Kuiken, F. (2022). The effects of foreign language programmes in early childhood education and care: A systematic review. *Language, Culture and Curriculum*, 35(3), 334–351. <https://doi.org/10.1080/07908318.2021.1984498>

proficiency in both the foreign language and majority language of the society through exposure to both (Wipperman et al., 2010). However, it is unclear if bilingual exposure in foreign language ECEC will result in multilingual proficiency. For example, studies in multilingual home environments show that children sometimes only develop receptive multilingualism (De Houwer, 2015a). Moreover, the often-made time-on-task argument suggests that time dedicated to learning the foreign language may come at the expense of proficiency in the other language(s) children are exposed to, such as the majority or first language (Leseman et al., 2009). Indeed, there have been indications that the vocabulary sizes of multilingual children are smaller in each language separately compared to monolingual children (Bialystok, 2009). Reversely, the Linguistic Interdependence Hypothesis proposes that children's first and second languages positively influence each other's development, such that learning a foreign language in ECEC might improve native language skills (Cummins, 1979).

It is unclear which effects the exposure to an unfamiliar language has on young children's well-being, the degree to which they "feel at ease, act spontaneously, show vitality and self-confidence" (Laevers, 2015, p. 2). On the one hand, research in the primary school context indicates that children tend to be enthusiastic about learning a new language (Myles, 2017). On the other hand, studies in multilingual home settings suggest that children's well-being may be compromised if they do not achieve balanced multilingual development (De Houwer, 2015a). There are preliminary indications that children who do not understand or speak the ECEC language(s) well may experience lower well-being (Cekaite & Evaldsson, 2017; De Houwer, 2015b). Well-being, in turn, influences children's ability to learn (Marbina et al., 2015), and can therefore have an impact on children's language development in foreign language ECEC.

The effects of foreign language ECEC on language development and well-being might depend on the type of programme and the children attending it. Programme here refers to the ways in which the foreign language input is organised at the ECEC centre, for example in terms of activities, times of the day, and speakers. We could hypothesise that input quantity and quality in a foreign language ECEC programme are positively associated with foreign language development, as in the home setting (Hoff & Core, 2013; Unsworth, 2016). Input quantity in this context denotes the amount of input in a language provided by teachers in years, months, days, or hours. This is a very rough measure, while intensity considers the amount of input each individual child has access to, based on factors such as the actual time a child is present at preschool, and the amount of time a child spends interacting with a teacher (Bergström et al., 2016). Input quality in this context has been defined as the way in which input is presented to the child, for example in terms of vocabulary

sophistication, the use of teacher strategies and practices such as routines and feedback, the use of the first language, and the context in which input is embedded (Weitz et al., 2010). Moreover, we know from primary school research that the same bilingual programme can result in different outcomes for different children, for example because of differences in language background, socioeconomic status, and parental involvement (Genesee, 2006).

To the best of our knowledge, this is the first review on foreign language programmes with preschoolers in ECEC settings. The current review differs from earlier reviews in that it focuses on foreign language ECEC programmes rather than bilingual ECEC programmes in which children's home languages are spoken (Bialystok, 2018; Buysse et al., 2014) and looks at children of preschool age rather than primary school age (Butler, 2015; Nikolov & Mihaljević Djigunović, 2011). In foreign language ECEC, the ECEC centre is often the only source of foreign language input, and children are still very young, requiring different approaches to teaching. Furthermore, earlier reviews have not devoted much attention to well-being, programme characteristics (such as input quantity and teacher strategies), and child characteristics (such as home language background and socioeconomic status). Therefore, the present review is guided by the following questions:

1. What are the effects of a foreign language ECEC programme on young children's development of the foreign language, other languages such as the majority and first language, and on their well-being?
2. Which programme-related factors are linked to the outcomes of foreign language ECEC?
3. Which child-related factors are linked to the outcomes of foreign language ECEC?

## 2.2 Methodology

To find eligible studies for this review, we used the Core Collection of Web of Science (Web of Science Group, 2020). We opted for Web of Science because it is a worldwide collection of the most important research output forms (articles, conference proceedings, books), and all included publications are peer-reviewed and impactful in the field (based on various criteria, including a citation analysis, Web of Science Group, 2020). We entered the following search term in the Core Collection of Web of Science:

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TS = ((bilingual OR multilingual OR immersion OR "second language" OR L2 OR "foreign language") AND (preschool* OR childcare OR "child care" OR daycare OR "day care" OR kindergart* OR "early childhood education and care" OR "infant education" OR pre-primary))
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Our selection criteria were as follows: articles should (i) investigate foreign language ECEC (Howard et al., 2003), (ii) examine very young children, meaning that the study included children aged 0-4 years old (and sometimes, additional children aged 5 and 6 years old), and (iii) focus on language development or well-being, or how these relate to characteristics of the programme or the children. We read the titles and abstracts of studies, and in case of doubt, also the methodology, to determine whether studies met the inclusion criteria. Articles in other languages were also examined: they all contained titles and abstracts in English, and we translated the methodology if necessary.

Our initial search yielded 1812 unique results, featuring records up until 10 December 2020. Most articles did not meet the inclusion criteria, predominantly because they featured older children; focused on the primary school context; examined ECEC programmes with a home or minority language, instead of a foreign language; did not contain original research; or did not involve an ECEC programme. For seven articles, we were unsure whether they met the inclusion criteria based on the abstract, but the full article was inaccessible through the university library or other means, so they were excluded. Thirty-seven articles met the inclusion criteria. Of these, five articles reported extremely short exposure periods to the foreign language (only a few minutes) and were excluded.

This resulted in a final set of 32 included articles which we read in detail and report on in this review article: 14 quantitative, 16 qualitative, and 2 mixed-methods studies. None of these were included in earlier reviews that focused on bilingual ECEC for very young children at preschool age (Bialystok, 2018; Buysse et al., 2014), because those reviews did not examine the foreign language context. Studies targeted the outcomes of foreign language ECEC in terms of language development and well-being ( $n=23$ ), programme-related factors ( $n=19$ ), and child-related factors ( $n=9$ ). Twenty-seven studies investigated the introduction of English through foreign language ECEC, two studies examined a combination of English and Spanish as foreign languages, two studies looked at French, and one at German as a foreign language. Detailed information about each study's focus, main aim, participants, method, and main findings can be found in the Supplemental Online Material<sup>3</sup>.

The remainder of this chapter will focus on our three review questions. The first part reviews the outcomes of foreign language ECEC programmes in terms of foreign language development, development of the majority and first

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<sup>3</sup> <https://www.tandfonline.com/doi/full/10.1080/07908318.2021.1984498#supplemental-material-section>

language, and well-being. The second part describes which programme characteristics might relate to language development and well-being, including input quantity, programme design qualities, and teacher strategies and interaction practices. Lastly, we consider which child-related factors have been explored in research on foreign-language ECEC, such as the role of age, socio-economic background, and language background.

## **2.3 Outcomes of foreign language ECEC**

### **2.3.1 Foreign language development**

In total, 21 studies looked at children's development of the foreign language. Five longitudinal studies with high foreign language exposure provide the most compelling evidence for lasting foreign language development in foreign language ECEC (Bergström et al., 2016; Buyl & Housen, 2014; Cheour et al., 2002; Ferjan Ramírez & Kuhl, 2017, 2020). These studies showed that children developed phoneme discrimination abilities, alongside receptive and/or productive vocabulary and grammar skills in the foreign language over the course of several months or years, and there were indications that these learning gains were maintained for months after the end of the foreign language programme (Ferjan Ramírez & Kuhl, 2017, 2020). Most of the ECEC centres in these longitudinal studies offered English as a foreign language, alongside the majority language. The exact approaches differed: some used a one-teacher-one-language policy (Bergström et al., 2016, also some centres in Buyl & Housen, 2014, see Wipperman et al., 2010), while others had set English moments during the week (e.g., four to five hours a week, Ferjan Ramírez & Kuhl, 2017, 2020). Children in these studies spanned different age ranges: 0-3 years (Ferjan Ramírez & Kuhl, 2017, 2020), 2-6 years (Bergström et al., 2016), and 3-6 years (Buyl & Housen, 2014; Cheour et al., 2002). In several ECEC centres, children did not have a monolingual majority language background (Buyl & Housen, 2014). In the ELIAS project, receptive vocabulary (n=217) and grammar (n=168) development of children in nine bilingual preschools in Germany, Belgium, and Sweden were tested at least twice 6-12 months apart (Buyl & Housen, 2014). Bergström and colleagues (2016) assessed productive vocabulary and grammar development at four points over the course of two and a half years in an English-German centre in Germany. Ferjan Ramírez and Kuhl (2017, 2020) followed more than 250 children in total in English-Spanish infant education centres in Spain after 18 and 36 weeks of the intervention. All studies found significant foreign language learning gains, and Ferjan Ramírez and Kuhl (2017, 2020) showed that learning effects were retained for an additional 18 weeks after the end of the programme.

That said, the aforementioned ELIAS project reported a large gap between receptive and productive skills, with productive skills lagging behind (see

Rohde, 2010). Moreover, some studies found more moderate learning gains than the longitudinal studies above, which seemed to be related to programme characteristics. For example, Lugossy (2018) examined two English-Hungarian preschools in Hungary with daily English sessions and occasional use of English during the day. She related the small learning gains of the 36 children in the study (1-7 years old) to the low need to communicate in English in the preschool, because of the frequent use of Hungarian and the low use of scaffolding techniques, such as elicitation and feedback. Overall, however, foreign language ECEC seemed to lead to lasting foreign language development in the reviewed studies, especially in case of prolonged and frequent exposure.

### **2.3.2 Development of other languages**

In total, nine studies examined the development of other languages in foreign language ECEC, to assess whether exposure to a foreign language comes at the expense of the other language(s), often the first or majority language. Four quantitative studies compared the results of an experimental foreign language ECEC group to those of a control group, and generally did not find negative effects on first language development (Bergström et al., 2016; Ferjan Ramírez & Kuhl, 2017, 2020; Takahashi et al., 2011). For example, Ferjan Ramírez and Kuhl (2017, 2020) randomly assigned Spanish-speaking children (n=250 in their 2017 study; n=252 in their 2020 study) to either a foreign language intervention group or a control group in infant education centres in Madrid (Ferjan Ramírez & Kuhl, 2017, 2020). In the intervention group, children were exposed to four to five hours of English per week, whereas the control group was exposed to two hours of English per week. Spanish receptive vocabulary development did not differ between children in the foreign language intervention group and the control group, and there was no interaction between time and group.

Several qualitative studies in various settings underscore these results (Alstad & Tkachenko, 2018; Boyd & Ottesjö, 2016a; Elvin et al., 2007; Lucas et al., 2021). They suggest that exposure to a foreign language could lead to positive transfer in the first language (Lucas et al., 2021), increased majority and first language use of children with a migration background (Alstad & Tkachenko, 2018), and awareness of distinctive linguistic features of the majority and foreign language (Boyd & Ottesjö, 2016a; Elvin et al., 2007). The only study that reported slower development of other languages, in this case the first language, was conducted at an English-only centre (Lin & Johnson, 2016). In this study, 25 Mandarin-speaking 2-to-6-year-olds in the foreign language programme scored significantly lower on Mandarin receptive and expressive vocabulary tests than 24 monolingual peers receiving no English input (matched on gender, nonverbal intelligence, and parental education). A possible explanation for this finding, also acknowledged by the authors, is that children were not exposed to Mandarin at preschool, and thus lacked school vocabulary

in Mandarin. In the other studies with control groups that were described earlier, this was not the case, which might explain why foreign language ECEC generally did not negatively affect children's development of the other language(s), often the first or majority language.

### 2.3.3 Well-being

Five studies in our set discuss how foreign language ECEC impacts on children's well-being. Three of these studies reported that the foreign language programme contributed to children's well-being (Alemi et al., 2017; Alstad & Tkachenko, 2018; Elvin et al., 2007). Positive well-being seemed to be related to the pedagogical approach in these studies: teachers were careful when introducing the foreign language to the children, devoting attention to reducing anxiety and developing positive feelings, and the programmes were informal and play-based (Alemi et al., 2017; Elvin et al., 2007). The programme that Elvin and colleagues (2007) described, for example, was based on games, songs, and stories, and the focus was on enjoyment and play; there was no instruction. Roughly 40 children (ages 3-6) participated, and observations showed that they enjoyed learning a new language. Alstad and Tkachenko (2018) also observed positive effects of foreign language ECEC on the well-being of minority language children in Norwegian ECEC centres, as they no longer felt alone in their multilingualism and language learning experiences.

However, not all studies reported positive results, and this seems to be related to programme design (Caporal-Ebersold & Young, 2016; Lugossy, 2018). In the study by Lugossy (2018), English sessions took place in an unfamiliar room, with unfamiliar teachers, in an unfamiliar language, and were very lesson-like. Observations showed that children wanted to leave, barely spoke the foreign language, and were crying and even kicking the teacher. When one teacher decided to break with institutional policy and offer more naturalistic English sessions, children's well-being seemed to increase. The same tension between institutional language policy and children's well-being also surfaced in another ethnographic study, which investigated an English-French parental crèche in Strasbourg with a strict one-teacher-one-language policy (Caporal-Ebersold & Young, 2016). Specifically, teachers expressed in interviews that they could not always abide by this policy, and for example considered it necessary to switch languages if children's well-being was at risk. In sum, earlier studies show that play-based programmes with a flexible language policy seemed to be most conducive to well-being, with teachers playing an important role in promoting well-being.

## **2.4 Programme-related factors**

### **2.4.1 Input quantity**

As already became evident above, the reviewed studies varied widely in programme characteristics of the foreign language ECEC centres investigated. Importantly, there were clear differences in input quantity, both across studies, and within studies. Some ECEC centres used 50-50 (for example, one-teacher-one-language) approaches (Bergström et al., 2016), while others mostly used the foreign language, for example for all instructional activities (Boyd & Ottesjö, 2016a). Again others mostly used the majority language and provided exposure to the foreign language at short and set points in time (Takahashi et al., 2011). A few studies indicated that the foreign language was used less in practice than on paper (Benz, 2017; Lugossy, 2018). Only a few reviewed studies discussed the role of input quantity and intensity in foreign language ECEC (Bergström et al., 2016; Buyl & Housen, 2014), and they all looked at foreign language input and development only and did not take input outside of the daycare into account.

Bergström et al. (2016) examined input intensity in an English-German preschool, and calculated the total number of hours that each child (n=27) spent interacting with the foreign language teacher, as well as the elaborateness of these contact moments. The authors found that input intensity was significantly related to receptive vocabulary and grammar knowledge in English at the last two (of four) time points over two and a half years. Similar findings on input intensity were obtained in the aforementioned ELIAS project (see Rohde, 2010; Steinlen et al., 2010). However, even in cases of intensive exposure to the foreign language for several years, children sometimes only developed receptive skills (see Rohde, 2010). Moreover, input quantity did not seem to be the only determinant of learning in some studies, as lower input quantity groups sometimes did not score lower than higher input groups (Alemi & Haeri, 2020, 2017; Buyl & Housen, 2014). Taken together, the results of these studies suggest that input quantity and intensity are important factors, but that other factors, like input quality, also play an important role in foreign language learning in ECEC.

### **2.4.2 Programme design qualities**

Eight qualitative studies looking into programme design qualities in terms of staff and language policy have suggested that a flexible language policy is vital to the success of foreign language ECEC (Caporal-Ebersold & Young, 2016; Lugossy, 2018; Sun et al., 2015). These studies observed adverse effects of strict language policies in which teachers may only use the foreign language. For example, Sun et al. (2015) conducted observations of four Chinese-speaking 3-year-old children during a 20-week-long English programme in China. These

authors showed that an English-only policy could lower children's participation and motivation. Alstad and Tkachenko (2018), in their examination of teacher practices in English-Norwegian ECEC centres in Norway, noted that teachers often abandoned the one-teacher-one-language policy, because they found it unnatural and noticed that it hampered mutual understanding and teacher-child relationships.

Another programme design topic for foreign language ECEC is teacher competence. In several studies, teachers had not received specific training for teaching foreign languages to young children, or had little experience with foreign language teaching (Andúgar & Cortina-Pérez, 2018; Kaščák et al., 2012; Lugossy, 2018). Based on interviews with 32 English teachers in an English-Spanish preschool in Spain, Andúgar and Cortina-Pérez (2018) noted that there appeared to be a shortage of teachers who were specialised in the ECEC age group and were able to provide high-quality input and keep children engaged. Moreover, in Lin's (2012) study at an English-Chinese ECEC centre in China, teachers sometimes had to rely on the first language, because their proficiency in the foreign language was not high enough. This low proficiency in the foreign language and reliance on the first language could result in less (naturalistic) exposure to the foreign language. Taken together, the results of these studies suggest that an effective foreign language ECEC programme requires well-educated, experienced, and professional teachers who can provide age-appropriate activities and are proficient enough in the foreign language, and who do not stick rigidly to a language policy.

### 2.4.3 Teacher strategies and interaction practices

Thirteen mostly qualitative studies discussed a wide array of teacher strategies and interaction practices and showed that these contributed to high quality input in foreign language ECEC. Scaffolding techniques (repetition, elicitation, feedback, etc.) appeared to promote foreign language learning in various studies (Björk-Willén, 2008; Fleta Guillén, 2018; Lin, 2009, 2012; Lugossy, 2018). Lin (2012), in an observation study, compared three scaffolding methods while children ( $n=93$ , aged 3-4) were playing a language game in an English-Mandarin bilingual ECEC centre in China. The author described the advantages of scaffolding that used both the foreign language and first language: it combined foreign language exposure with comprehensible input, children's noticing, and use of prior knowledge.

Besides the use of interactional techniques, meaningful language input is also highlighted as an important gateway to learning in various studies, and this can take the form of, for example, games, songs, and stories (Albaladejo Albaladejo et al., 2018; Elvin et al., 2007; Fleta Guillén, 2018; Lugossy, 2018; Pino Juste & Rodríguez López, 2010). Albaladejo Albaladejo and colleagues (2018) compared

the effectiveness of songs and stories in vocabulary acquisition at an English-Spanish preschool in Spain. The 17 Spanish-speaking children, aged 2-3 years old, took part in one intervention each week: in the first week stories, in the second week songs, and in the third week a combination of songs and stories. Stories were most effective in teaching vocabulary. The authors noted that the effectiveness of stories over songs for foreign language learning in this age group echoed earlier findings (Leśniewska & Pichette, 2014). However, song selection is also important: as Pino Juste and Rodríguez López (2010) remarked, many traditional children's songs use quite advanced and archaic language, and might therefore not be a source of meaningful language input.

Another type of activity that could be useful in developing the foreign language is the use of routines, as mentioned in several studies (Björk-Willén, 2008; Fleta Guillén, 2018; Lugossy, 2018). These are recurring activities with rather fixed forms and content, such as greeting rituals or lunch routines (Björk-Willén, 2008). Routines might not only be a useful tool for developing language competence in the second language, but also aid understanding and predictability. This became apparent when teachers did not stick to their routines (Björk-Willén, 2008; Kaščák et al., 2012), for example in a study in a multilingual preschool in Sweden, where Swedish was the main language, and English and Spanish language groups met four times a week (Björk-Willén, 2008). The children who participated (n=24) were aged 3-5 years and came from diverse home language backgrounds. Qualitative analyses of teacher-child conversations showed that the children got confused when the teacher deviated from the routines in the foreign language and did not understand what was expected of them. Routines might also prove beneficial to language learning in another way: by providing opportunities for children to re-enact these sequences in peer play. In another study in the same multilingual preschool in Sweden, children enjoyed repeating routines during peer interactions, which leads to the question whether promoting these interactions could help children consolidate what they have learned (Björk-Willén & Cromdal, 2009).

More generally, peer interactions in foreign language ECEC might foster foreign language development (Wang & Hyun, 2009). Participant observations in an English-Mandarin preschool in Taiwan showed that children (n=44, 3-5 years old) assisted each other in language learning during peer interactions using scaffolding techniques (Wang & Hyun, 2009). Alstad and Tkachenko (2018), in their aforementioned study, showed that it might be helpful to introduce the foreign language through a puppet, as children might then also start talking to the puppet in the foreign language during free play. High-quality peer play among children themselves could therefore also create opportunities for foreign language learning. Besides these peer interactions, the studies in this review

showed the importance of various teacher strategies and practices, such as scaffolding, routines, and stories, songs, and games.

## 2.5 Child-related factors

Much of the evidence about foreign language ECEC is based on children living in western countries, mainly in Western Europe (e.g., Germany, Belgium, Spain, Sweden). The foreign language that children were learning was generally English, while their home language was often another Germanic or Indo-European language (Bergström et al., 2016; Buyl & Housen, 2014; Ferjan Ramírez & Kuhl, 2017, 2020). Several researchers noted that foreign language ECEC programmes were generally attended by children from high socioeconomic backgrounds (Benz, 2017; Lin & Johnson, 2016; Lugossy, 2018). It is important to investigate if foreign language ECEC programmes are beneficial for diverse groups of children, but only nine of the reviewed studies investigated this issue. These studies looked at socioeconomic status, language background, child behaviour in class, and age. It is hard to draw conclusions on the basis of these studies, as there were not many and their results were sometimes contradictory.

Ferjan Ramírez and Kuhl (2017) considered the effects of foreign language ECEC on children with varying socioeconomic status, which has often been discussed in relation to bilingual education (Genesee, 2006). The authors found no effects of neighbourhood income on foreign language learning. Of course, neighbourhood income is a crude measure of children's socioeconomic status, and because it was measured at the ECEC centre level, it may have been confounded with other ECEC centre characteristics.

A related factor might be parental involvement, which was studied at three rural English-Spanish preschools in Spain attended by lower socioeconomic status families (Pino Juste & Rodríguez López, 2007). Parental questionnaires (n=244) and interviews with staff suggested that both parents and teachers valued parental participation and recognised that it could increase foreign language learning in children. However, parental involvement was low in the foreign language programmes for various reasons, including low parental English proficiency.

The languages that parents speak with their children could also influence the outcomes of a foreign language ECEC programme. For some children, both daycare languages were new, as they also did not speak the majority language at home (Björk-Willén & Cromdal, 2009; Buyl & Housen, 2014; Lugossy, 2018). For other children, the foreign language was not new, as they actually spoke it at home (Benz, 2017; Björk-Willén, 2008; Boyd & Ottesjö, 2016a; Wang & Hyun, 2009). This means that the proposed theoretical categorisation (Howard

et al., 2003) of foreign language programmes is not as clear-cut in practice. Javorsky and Moser (2020) found that non-majority language background was not an important predictor for French language development in a French-English preschool in the US South, but exposure to French was relatively modest, with a weekly 30-60 minute world language (French) class during 10 weeks. Moreover, the study was based on only 12 children aged 3 years old. However, these results mirror findings from the larger ELIAS project: differences in foreign language outcomes were not related to home language background, and typological distance between home language and foreign language had no clear effect on foreign language learning (Buyl & Housen, 2014, see also Rohde, 2010; Steinlen et al., 2010). The few results on home language background therefore suggested no effects of home language on foreign language learning.

Child behaviour has not been studied extensively either, and only in small samples. Albaladejo Albaladejo et al. (2018) indicated that child behaviour in class could be related to learning, as the two children with the highest learning had a quiet focus during the session, while the two children with the lowest learning were more active during the session. Javorsky and Moser (2020) found that children's engagement was an important predictor of French learning in the 12 children, in contrast to age, gender, or home language background. Temperament of the four children in the aforementioned study by Sun et al. (2015) was assessed with a parental questionnaire and appeared to be related to their language development (Sun et al., 2015). Higher adaptation and activity levels, as well as positive mood and more initial reactions were related to more foreign language production during the activities. While the few studies on child behaviour therefore showed some tentative evidence for effects on learning, all of them are very small-scale studies.

Lastly, age is a complex factor to examine, because it may be confounded with many other factors, such as age of onset and cumulative exposure to the foreign language. Javorsky and Moser (2020) found that age was not significantly related to French learning, which could be due to the small sample size ( $n=12$ ). In the study on English-Spanish ECEC that was described earlier, Ferjan Ramírez and Kuhl (2017) looked at differences in language outcomes in four age clusters: 7-14 months, 14-20 months, 20-27 months, and 27-33 months. The study showed that every age group ( $n=250$ ) attending foreign language ECEC outperformed the control children on both vocalisations and mean length of utterance. Older children showed larger learning gains during the study than younger children in English productions, which might be related to maturational differences in production, as the youngest children were barely 1 year old. Other studies on age were even harder to interpret, because a higher age was correlated with higher cumulative exposure (Hidaka et al., 2012;

Łockiewicz et al., 2018). These studies showed higher learning in the older groups of children, but this could be due to both age-related cognitive development or higher cumulative input. Results on age, like on other child-related characteristics, are therefore not only scant, but also hard to interpret.

## **2.6 Discussion**

### **2.6.1 Summary of review findings**

In this review, we synthesised findings on foreign language ECEC in very young children, aged predominantly 0-4 years old. The first aim of our study was to examine the effects of young children's exposure to a foreign language in ECEC. In line with earlier reviews in different ECEC settings (Bialystok, 2018; Buysse et al., 2014), we concluded that research showed positive effects of foreign language ECEC on children's foreign language development (Bergström et al., 2016; Buyl & Housen, 2014; Cheour et al., 2002; Ferjan Ramírez & Kuhl, 2017, 2020; Hidaka et al., 2012). In a large-scale study on English-German, English-French, and English-Swedish daycare, children mostly developed receptive skills in the foreign language (Rohde, 2010), which echoes other research in different bilingual ECEC contexts (Björklund et al., 2014; Prošić-Santovac & Radović, 2018). This might be linked to the young age of children, in which they are also still developing their first language. Negative effects were generally not reported in the studies looking into children's development of the majority and first language (Alstad & Tkachenko, 2018; Bergström et al., 2016; Boyd & Ottesjö, 2016a; Ferjan Ramírez & Kuhl, 2017, 2020; Lucas et al., 2021; Takahashi et al., 2011). However, one study suggested that exposure to the first language at preschool was important for children to develop school-related vocabulary in this language (Lin & Johnson, 2016). The few studies investigating children's well-being included in our study review indicated that foreign language ECEC programmes could lead to positive well-being in children in general, and additionally to a feeling of recognition and acceptance of children with different language backgrounds (Alemi et al., 2017; Alstad & Tkachenko, 2018; Elvin et al., 2007). However, this was only true for settings in which teachers paid attention to child well-being, ensured a play-based and safe environment, and did not strictly adhere to a language policy (Alemi et al., 2017; Caporal-Ebersold & Young, 2016; Elvin et al., 2007; Lugossy, 2018).

Our second aim was to assess the influence of programme characteristics on foreign language ECEC outcomes. The few studies on input quantity and intensity found that these were positively associated with foreign language grammar and vocabulary learning (Bergström et al., 2016, echoing findings from the wider ELIAS project, Rohde, 2010; Steinlen et al., 2010). It therefore seemed to be beneficial if children attended the ECEC centre and heard the

foreign language frequently, but the way in which the input was presented also mattered. Studies showed adverse effects of a strict language policy (e.g., foreign language only, or strict forms of one-teacher-one-language) on language development, motivation, well-being, and social relations (Alstad & Tkachenko, 2018; Caporal-Ebersold & Young, 2016; Sun et al., 2015). Moreover, various studies reported that teachers in foreign language ECEC programmes were not necessarily experienced or educated for this goal and age group, which sometimes decreased input quality and programme outcomes (Andúgar & Cortina-Pérez, 2018; Kaščák et al., 2012; Lugossy, 2018). In terms of teacher strategies and practices, the studies identified the following factors as conducive to foreign language development: employing scaffolding techniques and the home language when they can aid learning and well-being, and using meaningful, enjoyable, context-based activities such as games, stories, and routines (Albaladejo Albaladejo et al., 2018; Alstad & Tkachenko, 2018; Andúgar & Cortina-Pérez, 2018; Björk-Willén, 2008; Elvin et al., 2007; Fleta Guillén, 2018; Lin, 2012; Lugossy, 2018; Sun et al., 2015). Peer interactions between children themselves also fostered foreign language learning (Björk-Willén & Cromdal, 2009; Wang & Hyun, 2009). However, more research – ideally involving larger samples – is needed to enable firm conclusions about the role of these programme-related factors, as most studies in this domain were qualitative case studies.

Our third aim was to identify which child-related characteristics, such as age, socio-economic background, parental involvement, child temperament and in-class behaviour, and language background, might modulate the effects of bilingual ECEC (Albaladejo Albaladejo et al., 2018; Buyl & Housen, 2014; Ferjan Ramírez & Kuhl, 2017; Hidaka et al., 2012; Javorsky & Moser, 2021; Pino Juste & Rodríguez López, 2007; Sun et al., 2015). The main findings were that age, child temperament, and behaviour were related to foreign language development, but it was hard to formulate conclusions for several reasons. Few studies examined child-related factors, there were confounding factors, and findings were sometimes contradictory. This review has made it quite clear that these factors have been studied insufficiently in relation to foreign language ECEC to draw firm conclusions.

### **2.6.2 Directions for future research**

If there is one point that this review makes clear, it is that most research into foreign language ECEC has been exploratory. For example, in most reviewed studies, time spans were relatively short, mostly a couple of hours a week of foreign language exposure over the course of a few weeks or months. Only two studies looked into language learning over the course of more than one year (Bergström et al., 2016; Buyl & Housen, 2014). When participants are very young and the ECEC classroom is the only source of foreign language input,

the effects of bilingual ECEC on foreign and majority language development may only be visible after prolonged exposure. Future studies could examine in more detail to what extent foreign language learning effects persist in later years, well into primary school.

Besides tracking language development longitudinally, studies could research child well-being in foreign language ECEC more extensively. Although many of the included studies on well-being were small-scale and anecdotal, they showed that well-being in foreign language ECEC is not self-evident (Lugossy, 2018). Since teacher practices and peer behaviour in ECEC seemed to relate to lowered well-being (Cekaite & Evaldsson, 2017; Lugossy, 2018), it is worth investigating teacher-child interactions and peer interactions in more detail. Another avenue to be explored further is how children's developing multilingual proficiency relates to well-being, as this could be a dynamic relationship in which multilingual proficiency and well-being show reciprocal relationships (Marbina et al., 2015).

The precise effects of input quantity and intensity on children's language development require further attention too. For example, various studies indicated that the amount of foreign language input in these programmes was lower in practice than on paper (Alstad & Tkachenko, 2018; Benz, 2017; Boyd & Ottesjö, 2016a; Lugossy, 2018). Furthermore, there was variation in how often individual children attended the ECEC centre, and how much they were exposed to foreign language input (Bergström et al., 2016). Generally, this review showed that more foreign language input resulted in more foreign language learning (as would obviously be expected). It is not clear, however, how many hours or days exactly the foreign language should be offered, how often children should attend, and what this means for their foreign, majority, and first language development.

Studies on input quantity did not take the home language situation into account. However, it turned out that some children did not speak either of the daycare languages at home, while others spoke the majority language, the foreign language, or even both daycare languages at home (Benz, 2017; Björk-Willén, 2008; Boyd & Ottesjö, 2016a; Buyl & Housen, 2014; Lugossy, 2018; Wang & Hyun, 2009). In this light, it was surprising that several studies did not provide information about children's home language backgrounds (see Supplemental Online Material<sup>3</sup>), making it difficult to assess whether effects in language development, and perhaps even well-being, could be linked to the situation at home. In such studies, any observed effects could not be attributed unequivocally to the input provided at the ECEC centre, as they might (also) be due to the input received at home, a question which should be examined further to determine the effects of foreign language ECEC.

Another understudied issue in foreign language ECEC relates to the characteristics of the input in the classroom. As a reviewer noted, the effect of teachers' language background and proficiency should be examined further. Bilingual teacher-child interactions also deserve more attention, as these were mostly only examined in an exploratory way. Work on this topic could adopt methodological approaches and concepts from the extant literature on early bilingual language learning in the home context. Particularly helpful in this respect is a study by Lanza (2004) who investigated how parental discourse strategies affected children's use of the minority language. A comparable approach in the context of the foreign language ECEC centre could be used to characterise teacher strategies as well as children's reactions to such strategies, and link these to language development, as well as well-being.

The current review indicates that an additional source of language input in foreign language ECEC are peer interactions, and these warrant further research. The few available studies addressing this issue showed that children re-enacted instructional activities during peer play and that this could promote foreign language development (Alstad & Tkachenko, 2018; Björk-Willén & Cromdal, 2009; Wang & Hyun, 2009). However, there are more ways in which peer interactions could influence children's development of language and social skills and well-being. There is preliminary evidence that the amount of peer input differs across children in ECEC, that peers might have language preferences when talking amongst themselves, and that some children could be excluded by their peers based on language background and proficiency (Boyd et al., 2017; Cekaite & Evaldsson, 2017; Chaparro-Moreno et al., 2019), which could all impact language development. Low daycare language competence could lead to fewer peer interactions (Dominguez & Trawick-Smith, 2018), which might negatively impact language and social skills and well-being (Coplan & Arbeau, 2009).

Future studies could also delve more deeply into the role of child-related characteristics in foreign language ECEC programmes. Child-related factors were hardly examined in the reviewed studies, and results remain hard to interpret. For example, only one study in the current review looked at parental involvement (Pino Juste & Rodríguez López, 2007). Earlier research on ECEC has pointed to the importance of this factor, indicating that children may benefit more from language exposure in preschool when their parents are involved in their education and perform language-oriented activities at home (Dearing et al., 2006; Duch, 2005).

Furthermore, the reviewed studies showed that foreign language ECEC programmes may be more popular with families from higher socioeconomic backgrounds and with prestige languages, such as English. It would be

interesting to examine what draws these parents to early foreign language programmes, and why particular languages are chosen, for example English because of its lingua franca status. It is unclear to what extent results can be generalised to other populations. Earlier research suggests that positive effects of ECEC on development could be larger for children from low socioeconomic status homes than children from high socioeconomic status homes (Leseman et al., 2017; Melhuish et al., 2015). The question therefore arises whether children from certain backgrounds benefit more from bilingual language input at ECEC than others, a question that cannot be answered on the basis of the current literature.

In conclusion, foreign language ECEC may be an interesting and promising way to meet the increasing demands for early foreign language programmes. The current review on foreign language ECEC showed that these programmes fostered foreign language learning, and did not hinder majority or first language development. However, exact effects on language development and well-being seemed to depend on programme and child characteristics. This review highlighted that these factors warrant further research. Notably, while interest in foreign language programmes for young children is increasing in parents, caretakers, educators, and policymakers, research on this type of bilingual education is still in its infancy.



### 3. Teachers' reported experiences with the peer interactions of emergent multilingual children in ECEC<sup>4</sup>

“Dan zie je soms dat dat Marokkaanse meisje toch een beetje erachteraan loopt [...]. [Maar als we zeggen] zij mag ook meespelen, hè, en we spelen even mee, dan gaat het wel weer sneller, weet je, dan gaan ze d'r toch erbij betrekken, maar je moet er wel op blijven anticiperen.”

“You do sometimes see that the Moroccan girl is left behind a bit [...] [But if we say] she can also join, and if we join the play ourselves, then it happens more quickly that they involve her too, but you do need to keep anticipating it.”

(teacher K, Thieme et al., 2025a)

#### 3.1 Introduction

The importance of peer play for young children was already addressed in the theories of Piaget and Vygotsky (Veraksa et al., 2022). Research has shown that peer interactions and peer play contribute to children's linguistic, social, and cognitive development, especially if they involve complex language, cooperation, and play forms such as role and fantasy play, in other words, if there is high peer play quality (Coplan & Arbeau, 2009; Quinn et al., 2018). In early childhood education and care (ECEC), children typically get time to play with peers during free play. Peer interactions in ECEC seem to be especially helpful for emergent multilinguals, that is, children who speak another language at home and who are developing as multilinguals (García, 2009). Through peer interactions, especially with peers who have a similar language background, multilingual children can experience an increased sense of belonging and feel socially included in an environment where another language is spoken than at home (Eggum-Wilkens et al., 2014; Halle et al., 2014; Licandro, 2016). Peer interactions can also foster multilingual children's skills in the ECEC language if they frequently play with peers with a high ECEC language proficiency (García, 2021; Rydland et al., 2014; Washington-Nortey et al., 2022).

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<sup>4</sup> This chapter is a slightly modified version of a published article: Thieme, A. M. M., Kuiken, F., Andringa, S., & Verhagen, J. (2025). Teachers' reported experiences with emergent multilingual children's peer interactions in early childhood education and care in the Netherlands. *Journal of Research in Childhood Education*, online first. <https://doi.org/10.1080/02568543.2025.2506701>

There is a lack of systematic research into what linguistic diversity means for peer play at a young age (Halle et al., 2014; Washington-Nortey et al., 2022). There is evidence that language background might guide peer group formation as peers play together and form peer groups. Children could be more likely to play with same-language peers (Feng et al., 2004; Kyratzis et al., 2009; Thompson, 1996), which could affect peer learning opportunities. However, some ECEC teachers have voiced concerns regarding the peer interactions of emergent multilingual children (Mansikka et al., 2024). There are indications that emergent multilingual children experience less social inclusion, namely, that they have fewer peer interactions, and are excluded more often than their monolingual peers (as also noted in Chapter 2, Bernstein, 2018; Dominguez & Trawick-Smith, 2018) and that they experience lower peer play quality (Arvola et al., 2021; Stangeland, 2017). These findings should not be interpreted through a deficit lens, as if they are due to a problem in multilingual children's development. In fact, it is likely that many (situational) factors play a role, such as the ECEC centre's language policy or other characteristics of the ECEC centre, the teachers, or the children. These factors might help explain why previous findings on this topic have been mixed.

The mixed-methods study in this chapter was designed to query teachers more systematically on the concerns they raise and to find out more about factors that could play a role in the relationship between multilingualism and peer interactions. Using surveys and interviews, we asked teachers about multilingual children's social inclusion, peer play quality, and peer group formation.

### **3.2 Previous studies on the peer interactions of emergent multilingual children in ECEC**

Below, we first lay out what is currently known from the literature about multilingual children's social inclusion, peer play quality, and peer group formation in ECEC. We conclude that there is a lack of research on teachers' reported experiences with emergent multilingual children's peer interactions, while these experiences can bring interesting insights.

#### **3.2.1 Social inclusion of young multilingual children in ECEC**

There are indications in the literature that emergent multilinguals might experience less social inclusion (Bernstein, 2018; Cekaite & Evaldsson, 2017; Dominguez & Trawick-Smith, 2018; Neitzel et al., 2019). Small-scale studies with mostly 4-year-old children in the United States have shown that emergent multilingual children's attempts to access peer play were rejected more often (Neitzel et al., 2019), that they experienced more difficulty and frustration interacting with peers (Banerjee, 2023), had fewer peer interactions (Banerjee, 2023; Dominguez & Trawick-Smith, 2018), were disliked more often (Gertner

et al., 1994), and held more marginal positions in peer networks (Bernstein, 2018; Neitzel et al., 2019). An observation-based Israeli study that included 32 children (3-7 years old) in Hebrew ECEC had similar findings, although emergent multilingual children did have more peer interactions over time as their ECEC language proficiency increased (Blum-Kulka & Gorbatt, 2014). In a Swedish ethnographic case study, Cekaite and Evaldsson (2017) analysed the difficulties that a 3.5-year-old Arabic-speaking girl had when she entered Swedish ECEC and attempted to interact with her peers. Her peer play access strategies were communicatively basic and involved physical acts, like entering other children's play space and taking toys, and her language was ridiculed by her peers.

The latter study indicates that more factors might be at play than only language background and proficiency, such as social and communicative competence and peer play access strategies. This aligns with literature showing that multilingual children's social skills and communicative needs play a role in their peer interactions and, through these interactions, their language development (Schwartz, 2024; Wong Fillmore, 1991). Moreover, Halliday and colleagues (2022) found that shyness could be a moderating factor in the relationship between preschool language proficiency and classroom integration. In their study, lower preschool language proficiency related to lower classroom adjustment; however, there was no relation between preschool language proficiency and classroom adjustment for the shiest children. Also, the studies above show that, for successful peer interactions and a conducive peer learning environment, the agency and cooperation of not only the multilingual child, but also their peers, plays an important role (Schwartz, 2024).

### **3.2.2 Peer play quality of multilingual children in ECEC**

Regarding peer play quality, the literature indicates that emergent multilinguals might have fewer opportunities for complex peer interactions, but that children's sociability, nonverbal communication, and code-switching also play a role. In a large-scale Finnish project by Arvola and colleagues (2021), 5- to 6-year-old children with culturally and linguistically diverse backgrounds engaged mostly in basic rule play, instead of more complex role play. A large-scale study on 2-year-olds in Norwegian ECEC also showed that peers with lower ECEC language skills engaged in more solitary and less complex play than children with higher ECEC language proficiency (Stangeland, 2017). However, in an ethnographic study in an American preschool, 3- to 5-year-old multilingual children did engage in complex peer interactions, also if they had lower ECEC language proficiency, for example through code-switching and nonverbal communication (Kyratzis et al., 2009). The ability to use other communicative resources (nonverbal, the home language) might be a moderating factor in the relationship between emergent multilingualism and peer play quality. Social

competence could also play a role: in the aforementioned study in Norway, social competence explained variance in play quality above and beyond ECEC language proficiency (Stangeland, 2017).

### **3.2.3 Peer group formation and multilingualism in ECEC**

With respect to the relationship between multilingualism and peer group formation, a social preference has been found in older children for peers who speak the same language (Arredondo & Gelman, 2017; Kinzler et al., 2009; Lee & Walsh, 2003; Paquette-Smith et al., 2019). In ECEC, small-scale qualitative studies have also shown that children tend to play with others with the same language background (language-based homophily) and use their home language in play (Feng et al., 2004; Kyratzis, 2010; Thompson, 1996). In an ethnographic study, Kirsch and Mortini (2023) have described that, in one of two ECEC settings in Luxemburg, children (2 and 3 years old) tended to play with peers with the same home language. This seemed to depend on (informal) language policy: in that particular ECEC centre, few opportunities were created for the mixing of the ECEC language and home language.

### **3.2.4 Teachers' experiences with the peer interactions of emergent multilingual children**

There are few studies on teachers' reported experiences with emergent multilingual children's peer interactions. With teachers' reported experiences, we refer to what teachers have observed in their classrooms and how they analyse these situations; teachers' experiences are part of teacher cognition: what teachers think, notice, believe, and do (Borg, 2015; Cichocka, 2024). Teachers are interesting informants, as they have a lot of experience with diverse groups of children in various settings (also see Chen et al. 2019). Compared with observation-based studies, teacher accounts are based on more data and are not subject to the potential influence of a researcher's presence on children's behaviour. There have been calls to take teachers' perspectives more seriously and to avoid placing researcher perspectives above teacher perspectives (Lefstein & Snell, 2011). Moreover, teachers' experiences relate to teacher noticing: events teachers notice and regard as significant for learning (Keppens et al., 2021; Meschede et al., 2017; Roose et al., 2019). What teachers observe and notice in the classroom might influence their pedagogy, and thus, the learning opportunities that children have (Keppens et al., 2021; Meschede et al., 2017). Teachers play an important role in creating opportunities for, stimulating, and guiding (multilingual) children's peer interactions and peer play (Nilsen, 2021; Rosiers et al., 2016). Listening to teachers' experiences is therefore also a way of investigating what is on their radar, how they think this works, and what they do in the classroom.

Teachers have been consulted as informants in studies on multilingualism in education (e.g. Alisaari et al., 2019; Flores & Smith, 2009; Pohlmann-Rother et al., 2023), but studies with ECEC teachers are less common (Alstad & Mourão, 2021). Existing studies mainly look at teachers' beliefs about multilingualism in ECEC (Aleksić & Bebić-Crestany, 2023; Alstad & Tkachenko, 2018; Lengyel & Salem, 2023). However, in one recent study, teachers were interviewed about the role that language plays in social inclusion and exclusion in a Swedish-Finnish ECEC centre (Mansikka et al., 2024). Some teachers mentioned that children who did not speak the language of their peers well were at risk of exclusion, such as emergent multilingual children who did not have high proficiency in Swedish and Finnish yet.

### 3.3 The present study

There is a lack of research on teachers' reported experiences with the peer play quantity, quality, and peer group formation of emergent multilingual children in ECEC. Previous observational research suggests that emergent multilingual children could experience less social inclusion and have fewer complex peer interactions, despite the importance of such interactions for linguistic, social, and cognitive development (Coplan & Arbeau, 2009). Multilingualism might guide peer group formation and thereby peer learning opportunities (Erdemir & Brutt-Griffler, 2022; Halle et al., 2014; Washington-Nortey et al., 2022). ECEC teachers seem to recognise part of these findings in the literature: at least some of them express worries about the social inclusion of emergent multilingual children (Mansikka et al., 2024). However, it is an open question as to what extent these concerns are shared by other teachers. Moreover, it is unclear what teachers' reported experiences are with the peer play quality and peer group formation of emergent multilingual children, and which other factors they think might be playing a role.

Previous evidence on emergent multilingual children's peer interactions primarily comes from small-scale studies, making it difficult to assess the scale of the issue. Teachers can help provide a sense of scale, based on many years of experience with a diverse group of children in different settings. Moreover, the studies presented above were mostly about children around or above the age of four, while many children in ECEC are younger. It is unclear to what extent multilingualism relates to peer interactions in this younger age group, when children are beginning to learn to use language to communicate. Young children might rely more on nonverbal communication strategies, possibly reducing the impact of language differences (Blum-Kulka & Gorbatt, 2014). Compared to researcher observation, teacher accounts are especially useful for this young age group, as they know these children better than researchers, and as not all parents and children may feel comfortable with a researcher observing (Chen et al., 2019). Moreover, teachers might also have ideas about possible

mechanisms and factors that play a role in emergent multilingual children's peer interactions, such as the importance of finding a common language for peer play (Mansikka et al., 2024), which could then be examined further in observational or intervention research. For example, there are indications from the literature that factors like language policy, social and communicative competence, personality, and peer culture could impact emergent multilingual children's peer interactions (Ertanir et al., 2021; Oades-Sese et al., 2011; Stangeland, 2017; Theobald et al., 2016; Wong Fillmore, 1991).

The aim of our study was to query teachers on the concerns they might have and the factors that they think could play a role in emergent multilingual children's peer interactions during free play in ECEC. Our research questions were:

1. What are teachers' reported experiences with the social inclusion, peer play quality, and peer group formation of young emergent multilingual children during free play?
2. Based on teachers' reported experiences, which factors might play a role in emergent multilingual children's peer interactions?

Our study took place within the context of ECEC in the Netherlands. In the Netherlands, ECEC targets children below the age of four, starting at 0 years of age, up to and including 3 years of age. Like in other Western countries, there is an increasing number of multilingual children in ECEC in the Netherlands (Langeloo et al., 2019; Steffens, 2020). Two and a half million people, in a population of almost eighteen million, have a migration background and grew up with a different language at home (KNAW, 2018). However, at the time of our research, Dutch law enforced monolingual ECEC in Dutch or an official regional language; ECEC teachers could only use other languages in exceptional cases (MIND Team et al., 2021). As a result, only a few ECEC locations in the Netherlands use different languages in ECEC than Dutch or regional languages – most often English (Schalkwijk et al., 2022). After our data had been collected, a law was passed that allowed the general use of English, French, and German in ECEC settings for maximally 50% of the time (but not other languages). Dutch ECEC law does not focus specifically on supporting multilingual children and their home languages (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2024). However, there are some pedagogical handbooks that do (d'Haens & Roest, 2021; Singer et al., 2009; Stam et al., 2022). Teachers who work in groups targeting children with a so-called 'language delay'<sup>5</sup> get special training about language development, including

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<sup>5</sup> Often one criterion for such a so-called 'language delay' is emergent multilingualism (Gemeente Den Haag, 2023; Onderwijs010, n.d.).

multilingual development, but with a focus on developing the Dutch language (Inspectie van het Onderwijs, 2024; Onderwijsinspectie, 2016). We were interested in teachers' experiences with multilingual children's peer interactions in this context with a rather monolingual national ECEC language policy.

### 3.4 Methodology

#### 3.4.1 Participants

We asked ECEC teachers in the Netherlands about their experiences with young emergent multilingual children's peer interactions through a survey ( $n = 216$ ) and in-depth interviews ( $n = 13$ ). We used a concurrent complementary mixed-methods approach: the surveys and interviews were set out in parallel and focused on similar questions about multilingual children's social inclusion, peer play quality, and peer group formation in ECEC. The interviews allowed respondents to add more information and examples related to specific cases, pedagogy, possible mechanisms, and factors that might play a role.

##### *Survey participants and their ECEC groups*

Teachers were contacted through e-mail, newsletters, websites, and social media groups for teachers at ECEC, as part of a project on multilingual ECEC (MIND Team et al., 2021). Teachers worked in all types of ECEC that exist in the Netherlands, including both centre-based and home-based facilities for children below the age of four. Therefore, note that when we use the term 'ECEC centre' in the text below, this includes home-based care facilities.

A total of 329 teachers started filling out the survey, of which five were excluded from the dataset because they worked exclusively with older children (above the age of 4), and one was excluded from the dataset because she worked in Belgium. Furthermore, 85 teachers did not complete the survey, and 22 reported that they had no experience with multilingual children, so their responses were not included in the analysis, resulting in 216 survey participants in the current study. The participating teachers reported having "some" or "a lot of" experience<sup>6</sup> working with multilingual children (median age = 38, mean age = 40,  $sd = 10.9$ , 215 female, 1 male). Background information about the participating teachers in the survey can be found in Table 3.1. It shows that teachers from a wide variety of ECEC centres and backgrounds participated. While all teachers reported having at least some experience working with

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<sup>6</sup> The amount of experience was the teachers' own judgment, as there are a lot of ways through which a teacher might, for example, gain "a lot of" experience: because they have many multilingual children in their group currently, because they had some multilingual children over many years, because their ECEC centre devotes a lot of attention to multilingualism...

multilingual children, 32% had (almost) no multilingual children in their current ECEC group. In the Netherlands, group size is government-regulated, and typically varies per day – with a maximum of six infants, ten 1-year-olds or sixteen 2- and 3-year-olds with two teachers in a group (Ministerie van Algemene Zaken, 2021).

Table 3.1. Background information about the surveyed teachers ( $n = 216$ ).

	<i>n</i>	%
<b>Teacher's experience with multilingual children</b>		
Some experience	132	61%
A lot of experience	84	39%
<b>Teacher has taken courses on multilingualism</b>		
Yes	56	26%
No	160	74%
<b>Language background of teacher</b>		
Dutch only	28	13%
Dutch and English only	97	45%
English only	2	1%
Other languages besides Dutch and/or English	89	41%
<b>Educational background of teacher</b>		
Secondary school	3	1%
Vocational ( <i>mbv*</i> ) level 1-2	6	3%
Vocational ( <i>mbv*</i> ) level 3-4	138	64%
Applied university ( <i>hbo*</i> )	63	29%
Research university ( <i>wo*</i> )	6	3%
<b>Official ECEC language(s)</b>		
Monolingual Dutch	191	89%
Dutch/English	19	9%
Dutch/Frisian	3	1%
Dutch/Limburgish	3	1%
<b>Multilingual children in the current ECEC group</b>		
(Almost) no children	69	32%
Some children	93	43%
Roughly half of the children	28	13%
Most children	19	9%
(Almost) all children	7	3%

Table 3.1 (continued). Background information about the surveyed teachers ( $n = 216$ ).

	<i>n</i>	%
<b>Common non-Dutch home languages in the teacher's current ECEC group**</b>		
English	76	38%
Turkish	53	26%
Polish	51	25%
Spanish	30	15%
Arabic	27	13%
German	23	11%
'Moroccan' (unclear whether Berber or Arabic)	22	11%
<b>Highly educated (<i>hbo/wo*</i>) parents in the teacher's current ECEC group</b>		
(Almost) no parents	17	8%
Some parents	57	26%
Approximately half of the parents	67	31%
Most parents	57	26%
(Almost) all parents	18	8%
<b>Age of children in the current ECEC group</b>		
Only 0-year-olds	9	4%
Only 1-year-olds	5	2%
Only 2-year-olds	16	7%
Only 3-year-olds	17	8%
Youngest children (0 and 1 years old)	27	13%
Young children (1 and 2 years old)	4	2%
Toddlers (2 and 3 years old)	48	22%
Vertical (e.g., 0-3 or 1-3 years old)	88	41%
Works with older children, but also flexibly in ECEC	1	0.5%

Note: Percentages might not always add up to exactly 100%, as they are rounded off.

\* Dutch post-secondary school education consists of *mbo* (vocational education) levels 1-4, *hbo* (applied university) and *wo* (research university). There are also associate degrees (*AD*), which are short *hbo* degrees.

\*\* Open question, so the percentages do not add up to 100%; the languages in the table were mentioned by >20 teachers. A total of 202 teachers filled out this question. Teachers were not exhaustive in their answers.

***Participants in the interviews and their ECEC groups***

A total of 13 teachers participated in in-depth interviews (median age = 45, mean age = 43, sd = 11.8, all female). Interviewees were recruited via e-mail and personal contacts, and through the survey (n = 6). Two teachers (K and L) who worked at the same ECEC centre were interviewed together at their request. All teachers reported having experience working with multilingual children; less than half of the interviewees had taken courses on multilingualism (n = 5). Quite a few interviewees worked in English-Dutch or French-Dutch ECEC centres (n = 5). Table 3.2 contains more information about the interviewed teachers.

Table 3.2. Background information about the interviewed teachers ( $n = 13$ ).

Expe- rience (years)	Age (years)	Education	Official ECEC language	Ages of children in ECEC group (years)	SES of parents of ECEC group	Multilingual children in ECEC group	Also completed the survey
<b>A</b> 20	50	Applied university ( <i>hbo</i> )	English-Dutch (OTOL)	2 and 3	High	Almost all	
<b>B</b> 3	36	Research university ( <i>ru</i> )	English-Dutch (OTOL)	1, 2, and 3	High	Most	
<b>C</b> 14	35	Vocational education ( <i>mbo 4</i> )	English-Dutch (English during fixed moments)	2 and 3 (with some children who just turned 4)	Mixed	Some	
<b>D</b> 20	47	Vocational education ( <i>mbo 3/4</i> )	English-Dutch (OTOL)	3	High	Most	Yes
<b>E</b> 2	26	Vocational education ( <i>mbo 4</i> ) (unrelated <i>hbo</i> degree)	Dutch, also shares experiences with French-Dutch (OTOL)	Vertical	Mixed	Most	
<b>F</b> 15	61	Applied university ( <i>hbo 3/4</i> ) <i>master</i> )	Dutch	All groups	High	Half	Yes
<b>G</b> 15	56	Vocational education ( <i>mbo 3/4</i> )	Dutch	1	High	Almost no	Yes

Table 3.2 (continued). Background information about the interviewed teachers ( $n = 13$ ).

Expe- rience (years)	Age (years)	Education	Official ECEC language	Ages of children in ECEC group (years)	SES of parents of ECEC group	Multilingual children in ECEC group	Also completed the survey
<b>H</b> 20	50	Vocational education ( <i>mbo</i> 3/4 (now <i>AD</i> ))	Dutch	2 and 3	High	Some	Yes
<b>I</b> 4	31	Vocational education ( <i>mbo</i> 4)	Dutch	0, 1, 2, 3	Low	Half	Yes
<b>J</b> 18	37	Applied university ( <i>hbo</i> <i>bachelor</i> )	Dutch	All groups	Mixed	Some	Yes; works as teachers' coach
<b>K</b> 30	57	Vocational education ( <i>mbo</i> 3)	Dutch	2 and 3	Low	Almost all	
<b>L</b> 3	26	Vocational education ( <i>mbo</i> 3)	Dutch	2 and 3	Low	Almost all	
<b>M</b> 27	45	Vocational education ( <i>mbo</i> ), then applied university ( <i>hbo</i> )	Dutch	All groups	Mixed	Some	

Note: OTOL: one teacher one language.

See Table 3.1 for more information about Dutch post-secondary education programs.

Teachers K and L were interviewed together.

The playgroups of teachers H, K, and L are included in Chapter 4 as A and C and in Chapter 5 as II and III respectively.

### 3.4.2 Materials and procedure

Surveys and interviews took place concurrently at the end of 2021 and the start of 2022. The survey took place online via Qualtrics (Qualtrics, 2021) and took approximately 15 minutes to complete. The interview lasted between 30 and 60 minutes and was semi-structured, with an interview guide that allowed for follow-up questions. The teachers were interviewed by the author. Teachers could take the survey and/or interview in Dutch or English: 206 surveys were completed in Dutch, and ten in English; twelve teachers were interviewed in Dutch and one interview was conducted in English. This reflects the multilingual background of participating teachers (most teachers spoke English as one of their languages) as well as the fact that some worked in bilingual English-Dutch ECEC (see Table 3.1). Written informed consent and oral informed consent were obtained from each survey and interview participant, respectively. The study was approved by the Ethics Committee of the Faculty of Humanities of the University of Amsterdam (application number: 2017-61).

The interview and survey questions were based on findings from earlier research (see Section 3.2), as well as anecdotal indications by teachers in the MIND project about multilingual ECEC (Stam et al., 2022). Our questions asked teachers about their experiences and their observations in the classrooms, instead of about their beliefs, attitudes, or preferences. Interviews A and B served as pilot interviews before the survey was distributed and before further interviews were held, but these interviews were included in the analysis because they were very similar to the final interviews. Based on the pilot interviews, a few questions about peer play quality were added to the survey and interviews. To reduce social desirability bias, participants were explained prior to the interviews that there were no right or wrong answers and were told that we were interested in teachers' experiences and that they were the experts (Bergen & Labonté, 2020; Esterberg, 2002; Krug & Sell, 2013). The questions in the survey and interviews followed a specific format to decrease social desirability bias (Bergen & Labonté, 2020), in which the interviewer asked questions of the following type:

“Some teachers say that children have fixed playmates. Other teachers say that children play with everyone equally. What has been your experience?”

To increase rapport, the survey and interview started with questions that were about simple facts (Esterberg, 2002), such as the day schedule at the teacher's playgroup or ECEC centre. At the start of the survey and interview, it was stated that free play is the context of interest of the study, defining this as periods in which children are free to choose with whom, with what, and how they want to play. All teachers reported free play moments during the day, and

all teachers in the interviews and 99% of teachers in the survey reported more than one hour of free play per day.

The following survey and interview questions were related to the first research question of this study, targeting social inclusion, peer play quality, and peer group formation. Regarding peer group formation, we asked teachers whether they witnessed the formation of peer groups and which factors they deemed relevant for peer group formation. At this point, there had been no mention of language skills or multilingualism yet, and we were interested in seeing whether teachers would spontaneously mention factors like home language and language proficiency. A follow-up question zoomed in on the role of home language and language proficiency (“in your experience, how important [are these factors] in determining which children spend time together during free play?”). Regarding social inclusion, we asked teachers whether children who do not speak the ECEC language(s) well generally form shallower friendships or not, and whether children who do not speak the ECEC language(s) well generally have difficulties connecting to other children or not. Another question about social inclusion asked if, and how often teachers witnessed a child excluding another child by accident (or on purpose) by speaking a language that the other child does not understand. Regarding peer play quality, we asked teachers whether children who do not speak the ECEC language(s) well generally engage in simpler forms of play or not, and whether children who do not speak the ECEC language(s) well generally have simpler interactions with each other or not. In the interviews, all questions were open-ended, and we asked follow-up questions about individual differences, the role of group composition, teacher pedagogy, and long-term effects, and we asked teachers if they could describe any striking examples, to allow relevant factors to surface (RQ2). Finally, we asked background questions about the ECEC centres, the children, and the teachers (Tables 3.1 and 3.2). The survey questions and interview guide can be found on OSF<sup>7</sup>.

### 3.4.3 Analysis

Descriptive statistics for the survey questions were gathered to gain a general overview of emergent multilingual children’s peer interactions. For general questions about multilingualism and peer play, all ECEC teachers who reported having experience working with multilingual children ( $n = 216$ ) were considered. For questions about their current group, only teachers were considered who indicated that they had at least some multilingual children in their group at the time of filling out the survey ( $n = 156$ ). This is indicated in Section 3.5 where appropriate. Teachers were free to skip questions, although

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<sup>7</sup> <https://doi.org/10.17605/OSF.IO/N6P74>

not many did, so sample sizes might vary slightly for each question. This is always indicated in the tables and figures in Section 3.5. The survey data and R script (R Core Team, 2024) are available on OSF<sup>7</sup>.

The interviews were transcribed by hand, but with the help of automatic transcription tool Kaldi-NL and the Oral History models (Gompel et al., 2021; Yilmaz et al., 2021), which were used offline to protect the participants' privacy. The transcripts were coded for the interview question, the answer to that question, and for any additional themes that emerged. These additional themes were then analysed following grounded theory procedures in iterative rounds of open coding, axial coding, and selective coding (Glaser & Strauss, 1967). In the open coding phase, descriptive codes were jotted down next to the interview transcripts. In the axial coding phase, these codes were specified and then grouped together in themes. In the selective coding phase, the themes were further grouped and only selected for further analysis if they concerned the research questions about multilingual children's peer interactions and play. In that case, within each theme, responses were grouped into categories of similar content. In Table 3.3, an example of these rounds of coding is given.

In Section 3.5 below, interviewees will be referred to using the letters from Table 3.2. Quotations were originally in Dutch and were translated into English (except those from interviewee D, who did the interview in English). The anonymised interview transcripts and codes are available on OSF<sup>7</sup>.

*Table 3.3. Example of coding procedure.*

<b>Interview excerpt</b>	<b>Open code</b>	<b>Axial code</b>	<b>Selective code</b>
<p>“There are people who just do not play with their children and what what we do in the classroom is trying to enrich their play. Parents have no idea, right, so if a child enters your ECEC centre and you think ‘well, it does not show much development’, but where does it come from, right.”</p> <p>(M)</p>	<p>parents not playing with their children</p>	<p>parents’ background and home situation</p>	<p>child-related factor: home situation</p>

### 3.5 Results

In section 3.5.1, we start by describing teachers' reported experiences with emergent multilingual children's a) social inclusion and exclusion, b) peer play quality, and c) peer group formation (RQ1). In section 3.5.2, we then report on factors that surfaced from teachers' reported experiences that could play a role in the relationship between multilingualism and peer interactions (RQ2). We focus on the main findings from the surveys and interviews; additional results and quotations can be found on OSF<sup>7</sup>.

#### 3.5.1 Emergent multilingualism and peer interactions

##### 3.5.1.1 *Social inclusion*

Table 3.4 shows that 55% of the survey participants thought that children with lower ECEC language proficiency generally do not experience more difficulties connecting to other children. In the interviews, two out of thirteen teachers explained that language differences do not matter much and that children can communicate nonverbally too (B, E).

However, over a third of the teachers (36%) in the survey thought that children who do not speak the ECEC language(s) well generally experience difficulties connecting to other children. In the interviews, four teachers said that they observed that not being able to communicate in the ECEC language makes it more difficult to connect to other children, and that this goes for emergent multilingual children, as well as for monolingual children with language delays (C, G, K, L). Seven teachers spontaneously mentioned externalising behaviour in the interviews: according to these teachers, difficulties in communication might make children frustrated, which means that other children might feel more reluctant to play with them (A, B, C, G, H, I, K):

“I notice that [children with lower ECEC language proficiency] might be angrier more often and out of frustration, in the sense that they want to participate but it is not going in the way they want, that they are a little angrier or tend to push or hit a child a little more often, [...] because they cannot express themselves well enough, but we also see this in children who are too young anyway to use language.” (I)

Table 3.4. Survey data on social inclusion of emergent multilingual children according to teachers ( $n = 215$ ).

	<b>True for most children</b>	<b>Not true for most children</b>	<b>I do not know</b>
<b>Children who do not speak the ECEC language(s) well experience difficulties connecting to other children</b>	77 (36%)	119 (55%)	19 (9%)
<b>Children who do not speak the ECEC language(s) well form shallower friendships</b>	48 (22%)	130 (60%)	37 (17%)

Table 3.4 shows that most survey participants (60%) reported that lower ECEC language proficiency did not relate to shallower friendships in their group. However, over a fifth of survey participants (22%) said that children who do not speak the ECEC language(s) well generally form shallower friendships than children with higher ECEC language proficiency. Two interviewees stressed that language is not always important for deep connections (C, D), for example, because they thought children are very flexible, open to diversity, and see no language-related differences (C).

Table 3.5 shows that children might sometimes be excluded if others speak a language that they do not understand, according to the teachers (either by accident or on purpose, based on teachers' own assessment). Over half of the survey participants (53%) said exclusion based on language never happens in their group. However, according to 47% of survey participants who had multilingual children in their group at the time of filling out the survey, children get excluded by accident on the basis of language once a year or more. Thirteen percent of the surveyed teachers reported it happens weekly, and 11% reported it happens daily. Three interviewees explained that children might be used to, or feel most comfortable speaking their home language with another child (for example because they see each other outside ECEC too), which could exclude other children (D, G, K). One interviewee gave an example:

“I have a particular group of girls, almost all girls between 3½ to 4, and they speak, in this case Turkish, their own language very well, and then there is a Moroccan girl who is almost 4 and she joins, but then they do keep on speaking Turkish and you do sometimes see that the Moroccan girl is left behind a bit [...] [but if we say] she can also join and if we join the play ourselves then it happens more quickly that they involve her too, but you do need to keep anticipating it.” (K)

A minority of teachers (14%) expressed in the survey that they believed exclusion on the basis of language could happen on purpose. However, according to four interviewees, exclusion on purpose through language usually does not happen at this young age (D, I, J, K).

*Table 3.5. Frequency of language-based exclusion, according to teachers who currently have multilingual children in their group, based on survey.*

	<b>Exclusion by accident (n = 156)</b>	<b>Exclusion on purpose (n = 155)</b>
<b>Never</b>	83 (53%)	133 (86%)
<b>Yearly</b>	23 (15%)	8 (5%)
<b>Monthly</b>	12 (8%)	5 (3%)
<b>Weekly</b>	21 (13%)	6 (4%)
<b>Daily</b>	17 (11%)	3 (2%)

### ***3.5.1.2 Peer play quality***

Table 3.6 shows that over a third of survey participants (38%) reported that children who do not speak the ECEC language(s) well generally engage in simpler forms of play. Two interviewees suggested that this might be less or simpler pretend play and role play, such as being given the role of a baby or animal by peers (D, F). Two other interviewees expressed that ECEC language proficiency was important for play complexity (J, L). Two interviewees thought lower peer play quality continues for a long time into ECEC, and can persist even when children leave ECEC to go to primary school (E, F).

As Table 3.6 shows, more than half of the survey participants (58%) reported that children who do not speak the ECEC language(s) well have simpler interactions with each other. According to two interviewees, this might be due to less detailed and less complex (role) play (F, L), or they might simply observe other children more and thereby acquire the language in a safe way (D). However, according to two other interviewees, children would interact anyway, either nonverbally or using their home language (H, I).

Table 3.6. Survey data on peer play quality of emergent multilingual children according to teachers.

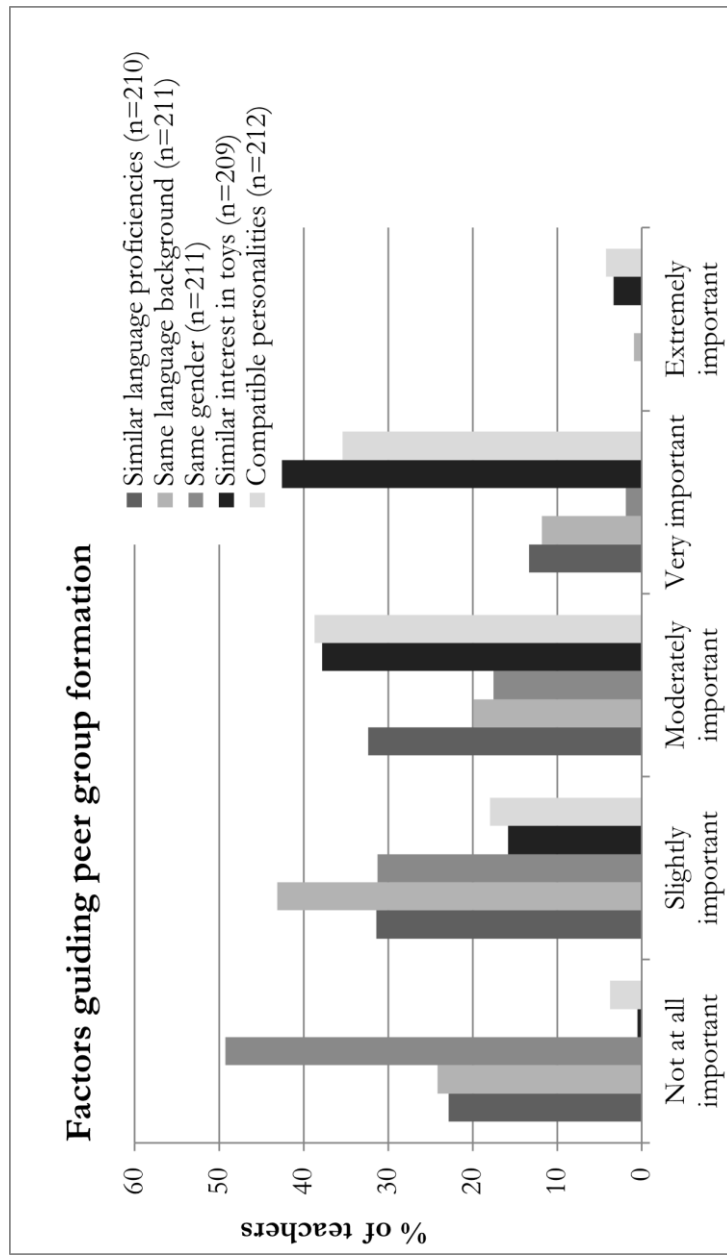
	True for most children	Not true for most children	I do not know
Children who do not speak the ECEC language(s) well engage in simpler forms of play (n = 215)	82 (38%)	100 (47%)	33 (15%)
Children who do not speak the ECEC language(s) well have simpler interactions with each other (n = 214)	125 (58%)	71 (33%)	18 (8%)

### 3.5.1.3 Peer group formation

Regarding peer group formation, 12% of the survey participants mentioned language spontaneously as a factor that influences peer group formation, without any earlier prompts about language or multilingualism. Most of these answers were general mentions about the role of language in peer group formation, while nine survey participants mentioned language proficiency specifically as a factor guiding peer group formation, and five survey participants mentioned language background specifically.

When asked explicitly, 160 survey participants (76%) said that speaking the same language is at least somewhat important in determining which children play together, and 162 survey participants (77%) said the same for having similar language proficiencies. Figure 3.1 shows that most teachers thought that language background and proficiency are slightly or moderately important in determining peer group formation. Figure 3.1 indicates that, as a group, survey participants thought that language is more important than gender in guiding peer group formation, but less important than having compatible personalities or similar interest in toys.

Figure 3.1. The role of language proficiency and language background in peer group formation (alongside other factors), in percentages of survey participants (n = 209-212).



According to five interview participants, children with the same home language understand each other better, find it easier to express themselves and play together, and recognise themselves in each other (C, E, H, K, M). Two teachers added that they thought same-language peer interactions help children with a different home language find safety, especially when first entering ECEC (E, M). According to two other teachers, however, children generally know what the ECEC languages are and stick to them (A, B).

According to two interviewees, children with high ECEC language proficiency play together more with each other (H, J), while three interviewees indicated that children with a lower ECEC language proficiency might play alone more (G, K, L). However, two other interview participants stressed that children are flexible and tend to help each other in communication, even when a child has lower ECEC language proficiency (B, D). Three interviewees thought that children can also communicate nonverbally and often understand each other quickly (C, E, H).

### **3.5.2 Factors that might play a role in multilingual children's peer interactions**

In the section below, we will focus on the second research question: which factors might play a role in emergent multilingual children's peer interactions, based on teachers' reported experiences. We will divide the factors into teacher-related factors, child-related factors, and ECEC-related factors.

#### ***3.5.2.1 Teacher-related factors***

Teachers differed in the extent to which they worried about low social inclusion and fewer peer play opportunities of emergent multilingual children. A post-hoc latent class analysis suggests there are two groups of teachers: one with more and one with fewer worries. We used the *multilevLCA* package in R (version 1.5.1) (Lyrvall et al., 2024) and a model with two classes proved to be the best fit to the data: one group of teachers with more worries and/or uncertainty about emergent multilingual children's peer interactions ( $n = 102$ ) and one group of teachers with fewer worries ( $n = 100$ ). None of the teacher and ECEC background variables significantly predicted group membership. The full results are available on OSF<sup>7</sup>.

Illustrating this finding, three interviewees said they did not worry much, because they thought children are all different, develop at their own pace, and these teachers thought that everything will work out eventually (I, K, M). For example, one teacher said: "I always wonder: what do we want as teachers? Which standards should [the children] meet? Should we make a child meet a particular standard or should we say: this child is this [particular] child?" (M). As long as a child is showing development (even if it is slow), that is a good

thing, according to this teacher (M). Another interviewee, however, said that it was important to still try to help children's development: "they often say, yeah, they all learn at their own pace and that is true, but you can help them to increase the pace a little" (E).

### ***3.5.2.2 Child-related factors***

Several child-related factors emerged: age, personality (particularly shyness), home situation, newness in the group, atypical development, and gender. Two interviewees believed that peer group formation effects depended on age: children should be old enough for language to play an important role in communication, to be able to use the home language together, and form language-based peer groups together (F, J).

Regarding personality, five teachers said that it would be harder to be included in the group if a child is both shy and not very proficient in the ECEC language (A, G, I, L, M). Two interviewees also indicated that some children are less open to friendships than others or get frustrated more easily when they experience difficulties in communication (H, I).

The situation at home was also frequently mentioned in the interviews. When it comes to simpler or less peer play, five interviewees said that some multilingual children are not used to types of play that are common in ECEC settings, and are unfamiliar with particular toys (E, I, K, L, M). Moreover, parental involvement was stressed by eight teachers to be of crucial importance in multilingual children's (play and social) development (A, C, D, F, G, H, K, L).

Other child-related factors that were brought up in the interviews included newness, gender, and atypical development. According to two interviewees, children might first gravitate towards same-language peers when they are new at the ECEC centre, but switch to the ECEC language and also start playing with other children if they are in ECEC longer (K, M). Similarly, two interviewees expressed that simpler or less peer play might be mostly visible at the start, when emergent multilinguals enter ECEC (B, C). Gender was mentioned in relation to language-based exclusion: two interviewees mentioned exclusion was more common with girls (C, E). Two other interviewees indicated that there is generally more going on when a multilingual child is excluded by peers, such as some kind of atypical development (K, L).

### ***3.5.2.3 ECEC-related factors***

Various ECEC-related factors emerged from the interviews: bilingual ECEC centre, group composition, SES, language policy, and pedagogy. One interviewee said that friendships and peer play developed less in her bilingual (English-Dutch) group than in a monolingual group (B). When asked explicitly

in the survey, a few of the 25 teachers working in bilingual and bidialectal ECEC thought that children in bilingual ECEC generally engage in simpler play ( $n = 1$ ), simpler interactions ( $n = 4$ ), have shallower friendships ( $n = 2$ ) and have more difficulty interacting with other children ( $n = 3$ ) than children in monolingual ECEC. It should be noted that bilingual ECEC in our study often entailed English-Dutch (foreign language) ECEC. An interviewee explained:

“I feel that, because the children are putting more energy into learning [...] multiple languages at the same time, they might therefore not be as far along in language communication with each other that would get role play started, because for that you really need [...] to discuss with each other, to make agreements.” (B)

Regarding group composition, two interviewees thought that their specific ECEC groups were so diverse that language did not really matter (D, E): “where I am located we have so many different nationalities that I don't think it's really defining who the child is – the nationality or their language” (D). Another interviewee said that emergent multilingual children's inclusion depends on whether children can find other children who are similar to them, for example in terms of language proficiency or background (J). Moreover, two interviewees mentioned that for language-based peer group formation to be possible, there should be multiple children in the group with the same home language background (G, I). One interviewee stressed the importance of continuity for multilingual children, making it easier to connect to each other, but remarked that, unfortunately, ECEC centres in low SES areas tend to be more unstable in terms of staff and children (F).

Another possible ECEC-related factor is the centre's language policy. In the survey, 95 teachers (44%) reported that they were expected to encourage children to only use the official ECEC language(s) together. In contrast, 37 survey participants (17%) were allowed to let children speak in any language, and the remaining 83 teachers (39%) had no formal or informal child language policies. When it comes to the teacher's language use, 84 survey participants (39%) were expected to only use the official ECEC language(s), while 65 survey participants (30%) could also use other language(s) in some situations, and the remaining 66 teachers (31%) had no formal or informal teacher language policies. Despite these generally strict language policies, 128 teachers (82%) who had multilingual children in their group at the time of filling out the survey reported that children sometimes used their home language together, with 58% mentioning weekly or daily use. When children switched to their first language, two interviewees said that they or their colleagues pretended not to understand the child or asked them to switch to Dutch (C, E):

“I have had colleagues who just say to a child: ‘sorry, I do not understand you, we speak Dutch here’ and I really think that is not okay. You know, the child chooses to say it in another language at that moment because they apparently do not feel safe enough, not comfortable enough to say it in Dutch.” (E)

The other teacher emphasised the use of Dutch when children used their home language: “[to prevent exclusion, I would tell children who are speaking in Turkish:] guys, we speak Dutch here” (C).

Four teachers, however, recognised the importance of welcoming the diversity of home languages in the classroom to make a multilingual child feel welcome, appreciated, and safe, especially when a child is new (A, E, H, M). They would, for example, count in various home languages, put on songs in a home language, or learn a few phrases in each home language. Five interviewees described and welcomed translanguaging practices (A, E, H, I, L): children might, for example, each use their own home language while playing together, and teachers might also switch between languages. However, one teacher noted that not all languages might be welcomed equally into the classroom:

“I do notice that people who have less experience working in ECEC, when they come across multilingualism, there are often more issues with Arabic than with other languages, with European languages, even though I think: we have a German child and you do count to five in German with them because you can, because that is nearby, but that child in Arabic, you do not do that with them. Yeah, well, I find that strange.” (M)

More generally, pedagogy frequently came up in the interviews as an important factor, for example in relation to social inclusion and peer group formation (A, C, E, G, H, I, K). Teachers often shared their strategies for promoting emergent multilingual children’s peer interactions (see OSF<sup>7</sup>). For example, two teachers stressed culturally sensitive play: trying to include a child by facilitating types of play that the child is familiar with from home (E, L). One interviewee explained how she did this:

“[Regarding a refugee boy in my group], they are just more used to playing with natural materials; those brightly coloured [toys] we have here, there is just no connection with what happens at home. So [I decided to play with wooden sticks outside with the other children and] I noticed that that boy totally flourished [...] and the other children thought that was absolutely amazing and they also understood more why, when we played outside, he would not ride a bike or run

after a ball, but would be playing in the shrubs and the bushes and with the trees.” (E)

### 3.6 Discussion

In this chapter, we explored teachers' reported experiences with emergent multilingual children's peer interactions in ECEC. Specifically, we asked ECEC teachers about their experiences with the social inclusion, peer play quality, and peer group formation of emergent multilingual children during free play. Based on teachers' reported experiences, we also examined which factors could play a role in emergent multilingual children's peer interactions. Our study was innovative for its mixed-methods methodology – combining both surveys and interviews – and its focus on teachers who work with infants and toddlers. By consulting teachers as informants, we could get a sense of scale of previously expressed concerns about emergent multilingual children's peer interactions (Stam et al., 2022), as teachers have many years of experience with diverse groups of children in different settings. We found large differences between the teachers and their reported experiences with emergent multilingual children's peer interactions. A sizeable group of surveyed teachers (36%-58%) thought that emergent multilingual children experience more difficulty connecting with other children and have fewer opportunities for high-quality peer play. The concerns voiced by these surveyed teachers echo results from earlier studies, which showed that emergent multilinguals experienced fewer peer interactions of high quality (Arvola et al., 2021; Cekaite & Evaldsson, 2017; Dominguez & Trawick-Smith, 2018). Some interviewees believed that less frequent peer interaction might be related to externalising behaviour (e.g., becoming outwardly frustrated) resulting from communication barriers, which has been found incidentally in previous studies (Banerjee, 2023; Vella, 2023), and has also been observed in the literature on developmental language disorder, autism, and other communicative individual differences (Chen, Justice, et al., 2020; McCabe & Meller, 2004; Shea et al., 2018; Yew & O'Kearney, 2013). Approximately half of the teachers in our survey said that they also observed exclusion based on language at least yearly, which coincides with earlier case-study reports (Cekaite & Evaldsson, 2017). Three quarters of the teachers in the survey said that children in ECEC might gravitate towards others with the same home language or language proficiency, in line with earlier findings (Feng et al., 2004; Kyratzis, 2010) and with the homophily principle in social network analysis, which suggests that people are more likely to form social ties with others who are like them (McPherson et al., 2001).

The interviewees brought up factors that they thought might influence the relationship between emergent multilingualism and peer interactions. These include a child's personality (e.g., sociability, whether they are shy), the child's age (e.g., it might become more important to speak the ECEC language when

the child gets older), children's home situation (e.g., children might not be used to certain types of play), newness in the group, gender (exclusion could be more common with girls), atypical development, group composition (e.g., whether there are others like them; continuity), language policy, and pedagogy, although some of these factors were mentioned only by a few teachers. While in an earlier study shyness weakened the relationship between ECEC language proficiency and classroom adjustment (Halliday et al., 2022), in our study, teachers suggested that children with low ECEC language proficiency had more difficulties integrating in the classroom if they were shy. All in all, our study highlights the importance of taking into account factors that might influence (teachers' reported observations about) the relationship between emergent multilingualism and peer interactions.

There are a couple of limitations to our study. First, teachers' reported experiences might have been influenced by beliefs about multilingualism and by the relatively monolingual context in which they worked. What teachers notice might be related to what they believe and know, although noticing as a concept is distinct from beliefs and knowledge (Meschede et al., 2017). Studies conducted in primary schools have indeed suggested that teachers' concerns about multilingual children could be related to monolingual beliefs or a lack of experience with or knowledge about multilingualism (Alisaari et al., 2019; Flores & Smith, 2009; Pohlmann-Rother et al., 2023). While all teachers in our study reported having experience working with multilingual children, they might have interpreted this in different ways, and their amount of experience might vary. Especially because some observations were shared by only a few teachers, our results should be confirmed by future observational studies. In any case, teachers' reported experiences should be taken seriously, as they can influence how they view multilingual children as well as the way in which they stimulate and guide (multilingual) children's peer interactions and peer play (Nilsen, 2021; Rosiers et al., 2016).

Given the design of our study, it was not always possible to disentangle multilingualism from other confounding factors, such as culture, SES, and ECEC language proficiency. Our focus was on emergent multilingual children, but many questions targeted children who might not speak the ECEC language well more broadly, and thus could relate to late talkers or children who experience communicative difficulties as well. Earlier studies suggest that it might not be so much multilingualism as lower communicative/pragmatic language which leads to fewer peer interactions (Gertner et al., 1994; Lin et al., 2019). Thus, observations of fewer and simpler peer interactions might not be unique for emergent multilingual children, but might have more to do with a lower proficiency in the language(s) spoken in ECEC.

Moreover, survey questions were not always interpreted in the same way by all teachers, which is why the reported percentages should be treated with caution. This pitfall was both brought to light by, and mitigated by the mixed-methods design of this study. Specifically, we noted eighteen instances in which a teacher's survey response alone could have been misleading. In twelve cases, this concerned a teacher who indicated in the survey that they had not generally observed fewer/simpler peer interactions. Later in the interviews, they commented that they had actually noticed something, but that, for example, it did not hold for all multilingual children, was something they actively worked on, or was not specific to multilingualism in their opinion. This finding suggests that the survey responses may be an underestimation of teachers' observed relationship between emergent multilingualism and peer interactions. More generally, it underscores the importance of mixed methods and shows how qualitative data can be crucial when interpreting quantitative data (Onwuegbuzie & Leech, 2005).

The results from our study suggest several directions that could be explored further. First, future research could explore the factors that emerged in our research to disentangle their role in multilingual children's peer interactions. For example, the interviews and surveys suggest possible differences between bilingual (mostly foreign language) and monolingual ECEC groups, which would be worth exploring further. Teachers mentioned several other factors that they thought related to emergent multilingual children's peer interactions, such as shyness or pedagogy, but the issue of causality is unclear. It is likely that these interrelated factors influence each other in turn, and there may be bidirectional effects (Kızıldere et al., 2020; Pleyer, 2020). Therefore, a longitudinal, dynamic systems approach might be worthwhile (see, for example, longitudinal data by Dai et al. 2022), as well as (randomised control trial) intervention studies. It is conceivable that a negative feedback loop may exist, in which emergent multilingual children get to play less with peers, thereby are presented with fewer opportunities to develop their social and ECEC language skills, which, in turn, makes peer play difficult.

Second, it would be interesting to examine whether internalising and externalising behaviour could play a role in emergent multilingual children's peer interactions and could make them less attractive play partners. There is some literature to suggest that, for bilinguals, there might be a relationship between not speaking the school language well and socio-emotional difficulties, such as internalising behaviour (Han, 2010). Future work could find out if there is a more general pathway between communicative barriers, internalising and externalising behaviour and peer interactions, as similar observations have been made in the literature on DLD, autism, and other communicative individual differences (Chen, Justice, et al., 2020; McCabe & Meller, 2004; Shea et al.,

2018; Yew & O’Kearney, 2013). There is some evidence that communicative barriers might lead to peer rejection, which then causes externalising behaviour, and might in turn make peer interactions more difficult (Menting et al., 2011). If this is indeed the case, an interesting avenue for further research would be to see whether allowing children to draw on all their communicative resources and full linguistic resources could increase opportunities for complex peer interactions (see e.g. Kyratzis et al., 2009) and take away or reduce internalising and externalising behaviour.

Third, future work could look into the role of children’s agency and beliefs. Teachers in this study disagreed on whether children, for example, could exclude others on purpose at this age. Observation-based studies, as well as studies in cooperation with children (Crump & Phipps, 2013; Little & Little, 2022), could shed more light on the role of children’s agency in shaping these peer interaction opportunities, as has been done previously in bilingual preschool contexts (Schwartz, 2018).

Finally, it would be worthwhile to study the consequences of our findings further. For example, do fewer and simpler peer interactions in ECEC have long-term effects on linguistic, social, and cognitive development? Children’s well-being could also be assessed in future research, as there are some tentative indications that children with lower ECEC language proficiency might display more signs of decreased well-being in ECEC (MIND Team 2021; Spanjer 2019). However, previous research suggests that a marginal position of emergent multilinguals in the peer network might not necessarily be bad, and may allow children to pick up the new language in a safe way (Bernstein, 2018). Moreover, some children might be more introverted and in fact prefer playing on their own at times. This was also echoed by some of the interviewed teachers, who said children are all different, develop at their own pace, and may acquire the language in a safe way by observing. Future work should therefore look further at the possible consequences of having few peer interactions of high quality for children’s linguistic and socio-emotional development.

In terms of practical implications, teachers mentioned various cases of inequality that would be worth addressing. To stimulate social inclusion and high-quality peer play, teachers may provide opportunities for culturally sensitive play. Teachers can help children use their full communicative and linguistic resources, using their own multilingual background to the advantage of the children (Chang et al., 2007; De Houwer, 2015b; de Oliveira et al., 2016). However, many of the participating teachers in our study who worked with multilingual children worked in ECEC centres with monolingual language policies, and only a quarter of teachers in the current study had followed courses about multilingualism and multilingual development in children. There

has been a lack of attention for multilingualism in Dutch ECEC teacher training. The monolingual language policies in our study reflect the rather monolingual language policies in Dutch ECEC law (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2024). At the time of writing, this national policy has changed, and teachers have been given the possibility to also use English, French and German (50% of the time or less), alongside Dutch, but other languages can still only be used in exceptional cases (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2024). Emergent multilingual children might benefit from more attention to multilingualism in ECEC in all languages, and, for example, translanguaging practices and pedagogies (Kirsch, 2020). Specifically, based on the context here examined, professional development about how to support multilingual children's peer interactions is warranted, as well as more attention to multilingualism in ECEC policy.



#### 4. An observation-based social network study of peer interactions of multilingual toddlers in ECEC<sup>8</sup>

“Ieder kind zoekt naar aansluiting en als jij de enige vreemde eend in de bijt bent [...] da’s [...] lastig [...]. Ik denk dat iedereen graag gelijkgestemden om zich heen heeft om zich goed in z’n vel te voelen. Als je de enige bent met iets, ja, dan voel je je eigen toch altijd minder begrepen.”

“Every child is looking for connection and if you are the odd one out [...] that is [...] hard [...]. I think everyone likes to have similar peers around them to feel good. If you are the only one with something, you will always feel less understood.”

(teacher J, Thieme et al., 2025a)

##### 4.1 Introduction

Peer interactions can help young children in early childhood education and care (ECEC) develop their linguistic, social, and cognitive skills (Coplan & Arbeau, 2009; Deunk, 2009; De Haan, 2015). They are especially important for multilingual children in ECEC, as peer interactions could help them foster ECEC language skills, home language skills, and feel welcome in the ECEC environment, which is linguistically different from home (Eggum-Wilkens et al., 2014; Garcia, 2021; Halle et al., 2014; Licandro, 2016; Washington-Nortey et al., 2022).

There are indications that children’s linguistic resources could influence their peer interaction opportunities, both whom they interact with, and how much they interact with peers (Cekaite & Ewaldsson, 2017; Dominguez & Trawick-Smith, 2018; Mansikka et al., 2024). Specifically, there is evidence for effects of language background (the language(s) a child grows up with), ECEC language proficiency (the proficiency in the language spoken at ECEC), and communicative competence (the verbal and nonverbal competences to communicate with others), although it is unclear which of these plays the biggest role (see Chapter 3, Cekaite & Ewaldsson, 2017; Dominguez & Trawick-

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<sup>8</sup> This chapter is a slightly modified version of a published article: Thieme, A. M. M., Verhagen, J., Kuiken, F., & Andringa, S. (2026). Peer interactions of multilingual toddlers in early childhood education and care in the Netherlands: An exploratory observation-based social network study. *Ampersand*, 16, online first. <https://doi.org/10.1016/j.amper.2026.100257>

Smith, 2018; Mansikka et al., 2024; Thieme et al., 2025b; Wilt, 2018). It seems that children with a multilingual background might be excluded more often and hold more marginal positions in the peer network than their monolingual peers (see Chapter 3, Bernstein, 2018; Cekaite & Evaldsson, 2017; Dominguez & Trawick-Smith, 2018). This type of exclusion at (pre)school stands in the way of harmonious multilingual development (De Houwer, 2020)<sup>9</sup>. Playing with same-language peers could help multilingual children feel more included, develop socio-emotional skills, understand the ECEC environment better, and stimulate home language skills, if children use the home language to play together (Halle et al., 2014; Langeloo et al., 2019). Some studies indeed show that children might play more with others with the same language background, similar language proficiency, or communicative competence, although many factors might play a role (Kyratzis, 2010; Mansikka et al., 2024; Thieme et al., 2025b). In this study, we use social network analysis to attempt to answer how children’s linguistic resources relate to whom they interact with and how much. In contrast to earlier social network studies, we used observational data collected through a specifically developed app, instead of teacher, child, or parental report (Bokhove, 2018). We apply generalised exponential graph models (Cranmer et al., 2020) to examine how language background, language proficiency, and communicative competence relate to who children interact with and how much, while controlling for age, gender, and sociability. Below, we describe literature about the relationship between children’s linguistic resources and how much they play and with whom, and we devote attention to earlier social network analyses.

#### 4.1.1 Linguistic resources and quantity of peer interactions

Multilingualism might be one factor that relates to how much children play with peers, but based on previous literature, there could be both a positive and a negative relationship. In case studies in the United States with mostly four-year-olds, emergent multilingual learners had fewer peer interactions than their monolingual peers (Banerjee, 2023; Dominguez & Trawick-Smith, 2018), their peer play attempts were rejected more often (Neitzel et al., 2019), they were disliked more often by peers (Gertner et al., 1994), and they had more marginal positions in the peer network (Bernstein, 2018; Neitzel et al., 2019). This could be due to contextual factors, such as pedagogy or social biases, perhaps passed on from parents (Thieme et al., 2025a). In a Swedish ethnographic case study, Cekaite and Evaldsson (2017) have described the difficulties that a 3.5-year-old Arabic-speaking girl had at Swedish ECEC when she tried to play with her peers. Her peer play access strategies were linguistically basic and often physical, such as entering other children’s play space and taking toys. Her peers

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<sup>9</sup> Usually referred to as ‘harmonious bilingual development’ (De Houwer, 2015a).

were reluctant to grant her peer play access and mocked her language. This study suggests the emerging awareness of social categories at toddler age (Kurtz-Costes et al., 2011), and how this might result in fewer peer interactions for multilingual children.

However, multilingualism might also be associated with advantages in peer interactions because of stronger communicative and socio-emotional skills (Fan et al., 2015; Halle et al., 2014; Han & Huang, 2010; Schroeder, 2018; Wermelinger et al., 2017; Yow & Markman, 2015), although evidence on communicative advantages is not clear-cut (Van Wonderen et al., 2023). For example, it seems that communicative and socio-emotional benefits of bilingualism are dependent on an inclusive multilingual environment in the preschool classroom (Chang et al., 2007; Halle et al., 2014). Moreover, several studies indicate that positive effects of bilingualism on socio-emotional and communicative skills, including peer relationships, might only surface if children are relatively well-balanced bilinguals, with proficiency in the majority language besides proficiency in the home language (Banse, 2021; Han & Huang, 2010; Sun et al., 2021; Winsler et al., 2014; Yow & Li, 2015).

Perhaps it is therefore not multilingualism per se, but ECEC language proficiency that plays a role in the quantity of peer interactions (Gertner et al., 1994). Not being able to express oneself in the ECEC language might cause socio-emotional difficulties, such as internalising and externalising behaviours (see Chapter 3, Halle et al., 2014; Long, 2017). These behaviours, including withdrawing or becoming angry, might impede social encounters with peers, and in turn, socio-emotional learning and language learning from peer contact (Halle et al., 2014; Thieme et al., 2025b). When children with low ECEC language abilities are rejected by peers, this itself could also lead to externalising behaviours, making children less attractive playmates (Menting et al., 2011), creating a feedback loop, in which children with low ECEC language proficiency interact less with peers and might therefore have fewer opportunities for linguistic, cognitive, and social development than classmates, which could then again negatively impact peer interactions.

Earlier studies indeed suggest that ECEC language proficiency plays a role in how many peer interactions children have (see Chapter 3, Blum-Kulka & Gorbatt, 2014; Mansikka et al., 2024; Syczewska & Licandro, 2021). For example, an observation-based Israeli study that included 32 children (3-7 years old) in Hebrew ECEC found that emergent multilingual learners had increasingly more peer interactions as their ECEC language proficiency developed (Blum-Kulka & Gorbatt, 2014). A German study with 30 children (3-6 years old) showed a significant correlation between peer rejection and low ECEC language proficiency (Syczewska & Licandro, 2021). However, evidence

is mixed. In the study in Chapter 3, ECEC teachers in the Netherlands were surveyed and interviewed about their experiences with multilingual children's peer interactions. Roughly a third of 215 teachers thought that multilingual children with lower ECEC language proficiency experienced more difficulty connecting with peers (Thieme et al., 2025b). This means there was a large group of teachers in this study who indicated that children play together regardless of language proficiency. Some interviewees expressed that children might instead be able to communicate nonverbally, using their communicative competence.

Indeed, there are some studies that suggest that communicative competence might play a role in the quantity of children's peer interactions, and could be more important than ECEC language proficiency. These studies, however, looked only at verbal communicative competence in older children (Van der Wilt, 2018) or did not focus on a multilingual population (Chen, Justice, et al., 2020). All in all, language factors seem to relate to how much interaction a child engages in, although it is unclear whether multilingualism, language proficiency, or communicative competence play a more important role.

#### **4.1.2 Homophily in peer interactions based on language**

It seems that these language variables may also influence with whom a child interacts. There are indications that multilingual children might be more likely to play with others who are like them: a concept known as homophily in the social network literature. For example, children often gravitate towards peers with the same gender, or the same age (Coplan & Arbeau, 2009; Teerink, 2009; Thieme et al., 2025b). Children might also interact more with peers who have the same home language background. Playing with same-language peers could help multilingual children feel more included, develop socio-emotional skills, understand the ECEC environment better, and stimulate home language skills if children use the home language to play together (Halle et al., 2014; Langeloo et al., 2019). However, playing with a same-language peer might not be as beneficial for ECEC language development if both children have lower ECEC language skills (Washington-Nortey et al., 2022; Wong Fillmore, 1991).

In ECEC, there is preliminary evidence that multilingual children indeed play with others with the same language background, and use this language in play (see Chapter 3, Bernstein, 2018; Feng et al., 2004; Kirsch & Mortini, 2023; Kyratzis, 2010; Mansikka et al., 2024; Thompson, 1996). For example, in an American preschool, Spanish-speaking girls grouped together to form a peer group, and often code-switched between English and Spanish (Kyratzis, 2010). However, language-based homophily is not always observed: some Dutch ECEC teachers in Chapter 3 reported that language background was not an important factor in peer group formation, either because there was already so

much diversity in their groups that language played no role, or because children would generally stick to the ECEC language (Thieme et al., 2025b).

Instead of language background, there might be homophily based on language proficiency, or communicative competence. This type of homophily could be predicted by developmental theories: children with a similar developmental level tend to play with each other, as they are capable of and enjoy similar types of play, and are most likely to learn from each other (Coplan & Arbeau, 2009). In the aforementioned study in Chapter 3 (Thieme et al., 2025b), Dutch ECEC teachers generally thought that having similar language proficiency plays a role in peer group formation. However, some teachers in Chapter 3 believed that children are flexible, can also communicate nonverbally, and just need to find someone like them, in a similar developmental stage. This raises the question whether similarity in communicative competence might be a better predictor for peer interactions than similarity in language proficiency.

#### **4.1.3 Social network analysis and generalised exponential random graph models**

The studies above show that a child's language background, ECEC language proficiency, and communicative competence may influence how much they interact at ECEC and with whom they interact. These studies, however, were generally based on qualitative observation or teacher report, and generally could not statistically take into account dyadic factors, such as homophily effects, or multiple language factors in tandem. Social network analysis can help us take multiple language factors into account, including dyadic factors, and thereby help us answer the question how a child's linguistic resources relate to how much they interact and with whom. Social network analysis studies the relationships between (social) actors, and which factors shape these relationships. Research in multilingualism and sociolinguistics has long recognised the importance of social networks and has analysed these networks to describe language use, language development, and language learning (e.g., Bernstein, 2018; Daming et al., 2008; Eckert, 2000; Gallagher & Robins, 2015; Lanza & Svendsen, 2007; Milroy, 1980; Paradowski et al., 2022). However, traditionally, multilingualism research has taken a qualitative or descriptive quantitative approach to social networks. Researchers might use descriptive measures from social networks to investigate, for example, how many people someone has in their network (degree centrality). There have been calls to go beyond this descriptive approach and use the latest innovative methodological and statistical tools in linguistics research (Clark & Trousdale, 2013).

To examine the structure of social networks inferentially, linear models cannot be applied, as network structures by default violate the assumption of independence. Specifically, if child A interacts with child B, that means child B

also interacts with child A. Moreover, if child A interacts with child B, and child B interacts with child C, child C is also more likely to interact with child A (the friend of my friend is my friend, an effect known as transitivity) (Stadtfeld et al., 2020). Exponential random graph models (ERGMs) have been developed to model such dependencies in the data (Frank & Strauss, 1986; Holland & Leinhardt, 1981; Snijders et al., 2006). ERGMs are tie-based stochastic models that examine to what extent certain factors can predict why the network looks the way it does, that is, why certain children interact with each other, and others do not. They allow researchers to both examine effects at the child (node) level and at the dyadic level, such as homophily effects (i.e., children who are similar in some way flock together). To the best of our knowledge, Gallagher and Robins (2015) were the first (and so far only) researchers to apply ERGMs to multilingualism research: they examined the social networks of English for Academic Purposes students, and found homophily effects, with students staying mostly within their own cultural circles. Students with higher willingness to communicate in their second language did not have more cross-cultural ties.

Traditional ERGMs only allow for binary ties: children either have a social relationship with someone or not. However, as Clark and Trousdale (2013, p. 44) noted, the “method of encoding relational data as binary is problematic: it is a gross simplification to describe social relationships as categorically present or absent”. Rather, it is more informative to instead allow the ties between children to vary in strength, so-called valued or weighted ties. Modelling this is computationally difficult, but recently, a new type of ERGM has been developed that allows for continuous valued ties: generalised exponential random graph models, GERGMs (Bhamidi et al., 2018; Cranmer et al., 2020; Desmarais & Cranmer, 2012; Wilson et al., 2017). These allow researchers to model how certain factors influence *how much* children interact (and with whom), not just whether they interact or not.

Moreover, previous ERGM-based studies have generally relied on reported peer networks, based on social network questionnaires (Chen et al., 2019; Clark & Trousdale, 2013; Gallagher & Robins, 2015), while studies based on observation are much scarcer (but see Chen et al., 2020). Bokhove (2018) suggests that observation apps can help researchers conduct observation-based social network studies.

## 4.2 The current study

In this study, we use the above-described innovations in social network analysis – GERGMs and observation apps – to investigate how children’s linguistic resources relate to whom they interact with, and how much. From previous literature, it is unclear what the relative importance is of language background, language proficiency, and/or communicative competence when it comes to

whom children interact with and how much. We preregistered our study<sup>10</sup>. Our research question was:

To what extent are a child's linguistic resources related to whom they interact with and how much, in linguistically diverse playgroups for toddlers in the Netherlands?

Our hypotheses were based on previous research and were as follows<sup>11</sup>:

1. Toddlers with a monolingual language background are on average more likely to have interactions with their peers compared to toddlers with a multilingual language background (e.g., because of the social exclusion of multilingual children) (based on e.g. Banerjee, 2023; Bernstein, 2018; Cekaite & Evaldsson, 2017; Dominguez & Trawick-Smith, 2018; Neitzel et al., 2019).
2. Toddlers with higher Dutch language proficiency are on average more likely to have interactions with their peers than toddlers with lower Dutch language proficiency (see Chapter 3, Blum-Kulka & Gorbatt, 2014; Mansikka et al., 2024; Syczewska & Licandro, 2021; Thieme et al., 2025b).
3. Toddlers with higher communicative competence are on average more likely to have interactions with their peers than toddlers with lower communicative competence (based on, e.g., Chen, Justice, et al., 2020; Van der Wilt, 2018).
4. Toddlers are on average more likely to have interactions with peers who speak the same home language (see Chapter 3, Feng et al., 2004; Kirsch & Mortini, 2023; Kyratzis, 2010; Mansikka et al., 2024; Thieme et al., 2025b; Thompson, 1996).
5. Toddlers are on average more likely to have interactions with peers who have similar Dutch language proficiency (see Chapter 3, Thieme et al., 2025b).
6. Toddlers are on average more likely to have interactions with peers who have similar communicative competence (see Chapter 3, Thieme et al., 2025b).

We observed peer interactions in linguistically diverse toddler groups in the Netherlands. Our study is innovative for its use of generalised exponential graph models and observational data, collected with a newly developed observation app. Generalised exponential graph models allowed us to include all the above-mentioned language factors in one model, and to control for age,

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<sup>10</sup> <https://doi.org/10.17605/OSF.IO/9GY6J>

<sup>11</sup> Some preregistered hypotheses contained two predictions; we have teased these apart for ease of reading.

gender, and sociability effects, as these have been shown to also play a role in children's peer interactions (Coplan & Arbeau, 2009; Stangeland, 2017; Teerink, 2009; Thieme et al., 2025b; Wong Fillmore, 1991; Wu et al., 2022). Responding to a call by Bokhove (2018), we developed an open source dynamic observation app – Classroom Social Network Analysis (CSNA) – to be able to collect observational data of these peer interactions (Thieme & Thieme, 2021).

### 4.3 Methodology

Below, we describe the methodology of our study. When a methodological decision deviates from the preregistration<sup>10</sup>, we will note this and explain why we made a different decision.

#### 4.3.1 Participants

We visited a total of 17 ECEC playgroups in the Netherlands and observed toddlers aged 2-4 years old there for the studies in this chapter and Chapter 5. In the Netherlands, toddler groups are common in ECEC facilities, and tend to include maximally sixteen toddlers with two teachers (Ministerie van Algemene Zaken, 2021). Some playgroups have special early childhood education programs called *vo* (voor- en vroegschoolse educatie, early and preschool education) for children with a so-called 'risk of Dutch language delay' (Ministerie van Algemene Zaken, 2013). In some municipalities, emergent multilingual children are targeted specifically for these programmes (Gemeente Den Haag, 2023; Ministerie van Algemene Zaken, 2013; Onderwijs010, n.d.). Dutch ECEC centres tend to have a monolingual focus, with Dutch law stating that home languages can only be used in exceptional circumstances (although after the present research was conducted, new legislation allowed English, French, and German – but not other languages – to be used maximally 50% of the time) (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2024).

When recruiting playgroups, we aimed for linguistically diverse groups, and we took care to include a wide variety of groups in terms of proportion of multilingual children, parents' socioeconomic status, and type of ECEC facility (full-day or half-day, with and without *vo*). We recruited ECEC playgroups through e-mail, social media, and telephone. All playgroups were part of different ECEC centres. Consent was obtained from the teachers, as well as parents of the participating children. Consent forms were available in six languages, and the researcher and teachers were available for further oral assistance. The study was approved by the Ethics Committee of the Faculty of Humanities of the University of Amsterdam (application number: 2021-FGW\_OTHR-13762).

Analysis of networks at the group level requires complete datasets. In five playgroups, we did not get full consent. We were thus unable to use data from these playgroups, as children with consent might be interacting with children without consent. We therefore included network data from twelve playgroups (n = 124) in the present study. Table 4.1 shows the characteristics of these playgroups. For the operationalisation of the variables in this table, see Section 4.3.4. Children in these twelve playgroups heard 36 different languages at home in total, the most common ones being Dutch (n = 98), English (n = 25), Turkish (n = 17), Arabic (n = 8), and Polish (n = 6).

*Table 4.1. Characteristics of the playgroups and the children in these playgroups (A to L).*

	<b>A</b> <b>(n=11)</b>	<b>B</b> <b>(n=3)</b>	<b>C</b> <b>(n=12)</b>	<b>D</b> <b>(n=9)</b>	<b>E</b> <b>(n=11)</b>	<b>F</b> <b>(n=16)</b>
<b>Mean Dutch proficiency (0-10) (SD)</b>	7.7 (1.3)	2.0 (2.6)	5.4 (2.8)	6.4 (3.6)	7.4 (3.5) (2 NA)	7.8 (2.3)
<b>Mean comm. competence (1-4) (SD)</b>	3.2 (0.75)	2.0 (1.0)	3.4 (0.79)	3.7 (0.71)	3.3 (0.96) (7 NA)	3.0 (0.97)
<b>Multilingual (%)</b>	64%	100%	89% (3 NA)	78%	82%	63%
<b>Dutch at home (%)</b>	91%	67%	89% (3 NA)	67%	91%	94%
<b>Mean age (months) (SD)</b>	35.9 (6.3)	29.0 (1.7)	38.9 (5.0) (4 NA)	41.6 (3.5)	34.5 (7.2)	39.1 (5.9)
<b>Gender (% female)</b>	73%	67%	67%	67%	64%	31%
<b>Mean sociability (1-5) (SD)</b>	3.6 (0.92)	4.3 (0.57)	4.2 (0.65) (4 NA)	3.7 (0.87)	3.8 (0.79) (1 NA)	3.8 (1.1)
<b>High SES (1-5)</b>	4	1	1	2	1	3-4
<b>Language policy</b>	mono	both	multi	mono	no data	mono
<b>Vve (ECEC programme)</b>	no	no	yes	no	yes	yes

Table 4.1 (continued). Characteristics of the playgroups and the children in these playgroups (A to L).

	<b>G</b> <b>(n=13)</b>	<b>H</b> <b>(n=9)</b>	<b>I</b> <b>(n=6)</b>	<b>J</b> <b>(n=10)</b>	<b>K</b> <b>(n=12)</b>	<b>L</b> <b>(n=12)</b>
<b>Mean Dutch proficiency (0-10) (SD)</b>	7.2 (3.7) (7 NA)	6.8 (3.7)	3.3 (3.2)	8.6 (3.1)	7.2 (2.6)	8.1 (2.4)
<b>Mean comm. competence (1-4) (SD)</b>	2.7 (0.82) (7 NA)	2.9 (1.2)	2.3 (1.4)	3.3 (0.95)	2.9 (0.90)	3.4 (0.67)
<b>Multilingual (%)</b>	83% (7 NA)	100%	83%	30%	67%	50%
<b>Dutch at home (%)</b>	67% (7 NA)	89%	67%	100%	83%	92%
<b>Mean age (months) (SD)</b>	34.3 (7.5) (7 NA)	39.0 (6.8)	34.0 (6.6)	38.2 (8.2)	37.3 (5.0)	41.1 (4.6)
<b>Gender (% female)</b>	67% (7 NA)	44%	83%	50%	58%	50%
<b>Mean sociability (1-5) (SD)</b>	4.2 (0.75) (7 NA)	4.0 (0.7)	3.8 (0.98)	4.2 (0.67) (1 NA)	3.8 (0.83)	3.6 (1.0) (1 NA)
<b>High SES (1-5)</b>	3	1	2	3	2	NA
<b>Language policy</b>	all	mono	mono	mono	none	mono
<b>Vve (ECEC programme)</b>	yes	yes	yes	yes	yes	yes

### 4.3.2 Measuring interaction

We used the specifically developed open source CSNA observation app to keep track of peer interactions during the observation period (Thieme & Thieme, 2021). Before observing, we entered all participant numbers into the app and created an avatar for each child (see Figure 4.1)<sup>12</sup>. To start the observation, we started the timer in the app. We could then drag the avatars around through the classroom in real time to indicate when specific children were interacting (Figure 4.1). We used the app to measure which children were interacting during the observation period and how long they were interacting.

The author and two research assistants visited the playgroups in 2022 and 2023, and observed the children with the observation app, while also keeping an observation logbook. The research assistants followed an elaborate training before conducting an observation. We observed each group during free play in the morning for 30 to 60 minutes (see Table 4.2). In almost all playgroups, we observed in person in the classroom using the above-described app. In one case (playgroup A), we mounted a GoPro 360-camera, as well as several microphones and regular cameras in the classroom and the app data were recorded afterwards based on these video recordings, because the ECEC centre preferred this. In the end, this observation was not very different from the other playgroups, as the researcher was still present in the classroom to take notes in the observation logbook.

Before starting the data collection, the observer first spent some time with the children to gain their trust, and then during free play sat aside and kept track of children's playing activity using the app. The observer, either on site or afterwards by watching the videos of playgroup A, continually indicated in the app which children were playing together at that moment in time. We also kept track of teacher-child interactions in the app. We took notes in the observation logbook when peer interactions were negative, based on the Penn Interactive Peer Play Scale (Fantuzzo et al., 1995), or if anything out of the ordinary happened that might influence the findings, e.g., a child started crying and other children were visibly distracted by it, a new teacher came in, etc. As our logbook contained only a few negative interactions per observation, we did not use these in further analyses. We also took notes about the extent to which teachers were involved in children's peer interactions, for example, whether they invited children to join peer play activities. The logbook is available on OSF<sup>13</sup>. At three playgroups (A, B, K), we observed not once but twice, but to

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<sup>12</sup> The avatars of the children were not saved after the observation episode, only their participant numbers and peer interactions.

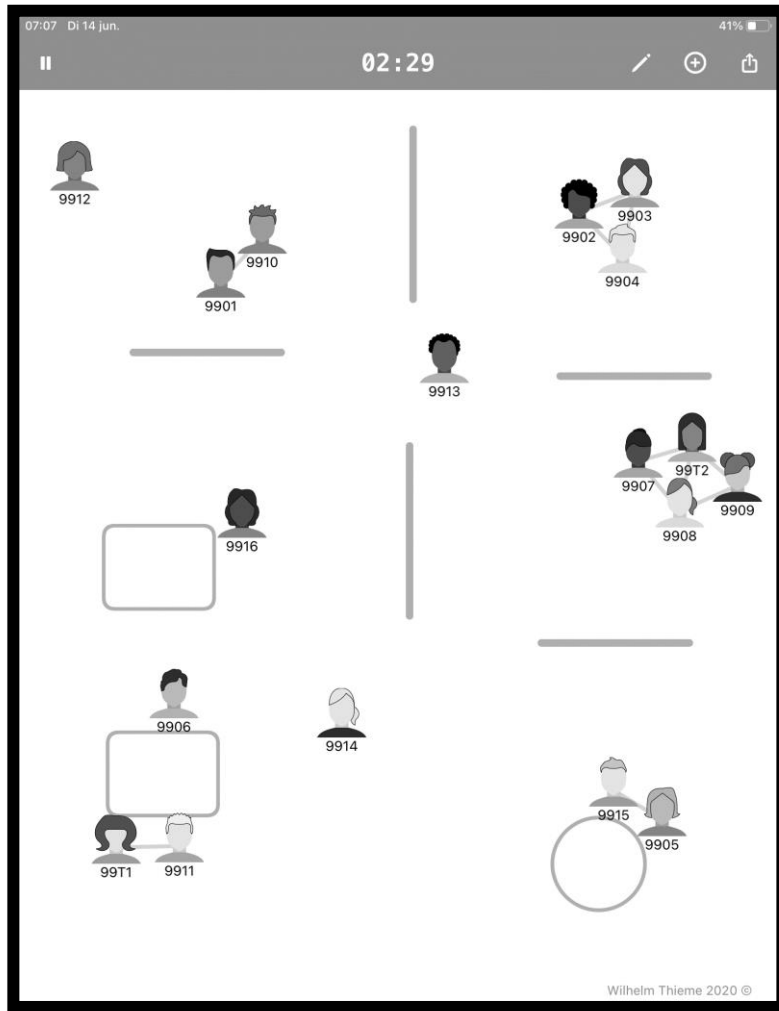
<sup>13</sup> <https://doi.org/10.17605/OSF.IO/465JT>

keep the data comparable between playgroups, we only used the first observation from these playgroups (see OSF<sup>13</sup> for the data of the second observations).

If children had a peer interaction, we indicated in the app that they were interacting. We based the operationalisation of ‘true peer interactions’ on Hay et al. (2009), as cited by Singer (2015), combined with criteria taken from play and peer interaction observation schemes for preschool children (Broadhead, 2006; Farmer-Dougan & Kaszuba, 1999; Parten, 1932). We counted an event as a peer interaction if the following criteria were met:

- Mutual engagement of attention (e.g., playing with the same toys, playing within the same narrative, talking or communicating about the same thing)
- Explicit verbal or nonverbal communicative acts (e.g., looking at each other, imitating each other, talking to each other)
- Sensitivity to the behaviour of the partner (e.g., responding to each other, helping each other)
- Coordination of actions (e.g., exchanging objects, responding to each other's actions, playing in turns)

Figure 4.1. Screenshot of CSNA app (Thieme & Thieme, 2021).



Note: Round and rectangular objects are tables. Lines denote separate play areas (e.g., a home play area and a construction play area).

Table 4.2. Duration of observation periods per playgroup in hours, minutes, and seconds.

Network	Duration (hh:mm:ss)
A	01:01:34
B	01:04:34
C	00:56:43
D	00:59:04
E	00:50:37
F	00:37:19
G	00:33:52
H	00:44:04
I	00:26:53
J	00:45:47
K	00:40:52
L	00:39:54

### 4.3.3 Surveys

Alongside the app, parent and teacher surveys were used (see OSF<sup>13</sup>), translated into any language as needed (i.e., Dutch, English, Arabic, French, Polish, and Turkish). Parents were asked for children's age, gender, home languages, dominant language, and sociability. To increase the likelihood of complete data, and because we wanted a diverse group of parents to participate, the parental survey was very short (one page, on paper). Teachers and researchers were available whenever the parents had questions, or wanted the survey to be read or explained to them. The teacher survey asked for the language policy in the playgroup, educational background of parents, children's Dutch language ability, children's communicative competence, how much children used Dutch in peer interactions, and information that was missing from parent surveys. The questions in the parent and teacher surveys that we used in this study are further detailed below.

**Language background** To determine children's language background, we asked parents to list each language that the child was exposed to, as well as describe who spoke this language to the child, and how often (less than one hour a week; a few hours a week; multiple hours on multiple days a week; (almost) all hours on (almost) all days). If parental information was missing, teachers provided the home languages.

**Dutch language proficiency** Dutch language proficiency was assessed with a scale from 0-10 in the teacher survey. This scale was based on language development landmarks for young children that have been developed and validated by Luinge and colleagues (Luinge, 2005; Luinge et al., 2006; Visser-

Bochane et al., 2020), also see Goorhuis-Brouwer (2007), such as “understands a two-word instruction, such as ‘coat on’” and “utters two-word sentences, such as ‘look cat’”. Daycare teachers were expected to be familiar with using these landmarks, as they are incorporated in oft-used ECEC observation scales in the Netherlands, such as KIJK! (Van den Bosch & Duvekot-Bimmel, 2012).

**Communicative competence** Communicative competence was assessed on a 4-point scale in the teacher survey. It was based on the validated CELF Preschool-2 pragmatics profile (Black et al., 2020; Pearson, 2012). The question asked teachers if the child communicates with other children when playing, whether verbally or nonverbally. Answer options were: never, sometimes, often, always.

**Age** Age was recorded in months by the parents, and if missing, by the teachers.

**Gender** Parents filled out the child’s gender, and if not available, it was based on teacher or researcher report.

**Sociability** Sociability was assessed in the parent survey, and if missing, in the teacher survey. The sociability question was taken from the Sociability Subscale of the validated Early Childhood Behaviour Questionnaire (ECQB) (Putnam et al., 2006), and adjusted for ease of interpretation, as follows: “Does your child often seek contact with other children, for example at a playground? no, not often at all / no, not that often / sometimes / yes, reasonably often / yes, very often”.

#### 4.3.4 Operationalisation of variables

Below, we explain the operationalisation of the variables that were measured through the app and the parent and teacher surveys<sup>14</sup>. These include both child-level variables and dyad-level variables.

##### **Outcome variable: interactions**

The outcome variable was the percentage of time that each dyad interacted within the total time they were observed. The CSNA app returned a time-coded edgelist (see OSF<sup>13</sup>), with time periods in which dyads had interactions. We first fixed any errors that were flagged in the observation logbook. We then added up all interactions of every dyad to get an aggregated edgelist (see OSF<sup>13</sup>) with

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<sup>14</sup> If parents or teachers crossed two adjacent categories on an ordinal scale, we took the mean of these two. This happened four times for communicative competence (network F) and one time for sociability (network C).

total durations of interactions per dyad. As the observations were not equal in length, we calculated the percentage of time that the dyad interacted within the total time they were observed, which was the outcome variable that we used for the analysis.

***Hypothesis 1: multilingual status***

For hypothesis 1, we examined if monolingual children have more peer interactions than children who are multilingual. A child was considered multilingual if they were exposed to another language than Dutch or alongside Dutch at home. We excluded languages if we knew that they were not used in interaction (e.g., which children heard only while watching TV or while overhearing a parent in videoconferences), were used outside the family context only (e.g., only in ECEC or when interacting with a neighbour), or were heard for less than one hour a week. We contrast-coded the child's multilingual status (-0.5: not multilingual, 0.5: multilingual). While we realise that multilingualism is a graded phenomenon, the background information we had was not specific enough to include it as a scalar variable. We only knew about children's current exposure, not about past exposure or proficiency, and not all parents filled out the information about frequency of exposure.

In our preregistration, we had specified that we would include a variable for each home language, to see how this was related to the quantity of peer interactions. However, given the large number of languages in the sample, this would have resulted in a factor with too many levels, and not enough observations for each home language. So instead, we looked at multilingual status, as research indicates that multilingual children in general might be excluded by their peers (Arvola et al., 2021; Banerjee, 2023; Bernstein, 2018; Dominguez & Trawick-Smith, 2018; Neitzel et al., 2019).

***Hypothesis 2: Dutch language proficiency***

For the second hypothesis, we examined if children with higher Dutch proficiency have more peer interactions. We took the highest language milestone that a teacher had indicated for a particular child.

Contrary to our preregistration, we chose not to use parental input data to estimate the child's Dutch language proficiency if teacher data was missing (9 out of 124). We decided not to use this information, because a child's Dutch proficiency also depends on their age, input quantity at an earlier age, input quantity outside the home, and input quality – correlations between language proficiency and input at home are usually low for majority languages, because of input outside the home or low majority language proficiency at home (Bosma & Blom, 2020; Unsworth, 2016). Instead, we imputed any remaining

missing values (see Section 4.3.5). The variable was mean-centred, based on the mean of the entire sample.

***Hypothesis 3: communicative competence***

For hypothesis 3, we examined if children with higher communicative competence have more peer interactions than children with lower communicative competence. We used communicative competence on a four-point scale, as explained above. The variable was mean-centred, based on the mean of the entire sample.

***Hypothesis 4: homophily based on language background***

For hypothesis 4, we examined if children were more likely to play together if they shared a home language. To determine language-based homophily, we included a matrix variable indicating for each dyad whether they shared a language other than Dutch as a home language (contrast-coded: -0.5: did not share a home language, 0.5: shared a home language)<sup>15,16</sup>.

***Hypothesis 5: homophily based on Dutch language proficiency***

For hypothesis 5, we examined if children played more together if they were more similar on Dutch proficiency. As Dutch proficiency was measured on a 10-point-scale, we took the absolute difference in scale points between the two children (as this is how the R package encodes it). Note that this variable therefore represents inverse homophily (heterophily), such that a larger value (larger difference) is predicted to make it less likely that children interact, and thus a negative effect means there is evidence for homophily.

***Hypothesis 6: homophily based on communicative competence***

For hypothesis 6, we examined if children were more likely to play together if they had similar levels of communicative competence. Communicative competence was based on a 4-point scale in the teacher survey, as explained above. Again, we computed this homophily effect as the absolute difference between the two children in their communicative competence (inverse homophily).

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<sup>15</sup> In a few cases, we did not manage to clarify the parental answer, but this did not pose a problem for the analysis. In three cases (“Moroccan”, “Eritrean”, “Surinamese”), there were no other children present with similar home languages in the particular network, so this was not a problem. The other case concerned network B (“Ghanaian”), but this network was excluded from the GERGM due to its small size, so this was also not a problem.

<sup>16</sup> It was not possible to use a nodematch variable, as children sometimes shared different home languages (e.g., child 1 shares English with child 2, but French with child 3).

***Control variable: gender***

Gender was contrast-coded (-0.5: boy, 0.5: girl).

***Control variable: sociability***

Sociability was assessed on a five-point scale, as explained above. This variable was mean-centred, based on the mean of the entire sample.

***Control variable: age***

Age was recorded in months. If the survey and the observation date were more than half a month apart, the child's age was adjusted to the observation date<sup>17</sup>. The parents of three children in the dataset, of which two were included in the social network analysis, only filled out the years, and not the months. We interpreted 3 years to mean 3 years and 0 months, although there is a possibility that the parent forgot to fill out the months. The age variable was mean-centred, based on the mean of the entire sample.

***Control variable: age-based homophily***

Age-based homophily was operationalised as the absolute difference between the two children in age in months (inverse homophily), see above.

***Control variable: gender-based homophily***

Gender-based homophily was operationalised with a nodematch (homophily) variable.

***Control (structural) variable: transitive triads***

We included this variable to control for transitivity effects: the effect of 'becoming friends with your friends' friends'. To aid the estimation process, we followed recommendations in the GERGM guidelines and added an exponential down-weight of 0.8, which can "make it easier to get starting values for the [...] parameter that are in the right ball park" (Denny, n.d.).

We had preregistered that we would control for popularity effects. Unfortunately, undirected GERGMs do not allow for a degree effect, that is, a popularity effect based on how much a child interacts with peers. Instead, we tried to include twostars, which is another type of popularity effect, based on how often a node has connections with two other nodes, with an exponential down-weight of 0.8 to aid the estimation process. However, it was not possible to get good model fit with this term, so we decided to drop it.

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<sup>17</sup> This was done by dividing the number of days between the survey date and the observation date by 30.5, rounding off the answer, and using this to adjust the age. For two children in network B (outside the scope of the GERGM), the survey date was missing, so their ages could not be adjusted.

### 4.3.5 Analysis

Our analyses proceeded in three steps. We first visualised the peer networks and calculated descriptive statistics, to get a broad sense of the peer networks. We then ran generalised exponential random graph models for each network, to identify which factors predicted which children played together and for how long. Finally, we performed a Bayesian meta-analysis in an attempt to identify which effects held true across playgroups.

First, we visualised the peer networks for each ECEC playgroup, using ORA-LITE software (CASOS, 2022). We also calculated descriptive statistics of degree centrality, how many peer interactions children had in each of the networks, using the *igraph* package version 2.0.3 (Csárdi et al., 2024) in R version 4.3.3 (R Core Team, 2024). We operationalised this as each child's average tie value: how long on average a child was interacting with a potential play partner.

Second, we ran a generalised exponential random graph model for each individual playgroup with the *GERGM* package version 0.13.0 (Desmarais & Cranmer, 2012). Children's background data (attributes) and the edgelist with peer interactions are available on OSF<sup>15</sup>. The model was specified as follows:

$$\begin{aligned} \text{matrix of interactions (edgelist)} \sim & \text{intercept (edges) + multilingual} \\ & \text{status + Dutch proficiency + communicative competence +} \\ & \text{homophily home language + absolute difference Dutch proficiency +} \\ & \text{absolute difference communicative competence + age + gender +} \\ & \text{sociability + absolute difference age + homophily gender + transitive} \\ & \text{triads} \end{aligned}$$

A dispersion parameter is included automatically in GERGMs and accounts for variability that is not explained by the model.

GERGMs cannot deal with missing data, so we had to impute missing predictor values or leave these out. If fewer than half<sup>18</sup> of the data points of a

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<sup>18</sup> For network E, communicative competence was missing from more than half of the children: seven of eleven children. A model without communicative competence had similar results as a model with communicative competence imputed; one effect (sharing a language) was significant in the model with communicative competence, while there was no clear effect in the model without communicative competence (see OSF<sup>15</sup>). We decided to report on the model with communicative competence in this chapter to make the reported models more comparable.

variable were missing, they were imputed<sup>19</sup> 100 times using the R package *MICE* version 3.16.0 (Buuren & Groothuis-Oudshoorn, 2011). As it would be computationally very complex to run a model for each imputation, we took the mean values of the 100 imputations to run the model. For the network of playgroups C and G, information was missing about children's language backgrounds, which we did not deem suitable to impute, and we therefore excluded all variables related to language background in this network. We also excluded variables in individual networks if there was no variation: for example, if there were no children who spoke the same home language, or if every child in the network was multilingual. In the results section, we will indicate in the table with GERGM results whenever variables were excluded.

In some networks, independent variables were highly correlated (age and Dutch proficiency  $>.8$  for A and K; communicative competence and Dutch proficiency  $>.8$  for H). As a post-hoc analysis, we fitted models that excluded either of these two correlated variables. Overall, the models were highly similar, except for two effects which gained/lost significance when one of the correlated variables was left out, but these effects never changed sign. In this chapter, we therefore report on the full models containing all variables (see OSF<sup>13</sup> for the models in which one or more variables were left out).

It is not uncommon to fit ERGMs on networks of 8-16 people (Slaughter & Koehly, 2016; Tolochko & Boomgaarden, 2024), the size of typical toddler groups in the Netherlands. Even for a small network with 10 children, the outcome variable consists of 45 unique dyads. However, since we wanted to decrease the chance of overfitting, we only included networks that had more nodes than node-level variables (multilingual, Dutch proficiency, communicative competence, age, gender, sociability). This resulted in the exclusion of networks B and I that contained only three and six children, respectively. In network G, the full data of more than half of the participants were missing (language background, language proficiency, communicative competence, age, gender, sociability) and we ended up having data from six participants only, so we also excluded this playgroup from the GERGM. This resulted in GERGMs for a total of nine networks, with 545 dyads as the outcome variable.

In the code, we indicated that GERGM model fitting should stop if signs of degeneracy (a common fitting problem in ERGMs) were encountered, but this

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<sup>19</sup> In network C, we imputed age for four children and sociability for four children. In network E, we imputed Dutch proficiency for two children and sociability for one child, and the aforementioned communicative competence. In network J, we imputed sociability for one child. In network L, we imputed sociability for one child.

was not the case for any of the models. Goodness of fit was determined for each model through four tests. Specifically, we first looked at whether simulated descriptive network statistics were statistically indistinguishable from the observed descriptive network statistics in terms of twostars, transitive triads, and edges. Second, we checked whether the simulated estimates for twostars, transitive triads, density, and intensity were within the interquartile range of the observed values. Third, we checked whether the hysteresis plot did not show signs of degeneracy, and finally, we looked at whether the trace plot looked stable (Denny, n.d.). All estimated GERGMs that are reported in this chapter showed acceptable goodness of fit on all of these tests.

Finally, we meta-analysed the results from the individual networks, to see which effects held true across playgroups. We did not specify a specific meta-analysis procedure in our preregistration, but following other network studies (Slaughter & Koehly, 2016; Tolochko & Boomgaarden, 2024), we opted for a multivariate Bayesian meta-analysis using the *brms* package version 2.20.4 (Bürkner, 2017). In this analysis, we could unfortunately only include networks which included the same variables, to ensure that they were comparable. Out of nine networks, only six were estimated with the exact same variables (i.e., A, D, E, F, J, K, L), and hence could be included. We only included our variables of interest (the language-related variable) in this meta-analysis, to ensure that we did not have too many variables. We were able to include only this subset of variables in the meta-analysis because all individual models were estimated equally. In principle, such an analysis would allow the inclusion of group level variables, such as group language policy, but there were too few playgroups to allow this. As we could only include a subset of the networks, please note that this analysis is exploratory<sup>20</sup>.

Given the lack of previous quantitative research on the topic, we used weakly informative priors to guide the analysis towards realistic values (Bürkner, 2017; Stan, 2024; Williams et al., 2018). We performed a prior sensitivity analysis (Depaoli et al., 2020; Kruschke, 2021), comparing the results of models with several weakly informative priors, the default flat priors, and priors with means based on our hypotheses. As results were extremely similar regardless of prior selection (see OSF<sup>13</sup>), we here report on just one of the models, namely the one with the following weakly informative priors: normal (0,18) for binary variables, normal (0,6) for variables on a 4-point-scale and normal (0,2) for variables on a

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<sup>20</sup> We did, however, verify that estimates had the same sign in a meta-analysis with all networks. This meta-analysis did not include all variables - the variables related to language background had missings for some networks and had to be left out.

scale from 0-10. We ran 20,000 iterations with 4 chains<sup>21</sup>. The model converged and produced reliable estimates: R-hat-values of 1.0, Bulk and Tail ESS > 10,000 (Bürkner, 2017; Kruschke, 2021).

To quantify the strength of evidence for the effects in the Bayesian meta-analysis, we computed Bayes factors with the *hypothesis* function in the *brms* package (Bürkner, 2017). Bayes factors express the strength of evidence for a particular hypothesis compared to another. We compared the alternative hypothesis, that there is an effect, to the null hypothesis. We computed the strength of evidence for the alternative hypothesis over the null hypothesis (BF10) and for the null hypothesis over the alternative one (BF01)<sup>22</sup>. In interpreting the Bayes factors, we followed the conventions of Kass and Raftery (1995) (modelled after Jeffreys, 1961), where a Bayes factor below 1 constitutes evidence for the other hypothesis, a Bayes factor between 1 and 3 constitutes inconclusive evidence for the hypothesis in question, a Bayes factor between 3 and 20 positive evidence, a Bayes factor between 20 and 150 strong evidence, and above 150 (until infinite) very strong evidence.

#### 4.4 Results

Our aim was to examine how children's language background, language proficiency, and communicative competence relate to whom children interact with, and how much, in ECEC playgroups. Below, we first describe the first step of the analysis, the visualisation of the networks and the descriptive statistics, to get an overview of the peer interactions in the playgroups. We then present the analyses of the individual networks per playgroup and the meta-analysis across playgroups.

##### 4.4.1 Description of the network structures

The networks are visualised in Figure 4.2. Figure 4.2 shows large differences in structure between the networks. Some networks (such as A, F, L) are dense, which means there were many interactions between children. Other networks (such as G, I) are much less dense.

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<sup>21</sup> With `adept_delta = 0.999`, `step_size = 0.0001`, and `max_treepdepth = 20`, to ensure there were no divergent transitions.

<sup>22</sup> These are each other's inverses.

Figure 4.2. Visualisation of the networks.

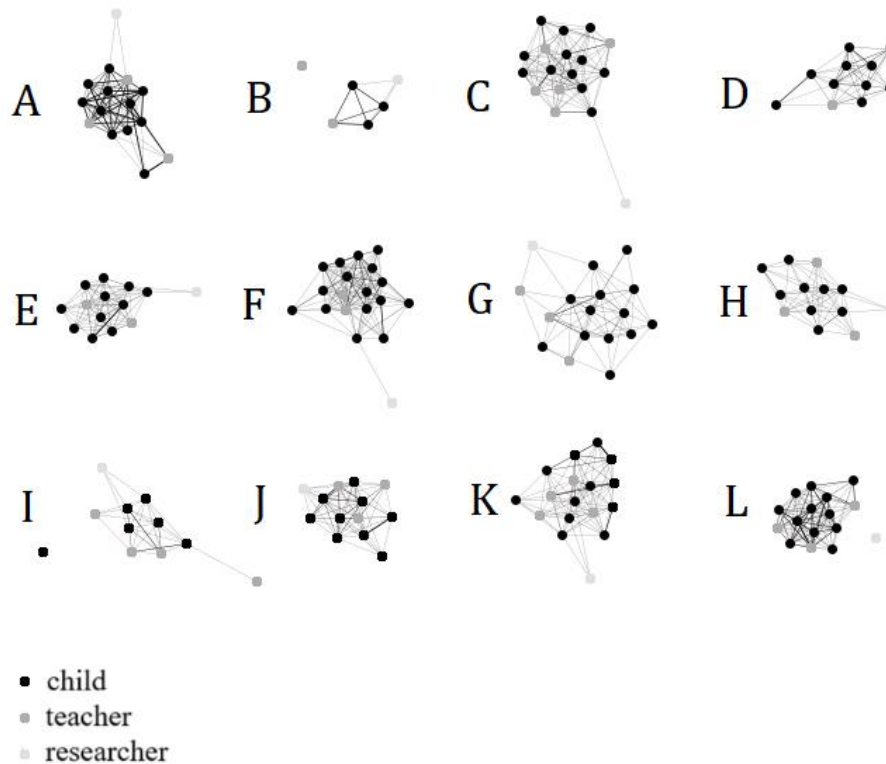


Table 4.3 shows that child degree centrality differed a lot between networks; in other words, in some networks children had more peer interactions than in others. In network A, for example, mean child degree centrality was 28.3, meaning that, on average, children were interacting with a potential peer for 28.3% of the time (their average tie value was 28.3). In network G, on the other hand, mean child degree centrality was 3.9. In network I, there was one child who did not interact with peers at all during the observation period. In this playgroup, there were also no children who shared a home language. The child degree data exclude interactions with teachers. That said, as indicated in Table 4.3, in some playgroups (such as A, B, D, J, L), teachers were very involved in children's play<sup>23</sup>. Overall, there was a significant positive correlation between

<sup>23</sup> In other playgroups, teachers were much less involved in guiding peer interaction. This might be because they did not want to influence the peer interactions that we were studying. In any case, there was variation in teacher involvement between groups,

the children's and teachers' average degree centrality in the networks (*Pearson's*  $r(10) = 0.73$ ,  $p < 0.01$ ), which indicated that children were more likely to interact with others if their teachers were also more interactive.

*Table 4.3. Degree centrality in the networks per playgroup. Child degree excludes interactions with teachers and researcher.*

<b>Network</b>	<b>Mean child degree (SD)</b>	<b>Min – max child degree</b>	<b>Teacher involvement</b>	<b>Mean teacher degree (SD)</b>
<b>A</b>	28.3 (11.2)	9.0-40.7	Teacher-led activities, teacher involvement in play	21.3 (8.0)
<b>B</b>	43.9 (3.7)	41.1-48.1	Coupling, children have to choose activity prior to free play, teacher involvement in play	14.3 (20.3)
<b>C</b>	5.4 (2.0)	2.5-9.3	Children have to choose activity prior to free play, teacher involvement in play	6.5 (1.1)
<b>D</b>	11.3 (4.1)	6.0-17.2	Teacher involved only when help is needed	11.2 (3.3)
<b>E</b>	5.2 (3.4)	1.5-11.0	NA	6.4 (0.2)
<b>F</b>	8.5 (4.0)	2.4-16.1	Children have to choose activity prior to free play, teacher-led activities	9.2 (3.9)
<b>G</b>	3.9 (2.9)	0.4-8.2	Teacher involvement in play	4.1 (3.8)

which allowed us to see that teacher involvement is related to the quantity of peer interactions.

Table 4.3 (continued). Degree centrality in the networks per playgroup. Child degree excludes interactions with teachers and researcher.

Network	Mean child degree (SD)	Min – max child degree	Teacher involvement	Mean teacher degree (SD)
<b>H</b>	5.5 (1.7)	2.4-7.7	Children have to choose activity prior to free play, teacher involvement in play	3.5 (1.5)
<b>I</b>	5.5 (3.7)	0.0-9.2	Teacher-led activities, teacher involvement in play	4.6 (5.1)
<b>J</b>	10.5 (5.1)	2.6-16.7	Teacher-led activities, teacher involvement in play	14.3 (4.3)
<b>K</b>	7.8 (4.6)	0.9-14.8	Teacher involvement in play	5.0 (1.8)
<b>L</b>	18.2 (7.4)	5.9-28.5	Teacher-led activities, teacher involvement in play	16.5 (9.2)

*Note: Child degree is the child's average tie value: sum of a child's tie values (percentage of time playing with each of the other children) divided by child's number of potential ties (total number of potential interaction partners). Teacher degree, like child degree, is based on the app observations, while the description of teacher involvement is based on notes made in the observation logbook.*

#### **4.4.2 Generalised exponential random graph models and Bayesian meta-analysis**

In this section, we present the generalised exponential random graph models of the individual playgroups, and the meta-analysis across playgroups. These models allow us to examine how language background, Dutch proficiency, and communicative competence relate to whom children interact with, and how much they interact. Table 4.4 shows the results of the generalised exponential random graph models for each individual playgroup. Note that these models are based only on peer interactions between children and exclude teacher-child interactions. Table 4.5 shows the results of the Bayesian meta-analysis across playgroups, and Figure 4.3 visualises these results. As the meta-analysis only includes networks A, D, E, F, J, K, L (see section 4.3.5), the results should be treated with caution. Moreover, model fit was better for the child-level than the dyadic variables, based on plots of the posterior-predictive checks. Below, we present the results for each variable of interest separately, combining the results of the individual playgroup analyses and the meta-analysis across playgroups.

Table 4.4. Results of the generalised exponential random graph models for the peer networks in each playgroup (A to L), effects with standard errors.

	A	C	D	E	F	H	J	K	L
<b>Intercept</b>	66.24*	10.50*	36.53*	8.92	18.37*	6.25*	9.10*	0.92	39.05*
	7.37	1.71	1.66	0.59	2.83	0.99	0.94	0.68	2.68
<b>Multilingual (yes vs no)</b>	-1.10	NA	0.76	0.22	-3.39*	NA	0.61	-0.34	2.51
	3.57	NA	2.12	0.42	1.61	NA	0.95	0.42	1.81
<b>Dutch proficiency</b>	-0.18	-0.05	2.86*	0.43	-0.43	0.69	0.44	-0.15	0.23
	6.01	0.23	0.62	0.27	0.70	0.76	0.68	0.31	1.66
<b>Communicative competence</b>	12.68*	-0.16	1.10	-0.18	1.98*	-3.72	0.05	0.02	-2.32
	1.78	0.52	1.00	0.20	0.75	3.33	0.35	0.27	1.80
<b>Age</b>	-1.05	0.46	-3.01*	0.19	-2.06*	1.85	-0.31	0.27	2.38
	5.97	0.53	1.02	0.22	0.84	1.25	0.54	0.35	1.26
<b>Gender (girl vs boy)</b>	-0.26	-0.11	-1.25*	-0.01	2.17*	-1.34*	-0.18	0.05	-0.22
	1.84	0.35	0.61	0.16	0.62	0.62	0.50	0.28	1.11
<b>Sociability</b>	-4.03	0.03	1.73*	-0.36	-0.13	0.36	-0.28	-0.07	1.48
	2.68	0.37	0.68	0.19	0.55	0.41	0.38	0.15	1.24
<b>Shares home language</b>	-3.10	NA	9.97*	3.04*	0.32	-0.28	6.72*	-0.07	3.64*
	2.15	NA	0.57	0.24	0.38	0.34	0.24	0.12	0.90

Table 4.4 (continued). Results of the generalised exponential random graph models for the peer networks in each playgroup (A to L), effects with standard errors.

	A	C	D	E	F	H	J	K	L
<b>Absdiff Dutch proficiency</b>	1.91	-0.77*	-4.43*	-0.34*	-0.10	-0.24	0.41	-0.31	2.54*
	2.82	0.36	0.68	0.16	0.54	1.44	0.27	0.28	0.77
<b>Absdiff comm comp</b>	-3.13*	0.34	-1.96*	-0.10	0.40	0.25	0.15	-0.05	-3.80*
	1.53	0.36	0.81	0.17	0.56	1.66	0.21	0.13	0.67
<b>Absdiff age</b>	-2.99	0.44	-1.20	0.14	-0.44	-0.28	0.05	0.08	0.25
	2.53	0.35	0.81	0.18	0.61	0.55	0.24	0.20	0.81
<b>Same gender</b>	5.57*	2.19*	0.33	0.29*	0.22	0.98*	0.39	0.30	1.65*
	1.71	0.37	0.62	0.14	0.44	0.36	0.24	0.21	0.74
<b>Transitive triads</b>	0.05*	0.04*	0.04	0.05*	0.04*	0.09*	0.13*	0.10*	0.07*
	0.02	0.02	0.04	0.02	0.01	0.03	0.02	0.01	0.02
<b>Dispersion</b>	2.22*	0.77*	1.03*	0.03	1.32*	0.55*	0.44*	0.04	1.55*
	0.15	0.14	0.19	0.17	0.09	0.18	0.22	0.21	0.13

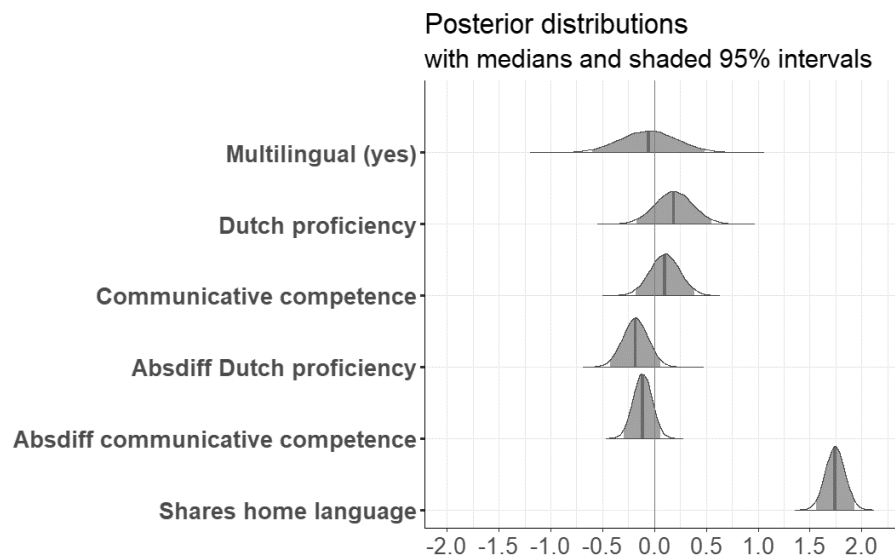
Note: coefficients are displayed with standard errors below them. \* means significant at the 95% level.  
Absdiff = absolute difference. Comm comp = communicative competence.

Table 4.5. Multivariate Bayesian meta-analysis across playgrounds A, D, E, F, J, K, and L.

	<b>Estimate</b>	<b>Standard error</b>	<b>95% credible interval</b>	<b>Bayes factor (1 0)</b>	<b>Bayes factor (0 1)</b>
<b>Multilingual (yes)</b>	-0.06	0.27	-0.60; 0.48	0.015	65.01
<b>Dutch proficiency</b>	0.19	0.18	-0.17; 0.55	0.15	6.64
<b>Communicative competence</b>	0.10	0.14	-0.18; 0.38	0.030	33.34
<b>Shares home language</b>	1.74	0.09	1.56; 1.93	Inf*	0*
<b>Absdiff Dutch proficiency</b>	-0.18	0.12	-0.43; 0.06	0.18	5.62
<b>Absdiff comm competence</b>	-0.11	0.09	-0.29; 0.06	0.032	30.78

Note: \* this means that all posterior draws supported the alternative hypothesis over the null hypothesis.

Figure 4.3. Posterior distributions of multivariate Bayesian meta-analysis across playgroups with medians and 95% intervals shaded in grey.



**Language status (multilingual):** There was a significant negative effect of multilingualism on peer interactions in playgroup F (est = -3.39, SE = 1.61), but not in other playgroups. This estimate should be interpreted to mean that, in playgroup F, multilingual children had significantly fewer peer interactions than monolingual children. Compared to other playgroups, playgroup F had a relatively low proportion of multilingual children (63%) and many children who spoke Dutch at home (94%). As Figure 3 shows, the meta-analysis showed no effect of multilingualism across playgroups. In this meta-analysis, there was strong evidence for the null hypothesis that multilingualism had no effect on peer interactions (BF01 = 65.01, est = -0.06; SE = 0.27; 95% credible interval = -0.60; 0.48).

**Dutch language proficiency:** There was a significant positive effect of Dutch proficiency on peer interactions in playgroup D (est = 2.86, SE = 0.62), but not in other playgroups. Compared to other playgroups, children in playgroup D had a relatively lower level of Dutch proficiency (mean = 6.4), bigger between-peer differences in Dutch proficiency (SD = 3.6), and fewer children spoke Dutch at home (67%). As Figure 3 indicates, the Bayesian meta-analysis showed no effect of Dutch proficiency across playgroups. In this meta-analysis, there was positive evidence for the null hypothesis that Dutch proficiency had no effect on peer interactions (BF01 = 6.64, est = 0.19, SE = 0.18, 95% credible interval = -0.17; 0.55).

**Communicative competence:** There was a significant positive effect of communicative competence on peer interactions in playgroups A and F (est = 12.68, SE = 1.78; est = 1.98, SE = 0.75, respectively). There was no immediately apparent common denominator between these playgroups. As Figure 3 indicates, the Bayesian meta-analysis showed no effect of communicative competence across playgroups. In this meta-analysis, there was strong evidence for the null hypothesis that communicative competence had no effect on peer interactions (BF01 = 33.34, est = 0.10, SE = 0.14, 95% credible interval = -0.18; 0.38).

**Homophily of language background:** We found significant language background homophily effects in four individual playgroups. Children with the same home language were significantly more likely to interact with each other in playgroups D, E, J, and L (est = 9.97, SE = 0.57; est = 3.05, SE = 0.24; est = 6.72, SE = 0.24; est = 3.64, SE = 0.90, respectively). In playgroup D, this effect seemed to have been driven by two children who shared English and Hindi as home languages and interacted with each other for 53% of the time. In playgroup E, this effect seemed to have been driven by two children who shared English as a home language and interacted for 77% of the time, as well as two children who shared Turkish as a home language and interacted for 13% of the time. In playgroup J, this effect seemed to have been driven by two children who shared Polish as a home language, and interacted with each other for 36% of the time. In playgroup L, this effect seemed to have been driven by four children who shared English as a home language, and each dyad in this English-language group interacted for more than 20% of the time. As Figure 3 displays, the Bayesian meta-analysis showed a positive homophily effect: children with the same home language were more likely to interact. In this meta-analysis, there was very strong evidence for a homophily effect of language background on peer interactions (BF10 = Inf, est = 1.74; SE = 0.09; 95% credible interval = 1.56; 1.93).

**Homophily of Dutch language proficiency:** The individual GERGMs showed diverging results on homophily of Dutch language proficiency. This variable was operationalised as the absolute difference the language proficiency ratings of each pair of children, which means that the effects for *the absolute difference in language proficiency* in Tables 4.4 and 4.5 are divergence/heterophily (i.e. the opposite of homophily) effects, as this is how this is coded in the *GERM* R package. Pairs of children with more diverging Dutch language proficiencies were significantly less likely to interact with each other in playgroups C, D, and E (est = -0.77, SE = 0.36; est = -4.43, SE = 0.68; est = -0.34, SE = 0.16, respectively), that is, there was a homophily effect in these playgroups. However, dyads with more diverging Dutch language proficiencies were significantly more likely to interact in playgroup L (est = 2.54, SE = 0.77).

Descriptively, children in playgroup C, D, and E had relatively low Dutch proficiency (means are 5.4, 6.4 and 7.4, respectively) and there was a relatively high proportion of multilingual children in these playgroups (89%, 78% and 82% respectively). In contrast, children in playgroup L had a relatively higher Dutch language proficiency (mean = 8.1) and there were fewer multilingual children in this playgroup (50%). As seen in Figure 3, the Bayesian meta-analysis showed no homophily effect of Dutch language proficiency. In this meta-analysis, there was positive evidence for the null hypothesis that there was no homophily effect of Dutch language proficiency on peer interactions (BF01 = 5.62; estimate = -0.18, SE = 0.12, 95% credible interval = -0.43; 0.06).

***Homophily of communicative competence:*** We found homophily of communicative competence effects in three individual playgroups. This variable was operationalised using absolute differences, which means that the effects for *the absolute difference in communicative competence* in Tables 4.4 and 4.5 are divergence/heterophily (i.e. the opposite of homophily) effects, as this is how this is coded in the *GERM* R package. Dyads with more diverging communicative competence were significantly less likely to interact in playgroups A, D, and L (est = -3.13, SE = 1.53; est = -1.96, SE = 0.81; est = -3.80, SE = 0.67, respectively) (i.e., there was a homophily effect). There was no clear common denominator between these groups, except for relatively low sociability (means of 3.6, 3.7, and 3.6 respectively). As Figure 3 shows, the Bayesian meta-analysis showed no homophily effect of communicative competence. In this meta-analysis, there was strong evidence for the null hypothesis that there was no homophily effect of communicative competence (BF01 = 30.78, est = -0.11, SE = 0.09, 95% credible interval = -0.29; 0.06).

#### 4.5 Discussion

In this study, we examined how children's linguistic resources relate to their peer networks in ECEC toddler groups. Our study was innovative because it was based on observations, for which we used a specially developed social network app and generalised exponential random graph models. This allowed us to include various language-related variables, such as dyadic variables (e.g., homophily based on language background), and add control (structural) variables (e.g., transitivity effects). There were large differences between the groups in terms of child degree centrality. In some networks, children were not interacting together much, while in other networks, peer interactions were frequent, possibly facilitated by teachers, as there was a significant positive correlation between the children's and teachers' average degree in the networks. This suggests that teachers play an important role in creating peer interaction opportunities for (multilingual) children.

In the literature, findings on the role of language background, language proficiency, and communicative competence in how much children interact and with whom have been mixed (Thieme et al., 2025b). Our results suggest why this might be the case: we found that effects did not surface in all groups, and sometimes, opposite effects were found. Earlier studies found that multilingual children had fewer peer interactions (Banerjee, 2023; Bernstein, 2018; Domínguez & Trawick-Smith, 2018), but we only found this hypothesis (hypothesis 1) confirmed in one playgroup, and across playgroups there was in fact strong evidence for the null hypothesis. A tentative explanation is that the communicative and socio-emotional advantages of multilingualism (Fan et al., 2015; Halle et al., 2014; Sun et al., 2021; Yow & Markman, 2015) balanced out this hypothesised effect in our sample. Alternatively, group composition might play a role, as the playgroup with a negative effect of multilingualism on peer interactions had a relatively low proportion of multilingual children and relatively many children who heard Dutch at home. Perhaps, multilingual children are excluded more often if there are fewer children like them. This would fit with the results of the dyadic factors (see below), which also indicate the importance of being able to find similar peers.

For hypothesis 2, we predicted that Dutch language proficiency would be positively related to peer interactions. This was true for only one playgroup, and the meta-analysis in fact found positive evidence for the null hypothesis. In our study, ECEC language proficiency therefore did not emerge as an important factor in peer interactions, in contrast to earlier literature and Chapter 3 (Blum-Kulka & Gorbatt, 2014; Mansikka et al., 2024; Syczewska & Licandro, 2021; Thieme et al., 2025b). The only playgroup in which it emerged as a significant predictor was a playgroup in which Dutch proficiency was generally low and variation between children large. It could be, therefore, that group composition plays a role and that ECEC language proficiency is only important in case of large proficiency differences between children.

For hypothesis 3, we predicted that communicative competence might be positively related to peer interactions, and this was true in two playgroups. The results for these playgroups echo earlier literature from ECEC and kindergarten which shows that communicative competence predicts peer interactions (Chen, Justice, et al., 2020; Van der Wilt, 2018). However, in the meta-analysis we found strong evidence in favour of the null hypothesis, and we were not able to identify a clear common denominator between the two groups that would help explain the result in these groups. In an earlier ECEC study (Chen, Justice et al., 2020), effects of communicative competence were very small, and there might also be interactions with gender (Van der Wilt, 2018), so that could explain why the effects only surfaced in two groups in our study.

For hypothesis 4, we predicted that children would be more likely to interact with each other if they spoke the same home language. We indeed found this for four playgroups and the Bayesian meta-analysis also showed very strong evidence in favour of this homophily effect compared to the null hypothesis. This effect has been observed in earlier small-scale studies (Feng et al., 2004; Kyratzis, 2010; Thompson, 1996) and fits with the results of Chapter 3 where 76% of the surveyed ECEC teachers said that speaking the same language was at least somewhat important in peer group formation (Thieme et al., 2025b). These types of same-language peer interactions can help multilingual children feel welcome at ECEC and aid socio-emotional development (Halle et al., 2014).

Hypothesis 5 stated that children would be more likely to interact if they had more similar Dutch proficiencies. In three playgroups, we indeed found a significant proficiency-based homophily effect, but in another playgroup, we found the opposite. Group composition could play a role in these diverging results: the homophily effect was found in groups with a relatively high proportion of multilingual children and relatively low Dutch proficiency. Across playgroups, the Bayesian meta-analysis found positive evidence in favour of the null hypothesis. This goes against teacher indications in Chapter 3 that children might play with those of similar language proficiency (Thieme et al., 2025b). Perhaps, the findings really depend on group composition, which might cancel out effects in the meta-analysis.

Hypothesis 6 stated that children with similar communicative competence might be more likely to interact. In three playgroups, we found a significant positive homophily effect. However, the Bayesian meta-analysis found strong evidence in favour of the null hypothesis. Again, it could be that this effect depends on group composition. While there has not been much research into this homophily effect of communicative competence, it would fit well with developmental theories and the observations of teachers in Chapter 3 (Coplan & Arbeau, 2009; Thieme et al., 2025b).

Our study has a couple of limitations. First, it is important to realise that the observed relationships are not necessarily causal relationships. Children with the same home language might also play together more because they are more likely to share a cultural background, ethnicity, or race. However, studies with older children suggest that sharing a language background might be more important than sharing ethnicity or race (Lee & Walsh, 2003; Paquette-Smith et al., 2019). Children might also have played together more because they saw each other outside ECEC too, but we only asked about this at the end of our data collection and it only concerned a few children, so we could not include this in our models. Furthermore, teachers might have played a role in the

opportunities children had for peer interaction, as teacher involvement during play was positively correlated with the amount of peer interactions. This means that the patterns we observed might not necessarily be shaped only by child characteristics, but also by teachers' pedagogy and children's ECEC environment.

Second, it is important to refrain from taking a deficit approach when interpreting our study results. Some earlier studies found that multilingual children had fewer peer interactions, but this could be due to contextual, social, and pedagogical factors, such as language policy, social biases, and exclusion. In our study, we found very little evidence that multilingual children have fewer peer interactions. In fact, we only found this for one playgroup, a playgroup in which there were few multilingual children, strengthening the idea that the social context plays an important role.

Third, most effects in our study were small in terms of magnitude and sometimes opposite in sign across playgroups. This might partly be due to the naturalistic design of the study, in diverse ECEC groups instead of more controlled settings. Parents sometimes did not fill out all data, meaning some data had to be imputed. Some data might not be very precise, as we received some surveys months after the observation moment – or months before, if it took a long time to plan an observation moment – despite our best efforts. However, our data do offer insight into naturalistic situations in a wide variety of ECEC centres.

Fourth, we did not have enough data to examine some questions. We had twelve playgroups for the descriptive degree data, nine for the exponential random graph models, and seven for the Bayesian meta-analysis, and we observed peer interactions for 30-60 minutes per playgroup. Results might have been different if we had observed more groups for longer periods of time. Moreover, because we wanted to get full survey data from parents with diverse backgrounds, we kept the parental survey short, meaning that most variables were based on one or a few questions only. Previous research suggests that variables in surveys, such as home language exposure, can be assessed with only one or a few questions, which has advantages for executability and reaching a wider group of participants (Bowling, 2005; De Cat et al., 2025).

Fifth, the effects of the Bayesian meta-analysis should particularly be treated carefully, as not all networks could be included in this analysis. There was not enough data and/or variation to systematically examine effects such as group composition, language policy, or interaction effects. Descriptively, differences between groups co-occurred with differences in the percentage of multilingual children in the group, children's mean Dutch proficiency, variation in children's

Dutch proficiency, and the percentage of children who heard Dutch at home. More specifically, a negative effect of multilingualism on the quantity of peer interactions surfaced in a playgroup with relatively few multilingual children and many children who heard Dutch at home. A positive effect of Dutch proficiency appeared in a playgroup in which children had relatively low Dutch proficiency, there was higher variation in Dutch proficiency, and there were fewer children who heard Dutch at home. A homophily effect of Dutch proficiency was found in playgroups with relatively low Dutch proficiency and relatively high proportion of multilingual children, while the opposite effect was found in a group with relatively high Dutch proficiency and relatively few multilingual children. However, we were unable to examine such group-level effects statistically.

Our results suggest a couple of directions for future research. For example, it would be interesting to examine interaction and group-level effects more systematically. Previous research indicates that multilingualism in combination with high majority language proficiency might result in advantages in peer interactions (Fan et al., 2015; Halle et al., 2014; Han & Huang, 2010; Sun et al., 2021; Yow & Markman, 2015). Moreover, ECEC teachers in Chapter 3 suggested that homophily effects mostly surface if children are new to ECEC (Thieme et al., 2025b). Furthermore, it might be expected that a multilingual language policy results in more peer interaction opportunities for multilingual children and children with low Dutch proficiency. There might also be more homophily effects in groups with a multilingual language policy (or fewer, see Kirsch & Mortini, 2023). Typical for the Dutch context, there was only one group with a multilingual language policy in our study, so these questions should be examined in future studies. It would also be interesting to look more systematically at the effects of group composition, which our descriptive results hinted at. Another interesting question is how playgroup social networks relate to teachers' pedagogy, and how teachers can create peer interaction opportunities for all children, regardless of communicative background.

It would also be interesting to examine how children exercise their agency when interacting with peers (Schwartz, 2018). Earlier studies suggest that children may explicitly choose or reject children as playmates (Cekaite & Evaldsson, 2017; Thieme et al., 2025b). If possible, it would be valuable to include children as active participants in the research and listening to their perspective, taking inspiration from earlier research with young children as active participants (Crump & Phipps, 2013; Little, 2023; Little & Little, 2022; Rodríguez-Carrillo et al., 2020).

In future work, it would also be worthwhile to collect longitudinal data and examine how interactions/social relations develop over time. This would also

give more insight into questions of causality. Dynamic network models might prove useful in this respect (De Nooy, 2011; Niezink et al., 2019; Paradowski et al., 2024; Stadtfeld et al., 2017), and they combine well with the type of real time data collection with an app. Besides apps, there are also other exciting new possibilities in network data collection, for example using sensing technologies (Foster et al., 2023; Messinger et al., 2019), making efficient data collection possible at a large scale. Future studies could use this technology to gather larger datasets about the role of children's linguistic resources in peer interactions in ECEC.

Generalised exponential graph models create interesting possibilities for researchers working in linguistics and multilingualism. They allow us to more systematically examine the role of language within social networks, which is important, as language is a social phenomenon, and people use language and learn through interaction with others (Hoff, 2006; Milroy, 1980; Vygotsky, 1986). In our study, we found that there are also various challenges associated with this type of social network analysis, such as intensive data collection, in which it was important to get full consent and data from all children in the classroom. To examine group-level effects, even more data are needed. That said, in our study we were able to account for a large number of variables because of our use of GERGMs. We could examine the separate roles of language background, ECEC language proficiency, and communicative competence in whom children interacted with and how much, while controlling for factors like age, gender, and sociability. Dyadic factors, such as language-based homophily, could be modelled, which helped paint a more complete picture of peer interactions.

It turned out that one of these dyadic effects was most prominent in the peer interactions we observed: children were more likely to interact with others with a similar language background. We also observed large differences between the observed toddler groups. In some groups, children hardly played together. Teachers' involvement in free play was positively related to children's degree centrality, so teachers seem to have an important role in creating opportunities for peer interaction. In terms of practical implications, and given the importance of peer interactions for development (Coplan & Arbeau, 2009; Deunk, 2009; De Haan, 2015; Washington-Nortey et al., 2020), teachers could try to stimulate peer interactions more in ECEC groups. Sometimes, teachers might view multilingualism as a 'problem' (Cromdal & Stoewer, 2022; Peleman et al., 2022; Thieme et al., 2025b), but this study suggests it is more about whether (multilingual) children are able to find peers with a similar language background. Following teachers in preschool and primary school (see Langeloo et al., 2019), teachers in ECEC might help multilingual children connect to same-language peers. Translanguaging practices (Bonacina-Pugh et al., 2021)

might prove beneficial for (multilingual) children's peer interactions, so they can use their full communicative repertoires to connect to their peers. In this way, all children, regardless of language background, can reap the full benefits of peer interactions.

## 5. Video observation of the play complexity and social behaviour of multilingual toddlers in ECEC<sup>24</sup>

“Je kan niet [tegen kinderen] zeggen: je mag geen Turks praten. Geen taal, geen spel, geen ontwikkeling.”

“[As a teacher] you cannot say [to children]: you cannot speak Turkish. No language, no play, no development.”

(teacher K, Thieme et al., 2025a)

### 5.1 Introduction

The importance of play for cognitive, social, and linguistic development has been well-established, and already featured in the theories of Piaget and Vygotsky (Lillard et al., 2013; Quinn et al., 2018). While many different definitions of play exist, play tends to be enjoyable, voluntary, creative, and explorative, for example involving toys or pretence (Rentzou et al., 2019). Complex and social forms of play, such as social pretend play, have been found to be particularly beneficial for development (Cekaite et al., 2014; Kızıldere et al., 2020; Lillard et al., 2013; Quinn et al., 2018; White et al., 2021). Pretend play is a complex play form in which children pretend that they are part of an alternative reality, pretending for example that they are taking care of a baby (Lillard et al., 2013). If they do this with other children, this is referred to as social pretend play. Based on longitudinal and experimental work, there are indications that social pretend play might contribute to cognitive, social, and linguistic development (Baumer et al., 2005; Jaggy et al., 2023; Rydland, 2009; White et al., 2021). Social pretend play provides a stimulating environment for language development, with symbolic, out-of-frame talk, and social interactions that involve joint attention, questions, and conversational turns (Hå, 2022; Kızıldere et al., 2020; Quinn, 2016; Quinn et al., 2018; Rydland, 2009). Therefore, both the complexity of play and the social interactions during play contribute to children’s language development (Coplan & Arbeau, 2009; Kızıldere et al., 2020; Orr & Geva, 2015; Quinn et al., 2018)

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<sup>24</sup> This chapter is a slightly modified and expanded version of a submitted article: Thieme, A. M. M., Verhagen, J., Kuiken, F., & Andringa, S. (submitted). *Multilingual children’s play in Dutch toddler groups: Video observation of their play complexity and social interactions during play.*

The literature reports evidence of language-based inequity in peer play in early childhood education and care (ECEC). Multilingual children might experience less complex play and play alone more than their monolingual peers (Arvola et al., 2021; Stangeland, 2017; Thieme et al., 2025b), although findings are mixed, as children might engage in complex play and in social play through nonverbal communication or their home language (Björk-Willén, 2016; Feng et al., 2004; Kyratzis et al., 2009; Thieme et al., 2025b). In this study, we therefore examined young multilingual children's play behaviour in ECEC by observing multilingual children's play complexity and social interactions during free play. Our aim was to see how play complexity and social interactions were related to children's linguistic resources (e.g., language background, ECEC language proficiency), nonverbal communication, and language use (e.g., home language use during play).

## **5.2 Play complexity and social interactions in multilingual children in ECEC**

Some studies suggest that multilingual children have fewer opportunities for complex play and social interactions during play in ECEC than their monolingual peers. For example, on the basis of large-scale observations in Finland, Arvola and colleagues (2021) showed that 5- and 6-year-old children with linguistically diverse backgrounds engaged mostly in basic rule play (such as games) and solitary play, instead of more complex role play or cooperative play. This study, however, did not examine children's specific linguistic resources in detail, and it thus remains unclear which language factors might explain their results. There are indications that ECEC language proficiency might play a role: children with smaller ECEC language vocabularies experienced more peer rejection and conflict, instead of cooperative social play, in a German study with 30 3-6-year-olds (Syczewska & Licandro, 2021). The role of ECEC language proficiency also surfaced in a large-scale study on 2-year-olds in Norwegian ECEC: children with lower ECEC language skills engaged in more solitary and less complex play than children with higher ECEC language proficiency (Stangeland, 2017). However, children's language backgrounds were not described or examined in detail in this study. Moreover, the researchers found that social competence was actually more important than ECEC language proficiency for play (Stangeland, 2017). Mixed findings about the role of ECEC language proficiency were also reported in the study in Chapter 3 (Thieme et al., 2025b). In that study, ECEC teachers ( $n = 216$ ) who worked with multilingual children (0-4-year-olds) were asked about their experiences with children's peer interactions and play. In total, 36% of teachers thought that children who do not speak the language(s) in ECEC well experience difficulties connecting to other children, 22% reported they form shallower friendships, 38% indicated they engage in simpler forms of play, and 58% thought they have simpler peer interactions (Thieme et al., 2025b). All in

all, the literature thus reports some evidence that multilingual children and/or children with lower ECEC language proficiency might experience less complex and social play in ECEC.

That said, other studies find that multilingual children engage in complex play full of social interactions using their home language, or using their (non-verbal) communicative competence. In a Finnish study that combined teacher interviews with observation, the amount of social inclusion and social play depended on finding a common language, as one teacher noted: “if there is no common language, it is difficult to start a good play” (Mansikka et al., 2024, p. 330). Similarly, Kyratzis and colleagues (2009) found, using video observations, that 3- to 5-year-old multilingual children in an American preschool engaged in complex social play, also if they had lower ECEC language proficiency. The emergent multilingual children in this study created these complex social interactions through code-switching. Likewise, in a study by Feng and colleagues (2004), a peer group of three toddlers (mean age: 3.6 years old) showed high levels of social play, with sophisticated language use and many pretend play episodes, using their home language Mandarin in an otherwise English-language ECEC setting. The results of these studies suggest that the use of the home language creates opportunities for complex play and social interactions during play. This resonates with the results of the previously mentioned study in Chapter 3, where some teachers believed that children could play and interact in complex ways non-verbally or in their home language (Thieme et al., 2025b). Home language use and communicative competence, the competence to communicate with peers verbally and nonverbally, may therefore be more important for social and complex play than ECEC language proficiency.

All in all, the literature suggests that many factors might play a role in the opportunities that multilingual children have for complex play and social interactions during play, not just their multilingualism and ECEC language proficiency, but also their communicative competence, nonverbal communication, and home language use (Arvola et al., 2021; Quinn et al., 2018; Stangeland, 2017). Some of these variables, such as nonverbal communication, might only be captured reliably through video observation. Video observation allows the researcher to rewind a play episode and examine it in more detail, paying close attention to nonverbal signs. Some forms of complex play might only become apparent once a play episode is viewed in detail multiple times, children’s nonverbal communication is coded and their utterances are translated. Perhaps unsurprisingly then, earlier studies that showed complex and social play in multilingual children mainly relied on (video) observation (Feng et al., 2004; Kyratzis et al., 2009; Mansikka et al., 2024). Therefore, in this study we videotaped play episodes in ten playgroups for toddlers across the

Netherlands. We coded children's play complexity and social interactions while paying attention to non-verbal communicative signs, and transcribed and translated children's utterances. We aimed to find out how children's play behaviour and social interactions during play related to their linguistic resources and language use. Our research questions were:

1. How do children's multilingual status, Dutch language proficiency, communicative competence, use of (the home) language, and nonverbal communication relate to the complexity of their play in toddler groups in the Netherlands?
2. How do children's multilingual status, Dutch language proficiency, communicative competence, use of (the home) language, and nonverbal communication relate to the social interactions during play in toddler groups in the Netherlands?

We examined these questions using Bayesian multilevel categorical models, and illustrated the results of these models with example excerpts from the videos.

### **5.3 Methodology**

#### **5.3.1 Participants**

We contacted ECEC organisations in the Netherlands through email to ask if they would be interested in participating in a project on multilingualism and peer play in ECEC (the same project as in Chapter 4). In the Netherlands, ECEC is largely play-based, and attended by at least 72% of young children, and probably even a higher percentage of toddlers (Centraal Bureau voor de Statistiek, 2025). Toddler groups for children aged 2 to 4 years old are common, and include maximally sixteen toddlers with two ECEC teachers (Ministerie van Algemene Zaken, 2021). While we initially recruited twelve playgroups for video observation ( $n = 101$ ), only 61 children in ten playgroups were on video for at least five minutes. We therefore only included these ten playgroups in our study. Detailed information about the ten playgroups is included in Table 5.1 below. The playgroups were diverse in terms of children's language backgrounds and parents' socioeconomic status. Seven out of ten playgroups targeted children at so-called 'risk of [Dutch] language delay', usually defined on the basis of their socioeconomic status and/or language background, who were offered an early childhood education program (Gemeente Den Haag, 2023; Ministerie van Algemene Zaken, 2013; Onderwijs010, n.d.). Informed consent was obtained from the teachers and the parents of all participating children and the study was approved by the Ethics Board of the Faculty of Humanities at the University of Amsterdam (application number: 2021-FGW\_OTHR-13762).

Table 5.1. Characteristics of the playgroups (I to X) that participated in the study.

<b>Playgroup*</b>	<b>Location</b>	<b>Language policy**</b>	<b>Highly educated parents***</b>	<b>Early childhood education programme</b>
<b>I</b>	mid-sized town outside metropolitan area (Randstad)	none	some	no
<b>II</b>	big city in Randstad	monolingual	most	no
<b>III</b>	mid-sized town in Randstad	multilingual	(almost) no	yes
<b>IV</b>	big city in Randstad	monolingual	(almost) no	yes
<b>V</b>	mid-sized town in Randstad	monolingual	some	no
<b>VI</b>	mid-sized town in Randstad	NA	(almost) no	yes
<b>VII</b>	mid-sized town in Randstad	monolingual	some	yes
<b>VIII</b>	big city in Randstad	monolingual	(almost) no	yes
<b>IX</b>	big city outside Randstad	monolingual	some	yes

Table 5.1 (continued). Characteristics of the playgroups (I to X) that participated in the study.

Playgroup*	Location	Language policy**	Highly educated parents***	Early childhood education programme
X	small town outside Randstad	monolingual	approximately half	yes

Note: \* playgroups II, III, V, VI, VIII, IX, and X were also included in the study described in Chapter 4, as A, C, D, E, H, I, and J respectively.

\*\* monolingual: children are encouraged to use the ECEC language when talking to each other, multilingual: children can use any language when talking to each other.

\*\*\* teachers' assessment, they were given the following options: (almost) no, some, approximately half, most, (almost) all.

### 5.3.2 Materials

We distributed parent and teacher surveys, translated into Dutch, English, Arabic, French, Polish and Turkish, depending on parents' needs. These surveys are available on OSF<sup>25</sup>. To increase the likelihood of complete data, the parental survey was short (one page). We chose to make the survey short and easy to fill out, because we wanted a diverse group of parents in terms of education and literacy to be able to participate, and minimise missing data. Below, we describe the variables that we measured through the surveys. These include both variables of interest (multilingual status, Dutch proficiency, communicative competence) and control variables (age, gender, sociability). The variables were defined in the same way as in Chapter 4.

**Multilingual status** In the parent survey, we asked parents about the child's language situation. Specifically, we asked parents to report (a) each language that the child hears, (b) who speaks this language to the child, and (c) how often (less than one hour a week, a few hours a week, multiple hours on multiple days a week, (almost) all hours on (almost) all days). We used this information to assess if a child was multilingual. Ideally, multilingual status would be operationalised as a graded variable, but since our survey was short and relatively simple (see above), our data were not specific enough to do that. For our analyses, a child was considered multilingual if they heard a language

<sup>25</sup> <https://doi.org/10.17605/OSF.IO/Q42US>

other than Dutch in the family context. Languages which were used less than one hour a week or not used in interaction (e.g., overhearing a parent use a language in an online work meeting) were discarded.

***Dutch proficiency*** In the teacher survey, teachers were asked to rate children's Dutch language proficiency on a scale (0-10), based on ten validated language development landmarks for young children (Luinge et al., 2007), for example, "understands a two-word instruction, such as 'coat on'" and "utters two-word sentences, such as 'look cat'". ECEC teachers were expected to be familiar with using these landmarks, as they are part of observation materials that ECEC teachers typically use (Van den Bosch & Duvekot-Bimmel, 2012).

***Communicative competence*** In the teacher survey, we also included a question about communicative competence based on the CELF Preschool-2 pragmatics profile (Pearson, 2012). The question asked teachers if the child communicates with other children when playing, whether verbally or nonverbally. Answer options were: never, sometimes, often, always.

***Age*** We asked parents for children's age as a control variable, as the type of play and social interactions that children display might be related to their age (Kelly-Vance and Ryalls, n.d.).

***Gender*** We asked parents for children's gender as a control variable, as there are indications of gender differences in (social) play (Colwell & Lindsey, 2005; Davis & Hines, 2020).

***Sociability*** We asked parents for children's sociability as a control variable, as it has been found to explain play and social interactions beyond language factors in earlier work (Stangeland, 2017). The sociability question was based on an ECBQ Sociability question (Putnam et al., 2006), and adjusted for ease of interpretation. The question asked: does your child often seek contact with other children, for example at a playground? no, not often at all / no, not that often / sometimes / yes, reasonably often / yes, very often.

Additionally, ECEC teachers were asked for the language policy in the classroom, to determine whether children could use their home language in the classroom when conversing with their peers. Answer options were: children are encouraged to use the ECEC language when talking to each other (monolingual), children can use any language when talking to each other (multilingual), or no informal or formal policies. The teacher survey also included a question about the educational background of parents of the toddler playgroup, to be able to know whether we had indeed managed to capture a wide variety of socioeconomic groups. We also asked teachers how much

children used Dutch in peer interactions. If information from parents was missing, teachers were also asked what children's home languages, age, and sociability were (based on the same questions as in the parents' survey<sup>26</sup>).

Table 5.2 displays the background characteristics of the children in our study. As we could only include children who were on video for at least five minutes in our analysis, 61 children across the ten playgroups were included. Almost three quarters (72%) of these children grew up multilingually; they spoke 26 different languages at home. The most common ones were English (n = 15), Turkish (n = 14), Arabic (n = 3), and Hindi (n = 3). Most children (85%) heard at least some Dutch at home.

Table 5.2. Background characteristics of the 61 children included in the study.

	Mean (sd)	Frequency (%)
<b>Age (months)</b>	36.95 (6.66)	-
	1 NA	-
<b>Sociability (1-5)</b>	3.85 (1.04)	-
	1 NA	-
<b>Dutch proficiency (0-10)</b>	6.58 (3.04)	-
	1 NA	-
<b>Communicative competence (1-4)</b>	3.17 (0.88)	-
	3 NA	-
<b>Gender</b>		
girl	-	33 (54.1%)
boy	-	28 (45.9%)
<b>Multilingual status</b>		
multilingual	-	44 (72.1%)
monolingual	-	17 (27.9%)
<b>Dutch at home</b>		
yes	-	52 (85.2%)
no	-	9 (14.8%)

<sup>26</sup> Teachers were not asked how much a child heard each language per week and from whom, as they usually did not know this.

### 5.3.3 Video observation and coding

Before videotaping at each playgroup, we spent some time with the children to allow them to get familiar with the person videotaping. We videotaped children's play during free play time in the morning, which typically lasted for 30 minutes to one hour, using cameras and voice recorders. Our focus was on play situations that involved multilingual children, as we were interested in multilingual children's play complexity and social interactions, and which factors (e.g., ECEC language proficiency, home language use) relate to these. Whenever possible, we therefore videotaped play situations that involved at least one multilingual child, alongside possible monolingual children. It was important to also include these monolingual children in our data, to be able to examine if there was an effect of multilingualism on play complexity and social interactions, in other words, to see whether there was evidence of language-based inequity between monolingual and multilingual children. We conducted a total of seven and a half hours of video observation across the ten playgroups that were included in the study. We then used the software ELAN (Max Planck Institute for Psycholinguistics, 2023) to transcribe and code the video observations using four tiers for each child: transcription, play complexity over time, a description of the play over time, and social interactions over time. Below, we describe the variables that we coded in the videos: language use (variable of interest), play complexity (outcome variable), and social interactions during play (outcome variable).

***Language use*** We transcribed all linguistic material, as well as nonverbal communication, from children that were visible on video, or whose behaviours were directly related to the play behaviour on video (for example, a child off-screen addressing a child that is playing on screen). We followed the CHAT conventions (MacWhinney, 2023). We translated any utterances in children's home languages. We used the transcriptions to code children's language use during each play episode (see Section 5.3.4 for more information about play episodes):

- No language, sound or gesture;
- Nonverbal communication only (sounds or gestures);
- Dutch only;
- Home language use: other language(s) than Dutch (sometimes code-switched with Dutch);
- Unintelligible (language unclear).

***Play complexity and social interactions*** Play complexity and social interactions were assessed using the Play in Early Childhood Evaluation System, a coding scheme developed to observe play complexity in naturalistic free play in ECEC settings, with good validity and reliability (Hendrickson et

al., 2019; Kelly-Vance & Ryalls, 2005). Our coding scheme is described below and can be found in more detail on OSF<sup>25</sup>.

We used the following overarching categories for play complexity: Nonplay Behaviours, Exploratory Play, Simple Pretend Play, and Complex Pretend Play (Kelly-Vance & Ryalls, 2005). Nonplay Behaviours are defined as any type of behaviours that do not involve exploratory play with objects or pretend play, such as being unoccupied, tidying up, or talking about a non-play-related topic. In contrast to some conceptualisations of play (e.g. Smith, 2009), the exploration of toys (mouthing, inspecting, manipulating toys) is seen as a form of exploratory play in this coding scheme. To increase the number of datapoints in each category, we took Simple Pretend Play and Complex Pretend Play together in the analysis. Therefore, the play complexity codes that were used for the analysis were:

- Nonplay Behaviours (e.g. being idle, cleaning up, conversing on a non-play-related topic);
- Exploratory Play (e.g., mouthing, basic manipulation, combining objects);
- Pretend Play (e.g., pretending to be a doctor, pretending to bathe a doll);
- Unclear (e.g., not clearly visible, the coder(s) cannot decide on the correct code).

We used codes for social interactions based on the Play in Early Childhood Evaluation System (Kelly-Vance & Ryalls, 2005). As the focus of this study is on peer interactions, we grouped all interactions with adults only together into one category. This resulted in the following social interactions codes for the analysis:

- Solitary Behaviour;
- Cooperative Interaction with Other Child(ren)<sup>27</sup>;
- Noncooperative Interaction with Other Child(ren)<sup>27</sup>;
- Interaction with Adult(s) Only;
- Unclear (e.g., not clearly visible, the coder(s) cannot decide on the correct code).

***Training and coding procedure*** We used a four-step training procedure (modelled after Kelly-Vance and Ryalls, 2005) to train our eight coders. Because we were unable to achieve sufficient intercoder reliability with the original Play

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<sup>27</sup> The Cooperative with other child(ren) and Noncooperative with other child(ren) categories also include interactions with both children and adults at the same time.

in Early Childhood Evaluation System coding scheme, we decided to only use the overarching codes for play complexity (as listed above) and to have each video coded by two coders. The coder pairs would first code their videos individually. The initial overlap between the individual codes of pairs across all videos was 82% for play complexity and 88% for social interactions<sup>28</sup>. After individual coding, the pairs would discuss their videos together, and in case of diverging codes, make informed decisions on the final code, or if they could not agree, code the episode as Unclear. In the final dataset, based on the joint coding files that pairs compiled after discussion<sup>29</sup>, the percentage of Unclear was 6% for play complexity and 1% for social interactions.

#### 5.3.4 Analysis

We examined how children's linguistic resources and language use were related to their play complexity (RQ1) and social interactions during play (RQ2). Children who were on video longer had more opportunities to show different types of play behaviour, so to make sure the data from the children could be compared, we took the first 300 seconds (five minutes) that each child was recorded and used this for the analysis. We limited our analysis to 300 seconds for each child to achieve a good balance in sample size and feasibility. In terms of sample size, we would have had to drop more children from the analysis if we had coded more seconds per child, as not all children were on video that long. In terms of feasibility, coding 300 seconds for each child could already take twenty hours of work per child, for transcribing and coding by two coders, discussing in pairs, and translating if applicable.

We had two dependent variables: play complexity and social interactions during play. These corresponded to two separate data files: one with play complexity codes, and one with social interaction codes. Each data point in these files was one episode: a period of time in which one child demonstrated the same behaviour uninterrupted. For example, if a child was engaging in Pretend Play for a period of time, this would correspond to one episode of Pretend Play in the play complexity data file. Episodes that were coded as Unclear were recorded as missing. We ended up with a total of 861 play complexity episodes and a total of 804 social interactions episodes (on average 13-14 per child). We used the following multilevel Bayesian categorical models to examine how children's linguistic resources and language use were related to the play complexity and social interactions in an episode.

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<sup>28</sup> Percentage of the time that both coders had the same code, compared to the total time they had both coded.

<sup>29</sup> This final dataset included 300 seconds of codes per child (see below).

### **Play complexity model**

This model tests the likelihood that a play episode had a particular play complexity code, as predicted by the following (language) variables:

Play complexity of an episode  $\sim$  multilingual status of child (multilingual or not) + Dutch proficiency of child + communicative competence of child + age of child + gender of child + sociability of child + language use of child in that play episode + (1 | ID | playgroup)

### **Social interaction model**

This model tests the likelihood that a play episode had a particular social interaction code, as predicted by the following (language) variables:

Social interaction during an episode  $\sim$  multilingual status of child (multilingual or not) + Dutch proficiency of child + communicative competence of child + age of child + gender of child + sociability of child + language use of child in that play episode + (1 | ID | playgroup)

All continuous variables in the models were mean-centred. Multilingualism and gender were contrast-coded (-0.5 not multilingual, 0.5 multilingual; 0.5 boy, 0.5 girl). As specified in the model, we included random intercepts for child ID and playgroup.

We ran the models in R version 4.3.3 (R Core Team, 2024) with the *brms* package version 2.20.4 (Bürkner, 2017). The data and R Script are available through OSF<sup>25</sup>. We performed a prior sensitivity analysis (Kruschke, 2021), testing the default flat priors, multiple weakly informative priors, and priors with means based on preliminary findings in the literature. The results of the models were very similar regardless of prior selection (see OSF<sup>25</sup>). A few credible intervals were slightly unstable, although the signs of the effects never changed – we will note this below in the Results section where applicable. We here report on the models with the following priors: normal (0,2) for binary variables, normal (0,0.7) for variables on a 4-point scale, normal (0,0.5) for variables on a 5-point scale, normal (0,0.25) for variables on a scale from 0-10, and normal (0,0.1) for age variables (which could range from 24 months to 47 months), so that the effect sizes within one standard deviation would correspond maximally to an odds ratio of roughly 10 across the entire variable range. The models converged and produced reliable estimates, as indicated by  $R\text{-hat} = 1.00$ , Bulk and Tail ESS above 10,000, and as shown by posterior predictive checks (Bürkner, 2017; Kruschke, 2021).

To quantify the strength of the evidence for the effects in our Bayesian models, we computed Bayes factors. Bayes factors express the support for one hypothesis over another. We calculated the strength of evidence for an effect compared to no effect (BF10) and, vice versa, the support for the null hypothesis over the alternative hypothesis (BF01). To determine the strength of evidence, we followed the classification of Kass and Raftery (1995) (which is based on Jeffreys, 1961): a Bayes factor below 1 signifies support for the other hypothesis, a Bayes factor between 1 and 3 entails inconclusive evidence for the hypothesis in question, a Bayes factor between 3 and 20 constitutes positive evidence, between 20 and 150 strong evidence, and above 150 very strong evidence. We report on Bayes factors above 3 for the variables of interest in the text; all other Bayes factors can be found in the tables.

We ran several alternative models to test the robustness of the findings. As the inclusion of the language use variable might take away variance of the Dutch proficiency variable or other child characteristics, we ran the same models without the language use variable (see OSF<sup>25</sup>). The effects did not change meaningfully. We also ran post-hoc models based on the data of multilingual children only. We chose to do this post-hoc analysis, because we were interested in the effects of language use on play complexity for multilingual children specifically. Home language use, after all, only applies to multilingual children. Does the use of the home language bring advantages for multilingual children? How does the effect of home language use compare to the effect of the use of Dutch only during a play episode for multilingual children? We will present the results of these post-hoc analyses in the Results section below.

To illustrate the findings from the models, we looked in more detail at excerpts from the video data in which children showed complex and social play. In the Results section, we include some excerpts as illustrative examples of effects that we found on pretend play and social interactions. We provide pseudonymised transcripts that show verbal and nonverbal communication during the excerpt, and a description of the scene and context. We analyse in what way these excerpts illustrate the findings from the models, and which additional insights they provide.

## **5.4 Results**

### **5.4.1 Play complexity**

We first describe the results on the relationship between play complexity and children's linguistic resources and language use (RQ1). Of the 861 play complexity episodes in our dataset, 434 (50%) featured Nonplay Behaviours, 338 (39%) featured Exploratory Play, and 89 (10%) featured Pretend Play. Table 5.3 presents the results of the model for play complexity, showing the

effects for each of the independent variables on the odds of a particular play complexity level, as compared to Nonplay Behaviours.

As Table 5.3 indicates, there was positive evidence that children's multilingualism had no effect on play complexity (BF01 = 8.55 for Exploratory Play, BF01 = 4.35 for Pretend Play). Similarly, there was positive evidence that children's Dutch language proficiency had no effect on the odds of Exploratory Play (BF01 = 3.05), although results were inconclusive for Pretend Play. The use of Dutch or the home language greatly increased the odds of Pretend Play compared to Nonplay Behaviours. If the home language was used during a play episode, the odds of Pretend Play were 8.70 times higher (log odds estimate = 2.16; SE = 0.57; CI = 1.02; 3.28). There was very strong evidence for this effect (BF10 = 406.35). Home language use had no effect on Exploratory Play compared to Nonplay, with positive evidence for the null hypothesis (BF01 = 4.19). The exclusive use of Dutch made the odds of Pretend Play 2.59 times higher than if no language was used; there was positive evidence for this effect (BF10 = 17.22; log odds = 0.95; SE = 0.31; CI = 0.34; 1.57). The effect of Dutch use on Exploratory Play compared to Nonplay was inconclusive. There was positive evidence that the use of unclear/unintelligible language had no effect on the odds of Exploratory Play as opposed to Nonplay (BF01 = 4.68). There was positive evidence that nonverbal communication had no effect on the odds of Exploratory Play compared to Nonplay (BF01 = 3.90). The effects of unclear language use and nonverbal communication on the odds of Pretend Play were inconclusive.

Table 5.3. Bayesian categorical model for all play complexity episodes ( $n = 713$ ).

Random intercept for ID   playgroup	Estimate	SE	95% credible interval		
Standard deviation: Exploratory	0.14	0.12	(0.01; 0.45)		
Standard deviation: Pretend Play	1.02	0.41	(0.42; 2.02)		
Cor: Exploratory & Pretend	-0.16	0.55	(-0.97; 0.91)		
Effects on Exploratory Play (vs Nonplay Behaviours)	Exp. estimate (odds ratio)	Estimate (log odds)	SE	95% credible interval	BF10; BF01
Intercept	0.30	-1.20	0.63	(-2.45; 0.03)	
Multilingual status (multilingual)	0.96 <sup>0</sup>	-0.04	0.24	(-0.50; 0.43)	0.12; 8.55
Dutch proficiency	1.05 <sup>0</sup>	0.05	0.04	(-0.03; 0.13)	0.33; 3.05
Communicative competence	0.74	-0.30	0.13	(-0.55; -0.05)	2.67; 0.37
Age in months	1.03	0.03	0.02	(-0.01; 0.06)	0.58; 1.73
Gender (girl)	1.05 <sup>0</sup>	0.05	0.18	(-0.31; 0.41)	0.096; 10.46
Sociability	1.06 <sup>0</sup>	0.06	0.10	(-0.13; 0.24)	0.23; 4.29
Language use (Dutch only)	0.59	-0.52	0.21	(-0.94; -0.12)	2.29; 0.44
Language use (home language)	0.93 <sup>0</sup>	-0.07	0.49	(-1.04; 0.88)	0.24; 4.19
Language use (language unclear)	0.87 <sup>0</sup>	-0.14	0.40	(-0.94; 0.64)	0.21; 4.68
Language use (nonverbal only)	1.31 <sup>0</sup>	0.27	0.41	(-0.55; 1.08)	0.26; 3.90

Table 5.3 (continued). Bayesian categorical model for all play complexity episodes ( $n = 713$ ).

Effects on Pretend Play (vs Nonplay Behaviours)	Exp. estimate (odds ratio)	Estimate (log odds)	SE	95% credible interval	BF10; BF01
Intercept	0.25	-1.38	1.29	(-3.91; 1.16)	
Multilingual status (multilingual)	1.22 <sup>0</sup>	0.20	0.42	(-0.61; 1.04)	0.23; 4.35
Dutch proficiency	1.10	0.10	0.07	(-0.04; 0.24)	0.79; 1.26
Communicative competence	1.15	0.14	0.25	(-0.35; 0.64)	0.42; 2.39
Age in months	0.98	-0.02	0.04	(-0.09; 0.04)	0.43; 2.33
Gender (girl)	0.84 <sup>0</sup>	-0.18	0.31	(-0.78; 0.43)	0.18; 5.55
Sociability	1.14	0.13	0.17	(-0.20; 0.48)	0.46; 2.19
Language use (Dutch only)	2.59*	0.95	0.31	(0.34; 1.57)	17.22; 0.058
Language use (home language)	8.70*	2.16	0.57	(1.02; 3.28)	406.35; 0.0025
Language use (language unclear)	0.76	-0.27	0.78	(-1.93; 1.12)	0.38; 2.60
Language use (nonverbal only)	2.98	1.09	0.59	(-0.11; 2.21)	1.67; 0.60

Note: Reference level for language use: no language, gesture or sound. The model only includes play complexity episodes with no missing data on any of the variables, so the number of play complexity episodes in this model ( $n = 713$ ) is lower than in the total dataset ( $n = 861$ ). BF10: strength of evidence for effect over no effect, BF01: strength of evidence for no effect over an effect. Evidence for an effect (BF10 > 3) is indicated by an asterisk. Evidence for the null hypothesis (BF01 > 3) is indicated by <sup>0</sup>.

We performed a post-hoc subgroup analysis on the play episodes of multilingual children only. There were 618 play episodes that focused on a multilingual child in our dataset: 312 (50%) concerned Nonplay Behaviours, 242 (39%) concerned Exploratory Play, and 64 (10%) concerned Pretend Play. Table 5.4 displays the results of the play complexity analysis with multilingual children only.

The results for the subsample with multilingual children only (Table 5.4) were similar to the results for the entire sample (Table 5.3). The biggest difference lies in the language use variable. In the sample with multilingual children only, the use of the Dutch language only during a play episode had no clear effect on the incidence of Pretend Play, in contrast to the results for the entire sample. For multilingual children, like for the entire sample, there was a large positive effect of the use of the home language on the odds of Pretend Play compared to Nonplay Behaviours (log odds estimate = 2.27; SE = 0.60; CI = 1.08; 3.46). More specifically, if the home language was used during a play episode, the odds of Pretend Play, as compared to Nonplay, were 9.70 times higher. Similar to the entire sample, there was very strong evidence for this home language effect on the incidence of Pretend Play as opposed to Nonplay Behaviours (BF<sub>10</sub> = 223.90).

Table 5.4. Bayesian categorical model for play complexity episodes of multilingual children only ( $n=527$ ).

<b>Random intercept for ID   playgroup</b>	<b>Estimate</b>	<b>SE</b>	<b>95% credible interval</b>
Standard deviation: Exploratory	0.16	0.13	(0.01; 0.50)
Standard deviation: Pretend Play	0.95	0.46	(0.24; 2.04)
Cor: Exploratory & Pretend	0.11	0.57	(-0.93; 0.97)

<b>Effects on Exploratory Play (vs Nonplay Behaviours)</b>	<b>Exp. est. (odds ratio)</b>	<b>Estimate (log odds)</b>	<b>SE</b>	<b>95% credible interval</b>	<b>BF10; BF01</b>
Intercept	0.35	-1.06	0.97	(-2.95; 0.86)	
Dutch proficiency	1.06	0.06	0.05	(-0.03; 0.15)	0.40; 2.53
Communicative competence	0.77	-0.26	0.15	(-0.55; 0.03)	0.97; 1.03
Age in months	1.02	0.02	0.02	(-0.02; 0.07)	0.39; 2.58
Gender (girl)	1.06 <sup>0</sup>	0.05	0.20	(-0.34; 0.45)	0.11; 9.45
Sociability	1.06	0.06	0.11	(-0.17; 0.28)	0.26; 3.82
Language use (Dutch only)	0.56	-0.59	0.24	(-1.06; -0.13)	2.70; 0.37
Language use (home language)	0.92 <sup>0</sup>	-0.08	0.53	(-1.13; 0.94)	0.26; 3.87
Language use (language unclear)	1.08 <sup>0</sup>	0.08	0.46	(-0.83; 0.98)	0.23; 4.30
Language use (nonverbal only)	1.99	0.69	0.52	(-0.32; 1.73)	0.63; 1.58

Table 5.4 (continued). Bayesian categorical model for play complexity episodes of multilingual children only ( $n=527$ ).

Effects on Pretend Play (vs Nonplay Behaviours)	Exp. est. (odds ratio)	Estimate (log odds)	SE	95% credible interval	BF10; BF01
Intercept	1.07	0.07	1.80	(-3.42; 3.65)	
Dutch proficiency	1.19	0.17	0.08	(0.01; 0.35)	2.90; 0.34
Communicative competence	0.95	-0.05	0.29	(-0.62; 0.50)	0.41; 2.42
Age in months	0.95	-0.05	0.04	(-0.14; 0.04)	0.81; 1.23
Gender (girl)	0.59	-0.52	0.36	(-1.23; 0.17)	0.51; 1.97
Sociability	1.20	0.18	0.20	(-0.22; 0.58)	0.59; 1.69
Language use (Dutch only)	1.77	0.57	0.36	(-0.14; 1.29)	0.63; 1.60
Language use (home language)	9.70*	2.27	0.60	(1.08; 3.46)	223.90; 0.0045
Language use (language unclear)	0.53	-0.63	1.00	(-2.81; 1.11)	0.52; 1.91
Language use (nonverbal only)	3.03	1.11	0.76	(-0.45; 2.54)	1.18; 0.85

Note: Reference level for language use: no language, gesture or sound. The model only includes play complexity episodes with no missing data on any of the variables, so the number of play complexity episodes in this model ( $n = 527$ ) is lower than in the total dataset ( $n = 618$ ). BF10: strength of evidence for effect over no effect, BF01: strength of evidence for no effect over an effect. Evidence for an effect ( $BF_{10} > 3$ ) is indicated by an asterisk. Evidence for the null hypothesis ( $BF_{01} > 3$ ) is indicated by  $^{\circ}$ .

To provide more details on the results above, we present two excerpts that involved pretend play below. These excerpts illustrate the finding that home language use co-occurred with more complex types of play. Interestingly, the excerpts also show that home language use occurred in playgroups which had a monolingual language policy, where teachers encouraged children to use Dutch only. Both Transcripts 5.1 and 5.2A below come from locations which had a monolingual language policy, but the children still exclusively used their home languages during pretend play in these excerpts.

In Transcript 5.1, Rayan and Prisha used English, which is one of their home languages. Rayan heard English, Hindi, and Dutch at home, while Prisha heard English, and Hindi at home. Both children were almost four years old (Rayan: 44 months, Prisha: 46 months) and were reported to have high communicative competence (4 on a scale of 4). Transcript 5.1 features pretend play: the children made food and drinks for a baby doll. The pretend play was quite complex and consisted of various steps: putting down a cutting board, putting down cups, getting the baby, getting a recipe book, reading the recipe book, putting the food in the oven, and turning on the oven. The use of their home language English made this type of verbal pretend play possible, as both children were reported to have relatively low Dutch proficiency (1 and 3 on a scale of 0-10 respectively). This excerpt illustrates that high level pretend play was possible for multilingual children with low Dutch proficiency through the use of their home language.

Similarly, Transcript 5.2A features a situation in which two children used their home language, Turkish, during pretend play. Emre and Musa both heard Turkish and Dutch at home, and were both around three years old (34 and 36 months old, respectively). In the excerpt, the two boys were playing in the sandpit, and Musa was pretending to be making bread. This became apparent both from his actions (stirring in a pan filled with sand, flipping its contents) and Turkish words “yemek yapıyorum” (I am cooking), “ekmek” (bread). In contrast to Transcript 5.1, the children used their home language while their Dutch proficiency was also quite high: they could both utter multi-word sentences in Dutch (their Dutch proficiency was 5 and 8 on a scale of 0-10, respectively). Their communicative competence, however, was lower (2 and 3 on a scale of 4 respectively). The children might have used Turkish because they were used to using Turkish together – they were cousins. In any case, both excerpts illustrate the findings from the analyses above: pretend play was related to home language use.

**Transcript 5.1: Cooperative pretend play in English at playgroup V.**

*Prisha and Rayan (pseudonyms) are making food and drinks for a baby doll in the kitchen.*

- Prisha: do you want this? [shows a cutting board.] Rayan.  
 Rayan: oh good.  
 Prisha: [gets cup.] this here. [puts down the board and a cup.]  
 a cup.  
 Rayan: a cup (.) here. [puts down another cup.]  
 Prisha: a cup oh well baby cup. [puts down a cup that has a  
 toy on it as a lid.] let's see if we [?] will find the baby.  
 [walks away.]  
 Prisha: the baby.  
 Rayan: recipe! Prisha I found a recipe book! [takes some type  
 of book from cupboard and looks around.] Prisha?  
 Prisha recipe book.  
 Prisha: [returns with the baby doll.] I found it!  
 Rayan: I found a recipe book! [shows/offers the book]  
 Prisha: good. [takes the book.] okay. [opens the book.] last  
 recipe [?]. put it in the oven. [pretends to read.] let's  
 put it in the oven. [closes book.] okay.  
 Rayan: but we can't put it in the oven.  
 Prisha: yes xxx.  
 Rayan: look. [opens the toy microwave.]  
 Prisha: this is the oven xxx. [opens another toy oven and puts  
 the board and a cup into the oven.]  
 Rayan: xxx the door.  
 Prisha: [closes the oven and turns the knobs on the oven.]

**Transcript 5.2A: Cooperative play in Turkish at playgroup X.**

*Emre and Musa (pseudonyms) are playing in the sandpit. Emre is stirring in a pan filled with sand, while Musa is looking.*

- Musa: yemek yapıyorum.  
 [Turkish: I am cooking.]  
 Emre: xxx ha [?]?  
 Musa: yelek [: yemek] bak! ekmek [?].  
 [Turkish: a dish, look! bread.]  
 Emre: hmm xxx.  
 Musa: ekmek! [?]  
 [Turkish: bread!]

*Note: transcription codes: (.) is a pause. xxx means unintelligible. [?] means that this is most probably what the children said.*

### 5.4.2 Social interactions during play

We will now describe the results for the second research question, about the relationship between social interactions during play and children's linguistic resources and language use. There were 804 social interaction episodes, of which 442 (55%) concerned Solitary Behaviour, 204 (25%) concerned Cooperative Interactions with Other Children, 63 (8%) concerned Noncooperative Interactions with Other Children, and 95 (12%) concerned Interactions with Adults Only. Table 5.5 displays the results of the social interaction model: the effects of the independent variables on the odds of various types of interactions, as compared to Solitary Behaviour.

As Table 5.5 shows, there was positive evidence that children's multilingualism (BF01 = 4.21), Dutch language proficiency (BF01 = 4.84), and communicative competence (BF01 = 3.82) had no effect on the odds of Cooperative Interactions with Other Children compared to Solitary Behaviour. There was also positive evidence that children's multilingualism did not relate to the odds of Noncooperative Interactions with Other Children compared to Solitary Behaviour (BF01 = 4.26). The results for the variables of multilingualism, Dutch language proficiency, and communicative competence were similar in an alternative model without the language use variable (see OSF<sup>25</sup>).

The results showed that there was a large positive effect of home language use on all types of interactions, compared to Solitary Behaviour. The odds of Cooperative Interactions with Other Children were 8.46 times higher when home languages were used (log odds = 2.14; SE = 0.46; CI = 1.25; 3.05). There was very strong evidence for this effect (BF10 > 1000). The odds of Noncooperative Interactions with Other Children were 10.44 times higher when home languages were used (log odds = 2.35; SE = 0.63; CI = 1.09; 3.56). The evidence for this effect was very strong (BF10 = 169.44). The odds of Interactions with Adults Only were 5.33 times higher when home languages were used (log odds = 1.67; SE = 0.80; CI = 0.03; 3.17). There was positive evidence for this effect (BF10 = 3.43).

Similarly, the use of Dutch only during a play episode greatly increased the odds of all types of interactions, compared to Solitary Behaviour. The odds of Cooperative Interactions with Other Children were 6.77 times higher when Dutch was used exclusively in a play episode (log odds = 1.91; SE = 0.24; CI = 1.44; 2.40). The evidence for this effect was very strong (BF10 > 1000). The odds of Noncooperative Interactions with Other Children were 8.61 times higher when Dutch was used exclusively (log odds = 2.15; SE = 0.37; CI = 1.44; 2.89). There was very strong evidence for this effect (BF10 > 1000). The odds of Interactions with Adults Only were 9.29 higher when Dutch was used

during a play episode (log odds = 2.23; SE = 0.36; CI = 1.52; 2.95). There was very strong evidence for this effect ( $BF_{10} > 1000$ ).

In sum, Dutch or home language use increased the odds of interactions. Still, there were also 70 play episodes in our dataset in which children used Dutch or the home language while playing alone. The use of a language that was unclear/unintelligible during a play episode had no clear effects on social interactions. The same was true for nonverbal communication.

Table 5.5. Bayesian categorical model for social interaction episodes: ( $n=621$ ).

<b>Random intercept for ID   playgroup (vs Solitary)</b>		<b>Estimate</b>	<b>SE</b>	<b>95% credible interval</b>		
Standard deviation: Cooperative		0.25	0.20	(0.01; 0.75)		
Standard deviation: Noncooperative		0.48	0.44	(0.03; 1.66)		
Standard deviation: Adult		1.75	0.68	(0.82; 3.41)		
Cor: Intercepts Adult & Cooperative		0.11	0.45	(-0.78; 0.87)		
Cor: Intercepts Adult & Noncooperative		0.02	0.42	(-0.78; 0.80)		
Cor: Intercepts Coop & Noncooperative		0.19	0.50	(-0.81; 0.93)		
<b>Effects on Cooperative with Other Children (vs Solitary)</b>		<b>Exp. est. (odds ratio)</b>	<b>Estimate (log odds)</b>	<b>SE</b>	<b>95% credible interval</b>	<b>BF10; BF01</b>
Intercept		0.02	-3.95	0.89	(-5.73; -2.21)	
Multilingual status (multilingual)		0.75 <sup>0</sup>	-0.29	0.29	(-0.86; 0.29)	0.24; 4.21
Dutch proficiency		0.99 <sup>0</sup>	-0.01	0.05	(-0.11; 0.09)	0.21; 4.84
Communicative competence		1.05 <sup>0</sup>	0.05	0.18	(-0.29; 0.40)	0.26; 3.82
Age in months		1.07*	0.07	0.02	(0.02; 0.11)	10.17; 0.10
Gender (girl)		1.06 <sup>0</sup>	0.06	0.24	(-0.41; 0.53)	0.12; 8.22
Sociability		0.93 <sup>0</sup>	-0.08	0.12	(-0.32; 0.15)	0.29; 3.40
Language use (Dutch only)		6.77*	1.91	0.24	(1.44; 2.40)	1.29·10 <sup>10</sup> ; 7.78·10 <sup>-20</sup>
Language use (home language)		8.46*	2.14	0.46	(1.25; 3.05)	3.37·10 <sup>4</sup> ; 2.97·10 <sup>-5</sup>
Language use (language unclear)		2.25	0.81	0.50	(-0.20; 1.76)	0.97; 1.04
Language use (nonverbal only)		0.63	-0.46	0.63	(-1.80; 0.68)	0.37; 2.73

Table 5.5 (continued). Bayesian categorical model for social behaviour episodes ( $n=621$ ).

Effects on Noncooperative with Other Children (vs Solitary)	Exp. est. (odds ratio)	Estimate (log odds)	SE	95% credible interval	BF10; BF01
Intercept	0.02	-3.92	1.40	(-6.67; -1.19)	
Multilingual status (multilingual)	1.03 <sup>0</sup>	0.03	0.47	(-0.88; 0.97)	0.23; 4.26
Dutch proficiency	1.09	0.09	0.08	(-0.07; 0.25)	0.54; 1.85
Communicative competence	1.03	0.03	0.28	(-0.52; 0.58)	0.40; 2.50
Age in months	1.02	0.02	0.04	(-0.05; 0.10)	0.48; 2.10
Gender (girl)	0.76 <sup>0</sup>	-0.28	0.37	(-1.00; 0.45)	0.24; 4.14
Sociability	1.03	0.03	0.20	(-0.36; 0.43)	0.40; 2.48
Language use (Dutch only)	8.61*	2.15	0.37	(1.44; 2.89)	7.31·10 <sup>15</sup> ; 1.37·10 <sup>-16</sup>
Language use (home language)	10.44*	2.35	0.63	(1.09; 3.56)	169.44; 0.01
Language use (language unclear)	3.16	1.15	0.72	(-0.37; 2.48)	1.41; 0.71
Language use (nonverbal only) <sup>a</sup>	0.17	-1.75	1.34	(-4.69; 0.52)	1.37; 0.73

Table 5.5 (continued). Bayesian categorical model for social interaction episodes: ( $n=621$ ).

Effects on Interaction with Adult Only (vs Solitary Behaviour)	Exp. est. (odds ratio)	Estimate (log odds)	SE	95% credible interval	BF10; BF01
Intercept	0.11	-2.23	1.72	(-5.67; 1.08)	
Multilingual status (multilingual)	1.73	0.55	0.51	(-0.43; 1.58)	0.44; 2.25
Dutch proficiency	0.94	-0.06	0.09	(-0.24; 0.11)	0.46; 2.19
Communicative competence	0.99	-0.01	0.27	(-0.54; 0.53)	0.39; 2.58
Age in months	0.97	-0.03	0.04	(-0.12; 0.05)	0.58; 1.71
Gender (girl)	0.69 <sup>0</sup>	-0.36	0.36	(-1.07; 0.34)	0.31; 3.23
Sociability	0.81	-0.21	0.18	(-0.57; 0.15)	0.71; 1.41
Language use (Dutch only)	9.29*	2.23	0.36	(1.52; 2.95)	2.48·10 <sup>15</sup> ; 4.02·10 <sup>-16</sup>
Language use (home language)	5.33*	1.67	0.80	(0.03; 3.17)	3.43; 0.29
Language use (language unclear) <sup>a</sup>	3.54	1.26	0.68	(-0.13; 2.52)	1.92; 0.52
Language use (nonverbal only)	0.49	-0.71	0.99	(-2.86; 1.01)	0.55; 1.82

Note: Reference level for language use: no language, gesture or sound. <sup>a</sup> means credible interval is unstable across priors, although effect sign never changes. The model only includes social interaction episodes with no missing data on any of the variables, so the number of social interaction episodes in this model ( $n = 621$ ) is lower than in the total dataset ( $n = 804$ ). BF10: strength of evidence for effect over no effect, BF01: strength of evidence for no effect over an effect. Evidence for an effect (BF10 > 3) is indicated by an asterisk. Evidence for the null hypothesis (BF01 > 3) is indicated by <sup>0</sup>.

Similar to the play complexity analysis, we also performed a post-hoc subgroup analysis of social interactions in multilingual children's play episodes only. There were 598 social interaction episodes that involved a multilingual child: 316 of those (53%) involved Solitary Behaviour, 155 of those (26%) involved Cooperative Interactions with other children, 50 of those (8%) involved Noncooperative Interactions with Other Children, and 77 of those (13%) involved Interactions with Adults Only. The results in this subgroup analysis were highly similar to the results for the entire sample, with no noteworthy differences for the variables of interest (see OSF<sup>25</sup>).

To illustrate the findings above and get additional insights, we examined excerpts of social play in the video data. The excerpts that were described earlier (Transcripts 5.1 and 5.2A) already illustrated the finding that home language use often occurred during cooperative interactions. Transcripts 5.2B and 5.3 below indicate that the use of (the home) language also appeared to be helpful in solving conflicts during interactions, allowing children to continue their social play. In Transcript 5.2B below, which is a continuation of Transcript 5.2A, Emre proposed in Turkish to put more sand in the pan: "put it inside that. Put it inside that, okay okay?". Musa replied in Dutch: "no no", while shaking his head. He code-switched between Turkish and Dutch "[Turkish:] I don't want it [Dutch:] no". Emre complied and emptied the jug of sand. The use of language, specifically the home language and some Dutch, allowed these children to solve this conflict and continue their cooperative play. Instead of simply putting the sand in the pan, Emre first asked Musa if he was okay with that. When Musa shook his head and replied he did not want it, Emre listened to him and emptied the jug. The children then continued their cooperative play after resolving the conflict, filling buckets with sand and flipping the contents of the pan. This excerpt illustrates the finding above that both cooperative and noncooperative play co-occurred with (home) language use, and it shows that (home) language use could help children solve peer conflict and continue cooperative play.

***Transcript 5.2B: Solving noncooperative play in Turkish and Dutch at playgroup X.***

*Emre and Musa (pseudonyms) are playing in the sandpit. Musa is pretending to make bread in a pan with sand. Emre has filled a jug with sand.*

Emre:	[holds jug of sand over Musa's pan.] içine koy. içine koy güzel güzel? [Turkish: put it inside that. put it inside that okay okay?]
Musa:	nee nee. [shakes his head.] [Dutch: no no.]

- Musa: xxx. ben istemiyorum nee. [turns away.]  
 [Turkish: I don't want it [Dutch:] no.]
- Musa: istemiyorum ben. [shakes head.]  
 [Turkish: I don't want it.]
- Emre: [empties the jug.]
- Musa: [flips contents of the pan.]

Children used language to solve situations of noncooperative play, and mimicked teachers' language use to do so. Transcript 5.3 below illustrates this. In this example, two multilingual girls wanted to bake cupcakes, but disagreed on the order and on who could do what. The children were both almost four years old (Kylie: 45 months, Victoria: 47 months). Victoria heard English, Dutch, and Sinhala at home, while Kylie heard Dutch and English at home. While they shared English as a home language, they both used Dutch only in the excerpt. This was perhaps because of the monolingual language policy in their playgroup VII, or because they both had quite high Dutch proficiency (Victoria 6 and Kylie 10 on a scale of 0-10). Their communicative competence was 3 and 4 on a scale of 4, respectively. The conflict started with language, when Kylie came into the home play area and wanted to start baking cupcakes but Victoria replied noncooperatively: "no no no not yet. We are not going to do anything yet. First put it in the oven." Kylie then also replied noncooperatively, using a phrase that she might have heard from adults, 'being a big kid': "you do not have to say all of that to me, really. I am a big kid already." Victoria got angry and told Kylie to go away. The conflict then became physical, in which the children made hitting motions, grabbed, pushed, and hit each other. Kylie tried to get the attention of an adult to help solve the conflict, turning around and saying "Victoria says I may not come in".

When no teacher came in to help, the children switched to using language again, mimicking phrases they had heard from teachers, to express their perspectives and to try to solve the conflict. Victoria apologised: "sorry. But you have to play together". Playing together ('samenspelen' in Dutch) is a phrase teachers often used in our dataset when children had conflicts. Kylie expressed her point of view through language: "yes but everyone can decide for themselves where they want to go". Victoria replied using a phrase that she might have also heard from teachers: "it is my turn" and "you may wait for a bit". Kylie also used phrases that teachers often employed, emphasising that language should be used to solve conflicts, instead of getting angry: "oh but you have to say it first. You do not have to be so angry. You have to say: can you go off the table?". Victoria repeated this question, and Kylie nodded and got off the table. Victoria then uttered some phrases she might have heard from teachers: "but you should be nice now. You have to be a big girl now really."

After they had solved their conflict, Kylie asked: “do you still want to play together?”. Victoria replied affirmatively, leading Kylie to smile.

In later videos, Victoria and Kylie had elaborate cooperative complex pretend play (the longest in our dataset), in which they pretended to bake cupcakes and make lemonade, and then distributed these to other children and teachers. Language, including language that children had heard from teachers, had helped these children solve their conflict and continue playing cooperatively. The children here mimicked the teachers. The excerpt therefore illustrates the finding that language helped the children solve peer conflict and continue cooperative play, and it suggests that the teachers set an important example for children on how to use language to navigate peer play.

***Transcript 5.3: Solving noncooperative cupcake pretend play in Dutch at playgroup VII.***

*Kylie and Victoria (pseudonyms) are having a conversation in the home area. Victoria had been engaging in pretend play there with another child, pretending to bake cupcakes. Kylie has just entered the home area.*

- Victoria: [turns around a whisk in a bowl.]  
 Kylie: [sits down at the table.] weer cupcakes bakken. nog gefeliciteerd hè [?!]  
 [Dutch: baking cupcakes again. belated congratulations!]  
 Victoria: nee nee nee nog niet. wij gaan nog niets [?] doen. eerst in de oven doen. [gets plates from the cupboard.]  
 [Dutch: no no no not yet. we are not going to do anything yet. first put it in the oven.]  
 Kylie: dat hoef je niet allemaal tegen mij te zeggen hoor. ik ben al een groot kind.  
 [Dutch: you do not have to say all of that to me really. I am a big kid already.]  
 Victoria: nee! nee! [looks angry and points at Kylie.] weg! even spelen weg. xxx. ga nu weg. ga eens weg. xxx. Kylie ga nu weg! [pretends to hit Kylie.]  
 [Dutch: no! no! away! playing for a bit away. xxx. go away now. go away. xxx. Kylie go away now!]  
 Kylie: [grabs Victoria's arm and pushes her away.]  
 Victoria: au! [whines, then screams].  
 [Dutch: ouch!]  
 Victoria: [takes a box and starts hitting with it against a chair.] weg weg weg!  
 [Dutch: away away away!]

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Kylie: [shakes head.]  
Victoria: ga eens weg. ik ben aan de beurt. [makes hitting motions with the box.] ik ben boos. weg! [makes hitting motions with the box.]  
[Dutch: go away. it is my turn. I am angry. away!]  
[...]  
Kylie: [turns around and tries to get the attention of an adult, shouts.] mag ik van Victoria mag ik niet binnenkomen.  
[Dutch: I may Victoria says I may not come in.]  
Victoria: [hits against the chair with the box.] jij mag niet xxx.  
[points at Kylie.]  
[Dutch: you may not xxx.]

*They start hitting each other.*

Victoria: nee nee nee nee nee! [hits Kylie with the box]  
[Dutch: no no no no no!]  
Kylie: [screams] au! [goes to sit on the table.]  
[Dutch: ouch!]  
Victoria: sorry. maar jij moet samenspelen.  
[Dutch: sorry. but you have to play together.]  
Kylie: ja maar iedereen mag zelf weten waar die heengaat.  
[Dutch: yes but everyone can decide for themselves where they want to go.]  
Victoria: maar nee jij mag niet in de tafel zitten. ik ben aan de beurt maar jij mag even wachten.  
[Dutch: but no you may not sit in [sic] the table. it is my turn but you may wait for a bit.]  
Kylie: oh maar jij moet eerst zeggen. je hoeft dan niet zo boos te doen. je moet zeggen: wil je hieraf gaan?  
[Dutch: oh but you have to say it first. you do not have to be so angry. you have to say: can you go off it [the table]?]  
Victoria: wil je hieraf gaan?  
[Dutch: can you go off it? [the table]]  
Kylie: [nods and gets off table.] zo. [puts chair next to table.] oké Victoria dan hoef je niet zo boos te doen.  
[Dutch: like this. okay Victoria then you do not have to be so angry.]  
Victoria: maar jij mag eventjes lief zijn. je moet nu groot zijn hoor.  
[Dutch: but you should be nice now. you have to be [a] big [girl] now really.]

Kylie: [walks towards a bed and sits down.] wil je nog  
samenspelen?  
[Dutch: do you still want to play together?]  
Victoria: ja xxx.  
[Dutch: yes xxx.]  
Kylie: xxx. [smiles]

*Later on, Kylie and Victoria continue their pretend play, baking cupcakes and making lemonade, and distributing them to other children and teachers.*

### 5.5 Discussion

In this study, we examined multilingual children's play complexity and social interactions through video recordings at ECEC playgroups. We examined how children's multilingual status, Dutch language proficiency, communicative competence, language use, and nonverbal communication related to their play complexity (RQ1) and social interactions (RQ2) during free play. We illustrated our findings with examples from the video dataset. Our study was innovative for its focus on various language-related variables and for the use of video recordings to examine these research questions in detail. This allowed us to pay close attention to play forms, social interactions, and verbal (including home language) as well as nonverbal communication during play.

Our results showed no effects of children's multilingual status, Dutch language proficiency, or communicative competence on play complexity and social interactions. In fact, there was often evidence for the null hypothesis. This goes against some results in the literature, that suggest that multilingual children, especially if they have lower ECEC language proficiency, might show less social and less complex play (Arvola et al., 2021; Stangeland, 2017; Syczewska & Licandro, 2021). However, there is also literature that indicates that home language use may allow multilingual children with lower ECEC language proficiency to play and interact in complex ways (Feng et al., 2004; Kyratzis et al., 2009). This is indeed what our results show.

We found large effects for language use on the incidence of social and complex play, with strong evidence for these effects. Language use, whether in Dutch only or the home language, positively related to the incidence of pretend play in the whole sample. When looking at multilingual children specifically, we found a clear effect of home language use, but not Dutch language use, on the odds of pretend play. This suggests that the effects of Dutch language use in the entire sample were driven by monolingual Dutch children. Therefore, for both monolingual and multilingual children, the use of the language they hear at home relates to more complex play. Dutch language use and home language use increased the odds of social interactions during play with both peers and

adults. While this effect was to be expected, there were also 70 play episodes in which children used Dutch or their home language, while playing alone. We did not see effects on social interactions for nonverbal communication, or communication in unintelligible language.

The excerpts we analysed illustrated these findings and provided additional insights. They showed that pretend play often featured home language use, also in playgroups a monolingual language policy, suggesting that the language policy on paper was not always enacted by children (or teachers) in practice. This has often been observed in studies about ECEC language policy (Boyd & Ottesjö, 2016b; Keydeniers et al., 2022). The excerpts also showed that language – whether the home language or Dutch – helped children solve peer conflicts, allowing children to continue their (complex) social play together. Children seemed to mimic language strategies that teachers use to navigate conflicts. Earlier studies found that children mirror and repeat teachers' language use and practices in ECEC more generally (Björk-Willén & Cromdal, 2009; Kirsch & Mortini, 2023) and our results suggest the same could be true when solving peer conflict. The findings indicate that teachers provide an important example for children on how to navigate peer play, and that it might be helpful if they draw on children's full linguistic resources to help them engage in complex social play.

There are some limitations to our study, which suggest pathways for future research. First, our ECEC centres were very diverse in terms of socioeconomic backgrounds and therefore give a rich picture of multilingual children's play in ECEC, but it would be good to conduct more observations. Our study was based on a snapshot of children's peer play in ECEC centres in the Netherlands, observing them one morning during free play, and coding 300 seconds per child. One should therefore be careful when generalising the findings. For example, it is possible that we would have witnessed other forms of play if we had observed the children for a longer period. Results might also depend on how children were feeling on the day of observation, which other children were present, etc. It would be therefore good to replicate our findings based on longer observation periods over multiple days. The specific (Dutch) context could have also influenced our results: there is not a lot of space for children's home languages in Dutch ECEC language policies (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2024), which might have limited children's home language use. Because almost all playgroups had a monolingual language policy, we were unable to examine the effects of language policy on complex and social play. Even with a monolingual policy, children in our sample still seemed to use their home languages during complex social play. In future research, it would be interesting to examine the effects of more inclusive language policies.

Second, our data was very heterogeneous by design, and not always very detailed. We chose to collect naturalistic data from a diverse group of participants, to increase external validity and to include a more diverse sample of participants. We needed to keep the parental survey very short to allow a diverse group of parents to participate, which could have had an effect on validity and reliability. That said, it seems to be possible to assess variables like home language exposure with only one or a few questions (Bowling, 2005; De Cat et al., 2025). Moreover, while we tried to get the survey data from all participants at the same time, some parents handed in the survey months before or after the observation period. While we adjusted the age variables to account for this, some of the other variables might have been less precise.

Third, one might wonder whether some of our language variables could be related. At first glance, communicative competence, Dutch proficiency, language use, and social behaviour during play could seem to tap into similar constructs, but our data suggests they are indeed separate constructs. For example, we found no effects of communicative competence or Dutch proficiency on social behaviour, while we did find effects of language use. There were still no effects when the language use variable was removed from the models. The operationalisation of these variables also suggest they measure slightly different things: communicative competence entailed the tendency of a child to communicate (verbally or nonverbally) with their peers, Dutch proficiency was measured through a child's passive and active language abilities in the majority language, language use was based on the communicative choices during a particular play episode, and social behaviour was coded by looking at the partner(s) and cooperativeness during play. Future studies could try to tease apart these different variables in more detail.

Fourth, the transcribing and coding of play episodes turned out to be more difficult than expected in our study. For example, we had to simplify our coding scheme to improve intercoder reliability. Moreover, the category of Exploratory Play was very broad in the coding scheme we employed (Kelly-Vance & Ryalls, 2005), as it included both the exploration of toys and construction play. In some conceptualisations of play (e.g. Smith, 2009), only the latter is regarded as real play. The inclusion of such a broad range of behaviours might explain why we found relatively few effects on Exploratory Play in our study. Future research might examine if results are different when Exploratory Play is defined more narrowly. Also, it can be hard to code a play episode if children do not talk while playing. This means that there might be more instances of unclear play for children who are less talkative or who have lower language proficiency. However, the overall percentage of unclear was low in our dataset, 6% for play complexity and 1% for social interactions, so this possible bias will not have had a large impact on our results. It might also be

more difficult to know if a play episode constitutes pretend play if children are not explaining what they are doing. As one teacher who participated in the study in Chapter 3 said: “a child who does not have high language proficiency will show less complexity in [their play] but the question is how that play happens in their head – although I do think: with more language comes more complexity” (Thieme et al., 2025a). We tried to mitigate this by also basing our codes on nonverbal signs, which the video recordings allowed us to do. While we used any type of nonverbal sign to decide on our codes, we only transcribed sounds and gestures and included these in our models as nonverbal communication. It could be that other types of nonverbal communication (eye contact, for example) might be more important for complex social play. Future work could shed more light on this question by looking more systematically into nonverbal communication.

Fifth, because of our cross-sectional approach, it was not possible to assess causal and temporal relationships. We observed more (social) pretend play with more (home) language use. This could mean that (home) language use created opportunities for social pretend play. It could also entail that higher (home) language use is a consequence of social pretend play’s role in language development, that (home) language use and social pretend play just co-occur, or that language and pretend play share the same underlying (symbolic) development (also see Lillard et al., 2013). Future research could take a longitudinal and/or experimental approach, with a larger sample, to shed more light on the relationship between home language use and social pretend play.

To conclude, we found that (home) language use was related to both complex play and social interactions during play in ECEC. The language children hear at home seemed to be especially important for play complexity: multilingual children had more complex play if they used their home language (but not if they used Dutch exclusively), while the use of Dutch seemed to relate to more complex play in monolingual Dutch children. Multilingual children with low Dutch language proficiency displayed complex and social play forms using their home language. In terms of policy and practice, this suggests that it can be useful for teachers to welcome home language use in the classroom, and help children find peers with a similar language background (see also Halle et al., 2014; Langeloo et al., 2019). After all, our results suggest that if children can use the language(s) they hear at home (whether Dutch or another language), they might have more opportunities for more complex and social play. Moreover, teachers seemed to set an example for children in how to use language to navigate and solve peer conflict, allowing them to continue their peer play. This points to the important role of teachers in children’s (peer) play, even when they do not participate in it directly. Multilingualism did not emerge as a significant factor in (peer) play, contrary to how teachers and policymakers

might sometimes see multilingualism as a ‘problem’ (Cromdal & Stoewer, 2022; Peleman et al., 2022; Thieme et al., 2025b). In fact, our analysis shows the opportunities that language use in general, and home language use specifically, could bring in ECEC during peer play.



## 6. General discussion and conclusion

“Het meisje is van Turkse afkomst en [we] merkten, we hebben ook een Turks jongetje, dat ze dat jongetje heel erg opzocht, ook omdat ze elkaar begrepen ook, en ze waren ook soms ook aan tafel Turks aan het praten.”

“The girl is of Turkish descent and we noticed, we also have a Turkish boy, that she gravitated towards that boy a lot, also because they understood each other, and they were sometimes speaking Turkish at the table too.”

(teacher H, Thieme et al., 2025a)

In this dissertation, we researched multilingualism in ECEC in the Netherlands, zooming in on multilingual children’s peer interactions and play. Peer interactions and play feature prominently in many theories of child development, such as constructivist theories and social learning theories (Bukowski et al., 2019; Veraksa et al., 2022). Empirical research has confirmed that children can learn a lot from peer interactions and (social pretend) play (Coplan & Arbeau, 2009; Kızıldere et al., 2020; Lillard et al., 2013; Quinn et al., 2018; White et al., 2021). Previous literature has reported evidence of language-based inequity in peer interactions, showing that multilingual children might experience fewer peer interactions of high quality (Arvola et al., 2021; Bernstein, 2018; Dominguez & Trawick-Smith, 2018; Stangeland, 2017). However, it was an open question which factors account for these findings. It is likely that situational factors play a role, as multilingual children might find themselves in a monolingually oriented ECEC environment (see Chapter 1). The aim of this dissertation was to examine which individual and situational language-related factors are associated with multilingual children’s peer interactions and play in ECEC.

In Chapter 2, we described a review study on the effects of foreign language ECEC. The reviewed studies indicated that children could learn a foreign language through ECEC, and that this did not come at the expense of the development of the majority language or their first language. Children’s well-being in foreign language ECEC was generally positive, as long as the foreign language was offered in a playful way, without a strict language policy. Input quantity and the use of teacher strategies were positively related to child outcomes in the reviewed articles. There was not enough research to systematically look at child-related factors, but older children and children who were more positive and involved seemed to have higher learning outcomes.

The findings also showed the importance of peer interactions for (language) learning. Specifically, earlier research suggested that peer interactions played an important role in outcomes, which prompted us to look at these further in the subsequent chapters of this dissertation.

Chapter 3 featured a teacher study about multilingual children's peer interactions, combining surveys and interviews. We asked teachers about their experiences with the peer interactions of emergent multilingual children who were still in the process of learning the ECEC language(s). The results showed that a sizeable group of teachers had concerns about the social inclusion and peer play quality of emergent multilingual children (a group of 36%-58% of teachers, depending on the specific concern). Three quarters of the teachers reported that children with the same language background or similar language proficiency flocked together during free play. In general, there were large differences between teachers' reported experiences with the peer interactions of multilingual children in ECEC, which might be related to language-related child, teacher, or ECEC factors.

To shed more light on the diverging results and the role of language-related factors, we decided to carry out two follow-up studies, conducting observations in toddler groups throughout the Netherlands. In Chapter 4, we explored how children's linguistic resources relate to whom they interact with and how much, using observations with a social network app. Through social network analysis, we found that children who shared a home language had more interactions with each other. In some toddler groups, children hardly interacted with each other, perhaps because children sometimes did not share home languages or teachers were less involved in play. We found that teachers' involvement during free play was positively correlated with the quantity of peer interactions that the children had. This finding suggests that teachers play an important role in stimulating peer interactions, and that it can be helpful for multilingual children to have others in the group with the same home language.

In Chapter 5, we examined multilingual children's peer play in more detail using video observation. We looked at social and complex play, as these have been shown to relate to children's development (Cekaite et al., 2014; Kızıldere et al., 2020; Lillard et al., 2013; Quinn et al., 2018; White et al., 2021). Specifically, we investigated if the occurrence of social and complex play was related to children's multilingualism, Dutch language proficiency, communicative competence, (home) language use during play, and nonverbal communication. Our results showed that when children used language during free play, including the home language, this related positively and strongly to the occurrence of social and complex play. There was evidence that the home language was more important than the ECEC language for complex play. After

all, there was no effect of Dutch language use on complex play in multilingual children, while there was a strong positive effect of home language use on complex play in multilingual children. Only when Dutch-speaking monolingual children were included in the analysis, Dutch language use had an effect on complex play. As Dutch is these children's home language, the overall conclusion was that home language use related to complex play. The excerpts of social complex play that we examined also showed that home language use often featured in these types of play, also in groups with a monolingual language policy. Furthermore, the excerpts suggested that the use of language helped the children solve peer conflicts and continue their peer play.

Overall, the results of the four studies shed a positive light on multilingualism in ECEC: the reviewed studies in Chapter 2 indicated that children could learn an additional language in ECEC, and the empirical studies in Chapters 4 and 5 found no negative effects of multilingual status and showed that the linguistic diversity in the classroom could in fact be beneficial for multilingual children's peer interactions and play. This dissertation was innovative for its combination of methods, for its focus on young children in ECEC below the age of four, and for its diverse samples and naturalistic data collection. Moreover, it made a novel contribution to the literature through examining the roles of various language-related factors in peer interactions and play. Below, we discuss the results of this dissertation using these factors as a guideline. Afterwards, we discuss theoretical and practical implications of these findings. We then point out limitations and directions for future research, before we draw final conclusions.

## **6.1 Discussion of the findings**

In this dissertation, we examined how various language-related factors are associated with multilingual children's peer interactions and play. We examined both individual factors and situational factors. Below, we will discuss these factors in turn, reviewing and reflecting upon the findings for these factors in this dissertation.

### **6.1.1 Individual factors**

We examined various individual factors, such as children's multilingual status, ECEC language proficiency, and communicative competence. Most of these language-related individual factors did not relate strongly to multilingual children's outcomes in ECEC. For example, there were no clear effects of children's multilingual status on children's learning outcomes, peer interactions, and play in the studies in this dissertation. In Chapter 2, the reviewed studies showed that children, whether they were monolingual or already bilingual, could learn an additional language in ECEC. In Chapters 4 and 5, we found no

negative effects of children's multilingual status on the quantity or quality of peer interactions and play; in fact, there was evidence for the null hypothesis which states that multilingualism does not relate to the quantity or quality of peer interactions. This stands in contrast with some teachers' concerns about multilingual children's supposed lack of peer interactions of high quality (Chapter 3). Studies in primary schools indicate that teachers' worries about and attitudes towards multilingualism might be influenced by monolingual beliefs or a lack of knowledge or experience (Alisaari et al., 2019; Bosch et al., 2025; Flores & Smith, 2009; Pohlmann-Rother et al., 2023). The latter could also have been true for teachers in our study, as three quarters of teachers had not received any training about multilingualism. However, teachers' worries do reflect case studies in the literature that suggest that multilingual children might be excluded more often and experience fewer peer interactions of high quality in ECEC (Bernstein, 2018; Cekaite & Evaldsson, 2017; Stangeland, 2017). This discrepancy between the literature and our work could be due to the fact that multilingualism is a graded phenomenon, and that effects of multilingualism could be due to other underlying factors, such as language proficiency and ECEC language policy.

We examined whether ECEC language proficiency could be one of these underlying factors, but it did not clearly surface as an important factor in this dissertation. In Chapter 3, a group of teachers (36%-58%, depending on the question) thought that children with lower ECEC language proficiency had fewer peer interactions and that their peer play was of lower quality, but the remainder of the teachers did not agree. Some teachers described that children with lower ECEC language proficiency might show externalising behaviour such as getting frustrated and taking others' toys, when they cannot express what they want, making them less attractive play partners. This is in line with earlier indications in the literature (Banerjee, 2023; Vella, 2023) and might be part of a more general mechanism, in which communicative barriers of any sort (due to language and communication differences, DLD, autism) can lead to externalising behaviour, which then negatively impacts peer interactions (Chen, Justice, et al., 2020; McCabe & Meller, 2004; Shea et al., 2018; Yew & O'Kearney, 2013). However, the observation-based studies in Chapters 4 and 5 showed no clear effects of ECEC language proficiency on peer interactions and play. The findings in Chapter 5 might explain why there was no effect of ECEC language proficiency in our observations: multilingual children with low ECEC language proficiency might still be able to play together in sophisticated ways through their home language.

Similarly, the role of communicative competence, the ability to communicate with peers verbally and/or nonverbally, was limited in this dissertation. A few teachers in the interviews reported on in Chapter 3 mentioned that multilingual

children, even if they have lower ECEC language proficiency, are able to engage with peers through nonverbal communication, and that peer interactions depend more on being able to find ways to communicate. However, the effects of communicative competence and nonverbal communication on the quantity of peer interactions and the quality of (peer) play were not so clear in the social network analysis (Chapter 4) and the video observation study (Chapter 5). This stands in contrast with literature that showed a positive effect of communicative competence in peer interactions (Chen, Justice, et al., 2020; Van der Wilt, 2018), but these earlier studies took place in different settings, with different instruments, and with different populations than ours.

Other individual factors that were not language-related, such as age and gender, did seem to play a role in this dissertation. In the foreign language ECEC review study (Chapter 2), children's age, temperament, and behaviour were related to foreign language development in the reviewed articles, although there were too few previous studies to draw any firm conclusions. The interviewed teachers in Chapter 3 mentioned that the following child-related factors might play a role in multilingual children's peer interactions: children's personality (e.g., shyness), age (language might become more important when children are older), home situation (whether children are used to certain types of play), newness in the group, gender (girls might be more likely to exclude others), and atypical development (peer interactions might become more challenging if multilingual children show atypical development in some respects). In the video observation study in Chapter 5, there was a small positive effect of age on the odds of having cooperative peer interactions. This finding for age is unsurprising, as children learn to cooperate with others as they grow older (Gerber et al., 2011). To summarise, individual factors that are not related to language, such as age, gender, personality, and home situation, might all play a role in multilingual children's development and peer interactions and play.

All in all, we found few effects of individual language-related factors on peer interactions and play. Earlier findings of language-based inequity might not be due to individual language-related factors, such as children's multilingualism or ECEC language proficiency, but due to the situation multilingual children find themselves in. A preliminary indication of this is that we only saw a negative effect of children's multilingual status on their peer interactions in a toddler group in which there were relatively fewer other multilingual children (Chapter 4). More generally, the importance of situational factors is suggested by the diverging results we found between different teachers/playgroups in Chapters 3 and 4. Apparently, some situations are more beneficial for multilingual children's peer interactions and play than others. In this dissertation, we

examined these types of situational language-related factors in more detail, and we will discuss these results below.

### **6.1.2 Situational factors**

The situational language-related factors proved to be more important than individual language-related factors for child (peer interaction) outcomes in this project. One situational factor was the presence of children with the same language background. Language-based homophily, interacting and playing with peers with the same language background, emerged as very important for children's peer interactions and play in our dissertation. The social network analysis (Chapter 4) showed that children with the same language background were more likely to interact with each other, and there was very strong evidence for this effect. The literature suggests that playing with same-language peers has positive effects on children's sense of belonging and socio-emotional development (Eggum-Wilkens et al., 2014; Halle et al., 2014; Licandro, 2016), and it is conceivable that it could also boost their home language skills. These findings fit with teachers' reported experience in Chapter 3 that children need to be able to find others like them. These findings also align with the homophily effect in social network theory literature (McPherson et al., 2001), and with case studies in the literature showing that children with the same home language might group together in ECEC (Feng et al., 2004; Kirsch & Mortini, 2023; Kyratzis et al., 2009; Thompson, 1996).

Related to language-based homophily, we found clear effects of home language use on complex play and peer interactions in this dissertation. In Chapter 5, playing in the home language increased the odds of pretend play and of peer interactions during play. Excerpts of social complex peer play in Chapter 5 featured the use of the home language. This fits with previous case studies in the literature that showed complex play in children with low ECEC language proficiency that were using their home language (Feng et al., 2004; Kyratzis et al., 2009). For complex play, we found further evidence in Chapter 5 that the use of the language spoken at home related to play complexity. Specifically, Dutch language use had an effect on complex play in a sample that included monolingual Dutch children, but not in a sample with multilingual children only, where there was only an effect of home language use. The direction of these relationships, however, is unclear. It is conceivable that the use of a language children know well allows children to expand and deepen their (peer) play, but there is also evidence in the literature that social pretend play boosts language skills because it stimulates particular types of language use or allows children to develop the symbolic skills they need for language (Kızildere et al., 2020; Lillard et al., 2013; Quinn et al., 2018; Rydland et al., 2014). These two mechanisms can also work in tandem.

Our findings on homophily and home language use imply that group composition plays an important role in multilingual children's peer interactions. This is indeed what we found. Teachers who participated in the study in Chapter 3 pointed out that it was important that there are similar children in the group, and that there is continuity, that the same children are present at ECEC on the same days. The only playgroup in which there was a negative effect of multilingualism on peer interactions in Chapter 4 had relatively few multilingual children, so perhaps, children here could not find similar peers to interact with. This finding suggests that individual and situational language-related factors might interact, such that there might only be effects of multilingualism if multilingual children find themselves in a monolingually oriented environment. Group composition might have also played a role for some of the other homophily effects we found: children with similar language proficiencies were more likely to flock together in groups with many multilingual children in Chapter 4. Home language use increased the odds of peer play of high quality in Chapter 5, which is only possible in groups where children share a home language. All these results suggest that it can be beneficial if there are children in the group that have similar linguistic resources, in keeping with earlier literature that shows the advantages of grouping emergent multilingual children with similar linguistic repertoires to foster peer interactions, socio-emotional development, and well-being (Eggum-Wilkens et al., 2014; Halle et al., 2014; Licandro, 2016).

Language policies also appeared to play a role in multilingual children's outcomes in ECEC in this dissertation. In the reviewed literature in Chapter 2, strict language policies, such as using the foreign language only, or a strict adherence to one-teacher-one-language, seemed to have a negative effect on well-being, social relations, and language development. We saw an echo of this in our empirical data in Chapter 5: fluid language use created peer interaction opportunities for the multilingual children in ECEC, especially if they did not speak the ECEC language well. This fits well with theories on translanguaging (García & Wei, 2014), in which multilingual speakers make use of their entire linguistic repertoires. Earlier research has highlighted how this type of fluid language use can be used purposefully to benefit multilingual children's development, also in ECEC (Kirsch, 2020). While many toddler groups in our data had a monolingual language policy, children still seemed to create peer interaction opportunities through the use of the home language in Chapter 5. Previous studies also showed that children and teachers might not always stick to strict language policies (Boyd & Ottesjö, 2016a; Keydeniers et al., 2022). The use of the home language therefore emerged as a positive factor both in the literature about foreign language ECEC (Chapter 2) and in the studies about multilingual children's peer interactions (Chapters 3, 4, 5).

Our four studies showed that other situational factors also played a role in these multilingual ECEC settings. For example, ECEC centres in lower SES areas might experience more difficulty in providing a stable (peer) group environment, according to teachers in Chapter 3. In the social network study in Chapter 4, we saw homophily based on children's gender. This is a well-known homophily effect in primary school (Garrote et al., 2023; Shrum et al., 1988; Stehlé et al., 2013), and it is apparently also already present at the toddler age. Teachers' education and experience was important for child outcomes in the reviewed literature about foreign language ECEC (Chapter 2) and in the teacher study on peer interactions of multilingual children (Chapter 3). The reviewed literature on foreign language ECEC in Chapter 2 showed a positive role of input quantity, input intensity, and input quality on language development. This is unsurprising, given earlier studies on input quantity and quality in (multilingual) language development (Hoff & Core, 2013; Unsworth, 2016).

## 6.2 Theoretical implications

Below, we discuss the implications that this dissertation has for theory and multilingualism research. First, this dissertation underscores the idea that we should not take a deficit approach in multilingualism research. After all, situational factors seemed to be more important than individual factors for the peer interactions and play of multilingual children. Multilingual children could have many peer interactions of high quality if there were children like them and if they used their home languages. This implies that earlier findings of language-based inequity in peer interactions and play (Arvola et al., 2021; Banerjee, 2023; Cekaite & Evaldsson, 2017; Dominguez & Trawick-Smith, 2018) might largely be due to situational factors, in which emergent multilingual children might not find themselves in supportive ECEC environments. The importance of situational factors suggests that policymakers and teachers can make a difference when it comes to language-based equity in ECEC, specifically related to the peer interactions and play of multilingual children. We come back to the practical implications of our findings for teachers, policymakers, and families in Section 6.3 below.

Our findings shed a positive light on learning and using multiple languages at a young age, which fits with the Linguistic Interdependence Hypothesis of Cummins (1979). According to this hypothesis, the learning of languages contributes to a shared knowledge base. Learners of a second language can benefit from knowledge they gained through acquiring their first language, and vice versa. In other words, learning a language positively influences the development of other languages. On the other hand, the time-on-task hypothesis suggests that learning an additional language comes at the expense of other languages, as less time is spent learning each language (Leseman et al., 2009). The reviewed literature in Chapter 2 showed that learning an additional

language in ECEC did not come at the expense of children's other languages. This goes against the time-on-task hypothesis (Leseman et al., 2009), but it aligns with the Linguistic Interdependence Hypothesis of Cummins (1979). Chapters 4 and 5 suggested that the use of multiple languages in ECEC could also have other advantages, namely for peer interactions and peer play.

However, our results showed that not all forms of multilingualism are always equally valued. Some interviewed teachers in Chapter 3 worried that high status languages that are familiar to teachers, like German, might be more readily welcomed into the classroom than languages that generally have a lower status in the Netherlands, like Arabic. Moreover, foreign language programmes in the reviewed studies in Chapter 2 mainly focused on the high-status language English. Similarly, the Dutch Ministry of Social Affairs and Employment has restricted language use in ECEC in the Netherlands to (chiefly) Dutch, regional languages, English, French, and German, creating no official space for the use of other (home) languages in ECEC (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2024). When teachers who participated in the study in Chapter 3 did use home languages, this was sometimes merely done in a transitional phase to Dutch, when a child was upset, or when it was needed for comprehension and acquisition of Dutch (Thieme et al., 2025a). This mimics earlier findings from the Dutch Limburg context, in which Limburgish was used in ECEC in one-on-one caregiving moments, but the majority language Dutch received a more prominent, educational role (Cornips, 2020; Rickert, 2023). These types of language hierarchies have long been attested in multilingualism research, with the majority language on top, high status (foreign) languages like English, French and German second, and regional and home languages, like Arabic, Turkish, and Polish at the bottom (Ellis et al., 2010; Skrandies, 2016; Thieme, 2020).

Our findings suggest that it is important to use diverse samples to research multilingualism in ECEC. In this dissertation, various individual and situational factors turned out to play a role, such as socioeconomic status, children's play situation at home, children's particular home languages, age, and group composition. This indicates that it is important to take such factors into account when selecting a sample and interpreting results. Unfortunately, the literature shows a bias towards WEIRD (Western, educated, industrialised, rich, democratic) samples with particular high-status languages, such as English (Andringa & Godfroid, 2020; Bylund, 2022; Henrich et al., 2010; Kidd & Garcia, 2022). This was reflected in the review study on foreign language ECEC in Chapter 2 as well: earlier studies mainly concerned English as a foreign language, and the foreign language programmes mainly attracted high-SES families. Similarly, earlier studies within the field of multilingual children's peer interactions largely took place in the United States or Nordic countries in

Europe, often also with slightly older children (Arvola et al., 2021; Banerjee, 2023; Bernstein, 2018; Dominguez & Trawick-Smith, 2018; Gertner et al., 1994; Neitzel et al., 2019; Stangeland, 2017). The difference in contexts and samples might also explain the discrepancy between our findings and those of some earlier studies. Diverging results might be due to differences in, for example, children's ages, SES, ECEC policies, teacher education, process quality, whether ECEC is play-based or more education-oriented, and teacher-child ratios.

The results of this dissertation fit with Bronfenbrenner's (1977) Ecological Systems Theory. According to this theory, systems at various levels in the environment of the child relate to the child's development. These include the microsystem, mesosystem, exosystem, macrosystem, and chronosystem. The microsystem is the system that immediately surrounds the child, such as family, peers, and ECEC. The mesosystem involves interactions between microsystems, such as between family and school. The exosystem includes the influences that are further removed from the child, such as the community or government policies. The macrosystem entails cultural influences. The chronosystem is concerned with changes over time, and transitions in a child's life. In line with this theory, our results show that factors in various environmental systems influence multilingual children's development. Effects in the microsystem were seen in all four studies: teachers, parents, and peers played an important role in multilingual children's peer interactions and play, and these types of situational factors seemed to be more important than individual factors. There might also be bidirectional influences, as shown in Chapter 3: teachers expressed that children who are not able to express themselves to their peers might develop internalising and externalising behaviours, which then affect their relationships with their peers, which could influence their development. Effects in the mesosystem were observed in Chapter 3 as well: teachers described that the play situation at home and the play opportunities at ECEC influenced each other, and that it would be good if these were adjusted to each other. Regarding the exosystem, teachers in Chapter 3 mentioned that the socioeconomic situation of the parents and the ECEC centre might play a role in the opportunities children have for peer interactions and play in ECEC. Furthermore, it is conceivable that local and national ECEC policies have an effect on the peer play and interactions of multilingual children in ECEC. For example, Chapter 5 suggests that the use of the home language might be beneficial for play, but this is not always allowed in local or national ECEC policy. In Chapter 1, we described that only a limited number of (foreign) languages are officially allowed in Dutch ECEC. Regarding results in the macrosystem, ideologies surrounding multilingualism might affect children's development: low-status versus high-status multilingualism (Chapter 3), teachers' beliefs about multilingual children's development (Chapter 3), and

beliefs about home language use in education, which was found to be beneficial in Chapter 5. Regarding the chronosystem, our studies were not longitudinal so results are tentative, but several teachers in Chapter 3 mentioned that the transition to primary school might be difficult for multilingual children if they were not able to develop themselves fully through peer interaction and play in ECEC. Therefore, consistent with Bronfenbrenner's theory, we found that factors in various systems in the environment affect the development, peer interactions, and play of multilingual children.

### 6.3 Practical implications

Although causality cannot be established and our results were based on a particular sample in the Netherlands, they do have a couple of practical implications. Our finding that situational factors play an important role suggests that policymakers, teachers, and parents might make a difference for multilingual children in ECEC. Earlier studies show that teachers and policymakers might sometimes view 'multilingualism' as a problem (Cromdal & Stoeber, 2022; Peleman et al., 2022), but our dissertation instead finds that the existing multilingualism might be used to the advantage of the children. Below, we lay out some practical implications of our findings: for ECEC policy, for teachers, and for families.

For ECEC policy, our results suggest the following implications:

- Inclusive language policies and translanguaging practices might offer advantages in early years settings. Chapter 2 showed the benefits these bring to foreign language ECEC and Chapters 3, 4, and 5 suggested they could be beneficial for the quantity and quality of multilingual children's peer interactions and peer play in ECEC. Home language use, in particular, seemed to relate to high quality peer play (Chapter 5). Policymakers could look into the advantages of translanguaging pedagogies, in which teachers make use of children's full communicative repertoires for pedagogical and didactical purposes (Kirsch, 2020; Veerman et al., 2025).
- Relatedly, it could be beneficial to place children and teachers who speak the same home language in the same ECEC group. In Chapter 5, we found that children who use their home language (together) during play had higher quality and more social play. The results of Chapter 4 showed that children who spoke the same home language flocked together and could have many peer interactions that way. Earlier literature suggests that this could help them find safety and aid socio-emotional development (Halle et al., 2014), although attention should be paid to ECEC language development too if these children are relatively new to the ECEC language (Washington-Nortey et al., 2022). In that regard, the literature indicates that it can be helpful if children with lower ECEC language proficiency find themselves in an

environment with other children with higher ECEC language proficiency (Washington-Nortey et al., 2022).

- Teacher training about multilingualism in ECEC is warranted. The reviewed studies in Chapter 2 suggested that teachers in foreign language ECEC had often not received training on foreign language learning in young children. Likewise, Chapter 3 showed that most teachers in our sample had never received training on multilingualism in ECEC. Specifically, teachers need training on how to use the linguistic diversity that is present in the ECEC classroom to the advantage of all children (Stam et al., 2022), for example supporting children in their peer interactions.

Our studies suggest that teachers can make a difference for multilingual children and their peer interactions in ECEC. For teachers, we formulate the following implications:

- Teacher strategies and practices, such as scaffolding, routines, stories, songs, and games, can be useful for (foreign) language learning, according to the reviewed studies in Chapter 2.
- Teachers can help (multilingual) children to be included in play, for example through culturally sensitive play (Chapter 3), by helping them connect with peers with a similar language background (Chapter 4), and by facilitating and stimulating peer play during free play. There was a significant positive correlation between teachers' involvement in play and children's quantity of peer interactions (Chapter 4).
- Teachers can give children examples of how to use language to engage with peers and navigate peer conflict. The analysed example in Chapter 5 showed that children picked up language from adults that helped them navigate peer interactions, and allowed them to solve peer conflict and continue to engage in peer play.
- Teachers could use home languages, and encourage children to make use of all their communicative resources in play, including their home language (Langeloo et al., 2019). This could be helpful for the (peer) play quality of multilingual children (Chapter 5). Children's home languages can be used purposefully for pedagogical and didactic goals, and teachers could take inspiration from earlier work on translanguaging and multilingual pedagogies (Kirsch, 2020; Veerman et al., 2025).
- It seems to be advantageous if teachers and parents work together to help children develop proficiency in all their languages. We saw positive effects for home language use on peer play in Chapter 5, and earlier literature suggests that proficient multilingualism might come with benefits in peer interactions, because of social and communicative advantages (Banse, 2021; Sun et al., 2021; Winsler et al., 2014; Yow & Li, 2015).

For families, the following implications are suggested:

- Parents should know that a large body of research, including this dissertation, suggests that multilingualism can come with advantages. If children are proficient multilinguals, for example, they might have social and communicative advantages (Banse, 2021; Sun et al., 2021; Winsler et al., 2014; Yow & Li, 2015), which might be helpful in peer interactions. If children know the home language well enough to use it in ECEC, this might come with advantages in peer play, as suggested by the results in Chapter 5. To support language development at home, parents should create a language-rich environment in the language(s) they know best (McCabe et al., 2013).
- Children learn a lot from (peer) play (Coplan & Arbeau, 2009; Deunk, 2009; De Haan, 2015), and playing (together) frequently at home might help peer play at ECEC become easier, according to teachers (Chapter 3).

#### **6.4 Limitations and directions for future research**

Of course, this dissertation also comes with limitations, which could be taken up in future research. First, longitudinal or experimental studies were unfeasible within the time frame of the PhD project, given the long time it took to collect and analyse the type of data we were interested in. Our cross-sectional approach did not allow us to investigate causality. In future research, longitudinal and experimental work would help shed light on questions about temporal and causal relationships. For example, there is some evidence that communication barriers between children can cause externalising behaviour (see Chapter 3), which can then impede peer interactions (Menting et al., 2011). Thus, there might be reciprocal relationships in which, for example, not being able to express yourself leads to fewer peer interactions, which causes lowered well-being and fewer opportunities for development, which again makes it harder to engage in peer interactions. It would be interesting to examine this relationship in future work. Future longitudinal or experimental research could examine in more detail the possibly reciprocal relationship between language proficiency and pretend play: it seems that pretend play might contribute to language proficiency, and that the reverse might also be true (Lillard et al., 2013; Quinn et al., 2018). Similarly, does home language use create (peer) play opportunities, is it a consequence of (peer) play, is there a reciprocal relationship, or does home language use merely coincide with (peer) play (see Chapter 5)?

Second, we were unable to collect large samples, due to the intensive data collection during which we tried to get a diverse group of participants and were aiming for full participation in each playgroup. Previous research on foreign language ECEC seemed to have the same sample size issue: for example, in Chapter 2, it was hard to draw conclusions about child-related factors based on

previous research due to small samples and few studies. In our empirical studies, we did not have enough data to systematically examine group-level or interaction effects in the social network study (Chapter 4). The results for peer play quality (Chapter 5) were based on only a subset of the children we observed, because there was not enough data for the other children and not enough time to code more data. We might have found different results if we had been able to include more children. In future studies, larger samples across different settings might help to draw a more complete picture of multilingual children's peer interactions in ECEC. Larger samples in diverse settings would help us to examine multilingualism in all its diversity, as well as interaction or group-level effects. For example, the literature suggests that multilingualism in combination with high ECEC language proficiency might bring advantages in peer interactions (Banse, 2021; Halle et al., 2014; Sun et al., 2021; Yow & Li, 2015). Earlier work indicates that age could moderate the relationship between language and peer rejection (Troesch et al., 2016). Furthermore, the teachers in Chapter 3 expressed that children might be more likely to interact with same-language peers if they are new to ECEC. To what extent do children with the same language background group together because they share a cultural or ethnic background (see Chapter 4)? Moreover, it would be interesting to sample many different playgroups and examine which types of pedagogies and policies create which (peer interaction) opportunities for multilingual children.

Third, our results suggest that some pedagogical interventions might be worthwhile, but we were unable to test this through an intervention study. Based on our results, it would be interesting to examine if an inclusive language policy, e.g., centred around translanguaging practices, would result in more peer interactions and play of higher complexity. Similarly, future studies might look more closely at the effects of grouping children with the same home language together. Our studies suggest it could be advantageous for multilingual children's peer interactions and play (Chapters 4 and 5), and earlier studies showed advantages for socio-emotional development (Halle et al., 2014), but concerns have also been raised regarding ECEC language development (Washington-Nortey et al., 2022). There are indications that some forms of multilingualism are valued and supported more in ECEC than others (see Chapter 3). All four studies in this dissertation suggest that teachers played an important role in creating opportunities for peer interaction, play, and learning. It would be valuable to look at the impact of pedagogy further using larger samples across different ECEC settings, examining which aspects of pedagogy are most important for peer interactions and play.

Fourth, a limitation was that we had to keep the parent survey short in Chapters 4 and 5, to allow a wide range of parents to participate. Our short parent survey meant that we could not fully analyse multilingualism as the

graded and multifaceted phenomenon that it is (see Chapters 4 and 5; Luk & Bialystok, 2013). We did look at differences between (multilingual) children in terms of ECEC language proficiency, communicative competence, nonverbal communication, and (home) language use during play, but we were unable to look systematically at other meaningful dimensions, such as the specific languages children were exposed to, input quantity, input quality, socioeconomic background, and the (play) situation at home. Moreover, some data were missing and had to be imputed in Chapter 4 and some data might have been less precise as they were based on few questions or were not all gathered at the same moment in time in Chapters 4 and 5. Future research might, for example, zoom into the effects of one or a few of these variables and try to measure them in more detail.

Fifth, our sample was very diverse and heterogeneous. This was a strength of this dissertation, especially in light of the WEIRD samples in (linguistics) research (see, e.g., Andringa & Godfroid, 2020; Bylund, 2022; Henrich et al., 2010; Kidd & Garcia, 2022), but the heterogeneity also meant that it might be harder to observe some effects. This heterogeneity might explain the diverging findings between participating teachers/playgroups in Chapters 3 and 4. And while our sample was diverse in terms of socioeconomic status, geographic location in the Netherlands, language background, and type of playgroup, it still took place in a WEIRD country, namely the Netherlands, which has a rather monolingual language policy. Future studies could try to do similar work in different countries in which multilingualism is more normalised. Future research could zoom into the diversity that is present, examining for example the roles of socioeconomic status (SES), language status, and home language situations. In the reviewed studies in Chapter 2, foreign language ECEC attracted primarily high SES families, and the foreign language was mainly the high-status language English. Teachers in the teacher study (Chapter 3) pointed out that ECEC teachers might be more likely to use home languages in ECEC settings if these are high-status languages that they already know themselves. They also observed that children in low-SES ECEC centres experienced less continuity and therefore a less stable environment to develop peer interactions. Moreover, they mentioned that children's home (language) situation is an important factor that might impact social inclusion and peer interaction opportunities in ECEC. It would be interesting to look at the interplay between the situation at home and the situation at ECEC in more detail.

Sixth, we found discrepancies between earlier literature, teacher worries (Chapter 3), and our observational data (Chapters 4 and 5), but we could not examine in detail why these discrepancies emerged. We did discover a few first clues: negative beliefs/attitudes of teachers, lack of teacher training, monolingual and strict language policies, having (no) similar peers, and (lack of)

home language use in ECEC. For example, teacher worries could partly be due to attitudes or beliefs about multilingualism. While we asked teachers about their experiences (instead of their attitudes or beliefs) and tried to minimise social desirability bias in Chapter 3, teachers' answers might still have been influenced by beliefs about multilingualism and by the relatively monolingual context in which they worked. There are indications that this might be the case: most teachers had received no training about multilingualism and our observation studies (Chapter 4 and 5) did not confirm all teachers' worries. We found no clear effects of multilingual status on peer interactions and play in the social network study (Chapter 4) and the video observation study (Chapter 5). That said, it is unclear if we would have been able to find separate effects of multilingual status at all, as we also included ECEC language proficiency and home language use variables in our study. In our observation data, it seemed that ECEC language proficiency had no clear effects on peer interactions and play, but that home language use and having similar peers mattered a lot (Chapters 4 and 5). This suggests that earlier findings in the literature might have not been due to multilingualism *per se*, but due to situational aspects, such as not being able to use the home language and a lack of similar peers. In general, we found that situational language factors played a more important role in multilingual children's peer interactions and play than individual language factors. Future research might examine if our findings can be replicated in other contexts, and if any other factors also play a role.

Seventh, we were unable to gather data about multilingual children's own perspectives on peer interactions and play. In future studies, it would be interesting to look at child agency and beliefs surrounding peer interactions and play. While children in ECEC are very young (under the age of four in this PhD project), our findings and other studies suggest they do exercise their agency in ECEC, for example going against language policy (Chapter 5, Boyd & Ottesjö, 2016) or excluding peers (Chapter 3, Cekaite & Evaldsson, 2017). It would be interesting to examine how children exercise their agency in peer interactions, what they think of ECEC pedagogies, and how they look at their peers. Future studies on child agency in ECEC could take inspiration from earlier work (Almér, 2017; Crump & Phipps, 2013; Ellis & Rixon, 2019; Little, 2023; Little & Little, 2022; Mourão, 2018; Rodríguez-Carrillo et al., 2020; Schwartz, 2018, 2024), applying methodologies like drawing, talking about a book, asking questions with a stuffed animal, and play.

Lastly, we observed that some children hardly interacted with their peers during the social network observation period (Chapter 4), but we were unable to examine the consequences of fewer (high quality) peer interactions and play. What effect does this have on these children? While we know that peer interactions and play contribute to development (Coplan & Arbeau, 2009;

Kızildere et al., 2020; Lillard et al., 2013; Quinn et al., 2018; White et al., 2021), it is important to examine what happens if children do not experience them much in ECEC. There are some indications in the literature that marginal positions in the peer network could also have advantages, granting children safety while allowing them to pick up the ECEC language (Bernstein, 2018). If children are introverted or shy, they could prefer playing alone occasionally. Moreover, there might be more ways for children to learn from (peer) play than pretend play. It is therefore important to examine in more detail how children fare if they have fewer peer interactions and less pretend play.

## **6.5 Conclusion**

This PhD project examined multilingualism in ECEC in the Netherlands through four studies. A review of the literature showed that children generally were able to learn at least some basics of a foreign language through ECEC and found this enjoyable, as long as it was approached in a playful way. In our teacher study, the surveyed and interviewed teachers sometimes had concerns about the peer interactions of multilingual children in ECEC, but we found no negative effect of multilingualism on peer interactions in our studies using social network analysis and video observations. What seemed to matter more is whether children were able to find peers that were like them, for example peers with a similar language background. The use of the home language in ECEC emerged as a positive factor in all four studies and it related to higher quality play and more peer interactions. Teachers seemed to play an important role in creating opportunities for peer interactions, setting examples for how to navigate peer play, and creating space for the home language.



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## Summary

### *Multilingualism, Peer interactions, and Play: A Multi-Methods Investigation in Early Childhood Education and Care in the Netherlands*

Multilingualism is the norm worldwide and an increasing number of children in the Netherlands are growing up multilingually. This multilingualism is also present in early childhood education and care (ECEC), which has led to many practical and theoretical questions. These questions concern not only language development, but also topics like well-being, play, and peer interactions. This dissertation contributes to the growing field of research on multilingualism in ECEC, and specifically examines the peer interactions and peer play of multilingual children. Peer interactions and play are related to the well-being of children and their cognitive, social-emotional, and linguistic development.

However, there are indications of language-based inequity: multilingual children may be excluded more often (consciously or unconsciously) and may have fewer opportunities for peer interactions and high-quality play, such as fantasy play, in ECEC. It is unclear which factors might explain these findings: are they related to ECEC language proficiency, an inability to use the home language in ECEC, being 'the odd one out'? In any case, these types of findings should not be interpreted through a deficit lens; social, pedagogical, and contextual factors probably play a role. Multilingual children might simply find themselves in an environment that is oriented towards monolingualism. In this dissertation, our aim was to examine the peer interactions and play of young multilingual children in ECEC in the Netherlands in more detail, and to investigate how individual and situational language factors relate to them. To do so, we used a range of methods, including literature review, questionnaires, interviews, social network analysis, and video observations.

The Netherlands is an interesting context for research into multilingualism in ECEC. In the Netherlands, relatively many children go to ECEC at a young age. An increasing number of children are also multilingual, for example because they grow up with a language other than Dutch at home, or because they grow up with multiple languages at home. However, this multilingualism is not immediately reflected in Dutch national ECEC policy. Until recently, the policy focused on Dutch and there was little room for the home languages of children. During the course of this PhD project, policy and pedagogical practice were becoming somewhat more multilingual. For example, the Ministry of Social Affairs and Employment implemented plans to make bilingual ECEC possible, in which English, French, or German would be offered as a foreign language in ECEC.

In Chapter 2, we examined the scientific literature on the effects of foreign language ECEC. Specifically, we wanted to know what was known about the effects of using a foreign language in ECEC for children aged 0 to 4 years old. Do children learn this foreign language, does it have consequences for the other languages that children are also learning, and what are the effects on the well-being of children? We also looked at the effects of programme characteristics and child characteristics on the outcomes of foreign language ECEC. Our literature study showed that scientific research on foreign language ECEC is still in its infancy. We found 32 scientific articles on this topic via Web of Science. The studies that we reviewed showed that children could learn a foreign language in ECEC, without coming at the expense of the majority language or their first language. However, children mainly acquired passive skills in the foreign language in the surveyed articles. The well-being of children in the programmes in the reviewed studies was positive, as long as the foreign language was offered in a playful way and the language policy was not too strict. Input quantity and the use of teacher strategies were positively related to child outcomes in the reviewed articles. There was little previous research on child characteristics, but older children and children who were more positive and involved seemed to have higher learning outcomes. An interesting finding was that children could learn a lot from other children at ECEC: the literature suggested that peer interactions seemed to contribute to (foreign) language development. However, there were indications in the scientific literature that not all children might benefit equally from these types of peer interactions. For example, multilingual children, especially if they are still learning the ECEC language, might not always have a lot of peer interactions or high-quality (peer) play. On the other hand, the literature also suggested that children sometimes gravitate towards peers who speak the same language at home, which could be beneficial for their well-being and social-emotional development.

In Chapter 3, we therefore wanted to zoom into multilingual children's peer interactions and play. We decided to ask a broad sample of teachers about their experiences with the peer interactions of multilingual children in ECEC. In questionnaires and interviews, we asked them about the social inclusion, the peer play quality, and the peer group formation of multilingual children. We also wanted to know which factors play a role in these interactions according to teachers. In total, 216 teachers participated in the questionnaire and 13 teachers participated in in-depth interviews. They worked in the Netherlands in (monolingual or bilingual) ECEC with young children under the age of four and had experience working with multilingual children. However, three quarters of the teachers had never followed trainings or courses on multilingualism. Our results showed large differences between the teachers. Some teachers had concerns about the social inclusion and peer play of children who do not yet speak the language of the ECEC centre very well, but most teachers did not.

According to the teachers, various factors could play a role, such as the age and sociability of children, the group composition, and the pedagogical climate. Three quarters of the teachers observed that children with the same home language or comparable language skills interacted more with each other.

Because we wanted to get a better picture of these diverging findings, we decided to observe toddler groups in the study in Chapter 4. We investigated how much (multilingual) children interacted with peers and with whom they interacted, using social network analysis. Previous research and the study in Chapter 3 suggested that children's linguistic resources are related to peer interactions. However, it was unclear which language-related factors were important: language background, ECEC language proficiency, or (verbal and nonverbal) communicative competence. The latest innovations in social network analysis allowed us to investigate these language-related factors, while simultaneously controlling for the effects of age, gender, and sociability. We developed an app that allowed us to keep track of which children interacted with each other and for how long. Previous research often used questionnaires to investigate this, but we were able to observe what really happened in the classroom. We observed 124 children in 12 toddler groups throughout the Netherlands. We wanted to know how children's language background, ECEC language proficiency, and communicative competence were related to how much they interacted and with whom. Our results showed that children gravitated towards each other if they shared a home language. Teacher involvement during free play was related to the quantity of peer interactions in our data. Across playgroups, there were no effects of children's language background, ECEC language proficiency, or communicative competence on peer interactions.

In Chapter 5, we used a different method, video observation, to examine the (peer) play of multilingual children in more detail. Previous research has described that play contributes to development, in particular complex and social play, such as pretend play. There are indications in the literature that multilingual children sometimes have fewer opportunities for complex play and social interactions during play, in particular if they do not yet speak the ECEC language very well. However, other research has suggested that multilingual children can show complex and social play when they use their home language or communicate nonverbally. By means of video observation, we were able to look in detail at the (peer) play of multilingual children. We made recordings of 101 children in 12 toddler groups throughout the Netherlands. We wanted to know how the play complexity and the social interactions of children during free play were related to their linguistic resources, nonverbal communication, and (home) language use during play. We coded the play complexity of 861 play episodes and the social interactions of 804 play episodes. In addition, we

analysed three illustrative examples of complex and social play. The results showed that language use during play, especially home language use, was associated with more complex play and more (peer) interactions during play in our data. There were no clear effects of multilingualism, Dutch language proficiency, or nonverbal communication on complex and social play. The analysed examples illustrated that complex social play often went hand-in-hand with home language use. The examples also showed that the use of language gave the children the tools to resolve conflicts and continue their play. Teachers seemed to have an exemplary function: the children used language that teachers also use to resolve conflicts.

In Chapter 6, we discussed the results of this PhD project, as well as implications for theory and practice, limitations, and suggestions for further research. The four studies in this dissertation all concerned multilingualism in ECEC for young children in the Netherlands. They were innovative for their focus on children under the age of four, for the combination of different methods, for their diverse samples and naturalistic data collection, and for investigating the effects of different language-related factors on peer interactions and peer play. The four studies painted a positive picture of multilingualism. The literature study in Chapter 2 showed that children could learn a foreign language at ECEC and also enjoyed it, as long as it was approached playfully. Children's multilingualism or Dutch language proficiency was not related to fewer peer interactions or lower quality of play in our data in Chapters 4 and 5. In fact, individual language-related factors did not emerge as very important in these studies, but rather, a supportive multilingual environment appeared to be more important. If children shared a home language, they gravitated towards each other and could have many peer interactions together, as shown in Chapter 4. If children used their home language during play, this increased the likelihood of complex play and peer interactions during play, as indicated by Chapter 5.

In terms of practical implications, this research suggests that the multilingualism in linguistically diverse ECEC settings should be welcomed. The use of the home language emerged as a positive factor in our research, indicating that a multilingual language policy in ECEC might have advantages. The home language seemed to help children in their peer interactions and social complex play, such as fantasy play. As one teacher in our research put it: "you cannot say: 'you are not allowed to speak Turkish'. No language, no play, no development." Translanguaging practices might be helpful in ECEC, allowing children to engage their full communicative repertoires. Teachers can help children find others who speak the same home language. In this sense, placing children and teachers with the same home language in the same ECEC group might be beneficial. It is important that teachers receive specific training about

multilingualism in ECEC; our research showed that this is unfortunately often not the case. Our dissertation contributes to earlier research in showing that the use of all languages, including home languages, is important for children's peer interactions and play. Teachers and parents can work together to stimulate multilingual development in all languages of the child. Teacher involvement during free play was related to the amount of peer interactions in our study. Teachers seem to have an exemplary function: they can show children how to use language to resolve conflicts. All in all, our research suggests that teachers play an important role in stimulating peer interactions and play and creating a welcoming environment in which multilingual children can thrive.



## Nederlandse samenvatting

### *Meertaligheid, Interacties met Leeftijdsgenoten en Spel: Een Multi-Methode Onderzoek op de Kinderopvang in Nederland*

Meertaligheid is wereldwijd de norm en ook in Nederland groeien steeds meer kinderen meertalig op. Op de kinderopvang zie je deze meertaligheid terug, wat heeft geleid tot allerlei praktische en theoretische vragen. Deze vragen hebben niet alleen betrekking op de taalontwikkeling, maar ook op thema's als welbevinden, spel en interactie met andere kinderen. Dit proefschrift draagt bij aan het groeiende onderzoeksveld naar meertaligheid in de kinderopvang, met specifieke aandacht voor het samenspel en de onderlinge interacties van meertalige kinderen. Kinderen kunnen veel leren van het spelen met andere kinderen. Interacties met leeftijdsgenoten hangen samen met het welbevinden van kinderen en hun cognitieve, sociaalemotionele en taalontwikkeling.

Eerder onderzoek laat echter zien dat er sprake kan zijn van talige ongelijkheid: meertalige kinderen worden soms (bewust of onbewust) buitengesloten op de opvang en hebben minder mogelijkheden voor interactie met leeftijdsgenoten en spel van hoge kwaliteit, zoals fantasiespel. Het is onduidelijk waardoor dit komt: komt het misschien doordat zij minder vaardig zijn in de taal die op de opvang gebruikt wordt, doordat zij hun thuistaal niet kunnen gebruiken op de opvang, of zijn ze de 'vreemde eend in de bijt' op de opvang? Waarschijnlijk spelen sociale, pedagogische en contextuele factoren een rol en gaat het niet zozeer om een 'achterstand' van meertalige kinderen. Misschien bevinden meertalige kinderen zich bijvoorbeeld simpelweg in een omgeving die gericht is op eentaligheid in plaats van meertaligheid. In dit proefschrift wilden we deze vragen nader onderzoeken. Daartoe gebruikten we een scala aan methoden, waaronder een literatuurstudie, vragenlijsten, interviews, een sociale netwerkanalyse en video-observaties. Ons doel was om de interacties met leeftijdsgenoten en het spel van meertalige kinderen op de kinderopvang in Nederland te onderzoeken. We wilden onderzoeken hoe deze samenhangen met kindspecifieke en situationele taalfactoren.

Nederland vormt een interessante context voor onderzoek naar meertaligheid in de kinderopvang. In Nederland gaan relatief veel kinderen op heel jonge leeftijd naar de opvang. Ook zijn er steeds meer kinderen meertalig, bijvoorbeeld omdat ze thuis met een andere taal dan het Nederlands of met meerdere talen opgroeien. Deze meertaligheid zie je echter niet gelijk terug in het Nederlandse kinderopvangbeleid. Dat beleid was tot voor kort vooral gericht op het Nederlands en er was weinig aandacht voor de thuistaal van kinderen. Tijdens dit PhD-project werden het beleid en de pedagogische praktijk langzaam meertaliger. Zo implementeerde het Ministerie van Sociale Zaken en Werkgelegenheid plannen om tweetalige kinderopvang mogelijk te

maken, waarbij het Engels, Frans of Duits als vreemde taal aangeboden zou worden op de opvang.

In hoofdstuk 2 onderzochten we de wetenschappelijke literatuur over het aanbieden van een vreemde taal op de kinderopvang aan kinderen van 0 tot 4 jaar. Leren kinderen deze vreemde taal? Heeft dat gevolgen voor de andere talen die kinderen ook aan het leren zijn? En wat zijn de effecten van het leren van een vreemde taal op het welbevinden van kinderen? We keken ook naar de rol van hoe het vreemdetaleraanbod werd vormgegeven en kindeigenschappen. Uit onze literatuurstudie bleek dat het wetenschappelijk onderzoek over een vreemde taal op de kinderopvang bij jonge kinderen nog in de kinderschoenen staat. Via Web of Science vonden we 32 wetenschappelijke artikelen over dit onderwerp. De resultaten van de literatuurstudie lieten zien dat kinderen de vreemde taal op de tweetalige opvang leerden zonder dat dit ten koste ging van de meerderheidstaal of hun eerste taal. Wel verwierven kinderen vooral passieve vaardigheden in de vreemde taal. Kinderen vonden het leuk om een vreemde taal te leren, zolang de vreemde taal op een speelse manier werd aangeboden en het taalbeleid niet te streng was. De hoeveelheid taalgebruik en het gebruik van taalstrategieën door pedagogisch professionals hing positief samen met de ontwikkeling van kinderen in de bekeken studies. Er was weinig bekend over de rol van kindeigenschappen bij het leren van de vreemde taal op de opvang, maar oudere kinderen en kinderen die positief ingesteld en betrokken waren leken hogere leeruitkomsten te hebben. Een bevinding in sommige studies was bovendien dat kinderen veel konden leren van andere kinderen op de opvang: interacties met leeftijdsgenoten leken bij te dragen aan de (vreemde)taalontwikkeling. Er waren in de wetenschappelijke literatuur wel aanwijzingen dat niet alle kinderen evenveel kunnen profiteren van dit soort interacties met leeftijdsgenoten. Meertalige kinderen, zeker als ze de taal op de opvang nog aan het leren zijn, hadden bijvoorbeeld niet altijd veel interacties met andere kinderen of (samen)spel van hoge kwaliteit. Aan de andere kant lazen we in de literatuur ook dat kinderen soms naar leeftijdsgenootjes toe trokken die dezelfde thuistaal spraken, wat goed zou kunnen zijn voor hun welbevinden en socialemotionele ontwikkeling.

In hoofdstuk 3 wilden we een beter beeld krijgen van de interacties en het spel van meertalige kinderen. We besloten een brede groep pedagogisch professionals naar hun ervaringen te vragen. In vragenlijsten en interviews bevroegen we hen over sociale inclusie, samenspelkwaliteit en groepsvorming van meertalige kinderen. Ook wilden we weten welke factoren volgens professionals hierbij een rol spelen. In totaal vulden 216 pedagogisch professionals de vragenlijst in en deden er 13 professionals mee aan de diepte-interviews. Zij werkten op de (eentalige of tweetalige) opvang met jonge kinderen onder de vier jaar en hadden ervaring met het werken met meertalige

kinderen. Driekwart van de professionals had echter nooit een vak, training of cursus gevolgd over meertaligheid. Onze resultaten lieten grote verschillen zien tussen pedagogisch professionals. Sommige professionals hadden zorgen over de sociale inclusie en het samenspel van kinderen die de taal van de opvang nog niet zo goed spreken, maar de meeste professionals niet. Volgens de professionals speelden verschillende factoren een rol, zoals de leeftijd en sociale openheid van kinderen, de groepssamenstelling en het pedagogisch klimaat. Driekwart van de professionals rapporteerde dat kinderen met dezelfde thuistaal of vergelijkbare taalvaardigheid meer met elkaar omgingen.

Om deze uiteenlopende bevindingen beter te begrijpen, besloten we in hoofdstuk 4 te gaan observeren op peutergroepen. We onderzochten hoeveel (meertalige) kinderen met andere kinderen omgaan en met wie. Het onderzoek in hoofdstuk 3 en eerder onderzoek suggereerden namelijk dat de taalachtergrond en taalvaardigheden van kinderen samenhangen met wie kinderen omgingen. Het was echter onduidelijk welke taalfactoren belangrijk waren: taalachtergrond, de taalvaardigheid in de opvangstaal of (verbale en nonverbale) communicatieve competentie van kinderen. Innovaties in sociale netwerkanalyse stelden ons in staat deze factoren te onderzoeken, en tegelijkertijd te corrigeren voor effecten van leeftijd, gender en sociale openheid. Daartoe ontwikkelden we een speciale app, waarmee we tijdens het observeren bij konden houden welke kinderen met elkaar omgingen en hoe lang. Eerder onderzoek gebruikte hiervoor vaak vragenlijsten, maar wij konden direct observeren wat er daadwerkelijk op de groep gebeurde. We observeerden 124 kinderen op 12 peutergroepen door heel Nederland. We wilden weten wat het verband was tussen de taalachtergrond, taalvaardigheid en communicatieve competentie van kinderen enerzijds, en hoeveel interacties de kinderen hebben en met wie anderzijds. Onze resultaten lieten zien dat kinderen naar elkaar toe trokken als ze dezelfde thuistaal deelden. De betrokkenheid van pedagogisch professionals tijdens het vrij spel hing samen met het aantal interacties tussen kinderen in onze data. In een overkoepelende analyse vonden we geen effecten van meertaligheid, Nederlandse taalvaardigheid en communicatieve competentie van kinderen op het aantal interacties met leeftijdsgenoten.

In hoofdstuk 5 gebruikten we een andere methode, video-observatie, om het (samen)spel van meertalige kinderen nader te onderzoeken. Eerder onderzoek heeft laten zien dat spel bijdraagt aan de ontwikkeling van kinderen, in het bijzonder complex en sociaal spel, zoals fantasiespel. Er zijn aanwijzingen in de literatuur dat meertalige kinderen soms minder mogelijkheden hebben voor complex en sociaal spel, zeker als zij de taal van de opvang nog niet zo goed spreken. Ander onderzoek suggereert echter dat meertalige kinderen complex en sociaal spel vertonen als ze hun thuistaal gebruiken of nonverbaal communiceren. Door middel van video-observatie konden we in detail kijken

naar het (samen)spel van meertalige kinderen. We maakten opnames van 101 kinderen op 12 peutergroepen door heel Nederland. We wilden weten hoe de spelcomplexiteit en de interacties van kinderen tijdens vrij spel samenhangen met de talige achtergrond van kinderen, nonverbale communicatie en (thuis)taalgebruik tijdens spel. We codeerden van 861 momenten de spelcomplexiteit van kinderen en van 804 momenten de sociale interacties van kinderen. Daarnaast beschreven we drie illustratieve voorbeelden van complex en sociaal spel. Uit de resultaten bleek dat taalgebruik tijdens het spel, in het bijzonder het gebruik van de thuistaal, samenhang met hoe vaak kinderen complex spel en interacties lieten zien. Er waren geen duidelijke effecten van meertaligheid, Nederlandse taalvaardigheid of nonverbale communicatie op complex spel of interacties. De geanalyseerde voorbeelden illustreerden dat complex sociaal spel vaak samenging met thuistaalgebruik. Ook lieten de voorbeelden zien dat taal kinderen handvatten gaf om conflicten op te lossen en door te gaan met hun spel. Pedagogisch professionals leken daarbij een voorbeeldfunctie te hebben: kinderen gebruikten in de video's zinnen die pedagogisch professionals ook gebruiken om conflicten op te lossen.

In hoofdstuk 6 bespraken we de uitkomsten van deze dissertatie, implicaties voor theorie en praktijk, beperkingen en suggesties voor vervolgonderzoek. De vier onderzoeken in dit proefschrift richtten zich allemaal op meertaligheid in de kinderopvang voor jonge kinderen in Nederland. Innovatieve aspecten van dit proefschrift waren onder meer de focus op kinderen onder de vier jaar, de combinatie van verschillende methoden, de diversiteit van de steekproef, de verzameling van naturalistische data, en het in kaart brengen van het effect van verschillende taalfactoren op interacties met leeftijdsgenoten en spel. Uit de vier onderzoeken kwam een positief beeld van meertaligheid naar voren. De literatuurstudie in hoofdstuk 3 liet zien dat kinderen een vreemde taal konden leren op de opvang en dit ook leuk vonden, zolang het speels werd aangepakt. Meertaligheid en Nederlandse taalvaardigheid van kinderen hield geen verband met minder interacties met leeftijdsgenoten of lagere (samen)spelkwaliteit in onze observaties in hoofdstuk 4 en 5. Individuele taalfactoren speelden sowieso geen grote rol in ons onderzoek; een inclusieve meertalige omgeving op de opvang leek belangrijker te zijn. Zijn er bijvoorbeeld andere kinderen met dezelfde thuistaal? Kinderen die een thuistaal deelden hadden meer interacties met elkaar in onze sociale netwerkanalyse in hoofdstuk 4. Het gebruik van de thuistaal hing samen met hoge spelkwaliteit en veel interacties in onze videostudie in hoofdstuk 5.

Voor de praktijk suggereert dit onderzoek dat de aanwezige meertaligheid op de kinderopvang verwelkomd moet worden. Het gebruik van de thuistaal kwam positief naar voren in ons onderzoek, wat aangeeft dat een meertalig taalbeleid voordelen heeft. De thuistaal lijkt kinderen te helpen om met anderen te spelen

en spel van hoge kwaliteit, zoals fantasiespel, mogelijk te maken. Zoals een pedagogisch professional in ons onderzoek het verwoordde: “je kan niet zeggen: ‘je mag geen Turks praten’. Geen taal, geen spel, geen ontwikkeling.” Pedagogisch professionals kunnen gebruik maken van *translanguaging*, waarbij kinderen hun volledige talige kennis in alle talen in kunnen zetten. Ons onderzoek suggereert dat het gebruik van alle talen, ook thuistalen, belangrijk is voor het samenspel van kinderen. Daarnaast kunnen pedagogisch professionals meertalige kinderen helpen om andere kinderen te vinden die op hen lijken en met wie ze samen kunnen spelen. Het kan de moeite waard zijn om pedagogisch professionals en kinderen die dezelfde thuistaal spreken in dezelfde groep in te delen. Het is belangrijk dat pedagogisch professionals gerichte (bij)scholing krijgen over meertaligheid in de kinderopvang; uit ons onderzoek bleek dat dit helaas vaak nog niet het geval is. Pedagogisch professionals en ouders kunnen samenwerken om de meertalige ontwikkeling in alle talen van het kind te stimuleren. De betrokkenheid van pedagogisch professionals tijdens het vrij spel hing in ons onderzoek samen met het aantal interacties tussen kinderen. Pedagogisch professionals dienen als rolmodel: kinderen kunnen van hen leren hoe ze met behulp van taal conflicten op kunnen lossen. Al met al suggereert ons onderzoek dat pedagogisch professionals een belangrijke rol spelen bij het creëren van een inclusieve omgeving waarin interactie en spel kunnen plaatsvinden en meertalige kinderen zich optimaal kunnen ontwikkelen.