



MASTER THESIS

## Exploring Linguistic Transfer in Bilingual Children through Repeated Digital Picture Book Reading

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**Abstract**

This study investigated the effect of repeatedly reading a digital picture book on the vocabulary development of Turkish-Dutch speaking children compared to only Dutch speaking children. The study aimed to explore the value of repeated reading in both languages and whether it enhances linguistic transfer, as well as whether the Home Literacy Environment (HLE) correlates with vocabulary knowledge and development. Forty-two children aged 4 and 5 years old, and their caregivers participated in this study. All children were read a digital story three times. A group of Turkish-Dutch children (n = 8) and a group of Dutch children (n = 25) heard the story in Dutch for all three readings, and another group of Turkish-Dutch children (n = 9) heard the story in Turkish the first reading and in Dutch the consecutive two times. The HLE was measured with a questionnaire filled out by their caregivers. Results indicated that all groups made similar progress over time, but there was no additional benefit to reading the story once in Turkish. In fact, the Turkish-Dutch children had higher pre-test scores in Dutch than in Turkish vocabulary. A rich HLE with more books and games and performing more literacy activities was associated with higher vocabulary knowledge in the pre-test, resulting in a higher post-test. Furthermore, having more books and games at home was also associated with higher vocabulary development. The study highlights the importance of creating a rich HLE and promoting repeated readings for enhancing children's vocabulary development.

*Keywords:* digital picture books, home literacy environment, Turkish-Dutch bilinguals, vocabulary development, linguistic transfer

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### Introduction

It is not uncommon for children to be raised with multiple languages. For example, in the Netherlands, 8,2% of the citizens speak another language at home. Common first languages are Turkish, English, Moroccan, Chinese and Polish (Schmeets & Cornips, 2021). Of the total population of people with a migration background in the Netherlands, the Turkish-Dutch group form the largest (CBS, 2022). However, Turkish-Dutch children from the Netherlands have a smaller vocabulary in both languages (Leseman, 2000; Scheele et al., 2009), and they score below monolingual children in several linguistic abilities (Schaars et al., 2019).

To ensure that this group has a proper development of their second language (L2), a language learned after the native first language, it could be very beneficial to have a strong proficiency in the first language (L1), which is acquired naturally during early childhood (Verhoeven, 2007). The linguistic resources of the first language are being used while learning a second language (Cummins, 1996 as cited in Leafstedt & Greber 2005). This is called linguistic transfer. According to Verhoeven (2007), linguistic transfer may occur when a learner has already acquired a complex linguistic map from a previously acquired language, which then could support the acquisition of a new language. For example, research conducted by Lugo-Neris et al. (2010) has shown that linguistic transfer through storybook reading could result in growth in the child's expressive knowledge of the L2 vocabulary. Another study by Naqvi et al. (2012) showed that dual-language books can help the development of bilingual children with their linguistic abilities.

Storybook reading has many other benefits, it is a crucial activity to develop the vocabulary of children (Logan et al., 2019). With this activity, the child and parent are both focused on the text and exploring the illustrations. Storybook reading to children in kindergarten plays a significant role in their language and literacy development, helping them to understand the structure and functions of oral and written language, which in turn aids their learning (Segers et al, 2004). It is not necessary to read stories from paper books, this can also be done by using digital picture books. Digital picture books feature narratives and interactive elements such as music, animation, video content, audio narration and sound effects (Sargeant, 2015). These added media elements could make the reading experience more engaging and enjoyable for children, which can also motivate them to read on their own. Moreover, children benefit from the visual and auditory enhancements of digital picture books, resulting in a deeper understanding of the story compared to books with static images (Sun et al., 2022). A number of digital picture book apps make it possible to listen to the story in another language (Fundels, 2017; Bereslim, n.d.). According to Naqvi et al. (2012) reading the same story in another language may help the linguistic transfer to occur.

Storybook reading is an activity that is also performed in the homes of children. In the home environment, children are exposed to and gain knowledge of the functions of written language (Van

Steensel, 2006). This is called the home literacy environment (HLE). The HLE is an important factor for the vocabulary and listening comprehension of children in kindergarten and at the beginning of primary school (Niklas & Schneider, 2013). Furthermore, the HLE has a significant influence on the development of academic achievement of children. It is therefore important to foster the HLE, which can be more important in a bilingual household, where children have the opportunity to develop proficiency in two languages. One way to achieve this is by encouraging parents to engage in literacy activities such as reading books, playing language games, and practising with their child in the L1, similar to what schools and teachers are doing in the L2. By doing so, parents could help their children build their language skills in both languages.

Despite of the existing body of research on the effects of reading digital picture books in multiple languages and linguistic transfer, research investigating the difference between monolingual children and bilingual children reading a digital picture book multiple times without vocabulary instructions has not been conducted before. The literature raises the question of whether it is beneficial for bilingual children to read a digital picture book in both of their languages. To advance current theory, the current study aimed to examine (1) whether the use of digital picture books in two languages can help the language development of bilingual children and (2) to explore the differences in learning gain between bilingual and monolingual children.

### **Theoretical Framework**

#### **Home Literacy Environment of Bilingual Children**

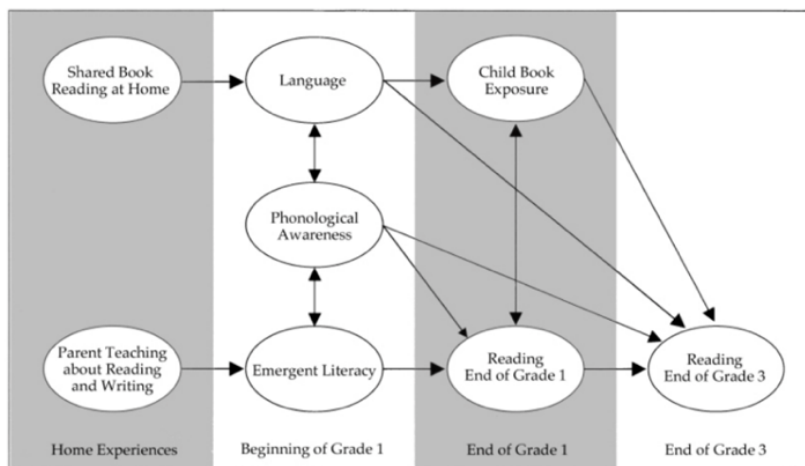
Being exposed to and gaining knowledge of the functions of written language begins long before the first day in school (Van Steensel, 2006). This happens through participating in and observing literacy activities in their homes, which is an important place to develop literacy (Nickse, 1990). This is called the home literacy environment (HLE). The HLE is created by parents by having books at home and performing literacy activities such as reading and writing together. Children who are read to a lot at home develop interest and skill in literacy and various aspects of oral and written language (Teale, 1981). The reading performance of children is correlated with early home literacy activities, the attitudes of parents towards reading and the number of books that are at home (Park, 2008).

Sénéchal and LeFevre (1998) found that there are two kinds of experiences involving prints that are presented at home: formal and informal literacy activities. The main difference between these activities is that informal literacy activities focus on the message that the print contains and on parent-child interaction, such as storybook reading (Sénéchal & LeFevre, 1998; Sénéchal & LeFevre, 2002). These activities stimulate the development of receptive language (Sénéchal & LeFevre, 2002). On the other hand, formal literacy activities focus on the print itself, where parents teach their children about

reading and writing, such as identifying letters and words in a storybook (Sénéchal & LeFevre, 1998). These activities promote the development of emergent literacy (Sénéchal & LeFevre, 2002). Sénéchal and LeFevre (2002) illustrated the relationship between experiences in the HLE and the development of receptive language and emergent literacy in a model (Figure 1). This model represents how informal and formal literacy experiences play distinct roles in children’s literacy development (Sénéchal & LeFevre, 2014). It indicates that reading storybooks are linked to the development of children’s receptive language skills, while active teaching of reading and writing by parents is associated with early literacy abilities (Sénéchal & LeFevre, 2002).

**Figure 1**

*The Home Literacy Model*



*Note.* From “Parental involvement in the development of children’s reading skill: A five-year longitudinal study” by M. Sénéchal, and J. A. LeFevre, 2002, *Child Development*, 73(2), p. 456 (<https://doi.org/10.1111/1467-8624.00417>). Copyright 2002 by The Society for Research in Child Development.

Research suggests that a well-established HLE could predict school success and early literacy proficiency (Teale, 1981; Puglisi et al., 2017; Carroll et al., 2018). It is therefore important to consider how the implementation of an HLE in a bilingual household could go along with challenges and advantages for enhancing children’s literacy abilities. However, families of bilingual households often have a less favorable HLE, with more time spent on watching TV and less time spent on storybook reading (Niklas & Schneider, 2013). As the HLE provided by the families plays a crucial role in children’s early competencies, these children may start kindergarten with a linguistic disadvantage. Nevertheless, some studies suggest that children who do have a rich HLE and a strong vocabulary in their L1 may improve their literacy skills in their L2 (Van den Bosch et al., 2020). Notably, bilingual children with high vocabulary in both languages tend to catch up with their monolingual peers in

vocabulary by the third grade, while those with a high L2 vocabulary but a low L1 vocabulary do not. In addition, Yeomans-Maldonado and Mesa (2021) found that bilingual children who visit the library more frequently and are having more reading activities have better language variability and vocabulary.

### **Traditional and Digital Storybook Reading at Home and School**

As previously mentioned, a crucial activity in the HLE to develop the vocabulary of children is through shared storybook reading (Logan et al., 2019). During storybook reading, both the child and parent are focused on the text and exploring the illustrations, providing a context for joint engagement and vocabulary development. Children who are read to aloud every day at home are exposed to 75,000 more words than those who are not. A study by Robbins and Ehri (1994) conducted at several kindergartens showed that children aged five and six can acquire new vocabulary from listening to stories. Their study found that children who have a larger vocabulary learned more new words than those who have a smaller vocabulary. Elley (1989) showed in his study that children learn between 15% and 20% of the words introduced after three readings within one week in the classroom. Children learned three words that they did not know before, without any explanation from the readers. Another study by Brett et al. (1996) showed almost the same results. In their study, the children who heard the story with explanations of words learned an average of three new words per book. These studies were all conducted at school or kindergarten. The quality and quantity of shared storybook reading may affect the words that children learn. It is important to consider the number of new words that are introduced and how often they are heard clearly (Flack et al., 2018).

In terms of quantity, research shows that parents may not read to their child often due to various barriers, such as time-related pressure, difficulties/discomfort with reading (because of the language or low literacy) and lack of awareness of reading benefits (Justice et al., 2015). However, digital picture books could help to overcome these barriers. As Sargeant (2015) and Serafini et al. (2016) explain, digital picture books are accessible on multiple devices, making them more convenient than paper books. They are essentially scanned copies of the original picture books, maintaining the same layout and presenting a fusion of visual, audio, written text, and interaction. This makes it easier for parents to read to their children at any time, in any location. Moreover, quality is also crucial when it comes to storybook reading. The quality of storybook reading involves the reading style and the use of dialogic techniques, such as providing definitions, asking questions, and pointing (Flack et al., 2018). A study by Nevo and Vaknin-Nusbaum (2018) found that children who had more interaction during storybook reading sessions made more progress in vocabulary than those who had no interaction. Digital picture books could foster both quantity and quality of storybook reading by offering additional

content that is not available in printed text, such as interactional features and navigational options (Sun et al, 2022). Moreover, they can incorporate animated digital content that can expand upon the central theme of the book and engage users in a more immersive manner (Sargeant, 2015). The features of the digital picture book could help the child to process the story by guiding their visual attention through the illustrations, allowing them to understand the storyline more deeply than a paper picture book, without the help of a parent (Sun et al., 2022).

Digital picture books could be used as a tool for children who speak another language at home to become more familiar with their second language outside of school (Wabbes & Willems, 2010). A study by Verhallen and Bus (2010) found that animated digital books enhance the development of expressive vocabulary in bilingual children more effectively than static illustrations. The children from this study lived in the Netherlands and came from families that spoke Turkish or Moroccan-Arabic or Berber at home. They learned an average of six new words with the digital book and four with the paper book. The digital book endorsed learning new vocabulary both expressively and receptively. Both conditions resulted in learning new vocabulary, but there was more gain in knowledge about words with the digital book. It is more difficult for immigrant children from low-income families to understand picture books. This group could therefore benefit more from the support, such as sound, music, navigation, and animation, of a digital picture book to learn new vocabulary.

### **Bilingual Vocabulary and Linguistic Transfer**

Several studies have shown that children who grow up with a different language at home than at school, start kindergarten with a disadvantage in their vocabulary (Bialystok et al., 2010; Janssen et al, 2019; Verhoeven & Vermeer, 2006). For example, Turkish-Dutch children entering kindergarten have been found to have lower Dutch vocabulary compared to their only Dutch speaking peers. They score below first-language learners on active vocabulary knowledge, which may affect their academic performance (Schaars et al., 2019; Droop & Verhoeven, 2003).

Despite the disadvantage that these children may face when starting kindergarten, researchers have identified a way for them to acquire vocabulary and catch up with their peers and succeed in kindergarten. This is called incidental learning which occurs when the learner guesses the meaning of the unknown word using the surrounding words that they already know through extensive reading (Huckin & Coady, 1999). The word that is being acquired is without the intention to commit the element to memory (Hulstijn, 2013). Incidental learning is contextualized, providing the learner with a richer understanding of the word's meaning and usage (Huckin & Coady, 1999). The presence of context has a positive effect on memorization (Mondria, 1997). Another form of incidental learning is through listening activities such as watching videos (Tang, 2020). It was found that learners improved



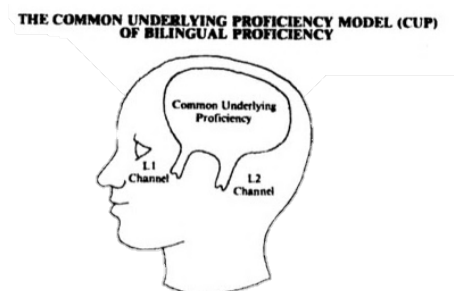
their vocabulary knowledge through this way of learning (Van Zeeland & Schmitt, 2013). Moreover, a study by Brown et al. (2008) showed that more words were learned through a reading-while-listening mode than only reading or only listening mode. In addition to incidental vocabulary acquisition, another effective way for bilingual children to acquire vocabulary at home is through simultaneous or successive methods (Kim et al., 2016). In simultaneous acquisition, children are exposed to both L1 and L2 from birth, which can lead to balanced knowledge of both languages. On the other hand, in successive acquisition, children receive initial exposure only to their L1 and are introduced to their L2 at a later stage, such as when they start attending kindergarten. This approach may lead to a stronger proficiency in the language spoken more often by the child.

Another way to learn a second language vocabulary is through linguistic transfer. This is when language proficiencies that are developed in their first language are transferred across the second language as their second language also develops (Durgunoglu, 2002). According to Yang et al. (2017), linguistic transfer is the use of linguistic knowledge from one language to enhance learning in another language. The Common Underlying Proficiency (CUP) Model, introduced by Cummins (1981), explains linguistic transfer by suggesting that language-related aspects of bilinguals' proficiency in their first- and second language are considered common or interdependent. This means that the understanding of ideas and meaning attributed to words in L1 facilitates their later development in L2 (Tunkiel & Bus, 2022). The concepts that are learned in L1 are not relearned in L2 but linked to new lexical labels. The CUP model suggests that communicative proficiency that is already developed in L1 can be transferred to L2 and that the knowledge of L1 is used to enhance acquisition in L2 (Cummins, 1981). This can be seen in Figures 2 and 3. Figure 2 shows that exposure to either language can help the development of the proficiency underlying both languages, provided that there is enough motivation and exposure to the languages both in school and the wider environment. In Figure 3 the underlying proficiency is presented through a 'dual iceberg'. This shows that common language skills underlie the distinctly different expressions of each language. For example, if a bilingual child knows the meaning of "carrot" in their first language, they will need less exposure to the term in their second language to understand its meaning than a child who is not familiar with the concept (Cummins, 1983).

Additionally, Jiang (2002) describes transfer in language as the mapping of lexical form to meaning. This mapping is developed through the process of vocabulary acquisition in the L2, either by connecting the new meaning to an existing semantic in the L1 or by learning the meaning directly. When acquiring vocabulary in an L1, the child must understand and acquire the meaning of each word (Jiang, 2000). In contrast, when learning an L2, the child only needs to remember the word. Words learned in the L1 are acquired as both semantic and formal units, whereas L2 words are mainly learned as only formal units because the meaning is already provided.

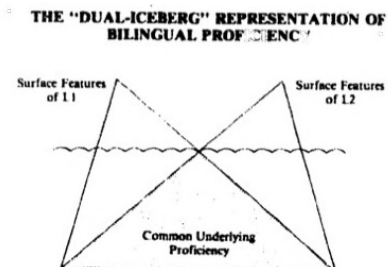
**Figure 2**

*The Common Underlying Proficiency Model*



**Figure 3**

*The 'Dual Iceberg' Representation of Bilingual Proficiency*



*Note.* From “The role of primary language development in promoting educational success for language minority students” by J. Cummins, 1981, *Evaluation, Dissemination and Assessment Center*. (<https://doi.org/10.13140/2.1.1334.9449>). Copyright 1981 by Office of Bilingual Bicultural Education

Several studies have shown that the linguistic knowledge that is acquired in the L1 could encourage the learning of their L2 through storybook reading in both languages. Children with strong proficiency in one language are more responsive to storybook reading in two languages and show comparable or greater growth in their expressive knowledge of vocabulary (Lugo-Neris et al., 2010). This can be explained by the benefits of comprehensible input, as demonstrated in Lugo-Neris et al.’s (2010) study of Latino-American children aged four to six. The children in this study showed slight improvements in their explanations of the targeted words when provided with vocabulary instructions in a comprehensible way. Two books were read to with only English vocabulary instructions and two with supplemental Spanish vocabulary instructions. For each targeted word, a different semantic feature of its meaning was given. This study showed a positive transfer of knowledge between L1 and L2 word learning, as words already known in L1 were linked to new lexical labels. Additionally, the vocabulary expansions showed a slight advantage of transfer between the child’s L1 and L2. Another study by Naqvi et al. (2012) demonstrated that dual-language books are a useful tool for developing foundational literacy skills in kindergarten who speak English, Punjabi, or Urdu. They conducted a dual-language book reading program. Each week a different story was read to in the classroom. The treatment group were read to in English and the second language (Punjabi, or Urdu). The comparison group were only read to in English. It was found in this study that the children of the treatment group made significantly more gains in their language skills than their peers who were read to in English only.

## The Present Study

### Aim of This Study

As previously described, children with a strong proficiency in one language show greater responsiveness to storybook reading in two languages. This is because they can link new lexical labels to the words that they already know. This linguistic transfer could occur during storybook reading. In addition, the HLE is an important factor to consider, as it may play a role in vocabulary acquisition. However, from the literature so far, it is by no means clear to what extent bilingual-speaking children benefit from reading a digital picture book in their two languages, compared to monolingual children who only read a digital picture book in one language. Previous research looked at the effects of reading a (digital) book in two languages or reading it in the second language with explanations in the first language. therefore, in the current thesis, I ask the following research questions:

*RQ1: To what extent does reading a digital picture book three times in two languages benefit the number of words that Turkish-Dutch speaking children (4 - 5 years) learn, compared to only Dutch speaking and Turkish-Dutch speaking children (4 - 5 years) who read the digital picture book in one language?*

Bilingual children, who speak both Turkish and Dutch, may start with a smaller vocabulary than Dutch-only speaking children but can be expected to learn more words after reading the story once in Turkish, followed by two times in Dutch. This is because they can use their linguistic knowledge of the Turkish language and enhance this in learning the Dutch language (Yang et al., 2017). It is important to take into consideration that this may only occur when the Turkish language of children has a strong proficiency, which could help them to show greater responsiveness to storybook reading in two languages (Lugo-Neris et al., 2010).

To answer these research questions this study made a comparison to determine if bilingual children learned more new words than monolingual children. The digital storybook was read three times in Dutch over one week, one group read the book one time in Turkish and two times in Dutch. After the intervention, the study analyzed the progress, that the children have made. This was done by using a pre-and post- vocabulary test.

*RQ2: To what extent does the home literacy environment of the children have an impact on the number of words that the children learn after reading the digital picture book three times?*

It could be expected that children with a richer HLE learn more new words than children with a poor HLE. The HLE may be seen as a good predictor for children's early literacy proficiencies (Teale, 1981; Puglisi et al., 2017; Carroll et al., 2018). The home literacy environment was measured by using a questionnaire which was filled in by the parents/caregivers of the participating children.

### **Scientific & Practical Relevance**

Previous studies have analyzed the effects of reading digital picture books in multiple languages or with vocabulary instructions in the first language (Leeuwestein, 2021; Lugo-Neris et al., 2010; Tunkiel & Bus, 2022), but did not compare the bilingual groups with monolingual peers. Furthermore, the current study contributes to the existing body of research by providing information on the impact of reading storybooks in two languages on bilingual children and their language development. Additionally, the study compares Dutch-only speaking children to Turkish-Dutch speaking children, providing insight into whether bilingualism could lead to greater vocabulary acquisition.

The study had practical implications for teachers and parents of bilingual children. The findings could inform teachers about the use of digital picture books as a tool to promote language development in bilingual children. Specifically, the study provides insight into the benefits of reading digital picture books in two languages, which could be used in the classroom to support the language learning of bilingual children. Additionally, the study highlights the importance of promoting the use of digital picture books and stories in the first language among parents, which could have a positive impact on their children's language development.

## **Method**

### **Research Design and Participants**

This study follows an experimental quantitative study design. Data was collected through a questionnaire for the primary caregiver, repeated reading intervention, and a pre-and post-test with the children. Quota sampling was used to recruit participants. In total, 60 schools and 150 children were recruited to participate in this study. However, six caregivers reported that they did not want to participate, and 102 caregivers did not respond. As a result, only 42 questionnaires were filled out and handed in to the researcher.

In total, 17 Turkish-Dutch children and 25 Dutch children and their primary caregivers participated. All children were in the first and second grades of kindergarten in the school year of 2022/2023. The sample consisted of 19 girls and 23 boys from five different schools in Almelo, Hengelo, Enschede and Deventer. The average age of the participating children was 4;11 (i.e., 4 years; 11 months;  $SD = 6.76$  months). The participants who identified as the primary caregiver were four fathers and 38 mothers. The average age of the primary caregiver was 35.92 years ( $SD = 4.49$ ). 25 caregivers had a higher educational level, and 17 caregivers had a lower educational level.

The participants were chosen based on the languages that they speak and were divided into three groups of 25 Dutch children (control group), nine Turkish-Dutch children (experimental group)

and eight also Turkish-Dutch children (control group). Out of these groups, there were two control groups (one only Dutch speaking and one Turkish-Dutch speaking) and one experimental group (Turkish-Dutch speaking). The Turkish-Dutch control group was used to compare with the experimental group. Moreover, the children from these groups were assigned to either the control group or the experimental group through an alternating selection process between Turkish children. The control groups read the digital picture book three times in Dutch and the experimental group read it in Turkish the first time and in Dutch the second and third times. The book was read over a period of one week.

### Instruments

The instruments that were used for this study are a repeated reading intervention, questionnaires for the caregivers and pre-and post-test for the children.

**Repeated reading intervention.** During the repeated reading sessions, children were exposed to a digital picture book called '*Klein Konijn en de Wonderwortel*' (Little Rabbit and the Miracle Carrot), from the app '*Fundels*'. The book is intended for children aged three years and older. The story was presented as a 4-minute and 17-second video on a 10.6/10-inch tablet and did not show pages or text. Instead, the app provided the audio in either Dutch or Turkish, with the pictures moving in sync with sound effects and music. During the sessions, the children were instructed to simply press play and watch the video, without any interaction during the story. However, they had the option to pause the video if they wanted to.

**HLE questionnaire.** The caregivers were asked to complete a questionnaire. This was to gather information about the home literacy environment of the children participating. The questionnaire was adapted from Segers and Kleemans (2020). The main adaptation from the questionnaire was the availability of literacy materials (five questions) and their literacy activities (11 questions) at home. The remaining questionnaire consisted of two parts (analog and math activities) which were not used in this study.

In part one of the questionnaire, questions were asked about the caregiver's age, educational level (to understand the indication of their socio-economic status), the language spoken at home and to what extent the Dutch language is spoken at home. The last question could be answered with a 4-point Likert scale ranging from "(hardly) ever (1)" to "daily (4)".

Part two of the questionnaire were questions about the availability of the materials and subscriptions at home. Such as the number of subscriptions to newspapers and magazines, the number of boardgames, the number of books at home and the number of visits to the library. A factor analysis on the availability of materials and subscriptions at home revealed two factors, with an explained variance of 71.56%. The two factors were found to be distinguished by books and games at home and

subscriptions at home. Using this information, two new variables were created by summing up the number of books and games at home (range 0 – 6 ) and the number of subscriptions at home (range 0 – 4).

The last part of the questionnaire were questions about literacy activities at home. The frequency of the following activities was asked: reading to the child, stimulating the child to read, stimulating the child to write, playing language and word games with the child, and listening/singing songs, poems, and rhymes with the child. Furthermore, the frequency of the activities that the child does individually was also asked. These were: looking into (picture) books, letter naming, playing language and word games and listening/singing songs, poems, and rhymes. These nine questions could be answered with a 5-point scale that ranged from “hardly ever (1)” to “several times a day (5)”. It was also asked in which language these activities are conducted. The factor analysis on the questions related to activities revealed only one factor with an explained variance of 46.09%. Therefore, the questions about the literacy activities were summed up as one variable (range 2 – 33).

**Vocabulary pre-test and post-test.** To indicate the vocabulary knowledge before and after the reading activity, a vocabulary pre- and post-test was developed. Two versions of the test were created, differing only in language (Dutch or Turkish), and were designed to measure the target words in both Dutch and Turkish. The vocabulary test was developed using the book "Streeflijst Woordenschat voor Zesjarigen" (Schaerlaekens et al., 1999), which provides a list of passive vocabulary that six-year-old Dutch-speaking children should know. Words that appear in the story were selected and checked against this book. As a result, a careful selection of words was made, so that not only words that few children should know, or words that all children should know, were tested. The pre- and post-test measured 12 target words such as “*pompoen*” (pumpkin), “*zaadjes*” (seeds), and “*tuin*” (garden). Both tests contained 12 pictures of the words, which the participants had to name. With each picture, the researcher asked the child if he or she could name the picture. The experimental Turkish-Dutch group completed the tests also in Turkish. No indication was given when a word was wrongly named or not known. Words that mean the same as the word that was tested were counted as correct. Participants were given one point for each correct answer and zero points for incorrect answers. The total score for each participant was calculated on a range of zero to 12, with 12 being the highest possible score. The validity of the vocabulary pre- and post-test was evaluated using Cronbach’s alpha. The calculated alpha value was 0.54 for the Dutch pretest, 0.34 for the Turkish pretest, 0.62 for the Dutch post-test and 0.75 for the Turkish post-test. The low alpha value for the pre-tests indicates that the items in the test may not be highly correlated with each other and may therefore not provide a reliable measure of the participants’ vocabulary knowledge. Despite the low alpha value, the vocabulary pretest was used in this study as it was deemed to be the most appropriate instrument for the research question

being studied. The results obtained from the vocabulary pretest were considered with caution and interpreted in light of the low alpha value.

### **Procedure**

Before data was gathered, the Ethical committee of the University of Twente was asked for permission to conduct this research, the permission was granted in July 2022 (nr. 221047). The study was conducted at five primary schools located in Almelo, Enschede, and Deventer and at six homes of Turkish-Dutch children. Each participant received an envelope containing the consent form and the questionnaire for their caregivers, either from their teacher or the researcher. The consent form provided information about the research and guaranteed the anonymity of participants (completely anonymous). Primary caregivers were asked to fill out the HLE questionnaire which was then returned to the schools or researcher.

The intervention was conducted either during school hours in a room outside the classroom with groups of up to four children or after school hours at the homes of the children. The children read the story individually on a tablet with headphones, while the researcher was physically present to assist with any difficulties or questions but did not interact during the reading. Three reading sessions were planned over one week, with the experimental (Turkish-Dutch) group reading the digital picture book first in Turkish, followed by two readings in Dutch. The control groups only read the story in Dutch.

Additionally, a pre-vocabulary test was conducted before the first reading session was executed. After the third and last reading session, the post-vocabulary test was conducted to see how many words the participants have learned from the digital picture book. The pre-and post-test was conducted by the researcher and with one child at a time.

### **Data Analysis**

Data were analyzed with IBM SPSS Statistics 27. Prior to conducting any analyses, the variables were checked for outliers to ensure the validity of the data. Additionally, a skewness and kurtosis test ( $-1.5 < \text{skewness and/or kurtosis} > 1.5$ ) indicated a normal distribution for the vocabulary tests. One question of the HLE questionnaire did not have a normal division and was removed because of this [extension to which Dutch is spoken at home].

To analyze the second research question, first, a factor analysis was conducted to explore the relationships among the items and identify underlying factors. A principal component analysis with oblimin rotation and Kaiser normalization was conducted for two sets of variables: literacy activities at home and materials at home. In contrast to the existing literature of Sénéchal & LeFevre (2014), only

one factor was identified for literacy activities, instead of two factors (informal and formal literacy). The scree plot showed a point of inflection at two components, which could be used as a cut-off for the remaining factors (Field, 2018). This indicated one factor with an explained variance of 46.09% of the total variance. Therefore, all nine questions about literacy activities were summed up as one variable.

For literacy materials at home, a two-factor solution was identified, which together explained 71.56% of the total variance. Factor loadings showed that items related to books and games loaded highly on Factor 1 ( $> 0.7$ ), while items related to subscriptions (e.g., magazine subscriptions, paper subscriptions) loaded highly on Factor 2 ( $> 0.8$ ) (see Table 1). With this information, items that were related to subscriptions were summed up as one variable and items that were related to books and games were summed up as one variable.

**Table 1**

*Structure matrix of the principal component analysis on the HLE questionnaire (materials)*

Questions	Component	
	Books and games	Subscriptions
Materials: How many subscriptions on paper are there at home		0.839
Materials: How many subscriptions on magazines are there at home		0.782
Materials: How many books are there at home	0.846	
Materials: How many boardgames are there at home	0.874	

## Results

### Descriptive Statistics

Before analyzing the words that are learned after the intervention (pre-test versus post-test scores), the test scores of the different pre- and post-test scores of Turkish-Dutch and Dutch children were evaluated. Descriptive statistics were first computed to provide an overview of the participants' pre- and post-test scores. Table 2 shows the means and standard deviations for the vocabulary pre- and post-tests, separately for Turkish-Dutch (experimental and control group) and Dutch children.



**Table 2***Descriptive statistics pre- and post-test*

	Dutch				Turkish			
	Pre-test		Post-test		Pre-Test		Post-test	
	M	SD	M	SD	M	SD	M	SD
Dutch (n =25)	6.00	1.32	7.36	1.63				
Turkish-Dutch (n = 8) Dutch only story	4.38	1.99	5.50	2.27				
Turkish-Dutch (n = 9) Turkish, Dutch, Dutch story	4.11	2.03	5.00	1.80	1.56	1.33	2.22	2.22
Total	5.29	1.81	6.50	2.05	1.56	1.33	2.22	2.22

*Note.* The Turkish-Dutch groups were divided in one control (n = 8) and one experimental group (n = 9).

Furthermore, a factor analysis was conducted to identify the components of HLE. Based on the results of this analysis, three new variables were computed (activities, subscriptions and books and games). To provide an overview of these variables means standard deviations, and ranges were calculated and are presented in Table 3.

**Table 3***Descriptive statistics HLE*

	<i>n</i>	<i>M</i>	<i>SD</i>	Min	Max
Subscriptions	42	1.02	1.28	0	4
Books and games	41	3.49	1.53	0	6
Activities	39	19.79	6.61	2	33

### **Effect of Reading Digital Picture Books in Two Languages on Vocabulary**

The first research question aimed to investigate the effect of reading a digital picture book multiple times in two languages on the vocabulary acquisition of Turkish-Dutch children compared to Dutch speaking and Turkish-Dutch speaking children who read the same book in only one language. Due to the low number of participants, we decided to conduct three separate analyses instead of one full analysis. As there is not enough power to run a GLM repeated measure with three conditions (groups) and two measurements (pre- and post-test.)

We first studied the Turkish-Dutch groups. The first analysis examined if there was a difference between the experimental group of Turkish-Dutch children and the control group of Turkish-Dutch children. The GLM repeated measure was carried out using time (pre- and post-Dutch vocabulary test)

as within-subject factor and condition (experimental and control group) as between-subject factor. The results showed a significant main effect of time ( $F(1,15) = 21.90, p < 0.001, \eta^2_p = .59$ ) and no main effect of condition ( $F(1) = 0.16, p = .696, \eta^2_p = .01$ ). This implies that both groups made progress in the Dutch words that they learned after the repeated readings and there were no differences between groups. There was no significant interaction between time and condition ( $F(1,15) = 0.30, p = .594, \eta^2_p = .02$ ), indicating that the children did not learn more in one condition (reading one time in Turkish and two times and Dutch) than the other condition (reading three times only in Dutch).

The second analysis focused on investigating whether there is a difference between the Dutch vocabulary or Turkish vocabulary of the experimental group. The GLM repeated measure was carried out using time and language as within-subject factors and did not use a between-subject factor. The analysis showed a significant effect of time ( $F(1,08) = 6.64, p = .033, \eta^2_p = .454$ ), indicating that the children's vocabulary improved in both languages. Furthermore, a significant effect of language was observed ( $F(1,08) = 12.19, p = .008, \eta^2_p = .604$ ), indicating that their vocabulary was higher in one language than the other. Specifically, the children scored higher on the Dutch words that were tested than the Turkish words. No significant interaction between time and language was found ( $F(1,80) = .229, p = .645, \eta^2_p = .028$ ), indicating that the children's rate of growth in vocabulary did not differ between languages.

The first analyses investigated the impact of reading a book in both Turkish and Dutch or only in Dutch on vocabulary acquisition of Turkish-Dutch children. As no effect was found in relation to vocabulary acquisition, this aspect was disregarded in the subsequent analysis. The following analysis focused rather on investigating the impact of repeated reading on vocabulary acquisition for all groups, and any differences observed between Dutch and Turkish-Dutch children from both groups. Therefore, the condition was not included. The GLM repeated measure was carried out using time (pre- and post-Dutch vocabulary test) as within-subject factor and L1 and L2 (Turkish and Dutch group) as between-subject factor. This analysis showed a significant main effect of time ( $F(1,40) = 56.70, p < 0.001, \eta^2_p = .59$ ), indicating that both language groups demonstrated progress in the words that they have learned after the repeated readings. The analysis revealed a significant between-subjects effect of language, indicating that on average, Dutch children had a higher vocabulary score than Turkish-Dutch children ( $F(1) = 14.58, p < 0.001, \eta^2_p = .27$ ). There was no significant interaction between time and language groups ( $F(1,40) = 1.32, p = .258, \eta^2_p = .032$ ), suggesting that the rate of vocabulary acquisition did not differ between the Dutch and Turkish-Dutch children.

**Effect of Home Literacy Environment on Vocabulary**

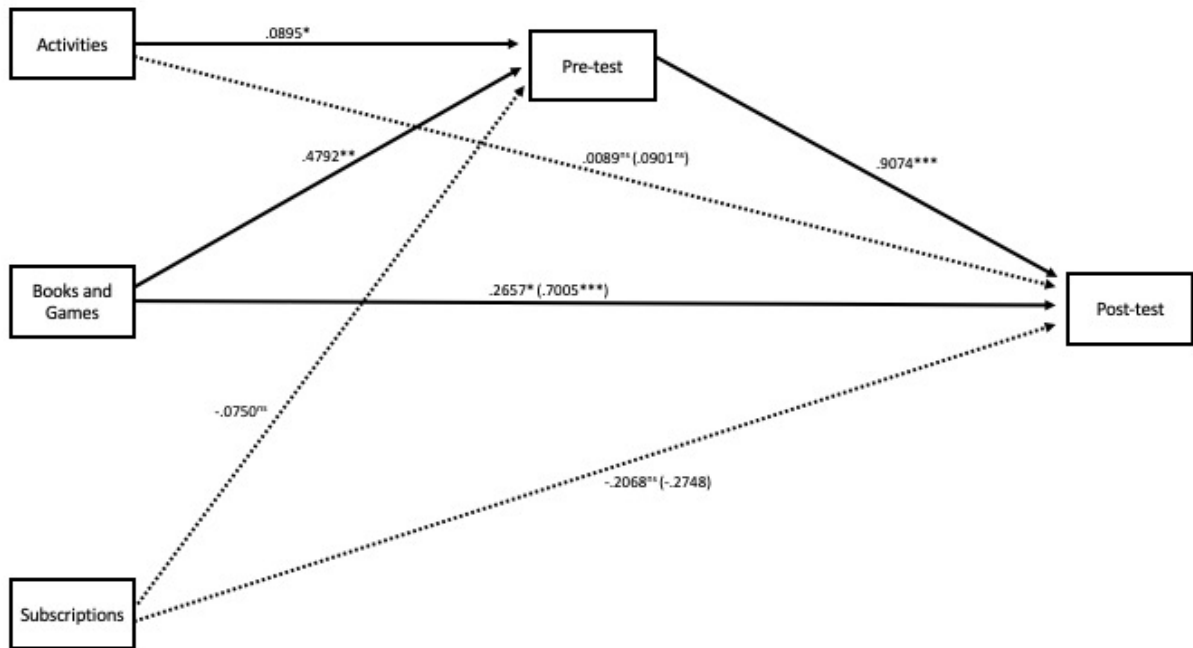
The second research question of this study aimed to investigate the impact of the HLE on the number of words learned by children after the intervention. To answer this question a mediation analysis was conducted using the PROCESS add-on in SPSS (Hayes, 2013), in which all relevant variables were combined. The independent variables in our analysis were the three HLE factors, namely Activity, Subscriptions, and Books and Games, while the pre-test was our mediator, and the post-test was the dependent variable. As we had three independent variables, we ran the model three times, each time with the other two independent variables as covariables to estimate the effects accurately. Bootstrapping was set to 5000 cycles to estimate the effects accurately.

The final model of this analysis, which includes standardized coefficients, is illustrated in Figure 7. The model's total  $R^2$  was .80 ( $p = < .001$ ) with a sample size of  $n = 38$ , demonstrating the HLE factors' impact on the pre- and post-test. The results showed a significant direct effect of Books and Games on post-test scores, with a total effect of .70 and a direct effect of .27. However, there was no significant direct effect of Subscriptions on post-test scores, with a total effect of -.27 and a direct effect of -.21. Similarly, Activities also had no direct effect on post-test scores, with a total effect of .09 and a direct effect of .01 (See Figure 7).

Further analysis revealed that books and games also had a significant total indirect effect on the post-test via the pre-test. The 95 % confidence interval for the indirect effect did not include zero ( $ab = .14$ ,  $CI = [.15 - .71]$ ), and the indirect effect size associated with this effect was .43. Similarly, the total indirect effect of activities on the post-test via the pre-test was also significant ( $ab = .030$ ,  $CI = [.03 - .15]$ ), with an indirect effect size of .08. However, the indirect effect of subscriptions on the pre-test was not significant ( $ab = .21$ ,  $CI = [-.57 - .27]$ ) and had an indirect effect size of -.07.

**Figure 7**

*Model for predicting HLE via pre-test and post-test*



*Note.* Standardized coefficients are reported. Between *brackets* are total effects and outside the brackets are the direct effects.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

### Discussion

The goal of this study was to examine whether bilingual children's language development could be improved by reading a digital picture book in two languages, compared to monolingual children, and if their home language environment (HLE) played a role in this. The study found that both monolingual and bilingual children showed similar progress over time, but there was no advantage to reading the story in another language. Additionally, the study found that having more books and games at home directly affected the children's vocabulary knowledge after the intervention and indirectly affected the vocabulary knowledge after the intervention via the vocabulary knowledge before the intervention. Performing literacy activities at home had no direct effect on vocabulary knowledge after the intervention, but it did indirectly affect the children's vocabulary knowledge after the intervention via the vocabulary knowledge before the intervention. Having more subscriptions at home did not have a direct or indirect effect.

### **Effect of Reading Digital Picture Books in Two Languages on Vocabulary**

Regarding the first research question it was expected that the Turkish-Dutch children would start the experiment with a smaller vocabulary than Dutch-only speaking children. Additionally, it was also expected that the Turkish-Dutch group would learn more words after reading the story once in Turkish, followed by twice in Dutch. However, the results showed that the Turkish-Dutch children had lower scores in Turkish than in Dutch, and their learning gains were similar to the Dutch group and did not benefit from a Turkish reading of the book. This finding is inconsistent with the research of Bus et al. (2022), who found that digital books in the first language could stimulate language development, although they also did not find a direct effect on language acquisition.

The fact that a Turkish reading of the book did not benefit the Turkish-Dutch children, is probably due to their relatively low Turkish knowledge of the words in the story. According to Lugo-Neris et al. (2010) children with lower proficiency in their L1, face a disadvantage when using linguistic transfer during L2 reading because they do not have a strong conceptual base in their L1. The Turkish-Dutch children from this study had a higher vocabulary knowledge in Dutch than in Turkish. This could be one explanation of why reading the story one time in Turkish and two times in Dutch did not have an added benefit.

The reason why the Turkish-Dutch children did not know many words in Turkish, may be that the tested words were school-related vocabulary. Research by Bialystok et al. (2010) concluded that there are differences in the vocabulary used at home and at school. The children in this study had a lower average score on the Turkish vocabulary test than on the Dutch vocabulary test. While the specific words that were tested may not be known in Turkish, the children may know more words in Turkish that are used more in their home environment. If these children had a greater knowledge of Turkish vocabulary, they would be better able to connect a new meaning with an existing semantic in their L1 (Jiang, 2002). It is important to emphasize that all groups showed comparable growth in their vocabulary over time. This again confirms that repeated reading from a digital picture book can be effective in promoting language development in young children (Brett et al., 1996; Elley, 1989).

### **Effect of Home Literacy Environment on Vocabulary**

In line with the second hypothesis, the results indicate that children with a richer HLE learn more new words than children with a poor HLE. The results showed that having more books and games at home improves vocabulary knowledge after the intervention via vocabulary knowledge before the intervention and directly improves vocabulary knowledge before and after the intervention.

The results indicate that having more books and games at home results in having a higher vocabulary and growth in vocabulary. This is in line with the research of Wößmann (2003), Park (2008)

and Johnson et al. (2008) who found a strong correlation between the number of books at home, the educational performance and expressive vocabulary of the students. Furthermore, a study of Bus et al. (2022) found that children who make more progress in their L1 vocabulary may also demonstrate greater interest in literacy activities, which could lead them to read more books. It could be possible that children who have a slight advantage in their language development read more books and, as a result, continue to develop their language skills, whereas those who read less may not develop as much. Additionally, McGinnity et al.'s (2017) research revealed that playing board games at home may indirectly enhance vocabulary through the promotion of social skills.

Moreover, the results also indicate that performing more literacy activities at home also improves vocabulary knowledge after the intervention via the vocabulary knowledge before the intervention. This is in line with the studies of Nagy et al. (1985) and Webb (2008), who found that a higher vocabulary may ensure more growth through contextual cues. In addition, several studies suggest that adult-child interaction during storybook reading in the first five years plays a significant role in vocabulary acquisition (Logan et al, 2019; Wasik et al., 2016). However, the results of this study also show that literacy activities do not directly improve vocabulary knowledge. According to Kim et al. (2015) performing more literacy activities at home is very beneficial for the development of the vocabulary of preschool children, and such activities are seen as a reliable predictor of vocabulary. The difference between this study and that of Kim et al. (2015) is that their study was followed over two years, whereas this study only followed the participants over one week. It could be possible that the children in this study did not develop that much in one week but could develop more if the intervention was more elaborate.

Lastly, the results of this study indicated that the number of subscriptions at home did not improve vocabulary development directly and also did not improve the vocabulary knowledge after the intervention via the vocabulary knowledge before the intervention. Other studies of Yeomans-Maldonado and Mesa (2021) and of Van Bergen et al. (2016) also found that subscriptions did not correlate with the literacy skills of children. However, the present study and other research only examined the availability of subscriptions and not the quality of the interaction with these literacy materials. Indication of the availability of literacy materials alone is not enough for a positive development of literacy skills (Sandberg, 1998).

### **Limitations and Future Research**

There are several limitations to consider when interpreting the results of this study. One important limitation is that the sample size that was used for this study was relatively small and limited to a specific group of bilingual children, namely Turkish-Dutch children. While the aim was to recruit

60 participants, only 42 participated in this study. It may be possible that these results are not representative of another group of bilingual children from different linguistic backgrounds. Generalization should therefore be done with caution.

Moreover, the pre-tests in both languages had a low calculated alpha value (0.54 for the Dutch pretest and 0.34 for the Turkish pretest), suggesting that the items in the pre-test were not highly correlated with each other. It should be noted that the test only measured specific vocabulary words that appeared in the story, rather than general vocabulary. It was therefore not expected that the test items would highly correlate, as it is possible that the participants were only familiar with some of the tested words and not necessarily with the others. Nevertheless, the post-test in both languages had a higher calculated alpha value (0.62 for the Dutch post-test and 0.75 for the Turkish post-test), suggesting that the items in the post-test were higher correlated with each other. This could mean that the children had become more familiar with the specific vocabulary words that were tested, resulting in a more consistent performance across the items.

Furthermore, the words that were tested were not typical everyday words and could have been less familiar to the Turkish-Dutch children in their L1, potentially affecting the study's results. To address this in future research, it could be beneficial to use a validated vocabulary test to assess the participants' true level of vocabulary, followed by a specific test, to evaluate the intervention's impact. It could also be useful to use two stories in future research, one that focuses on the home environment and another on the school environment. By testing more words that are commonly used at home, it is possible that Turkish-Dutch children may demonstrate greater knowledge of the Turkish vocabulary, which could result in more linguistic transfer. In addition, it could also be valuable to use an observation form to determine if the children were truly engaged and attentive during the story session, as this was not measured in the current study.

Finally, it should be noted that the second research question did not include the Turkish pre- and post-test in the analysis due to the finding that reading the story in Turkish first did not have an impact on their vocabulary knowledge. However, it is worth noting that Bus et al. (2022) found that children who make more progress in their L1 vocabulary may also demonstrate greater interest in literacy activities. Future research may want to consider including these tests as they could provide insight into the impact of the HLE on vocabulary acquisition for Turkish-Dutch speaking children, and how it interacts with L1 vocabulary knowledge.

### **Implications and Conclusion**

The findings of this study have important implications for both teachers and parents. For teachers, the results suggest that using a digital picture book for repeated readings is an effective

strategy for enhancing children's vocabulary acquisition. It could therefore be recommended to use more digital picture books in the classroom. For instance, teachers could introduce a story to the whole class, and then the children could read the book individually with the aid of a digital picture book.

For parents, the results suggest that engaging in more literacy activities at home and providing access to both paper and digital books and games could be beneficial for vocabulary acquisition. Therefore, it is recommended that parents prioritize engaging their children in literacy activities at home and provide access to a variety of paper and digital books and games to support the vocabulary development of their child. By implementing these strategies, teachers and parents could work together to help children build a strong foundation for language development.

In conclusion, this study has shown the impact of reading a digital picture book in two languages on vocabulary learning and the role of the HLE in this regard. The results showed that there was no added benefit of reading the story in two languages, but repeated readings via a digital picture book did promote vocabulary growth in both groups. Additionally, the study found that having more books and games at home and engaging in more literacy activities was strongly associated with higher vocabulary knowledge, resulting in the acquisition of more new words (Robbins & Ehri, 1994). Overall, these findings highlight the importance of repeated readings with digital picture books and the need to promote a rich HLE for vocabulary development.



## References

- Bereslim. (n.d.). *Digitale prentenboeken*. <https://www.bereslim.nl/digitale-prentenboeken/>
- Bialystok, E. (2010). Bilingualism. *WIREs Cognitive Science*, 1(4), 559–572.  
<https://doi.org/10.1002/wcs.43>
- Bialystok, E., Craik, F. I., Green, D. W., & Gollan, T. H. (2009). Bilingual minds. *Psychological Science in the Public Interest*, 10(3), 89–129. <https://doi.org/10.1177/1529100610387084>
- Bialystok, E., Luk, G., Peets, K. F., & Yang, S. (2010). Receptive vocabulary differences in monolingual and bilingual children. *Bilingualism: Language and Cognition*, 13(4), 525–531.  
<https://doi.org/10.1017/s1366728909990423>
- Brett, A., Rothlein, L., & Hurley, M. (1996). Vocabulary acquisition from listening to stories and explanations of target words. *The Elementary School Journal*, 96(4), 415–422.  
<https://doi.org/10.1086/461836>
- Brown, R., Waring, R., & Donkaewbua, S. (2008). Incidental vocabulary acquisition from reading, reading-while-listening, and listening to stories. *Reading in a Foreign Language*, 20(2), 136–163. <http://files.eric.ed.gov/fulltext/EJ815119.pdf>
- Bus, A., Broekhof, K., Vaessen, K., & Coenraads, C. (2022). *Meertalige digitale prentenboeken in het gezin - onderzoeksrapport*. Sardes. [https://sardes.nl/wp-content/uploads/2022/10/onderzoeksrapport\\_meertalige\\_digitale\\_prentenboeken\\_in\\_het\\_gezin-def.pdf](https://sardes.nl/wp-content/uploads/2022/10/onderzoeksrapport_meertalige_digitale_prentenboeken_in_het_gezin-def.pdf)
- Bus, A. G., van IJzendoorn, M. H., & Pellegrini, A. D. (1995). Joint book reading makes for success in learning to read: A meta-analysis on intergenerational transmission of literacy. *Review of Educational Research*, 65(1), 1–21. <https://doi.org/10.3102/00346543065001001>
- Carroll, J. M., Holliman, A. J., Weir, F., & Baroody, A. E. (2018). Literacy interest, home literacy environment and emergent literacy skills in preschoolers. *Journal of Research in Reading*, 42(1), 150–161. <https://doi.org/10.1111/1467-9817.12255>
- CBS. (2022, August 22). *Bevolking; kerncijfers*. CB StatLine.  
<https://opendata.cbs.nl/statline/#/CBS/nl/dataset/37296ned/table?ts=1669204044479>
- Cummins, J. (1981). The role of primary language development in promoting educational success for language minority students. *Evaluation, Dissemination and Assessment Center*.  
<https://doi.org/10.13140/2.1.1334.9449>
- Cummins, J. (1983). Bilingualism and special education: Program and pedagogical issues. *Learning Disability Quarterly*, 6(4), 373–386. <https://doi.org/10.2307/1510525>
- Droop, M., & Verhoeven, L. (2003). Language proficiency and reading ability in first- and second-language learners. *Reading Research Quarterly*, 38(1), 78–103.  
<https://doi.org/10.1598/rrq.38.1.4>

- Durgunoğlu, A. Y. (2002). Cross-linguistic transfer in literacy development and implications for language learners. *Annals of Dyslexia*, 52(1), 189–204. <https://doi.org/10.1007/s11881-002-0012-y>
- Elley, W. B. (1989). Vocabulary acquisition from listening to stories. *Reading Research Quarterly*, 24(2), 174–187. <https://doi.org/10.2307/747863>
- Field, A. (2018). *Discovering statistics using IBM SPSS statistics*. SAGE Publications Limited.
- Flack, Z. M., Field, A. P., & Horst, J. S. (2018). The effects of shared storybook reading on word learning: A meta-analysis. *Developmental Psychology*, 54(7), 1334–1346. <https://doi.org/10.1037/dev0000512>
- Fundels. (2017). *Fundels prentenboeken in de klas*. <https://www.fundels.com/nl-nl/prentenboeken/school/>
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis : A regression-based approach* (Ser. Methodology in the social sciences). Guilford Press.
- Huckin, T., & Coady, J. (1999). Incidental vocabulary acquisition in a second language. *Studies in Second Language Acquisition*, 21(2), 181–193. <https://doi.org/10.1017/S0272263199002028>
- Hulstijn, J. H. (2013). Incidental learning in second language acquisition. *The Encyclopedia of Applied Linguistics*. <https://doi.org/10.1002/9781405198431.wbeal0530>
- Janssen, C., Segers, E., McQueen, J. M., & Verhoeven, L. (2019). Comparing effects of instruction on word meaning and word form on early literacy abilities in kindergarten. *Early Education and Development*, 30(3), 375–399. <https://doi.org/10.1080/10409289.2018.1547563>
- Jiang, N. (2000). Lexical representation and development in a second language. *Applied Linguistics*, 21(1), 47–77. <https://doi.org/10.1093/applin/21.1.47>
- Jiang, N. (2002). Form-meaning mapping in vocabulary acquisition in a second language. *Studies in Second Language Acquisition*, 24(4), 617–637. <https://doi.org/10.1017/S0272263102004047>
- Johnson, A. D., Martin, A., Brooks-Gunn, J., & Petrill, S. A. (2008). Order in the house! Associations among household chaos, the home literacy environment, maternal reading ability, and children's early reading. *Merrill-Palmer Quarterly (Wayne State University. Press)*, 54(4), 445–472. <https://doi.org/10.1353/mpq.0.0009>
- Justice, L. M., Logan, J. R., & Damschroder, L. (2015). Designing caregiver-implemented shared-reading interventions to overcome implementation barriers. *Journal of Speech, Language, and Hearing Research*, 58(6), 1851–1863. [https://doi.org/10.1044/2015\\_jslhr-l-14-0344](https://doi.org/10.1044/2015_jslhr-l-14-0344)
- Kim, S., Im, H., & Kwon, K. (2015). The role of home literacy environment in toddlerhood in development of vocabulary and decoding skills. *Child & Youth Care Forum*, 44(6), 835–852. <https://doi.org/10.1007/s10566-015-9309-y>
- Kim, A. Y. A., Park, A., & Lust, B. (2016). Simultaneous vs. Successive bilingualism among preschool-

- aged children: A study of four-year-old Korean–English bilinguals in the USA. *International Journal of Bilingual Education and Bilingualism*, 21(2), 164–178. <https://doi.org/10.1080/13670050.2016.1145186>
- Leacox, L., & Jackson, C. W. (2012). Spanish vocabulary-bridging technology-enhanced instruction for young English language learners' word learning. *Journal of Early Childhood Literacy*, 14(2), 175–197. <https://doi.org/10.1177/1468798412458518>
- Leafstedt, J. M., & Gerber, M. M. (2005). Crossover of phonological processing skills. *Remedial and Special Education*, 26(4), 226–235. <https://doi.org/10.1177/07419325050260040501>
- Leeuwestein, H. (2021). *Tweetalige digitale prentenboeken voor Nederlands-Arabischtalige leerlingen*. [Poster presentation]. Talige Diversiteit in het Onderwijs, Groningen, The Netherlands. <https://pure.rug.nl/ws/portalfiles/portal/157624647/PosterCongres29012021.pdf>
- Leseman, P. P. M. (2000). Bilingual vocabulary development of Turkish preschoolers in the Netherlands. *Journal of Multilingual and Multicultural Development*, 21(2), 93–112. <https://doi.org/10.1080/01434630008666396>
- Logan, J. A. R., Justice, L. M., Yumus, M., & Chaparro-Moreno, L. J. (2019). When children are not read to at home: The million word gap. *Journal of Developmental & Behavioral Pediatrics*, 40(5), 383–386. <https://doi.org/10.1097/dbp.0000000000000657>
- Lugo-Neris, M. J., Jackson, C. W., & Goldstein, H. (2010). Facilitating vocabulary acquisition of young English language learners. *Language, Speech & Hearing Services in Schools*, 41(3), 314–327. [https://doi.org/10.1044/0161-1461\(2009/07-0082\)](https://doi.org/10.1044/0161-1461(2009/07-0082))
- McGinnity, F., McMullin, P., Murray, A., & Russell, H. (2017). Social inequality in cognitive outcomes in Ireland: What is the role of the home learning environment and childcare? *Childcare, Early Education and Social Inequality*, 109–130. <https://doi.org/10.4337/9781786432094.00015>
- Mondria, J. A. (1997). Woorden leren: Context, raden en onthouden. Hoe zit het nu écht? *Levende Talen Magazine*, 84(523), 476–480. [https://pure.rug.nl/ws/files/23000679/LT\\_1997\\_523.pdf](https://pure.rug.nl/ws/files/23000679/LT_1997_523.pdf)
- Nagy, W. E., Herman, P. M., & Anderson, R. A. (1985). Learning words from context. *Reading Research Quarterly*, 20(2), 233–253. <https://doi.org/10.2307/747758>
- Naqvi, R., Thorne, K. J., Pfitscher, C. M., Nordstokke, D. W., & McKeough, A. (2012). Reading dual language books: Improving early literacy skills in linguistically diverse classrooms. *Journal of Early Childhood Research*, 11(1), 3–15. <https://doi.org/10.1177/1476718X12449453>
- Nevo, E., & Vaknin-Nusbaum, V. (2018). Enhancing language and print-concept skills by using interactive storybook reading in kindergarten. *Journal of Early Childhood Literacy*, 18(4), 545–569. <https://doi.org/10.1177/1468798417694482>
- Nickse, R. S. (1990). Family and intergenerational literacy programs: An update of 'the noises of

- literacy'. ERIC, 342. <https://eric.ed.gov/?id=ED327736>
- Niklas, F., & Schneider, W. (2013). Home literacy environment and the beginning of reading and spelling. *Contemporary Educational Psychology*, 38(1), 40–50.  
<https://doi.org/10.1016/j.cedpsych.2012.10.001>
- Park, H. (2008). Home literacy environments and children's reading performance: A comparative study of 25 countries. *Educational Research and Evaluation*, 14(6), 489–505.  
<https://doi.org/10.1080/13803610802576734>
- Puglisi, M. L., Hulme, C., Hamilton, L. G., & Snowling, M. J. (2017). The home literacy environment is a correlate, but perhaps not a cause, of variations in children's language and literacy development. *Scientific Studies of Reading*, 21(6), 498–514.  
<https://doi.org/10.1080/10888438.2017.1346660>
- Robbins, C., & Ehri, L. C. (1994). Reading storybooks to kindergartners helps them learn new vocabulary words. *Journal of Educational Psychology*, 86(1), 54–64.  
<https://doi.org/10.1037/0022-0663.86.1.54>
- Sandberg, A. D. (1998). Reading and spelling among nonvocal children with cerebral palsy: Influence of home and school literacy environment. *Reading and Writing*, 10, 23–50. <https://doi.org/10.1023/A:1007958630788>
- Sargeant, B. (2015). What is an ebook? What is a book app? And why should we care? An analysis of contemporary digital picture books. *Children's Literature in Education*, 46(4), 454–466.  
<https://doi.org/10.1007/s10583-015-9243-5>
- Schaars, M. M., Segers, E., & Verhoeven, L. (2019). Cognitive and linguistic precursors of early first and second language reading development. *Learning and Individual Differences*, 72, 1–14.  
<https://doi.org/10.1016/j.lindif.2019.03.008>
- Schaerlaekens, A. M., Kohnstamm, G. A., & Lejaegere, M. (1999). *Streeflijst woordenschat voor zesjarigen* (3de editie). Swets & Zeitlinger.
- Scheele, A. F., Leseman, P. P. M., & Mayo, A. Y. (2009). The home language environment of monolingual and bilingual children and their language proficiency. *Applied Psycholinguistics*, 31(1), 117–140. <https://doi.org/10.1017/s0142716409990191>
- Schmeets, H., & Cornips, L. (2021). *Talen en dialecten in Nederland*. Centraal Bureau Voor De Statistiek. <https://www.cbs.nl/nl-nl/longread/statistische-trends/2021/talen-en-dialecten-in-nederland?onepage=true>
- Segers, E., Takke, L., & Verhoeven, L. (2004). Teacher-mediated versus computer-mediated storybook reading to children in native and multicultural kindergarten classrooms. *School Effectiveness and School Improvement*, 15(2), 215–226. <https://doi.org/10.1076/sesi.15.2.215.30430>
- Sénéchal, M., LeFevre, J., Thomas, E. W., & Daley, K. A. (1998). Differential effects of home literacy

- experiences on the development of oral and written language. *Reading Research Quarterly*, 33(1), 96–116. <https://doi.org/10.1598/rrq.33.1.5>
- Sénéchal, M., & LeFevre, J. A. (2002). Parental involvement in the development of children's reading skill: A Five-Year longitudinal study. *Child Development*, 73(2), 445–460. <https://doi.org/10.1111/1467-8624.00417>
- Sénéchal, M., & LeFevre, J. A. (2014). Continuity and change in the home literacy environment as predictors of growth in vocabulary and reading. *Child Development*, 85(4), 1552–1568. <https://doi.org/10.1111/cdev.12222>
- Serafini, F., Kachorsky, D., & Aguilera, E. (2016). Picture books in the digital age. *The Reading Teacher*, 69(5), 509–512. <https://doi.org/10.1002/trtr.1452>
- Sun, H., Roberts, A. C., & Bus, A. (2022). Bilingual children's visual attention while reading digital picture books and story retelling. *Journal of Experimental Child Psychology*, 215, 105327. <https://doi.org/10.1016/j.jecp.2021.105327>
- Tang, Z. (2020). A review on studies into incidental vocabulary acquisition through different input. *English Language Teaching*, 13(6), 89–95. <https://doi.org/10.5539/elt.v13n6p89>
- Teale, W. H. (1981). Parents reading to their children: What we know and need to know. *Language Arts*, 58(8), 902–912. <https://eric.ed.gov/?id=EJ254985>
- Tunkiel, K. A., & Bus, A. G. (2022). Digital picture books for young dual language learners: Effects of reading in the second language. *Frontiers in Education*, 7, 901060. <https://doi.org/10.3389/feduc.2022.901060>
- van Bergen, E., van Zuijen, T., Bishop, D., & de Jong, P. F. (2017). Why are home literacy environment and children's reading skills associated? What parental skills reveal. *Reading Research Quarterly*, 52(2), 147-160. <https://doi.org/10.1002/rrq.160>
- Van Den Bosch, L. J., Segers, E., & Verhoeven, L. (2020). First and second language vocabulary affect early second language reading comprehension development. *Journal of Research in Reading*, 43(3), 290–308. <https://doi.org/10.1111/1467-9817.12304>
- Van Steensel, R. (2006). Relations between socio-cultural factors, the home literacy environment and children's literacy development in the first years of primary education. *Journal of Research in Reading*, 29(4), 367–382. <https://doi.org/10.1111/j.1467-9817.2006.00301.x>
- Van Zeeland, H., & Schmitt, N. (2013). Incidental vocabulary acquisition through L2 listening: A dimensions approach. *System*, 41(3), 609-624. <https://doi.org/10.1016/j.system.2013.07.012>
- Verhallen, M. J. A. J., & Bus, A. G. (2010). Low-income immigrant pupils learning vocabulary through digital picture storybooks. *Journal of Educational Psychology*, 102(1), 54–61. <https://doi.org/10.1037/a0017133>

- Verhoeven, L. (2007). Early bilingualism, language transfer, and phonological awareness. *Applied Psycholinguistics*, 28(3), 425–439. <https://doi.org/10.1017/s0142716407070233>
- Verhoeven, L., & Vermeer, A. (2006). Sociocultural variation in literacy achievement. *British Journal of Educational Studies*, 54(2), 189–211. <https://doi.org/10.1111/j.1467-8527.2006.00341.x>
- Wabbes, C., & Willems, K. (2010). *Het belang van interactie bij voorleessessies voor de woordenschatverwerving van vierjarige kleuters* [MA thesis]. Universiteit Gent.
- Wasik, B. A., Hindman, A. H., & Snell, E. K. (2016). Book reading and vocabulary development: A systematic review. *Early Childhood Research Quarterly*, 37, 39–57. <https://doi.org/10.1016/j.ecresq.2016.04.003>
- Webb, S. (2008). The effects of context on incidental vocabulary learning. *Reading in a Foreign Language*, 20(2), 232–245. <https://files.eric.ed.gov/fulltext/EJ815123.pdf>
- Wößmann, L. (2003). Schooling resources, educational institutions and student performance: The international evidence. *Oxford Bulletin of Economics and Statistics*, 65(2), 117–170. <https://doi.org/10.1111/1468-0084.00045>
- Yang, M., Cooc, N., & Sheng, L. (2017). An investigation of cross-linguistic transfer between Chinese and English: A meta-analysis. *Asian-Pacific Journal of Second and Foreign Language Education*, 2(1). <https://doi.org/10.1186/s40862-017-0036-9>
- Yeomans-Maldonado, G., & Mesa, C. (2021). The association of the home literacy environment and parental reading beliefs with oral language growth trajectories of Spanish-English bilingual children. *Early Childhood Research Quarterly*, 57, 271–284. <https://doi.org/10.1016/j.ecresq.2021.07.001>