MASTER'S THESIS LINGUISTICS

The language environment of children with SLI

Do parents of children with SLI talk differently?

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3657140

July 2015

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Introduction

Interaction between parent and child plays a big role in the language development of a child. Imperceptibly, parents create an unique language environment that is individualized to the child in terms of the *amount* of talk they direct to their child, but also in terms of *how* they communicate (Burgess et al., 2013). The quality of the child's language environment, provided by the parents, is argued to be of great importance for language development, and vocabulary development in particular (Weizman & Snow, 2001). A study by Hart & Risley (1995) showed that parental communication had a stronger influence on children's rate of vocabulary growth and vocabulary use than parent education and socioeconomic status (SES). Rowe (2012) found that quality of parental talk can explain variation in later child vocabulary skill. The findings of these studies combined show that quantity and quality of the language environment are both of great importance for child vocabulary development.

When a child does not experience a normal language development and most certainly when a child is language impaired, it is arguable that the language environment provided by parents is of extra importance. Studies have shown that there are qualitative differences in language environment provided by parents between normally developing children and language impaired or language delayed children (Conti-Ramsden et al. 1995, on Specific Language Impairment (SLI); Vigil et al. 2005, on late-talking toddlers). Furthermore, parents of language impaired or language delayed children are often approached to participate in parent training programmes, to learn to facilitate their child's language development (Vigil et al., 2005). These training programmes concentrate on improving certain qualitative aspects of parental talk, such as the use of expansions and decontextualized language.

The present study has been built on existing knowledge about the relation between language development and parental communication and it is an important contribution to the existing literature. The current research did not only focus on providing a review of quality measures of the language environment, it also investigated the language environments of both normally developing children and children with SLI simultaneously. Accordingly, the primary goal of this study was to determine whether there are differences in language environment between normally developing children and children with SLI with regard to the reviewed quality measures.

Throughout the literature many different measures have been employed to determine quality of the language environment provided by parents. The present study tried to eliminate potential confounds due to this variability in use of measures by applying all the measures to the same speech sample. Furthermore, researchers in previous studies always recorded parental talk during predetermined events such as storybook reading. The current study used LENA to record speech. LENA stands for Language ENvironment Analysis and it provided us with a way to sample

language naturally, since the child carried the LENA recording device on him/her for a whole day. Obviously, this way of recording produced a great amount of spontaneous speech.

Throughout this thesis the term "language environment" will be used to indicate how parents provide their children with linguistic input, from the child's point of view. "Parental talk" and "parental communication" will denote actual parental behaviour towards their child.

Theoretical framework

Specific Language Impairment

The language environment in which children grow up has a great influence on the language development of normally developing children, but it is supposedly even more important for children with SLI. SLI is classified as a language disorder with no assignable cause (Leonard, 2014). The language ability of children with SLI is impaired, but other factors that usually accompany language learning problems – such as neurological dysfunction, hearing impairment, low nonverbal IQ – are not present. In fact, diagnosis of SLI is much more based on exclusion rather than on inclusion, since other disabling conditions should not be present for a SLI-diagnosis. One of the inclusion criteria of SLI is that language acquisition is slower: at least 1.25 SD below the norm. The language development of children with SLI is characterized by problems with production, comprehension, or a combination of both. It is argued that the expressive language output of a child with SLI is comparable to that of a much younger child with a normal language development (Conti-Ramsden, Hutcheson & Grove, 1995). Others claim that the language development of children with SLI is not only delayed, but also deviant. Leonard (2014) for example, argues that some SLI children are considered to never reach mastery levels in their language development. This *plateau* effect is accompanied by a delay in language development as well.

In either case, parents of children with SLI are probably aware of their child's language ability, so they may be inclined to adapt their communicative behaviour (Conti-Ramsden et al., 1995). Additionally, parents may even assume that simplified utterances help their child's comprehension and therefore their child's language development (Conti-Ramsden, 1990). A study by Hammer, Tomblin, Zhang & Weiss (2001) concluded that parents of children with SLI communicated differently than parents of normally developing children. The latter parents were more likely to read to their children and to discuss daily events, activities and feelings. Parents of children with SLI were found to teach their children the alphabet more frequently than parents of the control group. Hammer et al. (2001) hypothesized that this difference in parental communicative behaviour is due to the fact that parents of children with SLI try to compensate for their children's language problems. This way they try to avoid tasks that the child may find

difficult, such as having a conversation. Instead, these parents engage their children in activities that they think are less linguistically demanding. Tannock & Giralametto (1992) have dubbed this vicious circle the "idiosyncratic feedback cycle" and this will be elaborated on later in this thesis.

The fact that there are no hearing losses, cognitive delays, or neurological abnormalities present in children with SLI, raises an interesting question about the relationship between language development and the influence of the language environment provided by parents. Ever since the relation between language input and child vocabulary development has been established, researchers have shown interest in the language environments of children with SLI. The measures that can be employed to investigate the quality of the language input are numerous, which makes it difficult to compare the results of different studies. A detailed review of this subject is below.

Quality and quantity of the language environment

Vocabulary development of young children is influenced by several factors, including genetics and the environment in which they grow up. For example, the linguistic input to which children are exposed contributes greatly to early vocabulary and language development. Many studies on this subject have concluded that parental communication and child vocabulary development are related (Morgan & Goldstein, 2004; Pan, Rowe, Singer, & Snow, 2005; Rowe, 2008), but these studies differ with regards to the measures of language input. Whereas the Hart & Risley study (1995) focused on *quantity* of the language input, other studies investigated *quality* of the language input (Morgan & Goldstein 2004, on parental use of decontextualized language; Weizman & Snow 2001, on the use of sophisticated vocabulary by parents).

The amount of talk that parents direct to their child has a great influence on the child's vocabulary development. A study by Rowe (2012) investigated to which extent the relation between parental input and child vocabulary development is driven by the quantity of the talk, the quality of the talk, or both. The main finding was that the quantity of input is most important during the second year of life, but from age three and up, the quality of input becomes more important. Interestingly, measures of input quality and quantity that are being used in research are not always consistent. Input quantity is relatively easy to determine. For example, Rowe (2012) examined the number of word tokens, whereas Burgess, Audet & Harjusola-Webb (2013) measured adult word count, conversational turns and child vocalization count by using LENA. Input quality, on the other hand, is a much more subjective measure, since it is not possible to just count utterances. So, what constitutes a qualitative language input?

Quality measures

As mentioned before, children's language environments are often examined by several quality measures. However, the literature provides a wide variety of measures that assess parental communication. Table 1 shows an overview of all measures reviewed in this framework. Each of these measures will be discussed below. Most studies focussed on the language environment of normally developing children, only a few also included children with SLI.

Quality measure	What does it imply?	Literature	Nature of speech sample
Vocabulary diversity	Total number of different word types/Type-Token-Ratio	Rowe (2012)	Recording during ordinary daily activities
Vocabulary sophistication	Total number of different *rare* words (in proportion to tokens or types)	Rowe (2012); Beals (1997); Weizman& Snow (2001)	Recording during ordinary daily activities; language activities; storybook & mealtime
Decontextualized language	Utterances containing language that is removed from the here and now (narratives, pretending, explanations)	Rowe (2012)	Recording during ordinary daily activities
Degree of child-directed speech	Percentage of utterances directed to the child	Burgess, Audet & Harjusola-Webb (2013)	Spontaneous
Degree to which utterances elicit child speech	Percentage of questions (yes/no and open-ended)	Burgess, Audet & Harjusola-Webb (2013); Rowe (2008)	Spontaneous; recording during playtime
Behavioural directives	Percentage of (imperative) utterances that direct the child's behaviour	Rowe (2008); Vigil et al. (2005)	Recording during playtime
Simple recasts	Percentage of utterances that remodel child speech simply	Conti-Ramsden et al. (1995)	Recoding during playtime
Complex recasts	Percentage of utterances that remodel child speech in a more complicated way	Conti-Ramsden et al. (1995); Kuczaj (1982)	Recoding during playtime
Expansions	Percentage of utterances that complete child utterances	Vigil et al. (2005)	Recording during playtime
Mean Length of Utterance	Mean length of utterance in words	Rowe (2008), Vigil et al. (2005)	Recoding during playtime

Table 1. Overview of quality measures in the literature.

Vocabulary diversity

Measures of vocabulary diversity are widely used in linguistic research. Not only do they reflect a speaker's variety of active vocabulary, they can also provide insight in lexical density (the proportion between content words and functions words) (Malvern & Richards, 2002). As mentioned before, the amount of words is regarded to be of great importance (Hart &Risley, 1995), but a larger amount of words does not necessarily mean that parents' vocabulary is more diverse. According to Rowe (2012),vocabulary diversity is most important during the 3rd year of life. In fact, she found that parents who used more different words, had children with larger

vocabularies one year later than parents who used fewer different words. So, parents' use of a diverse vocabulary is related to child vocabulary development. However, measuring vocabulary diversity can be tricky. A widely-known diversity measure is the Type-Token Ratio (TTR), which is based on the comparison between the number of different words (types) and the total number of words (tokens). According to Malvern & Richards (2002) the TTR can be problematic, since it is a function of sample size. A speech sample containing a large number of tokens produces a lower TTR than a speech sample containing a smaller number of tokens. For this reason Malvern & Richards claim that it is not valid to compare TTRs calculated from speakers that vary too much in the amount of words they utter in the speech sample.

The vocabulary diversity measure used in the study of Rowe (2012)counted the total number of different word types that parents produced. Her longitudinal study consisted of three sessions. At 18, 30 and 42 months of age parent-child interactions were recorded for 90 minutes. The age groups that are of interest for the present study are the 30- and 42-month-olds. On average, parents used 432 and 443 different word types, respectively. Table 2 below provides an overview of the descriptive statistics.

	Word tokens M (range)	Word types M (range)
30-month-olds	3700 (696-7673)	432 (172-714)
42-month-olds	3572 (488-9528)	443 (144-841)

Table 2. Descriptive statistics for vocabulary diversity (n =50). Adapted from "A longitudinal investigation of the role of quantity and quality of child-directed speech in vocabulary development" by M. Rowe, 2012, *Child Development, 83,* 1762-1774.

The amount of words parents uttered during the recording differed greatly (see Table 2 for ranges), so Rowe solved the sample size problem by merely counting word tokens and word types and not calculating TTRs. Rowe then argued that with the quantity of the parental talk controlled, the sheer number of different words still explained variation in later child vocabulary skill.

Vocabulary sophistication

Aside from vocabulary diversity, parents' use of sophisticated vocabulary is also argued to be related to children's vocabulary development (Weizman & Snow, 2001). In most studies, the term *sophisticated language* or *use of rare words* is used to refer to words that fall outside the 3000 most common words and their inflections (Beals, 1997; Beals & Tabors, 1995; Rowe, 2012; Weizman & Snow, 2001). Vocabulary sophistication seems to be a powerful element of language input. A study on the effects of sophisticated vocabulary exposure by Weizman & Snow (2001) found a powerful linkage between early exposure to sophisticated vocabulary and later vocabulary performance. Most striking is the fact that rare words made up as little as 2% of total word types uttered by parents, which means that the use of these words had great influence on

the children's vocabulary development. Similarly, Beals' (1997) study on rare words to children showed a positive linear relationship between informative uses of sophisticated language and later vocabulary size. Finally, according to Rowe (2012), parental talk with a higher proportion of sophisticated vocabulary at child age 30 months was most related to vocabulary skill one year later, even when the quantity of the input was controlled for.

Vocabulary sophistication can be calculated in proportion to tokens or types. Weizman & Snow (2001) did both, and in both instances a very small proportion of the maternal language consisted of rare words (0,8% in case of word tokens and 1,77% in case of word types). Just as the measure of vocabulary diversity, Rowe (2012) counted the total number of different rare words produced by parents. Both the Weizman & Snow study and the Rowe study adopted a method by Beals & Tabors (1995) to distinguish rare words from the 3000 most common words. They were identified by and adopted from an updated version of the Dale-Chall word list (Chall& Dale, 1995).

Additionally, Beals (1997) coded utterances that contained a rare word as informative or uninformative. Parents can provide a conversational context from which the child can infer some sense of the rare word's meaning and these kinds of contexts are therefore informative. To make this distinction during coding, Beals asked whether a three-year-old could gain some sense of the word's meaning from the context in which the word was used, if it was the child's first exposure to that word. Beals then identified four different ways of parents providing contextual support in order to explain the difficult word to their child. These four categories will be elaborated on later in this thesis.

Decontextualized language

Decontextualized language involves concepts and notions that are removed from the immediate situation (Morgan & Goldstein, 2004), and it can be divided into three categories: explanation, pretend, and narrative. Table 3 (adapted from Rowe, 2012, p. 1767) contains definitions and examples for each of the three categories.

Category	Definition	Examples
Explanation	Talk that requests or makes a logical connection between objects, events, concepts or conclusions (Beals, 1997, 2001)	"Oh, we can put them in the bus because the bus is full of blocks" "Because the lights have to be on for the remote to work"
Pretend	Talk during pretend episodes of interaction including making an object represent another; attributing actions, thoughts, or feelings to inanimate objects; assuming a role or persona, enacting scripts or routines (Katz, 2001)	"I'll save you from the wicked sister" "We have to have the police come and make an accident report now"
Narrative	Talk about events that happened in the past or will happen in the future (Beals & Snow, 1994)	"He is going to look in your nose and your throat and your ears" "Oh yes, we have popcorn in the movie theatre, remember?"

Table 3. Definitions and Examples of Categories of Decontextualized Utterances. Reprinted from "A longitudinal investigation of the role of quantity and quality of child-directed speech in vocabulary development" by M. Rowe, 2012, *Child Development, 83,* 1762-1774.

First of all, Rowe (2012) suggests there is a developmental scenario in which the use of decontextualized language by parents is most beneficial during the 4th year of life. This is consistent with the results of her study on the use of decontextualized language which are below in Table 4. As the children participating in the study got older, parents' use of decontextualized language increased, whereas the total number of words decreased (see Table 2 for tokens).

	Narrative utterances M (range)	Pretend utterances M (range)	Explanation utterances M (range)
30-month-olds	23.7 (0-258)	32.9 (0-264)	12.7 (0-39)
42-month-olds	30.3 (0-220)	49.7 (0-637)	13.3 (0-45)

Table 4. Descriptive statistics for decontextualized utterances. Adapted from "A longitudinal investigation of the role of quantity and quality of child-directed speech in vocabulary development" by M. Rowe, 2012, *Child Development, 83,* 1762-1774.

Not only did parental use of decontextualized language increase when the child got older, Rowe also found that the use of this type of language input at child age 42 months was related to later vocabulary skill. The use of narratives contributed to this finding in particular. This means that parents who talked more with their children about past and upcoming events, had children with larger vocabularies one year later than parents who produced less narrative utterances.

The amount of decontextualized utterances was counted by judging whether an utterance was a narrative utterance, a pretend utterance or an explanation, or none of those.

Child-directed speech

In order to determine the qualitative characteristics of school and home language environments of preschool-aged children with Autism Spectrum Disorder, Burgess et al. (2013) took the degree to which adult talk was child-directed. The quality measure consisted ofthe percentage of parental utterances that were directed to the target child. Some studies do not make the

distinction between parental talk that is directed to the target child and parental talk that is directed to other children, whereas other studies *only* examine child-directed speech thoroughly. Burgess et al. concluded that the children in their study were exposed to language of a sufficient quality, since 50% of the parental utterances was child directed.

Eliciting child expressive speech

Burgess et al. (2013) also examined the degree to which parental talk facilitated child expressive language use and/or participation in reciprocal conversation. The results showed that approximately 25% of the parental utterances consisted of questions (the majority of them was open-ended). According to Burgess et al. this suggests that the parental talk was used to encourage the child to use more complex expressive language. Rowe (2008) also regarded the percentage of questions (both yes/no and open-ended questions) as a measure of eliciting child speech. Analysis showed that 31% of the parental utterances consisted of questions. Rowe's study aimed to investigate the relation between SES and child-directed speech. High-SES parents talked more to their children and produced longer utterances, but there was no positive relation between SES and the proportion of parental utterances that elicited child expressive speech. Rowe argued that parental questioning is a measure that is perhaps not sensitive enough to capture SES differences.

Behavioural directives

Rowe (2008) also investigated the amount of parental talk that was used to direct the child's behaviour. These were utterances formed in the imperative, such as 'don't touch that'. The results showed that 12% of the utterances directed the child's behaviour. Furthermore, Rowe also found a negative relationship between the proportion of utterances that directed the child's behaviour and the quantity and diversity of parental talk. This means that parents who used more behavioural directives produced fewer word tokens and had a less diverse vocabulary than parents who used less behavioural directives.

Vigil, Hodges & Klee (2005) regarded the amount of behavioural directives as a measure of quality of language environment as well. Their definition of behavioural directives was more extensive: "verbalizations that elicit or constrain the physical behaviour of the infant by commanding, requesting or encouraging the infant to do or desist from doing something" (p. 114). It was hypothesized by Vigil et al. that parents who produce directives frequently may not be following a child's lead. When parents do not extend their child's play, using the child's own topic, they are probably less inclined to expand their child's utterance. Could it be that a higher use of directives results in less instances of expansion? Vigil et al. did not perform any statistical analysis on this matter, but looking at the mean number of behavioural directives and the mean number

of expansions, there is a difference between the normally developing children and the late talkers. Whereas the normally developing group showed mean numbers of 13.53 and 8.37 (behavioural directives and expansions respectively), the group of children with language delay displayed mean numbers of 16.60 and 3.20. It seems that a more frequent use of directives results in less instances of utterance expansion. Of course, there is no statistical analysis to prove this line of reasoning, but it makes sense in light of what Vigil et al. hypothesized about parents not following a child's lead and being less inclined to expand their child's utterance.

Recasts and expansions

Another widely-know and commonly used measure of quality of language environment is the use of recasts or expansions. A recast is a way to correct an error or an omission in a child's speech without disturbing the communication. Parents can simply recast a child's utterance by repeating the utterance back in a corrected form. Recasts are important for a child's language development, since they facilitate syntactic development (Conti-Ramsden et al., 1995) and they offer linguistic scaffolding (Vigil et al., 2005). They provide the ideal opportunity for the child to compare a sentence structure that it already knows to a sentence structure that it has yet to acquire. Conti-Ramsden et al. identified two sorts of recasts: simple recasts and complex recasts. An example of each is provided below in (1) and (2).

(1) Simple recast
    CHI   crayons on knee
    MOT   put the crayons on your knees yes   [Conti-Ramsden et al, 1995]

(2) Complex recast
    MOT   what are you making?
    CHI   ship
    MOT   the ship enters the port

The simple recast provided by the mother in (1) maintains reference to the same meaning the child's utterance referred to, namely the crayons. Structural change is limited to only one of three complex components (subject, object and verb), since the mother only adds a verb. Complex recasts on the other hand, involve structural change to two or more of the complex components. The recast of the child's utterance in (2) contains an added verb and an added object. It is likely that complex recasts impede the rate of syntactic growth, since it is hard for a child to successfully compare complex recasts to sentences structures that it already knows (Kuczaj, 1982).

According to the Conti-Ramsden et al. (1995) study, there is reason to assume that there is a difference between the language environments of children with SLI and normally developing children with regards to recasts. The main finding was that children with SLI received

significantly fewer simple recasts from their parents than normally developing children did (mean number of 4,8 simple recasts versus mean number of 16 recasts). The amount of complex recasts was approximately the same for both groups. However, only six children with SLI and six controls participated in the study. The difference in language environment between the SLI children and the controls was explained by the fact that children with SLI have a more passive conversational nature which does not provide parents with opportunities to recast their child's utterances.

The definition of *simple recast* overlaps greatly with the definition of *expansion.* Vigil et al. (2005) define the term *expansion* as "a repetition of the child's preceding word approximation or verbalization and completion of the utterance by adding one or more morphemes or words" (p. 114). This behavioural function was only coded when the parental utterance occurred as a response to the child's previous utterance. Whereas Conti-Ramsden et al.'s definition aims at a structural improvement of the child's utterance, Vigil et al.'s characterization of the term *expansion* is somewhat more wide-ranging.

Vigil et al.'s study (2005) investigated the language input of toddlers with language delay and typically developing toddlers with regards to discourse function measures and behavioural function measures. One of the main findings of their study was that parents of children with typical language development expanded a significantly greater number of their child's utterances than parents of children with language delay[1]. Vigil et al. adopted Tannock & Giralametto's (1992) line of reasoning about why parents of late talkers expand less. They suggested that a child's language ability influences the parents and vice versa in a so called 'idiosyncratic feedback cycle'. Due to its language delay, the child is unable to provide the parent with adequate feedback, and the parent tries to compensate for this. As a result, parents might be inclined to adapt their communicative behaviour, since they assume simplified utterances help their child's language development. This continual cycle between child and parent and the simple fact that parents of children with language delay are provided with less utterances that they can expand upon, leads to a different behaviour to, and interaction with their children.

Mean length of utterance

Finally, mean length of parental utterance is a measure that some studies employ as well when investigating quality of the language environment. Rowe (2008) examined sentence complexity by calculating the mean length of parents' utterances in words. On average, utterances contained 4,16 words. Rowe did not find any relationship between quantity of parental talk and MLU.

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[1] Perhaps this is due to the fact that parents of children with language delay had less utterances to expand, since their children probably produced fewer utterances.

Vigil et al. (2005) also examined MLU as a measure of quality of language environment. No differences were found between parents of children with language delay and parents of normally developing children. Both groups produced MLU's of 3,54.

Conclusion

The review of quality measures above provides evidence for the fact that children's vocabulary development is not only influenced by the sheer amount of talk parents produce. Many of the studies discussed here have shown that quality of the language environment provided by parents is also related to vocabulary growth of the child.

Not every article or book chapter on the quality of the language environment uses the same measures to assess the language environment, while they do make claims about these measures being related to a child's later vocabulary skill. Some articles also suggest that certain aspects of parental talk are of lesser quality in the language environment of children with SLI and/or late talkers (Conti-Ramsden et al., 1995; Vigil et al., 2005). An example of the inconsistency in use of quality measures is the Burgess et al. (2013) study. They investigated the degree to which parental talk was child-directed and considered this to be a measure of quality. Yet, many studies that assess quality of the language environment do not even transcribe speech that is not directed to the target child in the first place (e.g. Huttenlocher et al, 2010; Rowe, 2012). This difference in regarding what constitutes a measure of quality might result in a skewed picture of the quality of the language environment.

The present study

The aforementioned inconsistency in the use of quality measures among studies gave rise to the current study. In what way can we investigate the language environments of both normally developing children and children with SLI without having to choose one or two quality measures beforehand? The current study had three advantages over previous studies on this matter: 1) dissimilarities in results among studies that are caused by the variety of measures are eliminated, since the current study investigated all these measures at the same time; 2) every measure was used on the same speech sample, therefore reducing the chance that results were influenced by differences among speech samples; and 3) using the LENA recording device enhanced the spontaneity of the speech samples. The LENA device recorded speech for approximately ten hours per child. This means that recording speech did not have to take place during predetermined events such as storybook reading or dinnertime conversation, which makes these recordings somewhat artificial. Parents are less aware of the fact that their speech is being recorded, which benefits the spontaneity of parental communication. This way, the measures provide us with a more realistic view on the quality of the child's language environment. All in all,

the present study is more comprehensive than previous work, and it adopts a surveyable approach in investigating the language environment accurately.

The primary goal of this study was to determine if there are differences in the language environments of children with SLI and normally developing children. As mentioned before, there is reason to assume that the language environment of children with SLI is different from the language environment of normally developing children. If there are aspects of the language environment on which the SLI population scores differently, this could be a way to identify those aspects of parental talk that need improving. In addition, a better understanding of the language environments of both children with SLI and normally developing children can contribute to the effectiveness of parent training programmes, which usually teach parents how to improve their communicative behaviour towards their children. The above-mentioned issues laid the foundation for the corresponding research question:

Are there differences between the language environments of children with SLI and normally developing children?

Method

In this exploratory research the language environment of normally developing children and children with SLI was investigated. In order to do so, 30 children have worn the LENA recording device for one day. For the purpose of this study, LENA was not used for its automatic quantitative analysis, but it was rather used as a tool to identify speech fragments with a great amount of interaction between parent and child. Fragments containing highest number of turn taking were used to measure quality of the language environment.

Why LENA?

The language environment of the child was assessed by means of the LENA device. LENA provided us with a reliable and automatic way of analysing spontaneous speech, which was used in the present study to zoom in on those parts of spontaneous speech that are hypothesized to contain the highest amount of parental talk.

LENA consists of a Digital Language Processor (DLP) and the Language Environment Software. The DLP is a small recording device that can be placed in the pocket of a shirt the child is wearing. 16 hours of continuous speech can be recorded with this device, which makes this way of recording the most naturalistic way of speech recording so far. The Language Environment Software is able to analyse speech samples automatically. For example, LENA can identify different speakers such as the mother and the father, but also the child itself. Quantitative measures such as adult word count, the amount of conversational turns and child vocalizations

are analysed automatically by LENA software. Measures with respect to the content, quality measures cannot be analysed by the software.

Participants

The participants in this study consisted of 13 normally developing children and 14 children diagnosed with SLI. All the children were between 2;1 and 4;1 years old during testing. Scores from the Schlichting Test voor Taalbegrip (receptive language) and the Schlichting Test voor Taalproductie (expressive language) were available for some of the children with SLI. Table 5 provides an overview of the characteristics of the participants.

	SLI	ND
No. of children	14	13
Age, mean (SD) mo	38.14 (2.12)	35.92 (7.35)
Age, rang mo	33-42	26-49
Gender, no (%)		
Male	10 (71%)	10 (77%)
Female	4 (29%)	3 (23%)
Socioeconomic status, mean (SD)*1	2.8 (0.6)	4.0 (0)
Receptive language, mean (SD)	93 (8.5)	-
Receptive language, range	79-108	-
Expressive language, mean (SD)	72 (5.9)	-
Expressive language, range	67-85	-

Table 5. Demographic profile of participants. *1 (1 = no/primary education, 2 = lower general secondary education, 3 = higher general education, 4 = college/university).

For the control group of normally developing children, no language delays and/or hearing problems were present. The recordings that were used in the current study came from data obtained by a larger study by NSDSK and Kentalis on the language environment of children with SLI. The NSDSK and Kentalis are health care institutions for children with SLI. The experimental group consisting of children with SLI were recruited by the NSDSK and Kentalis. These children participated in specialized treatment groups for three days per week. Parents of these children were approached to participate in the study by team leaders of NSDSK and Kentalis.

Normally developing children were recruited by researchers of the NSDSK as well. In order to do so, day care centres and infant welfare centres around Utrecht and Amsterdam were addressed with the question whether they wanted to help inform parents of normally developing children on the project. By doing this, we hoped to reach many families. Flyers, posters and

information booklets were distributed to the participating day care and infant welfare centres. The call for participants was also widely distributed on social media accounts of NSDSK.

Procedure

Parents of both normally developing children and children with SLI that were interested in cooperating in the study received additional information. An example of the information booklet is in Appendix A. If parents decided to participate, they were asked to sign informed consent. Furthermore, they were also asked to give permission to use recorded speech extensively.

After parents signed informed consent, they received the DLP recording device and an information booklet containing instructions on how to use the recording device. A logbook was provided as well. In here, parents could indicate if the day of the recording was a normal day and they were asked to report on their activities that took place during the day. For instance, for each hour of the day, parents wrote in the logbook what they did with their child, where they were, with whom and whether or not the child carried LENA. Importantly, parents could also use the logbook to mark pieces of the recording that could not be played back by the researchers, for whatever reason. It is beyond questioning that the collected data was very privacy-sensitive, since the recoding contained a whole day of talking, and parents were probably not very aware of the recording device after a few hours. Before the recording parents were also told that they could switch off the device at any time. Finally, parents were asked to fill in a form about the background of the family. Details such as socioeconomic status of the parents and the home language were retrieved by this form.

After a successful day of recording speech, the DLP was collected by a researcher. The participating children received a small present for their cooperation.

Transcription

The method of collecting speech that was used in this study yielded speech samples of approximately 10 hours long. Since LENA is not able to analyse aspects of speech content-wise, this needed to be done by hand. In order to make the data practicable, segments with the highest conversational turn count were selected. LENA software identified these segments automatically. Fragments with the highest conversational turn count were hypothesized to contain the richest examples of interaction between parent and child, and therefore a good reflection of the language environment provided by the parents. In accordance with Burgess et al. (2013), three 5-min segments were isolated from the total speech sample to serve as the samples that were subjected to quality measures. These segments were preferably *separate* 5-min segments. However, for four of the participants it was not possible to select three separate fragments, due to interference of other family members in the speech sample or for other reasons.

Only selected segments that contained the highest conversational turn count were transcribed. In line with Rowe (2012), the unit of transcription was the utterance, and an utterance was described as any sequence of words that is preceded and followed by a 2 s pause, a change in conversational turn, or a change in intonational pattern.

Coding

After transcription parental utterances were coded according to ten categories. An overview of the categories and a short description about how each measure was coded is in Table 6 below.

Vocabulary diversity was measured by calculating a Type Token Ratio (TTR) for every participant. The potential invalidity of the TTR discussed by Malvern & Richards (2002) (due to big differences in adult word count) will be commented on in the discussion part of this thesis.

To examine how many sophisticated words parents used in their communication towards their children, a list containing 3000 words that most three-year-olds understand was adopted. The list was compiled by NSDSK researchers and it combined wordlists of *Taaltherapie voor kinderen met taalontwikkelingsstoornissen* (Van den Dungen, 2006) and *De eerste 3000 woorden* (Schlichting, n.d.). These 3000 words and their inflections were removed from the total list of words parents uttered. The remaining list of words was further edited by removing the following set of words that was not considered rare: proper nouns, exclamations (ouch! Oops!), onomatopoetic forms, child reduced forms, slang, diminutive forms, incorrect forms, and child culture terms. The resulting list was hypothesized to contain words that are rare in the receptive vocabulary of three-year-olds.

Measure	How?
Vocabulary diversity	Count tokens and types, and calculate TTRs.
Vocabulary sophistication	Use list of 3000 Dutch words (and their inflections) most 3-year-olds know to identify sophisticated words. Calculate percentage of sophisticated words in proportion to word tokens and word types.
Decontextualized language	Calculate percentage of parental utterances that contain decontextualized language. (narrative/pretend/explanation).
Child-directed speech	Calculate percentage of parental utterances that are directed to the target child.
Eliciting child expressive speech	Calculate percentage of parental utterances that contain questions (both open-ended and yes/no questions).
Behavioural directives	Calculate percentage of parental utterances that direct child's behaviour.
Recasts and expansions	Calculate percentage of parental utterances that occur as a response to the child's previous utterance. Distinguish simple and complex recasts.
Mean length of utterance	Calculate MLU in words.

Table 6. Overview of measures and short description.

The method of identifying decontextualized language was adopted from Rowe (2012). Accordingly, there were three categories of decontextualized language: explanation, narrative and pretend. Descriptions and examples of each of these categories are in Table 3 above.

During transcription of the speech samples, speech from and to other family members such as siblings and grandparents was indicated as such. This made judging whether or not parental speech was directed at the target child easier. Parental talk towards siblings was not coded as directed at the target child. Communication between parents was also not regarded as child-directed speech. Assessing the amount of questions was also a matter of good transcription. Declarative sentences with a slight interrogative character such as *dat is een broodje met pindakaas hè* (that is a peanut butter sandwich isn't it) were not coded as questions and were therefore not considered as eliciting child expressive speech.

In line with Vigil et al. (2005) and Rowe (2008) an utterance was coded as a behavioural directive when it was used to direct the child's behaviour. Utterances of this description were either formed in the imperative or were constraining the physical behaviour of the child in any other way by commanding, requesting or encouraging the child to do or desist from doing something.

Utterances containing a recast or expansion were coded as such when the utterance was a response to the child's previous verbalization. The parent had to repeat and complete the child's utterance in order to count as a expansion. Furthermore, a difference was made between simple and complex recasts. As discussed above in the theoretical framework, a simple recast changed only one of three complex components (subject, object and verb), whereas a complex recast involved structural change to two or more of the components.

Finally, parents' mean length of utterance was measured in words. The amount of tokens was divided by the total number of utterances.

Results

Descriptive statistics for all measures are in Table 7 below. Ranges are also provided, since parental talk varied widely with regard to several measures. For example, the number of word tokens parents of normally developing children produced ranged from 382 to 1500. Similarly, there were parents who produced only 16 different rare words during 15 minutes of speech, whereas other parents used 80 different rare words during the same period of time. It is also evident from Table 8 that the number of utterances parents produced during the selected 15 minutes differed greatly. However, merely counting the number of rare words, behavioural directives, questions etcetera is not enough to be able to compare participants. Because of the large variation, it was necessary to calculate proportions to describe the relative differences between participants and groups.

	SLI	ND
Word tokens	806 (239.67)	824 (304.04)
ranges	375-1213	382-1500
Word types	233 (37.99)	255 (58.02)
ranges	161-322	144-329
Utterances**[2]	141 (37.62)	112 (23.07)
ranges	84-211	79-150
MLU**	5.72 (0.89)	7.23 (1.94)
Rare words	34 (7.63)	47 (22.21)
ranges	22-49	16-80
Directives	16 (6.94)	16.31 (9.27)
ranges	7-25	4-29
Questions*[3]	48 (20.92)	33 (9.73)
ranges	20-84	21-59
Decontextualized language	4.79 (3.6)	6.08 (4.21)
ranges	0-12	0-13
Child directed speech**	134 (39.25)	102 (19.75)
ranges	57-202	79-145
Expansions	6.14 (6.25)	5.62 (4.19)
ranges	0-24	0-14

Table 7. Descriptive statistics. Mean (SD) and ranges. **[2] p < .05. *[3] p < .01.

Vocabulary diversity

Type Token Ratios were calculated for every participant in order to measure vocabulary diversity. The mean TTR for the SLI group was 30.4 (SD = 6.13), whereas the control group had a mean TTR of 32.46 (SD = 4.49). An Independent Samples t-test showed that there was no significant difference in the use of diverse vocabulary between parents of normally developing children and parents of children with SLI (p = 0.339).

Vocabulary sophistication

As mentioned previously, the number of rare words produced by parents varied widely. In Table 7 the mean number of rare words produced by parents of both groups is presented. A Mann-Whitney U Test proved that this difference in absolute numbers was not significant. Since there was large variation in word tokens and word types between participants, the use of rare words was also calculated in proportion to the total number of word tokens and word types. Only 4.5%

(tokens) and 14.7% (types) was rare in the speech of parents of children with SLI. For the control group this was 5.6% and 17.5%. There were no differences between groups in the mean numbers of rare words in proportion to tokens and types (p = 0.096 for word tokens and p = 0.116 for types).

Decontextualized language

The use of decontextualized language was not very common among parents. There was no significant difference in the use of decontextualized language between the two groups (p = 0.399). Whereas some parents produced a few decontextualized utterances, others did not talk about things in the past or future at all. Only 5,4% of all the utterances produced by parents of normally developing children was decontextualized. For the parents of children with SLI the percentage of decontextualized utterances was even lower: 3,6%. This did not turn out to be significant (p = 0.148).

Behavioural directives

From Table 7 can be observed that there was no difference in the use of behavioural directives between parents of the two groups (p = 0.887). Similar as previous measures, the use of this type of language required examination in proportion to the total number of utterances. 11,4% of the utterances produced by parents of children with SLI was used to direct behaviour, whereas parents of normally developing children directed behaviour more often: 14,5% of the utterances was used to direct the child. This difference was not significant (p = 0.203).

Questions

Eliciting child expressive speech was measured by examining parental questions. On average, parents of children with SLI asked more questions than parents of normally developing children (48 vs. 33, see Table 7). This difference nearly approached significance since it was p = 0.054. Parents of normally developing children used 30,4% of their utterances to ask questions, whereas parents of children with SLI did so in 33% of the utterances. This difference was not significant (p = 0.403).

Child directed speech

Parents of children with SLI directed significantly more utterances toward their child than parents of normally developing children did (p = 0.013).

Expansions

Parents of children with SLI did not produce more expansions than parents of normally developing children and vice versa (p = 0.801). There was neither a difference between the two groups with regards to the use of simple and complex expansions (p = 0.690 and p = 0.402, respectively). The mean number of simple expansions was 2.71 (SD = 2.92) for the SLI group and 3.15 (SD = 2.73) for the control group. The mean number of complex expansions was 3.43 (SD = 3.59) for the SLI group and 2.46 (SD = 2.03) for the control group. For both groups, approximately 4% of the parental utterances was an expansion. In order to determine how many child utterances were expanded, the number of expansions had to be examined in proportion to the total number of child utterances. There was no difference between groups with regards to the percentage of child utterance that were expanded (p = 0.807).

Mean length of utterance

From Table 7 can be observed that parents of children with SLI produced more utterances during the 15 minute speech sample than parents of normally developing children (141 vs. 112). This difference also proved to be significant (p = 0.025). There was also a significant difference in MLU between the two groups of parents (p = 0.015). Parents of normally developing children produced more words per utterance than parents of children with SLI did.

Discussion

The purpose of this thesis was to contribute to previous research on the language environments of both normally developing children and children with SLI, and to investigate whether there were measures on which these two groups differ. Parents of children with normal language development and parents of children with SLI produced similar language in the speech samples in terms of diversity of vocabulary, the use of rare words, questions, decontextualized utterances, expansions and behavioral directives. Parents of children with SLI produced more utterances and they also directed more of these utterances toward their child than parents of normally developing children did. The number of words per utterance, on the other hand, is lower for parents of children with SLI. So, these parents tended to use more utterances that contained fewer words to convey messages.

The theoretical framework above reviewed a few studies that investigated the language environment of children with SLI and language delayed children. Vigil et al. (2005), for example, concluded that there were no differences in number of utterances and MLU between parents of normally developing children and parents of language delayed children. This finding does not match the findings of this thesis. However, it is questionable whether a group of language delayed children as in Vigil et al.'s study (2005) can be compared to a group of language impaired children,

as is the case in this thesis. Conti-Ramsden et al. (1995) did investigate the language environment of children with SLI. Their main finding that children with SLI experience a simple recast gap in their linguistic input cannot not be confirmed by this study, as there was no difference between groups with regard to the use of expansions.

Although this research did not show many differences between groups with respect to the content of language produced by parents, there were some important and meaningful differences between groups quantity wise. Parents of children with SLI produced fewer words per utterance than parents of normally developing children did, which might be an indication of impoverished language use. On the other hand, this lower MLU could also mean that these parents adapted their communicative behavior. This is in line with Hammer et al. (2001) who hypothesized that parents of children with SLI try to compensate by producing simplified utterances. Adaptation to the child's language ability could also be interpreted as a positive fact. The SLI children that participated in this study were already diagnosed with SLI and they have been in specialized treatment groups for some time. Parents of these children have had hints and tips on how to deal with the diagnosis of SLI. After accepting that their child is language impaired, most parents were probably inclined to take action and therefore they might have adapted their language use, resulting in more child directed utterances and more short utterances. The data obtained in the current study confirmed these assumptions and they are further supported by the fact that parents of children with SLI asked more questions. In order to interact with their child more, parents probably produced more questions, to keep the communication going. However, the results also showed that parents of children with SLI produced more utterances than parents of normally developing children in the same period of time. This is probably due to fact that these parents wanted to present their child with more language, but it is questionable whether the quality of the language benefits from this language behavior of 'keeping it simple'.

The quality of the language environment in terms of the use of behavioral directives, sophisticated words, expansions etc. as measured in the current study did not show any differences between groups, but parents of children with SLI in general are often advised to work on improving their communicative behavior. Parent training programs such as the Hanen programs teach parents how to model their language. For example, they learn how to extend the child's topic and how to expand on what the child says. These parent training programs presume that children develop new language features when these are presented in the Zone of Proximal Development (ZPD) (Feldman, 2013). For example, when parents expand their child's utterance by simply adding a verb, object *or* subject, the new information is in the ZPD. In general, this implies that good support: i.e., a language environment that is of sufficient quality, challenges the child to develop language, but also provides the child with language that is slightly adapted to the child's language ability.

The previously mentioned literature on SLI does not correspond completely to the results from the current study. This could be due to the small group of participants. However, it could also be the case that there is an alternative explanation for the absence of differences between groups. The SLI children that participated in this study were already in specialized treatment groups for some time, as mentioned previously. Their receptive and expressive language abilities were measured before participating in the study and it turned out that these scores were pretty high. The mean for the Schlichting Test voor Taalbegrip (receptive language) was 92.56 and the mean for the Schlichting Test voor Taalproductie (expressive language) was 72.33. By receiving specialized care, the SLI group scored much higher than children with SLI score in general. Unfortunately, the language abilities of the control group were not measured but it could be the case that the absence of differences between groups is due to the fact that the two groups were more similar than it was the case in previous studies.

The present study was methodologically interesting in that it provided a more natural way of recording speech, and it therefore benefitted the spontaneity of the speech sample. The LENA device was a great way to sample a lot of data and the automatic analysis software was very useful for zooming in on those parts of the speech sample that contained the most interaction between parent and child. However, having a lot of data can also be difficult to deal with analysis wise, since there was large variation between participants, which made it hard to compare participants. For example, the amount of words parents produced during the 15 min speech sample varied widely. Due to this, comparing Type Token Ratio's is less valid. There was no difference between groups with respect to vocabulary diversity, but differences within the groups were large. It is questionable whether the Type Token Ratio is a good way to measure vocabulary diversity for this study.

The outcomes of this study and the limitations discussed above combined suggest that the current study can be considered a pilot study in two respects. First of all, it has shown that this small scale study was not able to draw conclusions about the language environments quality wise. A larger group of participants and perhaps also larger speech samples are necessary to identify quality differences between groups. Secondly, and perhaps more importantly, this study has proven that this method to investigate the language environment of children, and children with SLI in particular, is very useful. It is not only recommended that the language environments of language impaired children need to be investigated, but it is probably useful to examine the language environment of children with pragmatic impairments as well.

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Het LENA-onderzoek
Informatiepakket

Onderzoek naar het taalaanbod thuis bij kinderen

Instructiebrief aan de deelnemende ouders

Hartelijk dank voor uw deelname aan het onderzoeksproject LENA! In deze instructiebrief leest u hoe u LENA kunt gebruiken.

Hoe lang moet het opname-apparaatje aan staan?

Wij vragen u om LENA gedurende één dag door uw kind te laten dragen. U zet het opname-apparaatje 's morgens aan (het liefst meteen bij het wakker maken, dus nog voor het aankleden) en 's avonds als het kind weer in bed ligt uit. Uw kind draagt het opname-apparaatje dus de hele dag bij zich zodat alles wat uw kind die dag hoort en zegt wordt opgenomen. Graag LENA de hele dag laten aan staan: **zet het apparaatje niet uit gedurende de dag!** Als u wilt dat bepaalde geluidsopnamen niet afgeluisterd worden, geef dit dan gerust aan in het logboek.

Op welke dag kunt u LENA het best gebruiken?

Kies een doordeweekse dag uit waarop u samen thuis bent met uw kind, en waarop u dingen doet die u normaal ook zou doen. U kunt dus gerust even boodschappen doen, buitenspelen, een broertje of zusje naar school brengen of even op bezoek bij familie als dat is wat u normaal ook doet. Kies geen dag waarop er hele ongewone of spannende dingen gebeuren (uw kind moet naar de tandarts, het buurjongetje komt voor het eerst spelen) of waarop uw kind ziek is. Ook willen we graag benadrukken dat het een gewone dag is, zoals alle andere dagen waarop u met uw kind samen bent. In het begin bent u zich er waarschijnlijk van bewust dat LENA aan staat, maar dat zal naarmate de dag vordert minder worden. Probeert u er niet te veel aandacht aan te schenken.

Hoe gebruikt u LENA?

We vragen u de instructies op de volgende bladzijde zorgvuldig te lezen. Als er iets onduidelijk is, kunt u altijd contact opnemen met uw teamleider XXXX.

Instructies

In de ochtend

1. Zet het opname-apparaatje aan zodra uw kind wakker is, dit doet u door de twee volgende stappen te volgen:
   - Druk gedurende een paar tellen op het **aan-knopje** rechtsboven totdat er letters op het display verschijnen (als u even wacht verschijnt er "Sleeping").
   - Druk gedurende een paar tellen op het **rec-knopje** rechtsonder tot het woord "Recording" op het display verschijnt. Vanaf dat moment kunt u op het display de tijd zien lopen en maakt LENA opnames.

> Aan/uit-knopje
> Display
> Rec-knopje

2. Plaats het apparaatje met het schermpje (en het olifantje) naar voren in het zakje aan de voorzijde van het speciale T-shirtje.
3. Leg het T-shirtje met het apparaatje voor en tijdens het aankleden in de buurt van uw kind.
4. Doe bij het aankleden het T-shirtje aan. Doe dit op een zo vroeg mogelijk moment op de dag, omdat anders opnametijd verloren gaat.

> Plaats LENA met het schermpje naar voren in het zakje

5. Mocht uw kind het apparaatje niet willen dragen, leg uw kind dan uit waarvoor het is en maak er zo nodig een spelletje van. Vertel uw kind bijvoorbeeld dat dit computertje voor één dag verstoppertje wilt spelen en nog een goede verstopplaats zoekt. Beloon uw kind als hij/zij het apparaatje bij zich houdt.

Lees verder op de volgende pagina

Instructies

Gedurende de dag

1. Let erop dat uw kind het apparaatje in het T-shirtje laat zitten en het er niet uithaalt.
2. Controleer gedurende de dag of het apparaatje nog in het zakje zit. Als uw kind het apparaatje eruit heeft gehaald, stop het dan weer terug.
3. Laat het opname-apparaatje de hele dag aanstaan, ook als uw kind 's middags gaat slapen, in bad gaat of in de auto zit. Volg in deze situaties de volgende instructies op:

   - Als uw kind 's middags gaat slapen doet u het T-shirtje (met het apparaatje erin) uit en legt u het T-shirtje in of vlak naast het bed van uw kind. Vergeet niet om het T-shirtje weer aan te doen als u uw kind weer uit bed haalt en aankleedt.
   - Als uw kind in bad gaat, of gaat douchen, leg het T-shirtje met het apparaatje in de buurt van uw kind, maar op veilige afstand van het water. Bij het aankleden doet u het T-shirtje weer aan.
   - Tijdens het autorijden haalt u het apparaatje uit het T-shirtje en legt u het naast uw kind in de auto. Bij het uitstappen stopt u het weer terug.

4. Uiteraard kunt u uw kind gewoon aankleden als u naar buiten gaat, het opname-apparaatje heeft geen last van een trui of jas.
5. Houdt er rekening mee dat iedereen in de omgeving van uw kind wordt opgenomen. Als dat maar om een paar zinnen gaat hoeft u de persoon niet in te lichten (bijvoorbeeld bij het afrekenen van de boodschappen in de supermarkt). Maar als de buurvrouw even op de koffie komt, of er een vriendje komt spelen dan raden wij u aan de buurvrouw of de ouder van het vriendje even in te lichten over de opnames.

Aan het einde van de dag

1. Bij het uitkleden en het naar bed brengen 's avonds laat u het apparaatje gewoon nog even in het T-shirtje zitten en legt u het in de buurt van uw kind.
2. Pas als uw kind echt gaat slapen stopt u de opname door gedurende een paar tellen op het aan/uit-knopje rechtsboven te drukken tot er "Power off" in beeld verschijnt.
3. Berg het apparaatje en de kleding ergens veilig op zodat uw kind er niet bij kan, totdat u weer op de behandelgroep bent. U hoeft de kleding niet te wassen, dat doen wij

Lees verder op de volgende pagina

Instructies

Het logboek en de vragenlijsten invullen

1. Wij verzoeken u om gedurende de dag dat uw kind LENA draagt een logboekje bij te houden. U kunt hiervoor het formulier bij deze brief gebruiken. U geeft aan op welk tijdstip de opname wordt gemaakt, waar dit gebeurt en met wie.
2. Ook vragen wij u de bijgevoegde vragenlijst in te vullen. Dit kan ook de volgende dag, maar wacht er niet te lang mee zodat u nog weet hoe het was om LENA te gebruiken.

De spullen weer inleveren

Lever de eerstvolgende keer dat u op de behandelgroep bent LENA, de kleding, het logboek en de vragenlijst in bij uw teamleider XXXX. **Zij zal de opnames meteen overdragen aan de verantwoordelijke onderzoekers en dus niet terugluisteren.** De onderzoekers kennen u niet. De opnames worden beveiligd opgeslagen.

Logboek LENA

Naam kind: …………………………………………………………… m/v
Geboortedatum kind: ……………………………………………………
Naam ouder: ……………………………………………………
Datum opname: ……………………………………………………
Voelde uw kind zich vandaag ziek of niet lekker? JA/NEE
Deze dag was… ☐ zoals het normaal gesproken gaat: er werd ongeveer net zo veel gepraat
       ☐ er werd vandaag minder gepraat dan normaal
       ☐ er werd vandaag meer gepraat dan normaal

Heeft u nog toevoegingen of opmerkingen over vandaag? Deze kunt u op de achterkant schrijven!

	Waar? (bijvoorbeeld thuis, buiten, in de speeltuin, in de winkel, …)	Wat? (bijvoorbeeld slapen, eten, aankleden, in bad, op de fiets, spelen, voorlezen, …)	Met wie? (bijvoorbeeld met moeder, vader, andere kinderen, …)	**Droeg uw kind LENA bij zich?** (of had hij het T-shirtje uit, bijvoorbeeld omdat hij aan het slapen was?)	Geef hier aan als er een stukje tussen zit dat niet beluisterd mag worden
06:00					
07:00					
08:00					
09:00					
10:00					
11:00					
12:00					
13:00					
14:00					
15:00					
16:00					
17:00					
18:00					

Ruimte voor eventuele opmerkingen

Vragenlijst over de achtergrond van uw gezin

Met deze vragenlijst willen wij wat meer te weten komen over de achtergrond van uw gezin. Uiteraard zullen alle gegevens vertrouwelijk worden behandeld.

Leeftijd vader: ………………………

 Leeftijd moeder: ………………………

Hoe is de opvoedsituatie van het kind?
☐ Twee-ouder-gezin
☐ Eén-ouder-gezin
☐ Anders namelijk …………………………………………………………

Hoeveel kinderen zijn er in totaal in uw gezin? …………

Wat is de leeftijd van het oudste kind in uw gezin? ………………

Wat is de leeftijd van het jongste kind in uw gezin? ………………

Wat is het hoogste niveau van onderwijs dat moeder heeft gevolgd?
☐ (geen) lagere school
☐ LBO/MAVO/MULO/V(M)BO
☐ MBO/HAVO/HBS/VWO
☐ HBO/universiteit
☐ Weet ik niet of wil ik niet zeggen

Wat is het hoogste niveau van onderwijs dat vader heeft gevolgd?
☐ (geen) lagere school
☐ LBO/MAVO/MULO/V(M)BO
☐ MBO/HAVO/HBS/VWO
☐ HBO/universiteit
☐ Weet ik niet of wil ik niet zeggen

Heeft moeder een betaalde baan?
☐ Ja voltijds (20 uur of meer per week)
☐ Ja deeltijds (minder dan 20 uur per week)
☐ Nee is student/scholier
☐ Nee is huisvrouw
☐ Nee is gepensioneerd
☐ Nee is om andere reden niet werkzaam
☐ Weet ik niet of wil ik niet zeggen

Heeft vader een betaalde baan?
☐ Ja voltijds (20 uur of meer per week)
☐ Ja deeltijds (minder dan 20 uur per week)
☐ Nee is student/scholier
☐ Nee is huisman
☐ Nee is gepensioneerd
☐ Nee is om andere reden niet werkzaam
☐ Weet ik niet of wil ik niet zeggen

→ Ga door naar de volgende bladzijde

Wat is het netto jaarinkomen van uw huishouden?

Hiermee bedoelen we het netto inkomen van uzelf en uw eventuele echtgeno(o)t(e) / vaste partner. Het inkomen van verdienende kinderen (indien van toepassing) en kinderbijslag hoeft u hierbij dus niet mee te rekenen. Netto is het bedrag dat u (samen) schoon in handen krijgt.

☐ Minder dan 15.000 euro per jaar

☐ 15.000 tot 30.000 euro per jaar

☐ 30.000 tot 45.000 euro per jaar

☐ 45.000 tot 60.000 euro per jaar

☐ Meer dan 60.000 euro per jaar

☐ Weet ik niet of wil ik niet zeggen

Welke taal spreekt uw kind thuis meestal?

Met moeder:	☐ Nederlands	☐ Andere taal	☐ Niet van toepassing
Met vader:	☐ Nederlands	☐ Andere taal	☐ Niet van toepassing
Met andere kinderen:	☐ Nederlands	☐ Andere taal	☐ Niet van toepassing

Deze vragenlijsten zijn ingevuld door:

☐ moeder

☐ vader

☐ iemand anders namelijk ……………………………………………

Het is voor ons belangrijk om te weten hoe u het vond om deze vragenlijsten in te vullen. Ook wanneer u foutjes in de vragenlijsten hebt ontdekt of andere opmerkingen heeft, kunt u dat hier vermelden. Aan de hand van uw opmerkingen kunnen wij verbeteringen aanbrengen.

………

………

……

Hartelijk dank voor het invullen van de vragenlijst. U kunt deze vragenlijst inleveren bij uw teamleider XXXX.

Toestemmingsverklaringsformulier (informed consent)

In te vullen door de ouder / verzorger:

- Ik verklaar op een voor mij duidelijke wijze te zijn ingelicht over de aard, methode, doel en de risico's en belasting van het onderzoek.
- Ik weet dat de gegevens en resultaten van het onderzoek alleen anoniem en vertrouwelijk aan derden bekend gemaakt zullen worden.
- Ik begrijp dat de geluidsopnames uitsluitend voor wetenschappelijke analyses gebruikt zullen worden.
- Mijn vragen zijn naar tevredenheid beantwoord.
- Ik stem geheel vrijwillig in met deelname aan dit onderzoek.
- Ik behoud me daarbij het recht voor om op elk moment zonder opgaaf van redenen mijn deelname aan dit onderzoek te beëindigen.

Naam deelnemer: …………………………………………………………………..

Datum: …………………………………………………………………………

Handtekening deelnemer: …..………………………………………………………

In te vullen door één van de contactpersonen binnen het LENA-project (teamleider of onderzoeker):

- Ik heb een mondelinge en schriftelijke toelichting gegeven op het onderzoek.
- Ik zal resterende vragen over het onderzoek naar vermogen beantwoorden.
- De deelnemer zal van een eventuele voortijdige beëindiging van deelname aan dit onderzoek geen nadelige gevolgen ondervinden.

Naam: …………………………………………………………………………….

Datum: …………………………………………………………………………

Handtekening: …..……………………………………………………………………..