The ontogenesis of relative clauses in preschool children acquiring Norwegian

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«Da har du problemer, ifølge peanøtthjerneforbundet»

- Joachim Nielsen (1964-2000)

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Summary

The current thesis addresses the acquisition of relative clauses in typically developing, monolingual Norwegian children through spontaneous speech sampling.

Relative clauses are finite subordinate clauses that modify noun phrases. Relative clauses have heads, which can have several syntactic functions in both the matrix clause and the relative clause. Many possibilities of combinations can arise as a virtue of this, and the developmental trajectory of these properties, as well as several others, constitutes the object of study.

The material consists of 56 one hour-long audio recordings of children between 1;0 and 5;6. The first relative clauses appeared in the age category 2;0-2;6.

The purpose of the thesis is to unite applied and theoretical approaches in describing the object of study. The applied framework that was used was LARSP, a clinical tool of diagnosation for children with Specific Language Impairment (SLI). The theoretical framework that was used was the usage-based framework. The intended result of this is a diagnosation tool in the form of a micro-profile, and a contribution to the theoretical discourse on the acquisition of relative clauses.

The micro-profile is a detailed model of acquisition for a specific property. A micro-profile for relative clauses was constructed based on the material.

The results showed that relative clauses develop through chunks and verb-island constructions, from pragmatically useful and propositionally simple to more complex. Thus, relative clauses develop in a manner that is very compatible with the previous research that has been done within the usage-based framework, and similar to that of many other languages that have been studied, but with several important differences. The differences have been accounted for in terms of language-specific properties, for example center-embedding versus right-branching, the difference between relative pronoun and subjunction and the existence and absence of certain grammatical constructions.

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1 Introduction

1.1 The aim of the current thesis

The overarching aim of the current study is to investigate the ontogenesis of relative clauses in typically developing Norwegian children. Relative clauses are complex clauses in the sense that they are finite clauses that post-modify a noun phrase. Furthermore, they have gaps in their internal structure that give their structure a possibility to diverge from canonical clause structure. It is perhaps as a virtue of these properties, and many more, that relative clauses have been a popular subject of research since the 1970's. Despite this, the body of research on relative clauses in Norwegian, acquisition in particular, is very sparse.

The thesis is part of the Norwegian adaption of Language Assessment Remediation Screening Procedure, which is a clinical tool with the purpose of diagnosing children with Specific Language Impairment (SLI). Previous research has found that relative clauses are a particular point of difficulty for children with SLI.

The thesis will attempt to unite the theoretical study of early language acquisition and the applied science of clinical linguistics. As will be explained and justified in due time, this will happen in form of a micro-profile, i.e. a model of acquisition designed to serve clinical purposes.

Furthermore, important aspects of the acquisition of syntax and relative clauses will be tested for Norwegian, with the humble hope of contributing to the cross-linguistic discourse of early language acquisition generally, and relative clauses particularly.

The present author joined the LARSP adaption project in late 2013 together with another MA student. Throughout the spring of 2014, informants were recruited, and the first round of data collection commenced June the same year. To this date, the project has been worked on for one and a half year.

1.2 Outline of the thesis

The thesis is structured as follows: the theoretical framework, namely the usage-based framework, applied in the interpretation of the data material will be presented and elaborated initially, in Chapter 2. Subsequently, Chapter 3, the background chapter, will present the relevant features of Norwegian grammar, discuss the available body of previous research and specify the role of the LARSP framework in the present thesis. Then the research questions will be presented, based on Chapters 2 and 3. Chapter 4 will minutely describe, discuss and justify the methodological design of the study.

The results of the study will be presented in Chapter 5, while Chapter 6 will be occupied with a discussion of the results and answering the research questions.

A short summary of the most important findings of the thesis and ideas for future research will be the purpose of Chapter 7, the thesis' final chapter.

2 Theory

2.1 Introduction

The ultimate purpose of any linguistic theory is to adequately describe every aspect of observed language. This chapter will describe how the theoretical framework applied relates to other frameworks as well as language acquisition in general. It will also give a description of the usage-based framework, which is the theoretical framework applied in this thesis.

2.2 The usage-based framework

2.2.1 Early language acquisition

Early language acquisition is the research area that is occupied with the development of language in the child's pre-school years. Early language acquisition provides psychological, neurological, biological and philosophical approaches in its aim to discover the nature of language acquisition. The main point of divergence in the field is about whether language represents a domain-specific innate capability, i.e. a pre-programmed potential for language.

2.2.2 Cognitive theories

Cognitive theories are domain general in the sense that they do not advocate an innate cognitive skill specialized for language, which so-called domain specific, or generative, theories do. The domain general view claims that language is a consequence of the social nature of humans, which prompts us to learn a language when we are exposed to it. These skills are naturally also innate. It is not a question whether language is innate or not, because it is in both theoretical frameworks. However, in the cognitive grammar tradition, the innate skills are shared with other domains of cognition, while it is not in the domain-specific school of thought.

Another difference between domain-specific (generative) and domain-general (cognitive) theories is their view of grammar and lexicon. In generative theories, grammar is an autonomous formal system. It can be viewed as a set of rules. Consequently, a sharp distinction is drawn between grammar and lexicon. Furthermore, generative theories are also

explicit on how they view language use. They emphasize that the primary object of study is the mental linguistic knowledge of a given speaker. All factors that may affect how the speaker puts this competence to use are irrelevant (Chomsky, 1965, pp. 3-4).

Although there are significant differences between generative and cognitive linguistics, both agree upon facts that had no overwhelming consensus as late as 1960. Before this, the structuralist school dominated linguistics, which had its basis in behavioral psychology. Such a theory describes language acquisition in terms of stimuli-response terminology, in which the acquisition of words is facilitated by positive or negative reinforcement. There is no room for concepts in behavioral psychology, which is present in both domain general and domain specific theories. Consequently, they are termed mentalistic. Behaviorist approaches to language acquisition are of little theoretical significance today.

The specialized language acquisition mechanisms presented in domain-specific theories are replaced with general skills in domain general theories. A crucial component of domain general linguistics is that they are construction-based. What this implies will be elaborated in the following.

2.2.3 A construction-based theory

Constructions

Usage-based theory is part of Langacker's grammatical paradigm (Langacker, 1987) in the sense that it is a construction-based theory. Construction-based theory is a family of theories, the most important tenet of which is that it views linguistic knowledge as a set of interrelated form and meaning-pairings (Diessel, 2004, p. 14). These pairings are called constructions, and the theory considers all grammatical assemblies as constructions. This view is clearly incompatible with generative grammar, in which the language knowledge primarily is a formal system of grammar, which the lexicon feeds into. Constructions can thus be seen as an extension of the saussurean sign, or symbol, (Saussure, 1983 [1917]), because the symbolic units in construction-based grammar are more than words – they refer to all kinds of linguistic assemblies and have interpretations at different levels of abstraction.

Evidence for constructions has been suggested by Goldberg (1995, pp. 152-179), who argued that the meaning of a linguistic structure is not necessarily evoked by the argument structure

of the verb. Consider “She sneezed the napkin off the table”. The clause can be understood the same way that “She dragged the child into the car” and “She forced the ball into the jar”. It is thus not the verb, but rather the more abstract construction “[SUBJ [V OBJ OBL]]”, or “The cause-motion construction” that evokes the interpretation that “X causes Y to move somewhere”. In other words, the interpretation of such sentences as exemplified above is a property of the structure as a whole.

Grammar and lexicon

In generative grammar, grammar is the core, i.e. the domain of regularity, while lexicon represents the periphery, i.e. the domain for irregularity. According to Langacker, this is an inadequate and “ingrained” description of reality (Langacker, 1987, p. 26). As mentioned above, grammar is considered symbolic because all aspects of it are form and meaning-pairings. The only thing that would separate grammar from words then is that grammar consists of two or more elements. However, words can also be complex in this sense. Consider “un+necessary” and “quick+ly”, which are words with derivational morphemes in their internal structure. Consequently, in a construction-based framework, it appears impossible to define a clear-cut boundary between lexicon and grammar. Rather, the elements of language exist on a continuum in construction-based grammar. They are all constructions varying in syntagmatic complexity and abstractness (Diessel, 2004, p. 18).

Syntagmatic complexity

Syntagmatic complexity, which henceforth will only be termed complexity, relates to how many meaningful parts a construction contains. Consider the constructions “very fast” and “I like you”. The first is an adjective phrase, and consists of two meaningful parts (very + fast), while the latter is a transitive clause and involves three meaningful parts (I + like + you). The latter thus has a higher degree of complexity, or is more complex, than the first.

Abstractness

Abstractness on the other hand, relates to what is termed the schematicity of a construction. Schematic constructions are constructions that involve unspecified elements, i.e. “slots” that can be filled by various concrete linguistic expressions. Such an unspecified element may be

subject and preposition. Concrete constructions are constructions that contain specific lexical items.

Consequently, the construction “kick the bucket” (Fillmore, Kay, & O'Connor, 1988, p. 505) is concrete because it contains three lexically specified elements, while the equally syntagmatic complex construction “SUBJECT-VERB-OBJECT” (the transitive clause construction) is abstract, because it doesn’t contain lexically specific elements.

In other words and more generally, a schema is a cognitive unit that consists of one or more unspecified elements. The manifestations of cognitive schemas are called instances. For example, the sentence “I like you” is an instance of the constructional schema “transitive clause”. Furthermore, some constructions are partially filled lexically. For example, “Why don’t you leave” and “I can’t help thinking about it” are instances of the respective schemas “Why don’t you X” and “Y can’t help Z”. They may be characterized as semi-schematic, because they contain both specified and unspecified elements.

In the preceding paragraph, “kick the bucket” was described as a fully specified construction. However, to complicate the matter, it is argued that it is not entirely idiosyncratic. Although the expression cannot be passivized or pluralized (“*the bucket was kicked” and “*kick the buckets”), it can be inflected for tense (“kicked the bucket” and “has kicked the bucket”). The example of “kick the bucket” serves to further illustrate that linguistic constructions exist on a continuum (Diessel, 2004, p. 16).

2.2.4 A usage-based theory

In usage-based grammar, grammar is thought of as the cognitive organization of one’s experience with language (Bybee, 2006). It is a construction-based framework because it acknowledges all linguistic units as constructions, from concrete words to abstract constructional schemas. Its roots stretch back to the typological linguistics of the 1960’s (Bybee, 2013), but Langacker was the one who coined the term “usage-based” (Langacker, 1987, p. 43). Although Langacker’s grammatical theory can be thought of as usage-based, the usage-based approach as it stands today, according to Bybee (2012), covers many more questions and constitutes a complete theory.

The use of language

There are two constitutional assumptions in the usage-based approach that cover respectively the functional and the structural dimension: (i) meaning is use, and (ii) structure emerges from use (Davood Mashhadi, 2012). The first assumption challenges the view that language refers to things, and rather attempts to address how language is used by a given speaker in terms of communicative goals. In other words, the pragmatic aspect of language, that the language serves a certain function in communicating, is emphasized. The second assumption challenges the generative idea of a formal grammar devoid of meaning. It accentuates that performance factors contribute to the molding of the mental grammar (Dabrowska, 2008, p. 931), i.e. the linguistic competence. In other words, it is about how linguistic symbols (the form-meaning-pairings) emerge from the use of language, and the symbols are subject to change through use, (Bybee, 2010, p. 9). This implies that the generative distinction of competence and performance is dissolved in the usage-based grammar.

The cognitive processes that underpin the organization of language in the usage-based framework do not originate from isolated modules in the cognitive architecture. They are general learning mechanisms, whose functions encompass more than language (Bybee, 2006, p. 711).

An exemplar-based theory

The most important idea of exemplar-based theory is that every token of experience is placed in an organizational network, and these tokens are not deleted, but influence the mental representations of constructions (Bybee, 2006, p. 716). A necessary prerequisite for this is the rich memory of which humans are capable. Humans have the general cognitive ability to recognize similarities and differences between all kinds of experience. Therefore, when a token of a given construction is experienced, it strengthens the exemplar if it's identical (Diessel, 2004, p. 23). If it differs in any way, phonetically (form) or semantically (meaning), it is stored near the exemplar, and they together make up an exemplar cluster, i.e. a category like morpheme, phoneme, or grammatical construction. The exemplar is therefore considered to be very complex, because it is sensitive to all facets of the linguistic sign in the input, be it semantic and pragmatic information, phonetic content, social context, or other linguistic context. The idea of an exemplar-based theory is compatible with the assertion that grammar is "the cognitive organization of one's experience with language" (Bybee, 2006, p. 711). In

other words, this cognitive organization is represented in exemplar and schematic generalizations over these exemplars.

Consequently, the strength of the mental representation of a given linguistic construction correlates with its frequency, and grammar is subject to change through use. The effect of frequency is particularly important in the usage-based approach, because it emphasizes the actual use of language, and it differs from domain specific approaches, which consider language use, as opposed to language competence, an uninteresting object of study. In this view, the formal system is static and fixed, on which the use of language has a minimal, or no, effect.

Chunking

When a sequence of experiences occurs together with a certain degree of frequency, the sequence may cease to be combined online for each activation, and start to be cognitively accessed as a single unit (Bybee, 2010, p. 34). This process, i.e. the process of combining repeated sequences of experience, is called chunking. Therefore, sequences that never have been experienced combined do not constitute a chunk. A chunk is a conventionalized instance of constructional schemas, and it may consist of smaller chunks (for examples morphemes or phonetic sequences), resulting in a hierarchical network of chunks. They are cognitive effort-savers in the sense that the instances do not have to be accessed through the schemas, but directly to the chunk.

Although a chunk is stored as one unit, it may still have internal structure (Bybee, 2010, p. 36). Consider for example the relatively frequent expression “Come over here!”. It should indeed be considered a chunk, but it is still an exemplar of the V + AdvP category/ exemplar cluster, and anyone who speaks English would be able to identify the parts it consists of. However, when a given sequence is chunked, it may become increasingly autonomous. Autonomy is a term referring to the two independent measures (i) compositionality, and (ii) analyzability of a chunk. Compositionality refers to whether the meaning of a chunk is a sum of its components (Bybee, 2010, pp. 44-45). Consider “hopeful” and “pull strings”. The meaning of the first one can clearly be interpreted as a function of its constituents, while the latter cannot. Analyzability refers to the degree of which the speaker is able to recognize the individual parts of a chunk. According to Bybee (2010, pp. 46-48), the degree of autonomy is largely determined by the chunk’s frequency.

Therefore, the usage-based theory is highly redundant because it is thought that linguistic information is stored more than once, and a rich mental representation is assumed. This contrasts with the generative framework and Minimalism Program in particular, which is highly economic (Hornstein, Nunes, & Grohmann, 2005, p. 14).

Analogical reasoning

Analogical reasoning, or analogy, is a crucial skill for the usage-based framework. It refers to the mapping of an existing structural pattern onto a novel instance (Bybee, 2010, p. 57). For example, a verb may be categorized as an irregular verb based on its similarity with other irregular verbs. Analogical reasoning has been studied in other domains than language (Bybee, 2010, p. 8; Gentner & Medina, 1998). It is thus a general cognitive skill that is relevant to language. Its relationship to language acquisition will be further elaborated below.

2.3 The usage-based approach to language acquisition

The adoption of usage-based grammar to early language acquisition involves applying the terminology and concepts of usage-based grammar with the purpose of adequately describing the structural linguistic knowledge of a child developing any naturally occurring language.

In the following section, the thinking behind the usage-based view of early language acquisition will be described. It will be related to what has been outlined in the previous sections, in relation to both the generative position and the usage-based position. How the usage-based grammar relates to the acquisition of syntax generally, complex syntax and relative clauses specifically will also be elaborated.

2.3.1 The usage-based parallelism

As mentioned above, the usage-based school of thought can be summarized in two assumptions: (i) meaning is use, and (ii) structure emerges from use (Davood Mashhadi, 2012). In Tomasello's version of usage-based grammar to early language acquisition, he has formulated two general cognitive processes that are essential to the acquisition of language, and they exhibit a parallelism to the two assumptions of the usage-based framework, in the sense that they attempt to describe the emergence of meaning and the emergence of structure. They are termed cultural learning and pattern-finding (Tomasello, 2003, p. 21).

Cultural learning

Around the age of 9 to 12 months, children become social agents in a completely different way than before. They start to understand the intentions of their social interlocutors, i.e. possess a theory of mind. This ultimately leads to what is called cultural imitative learning (Tomasello, 2000a), which is a crucial process in the acquisition of language. Cultural imitative learning refers to a general cognitive skill in which the children imitate their social interlocutors. Tomasello claims that imitation has previously been neglected in the literature, but draws a thick line between what he calls mimicking, i.e. the repetition of what the adult has just said, and cultural imitative learning, imitation in which the child understands the purpose or function of the behavior it is reproducing (Tomasello, 2000a, p. 238). This opens up for a whole other dimension in accordance with the usage-based framework, because the child is imitating and learning the symbolic aspect of language. Tomasello discusses two other cognitive skills which also serve as precursors to cultural learning: joint attentional frames and intention-reading (Tomasello, 2003, p. 21). In the following, they will be presented and succeeded by a more precise elaboration of cultural learning.

The social behavior that the children start to display around this age is not dyadic, i.e. between the child and the interlocutor, in nature, but triadic, i.e. between the child, the interlocutor and an object. The children become able to ground events in a joint attentional frame (Tomasello, 2003, pp. 21-22), i.e. they become able to understand the frames that they and the adult are cooperating within. For example, the child understands that he/she and the adult are playing with the toy car and the teddy bear, and that the diaper and the toy train, which also may be present in the room are not part of the joint engagement frame. In other words, there is an understanding of "what we are doing" (Tomasello, 2003, p. 22).

Children also acquire the skill of understanding that people can have communicative intentions. The child becomes able to understand that other people can have the intention to change the child's attention towards something. In other words, children become aware that other people than themselves are "intentional agents", and that they "intend something toward the intention states of someone else" (Tomasello, 2003, p. 23). As such, understanding communicative intentions is far more than understanding other's intentions: it is the understanding that someone's intention is to alter someone's intentional states.

When the child can establish the joint attentional frame and can grasp the communicational intentions of other people, cultural learning is enabled. As mentioned above, cultural learning is imitation of both sides of the linguistic symbol – the linguistic form and the communicative function. In other words, the child attempts to "reproduce the language that adults produce and for the same communicative reasons" (Tomasello, 2000d, p. 161). Thus, cultural learning is crucial to and facilitates learning of linguistic units.

Furthermore, in order to produce symbolic acts of communication, the child has to understand symbolic units as something intersubjective from both sides of the interaction (Tomasello, 2003, p. 27). This means that if a child simply reproduces an action that an adult did towards it, it would only direct the action against itself. It has to learn what Tomasello (2003, p. 25) terms "role reversal imitation" in order to learn linguistic symbols.

Evidence for cultural learning has been found in Meltzoff (1995) in which 18-months old children attempted to reproduce actions they saw an adult perform, even though the actions were not completed, as well as in a study documenting children attempting to reproduce intentional actions, but not accidental actions (Tomasello, 2000a, p. 238). A child cannot learn to use a linguistic expression properly if it does not grasp the communicative intention behind it. If it doesn't, it would just think that the adult is making noises for no reason - at most establish causal relations between the noise and the event, but that is not considered language, i.e. a linguistic sign (Tomasello, 2003, p. 23).

For these reasons, intention-reading is about the child's ability to comprehend the context of the social situation, the intentions of its conversational peers as well as the symbolic dimension of what is conveyed. For these reasons, intention-reading is one of the two cornerstones of language ontogeny within the usage-based framework. It is a characteristic of the human's social nature, i.e. the motivational force that facilitates and foreshadows language acquisition.

Pattern-finding

An important aspect of acquiring a language for children is figuring out where in running speech the word boundaries are. After all, there are no signals in the input as to where they are. In an experimental study (Saffran, Aslin, & Newport, 1996), it was suggested that children exhibit a remarkable skill in pattern-finding. That is, children are able to extract

recurring patterns from speech. 8 months old children listened to a two minute synthesized speech sample with non-sense words, for example “bidakupadotigolabubidaku” (Saffran et al., 1996, p. 1927). In this sample, some syllable combinations were recurring, for example “golabu”. When the children later were exposed to a sample that contained recurring syllable combinations and a sample that didn’t contain them, they showed a clear preference to listen to the speech sample in which these syllable combinations occurred. This result speaks in favor of children’s ability to segment running speech into recognizable parts of language, namely words, within their first year.

To argue against the idea that children possess a Universal Grammar, one has to argue for the idea that children possess other skills that make language possible to develop. In the usage-based framework, these skills are intention reading and pattern finding.

Item-based acquisition and development of abstract syntax

The language skills that children display are limited. Around the age of one, they utter their first word. After this, they acquire more words until they start combining them into multi-word phrases, for example “more juice” and “daddy’s car”. This development usually takes place around 1;6. Nativists often describe syntactic development in terms of abstract adult categories. A proposal here would for example be that children start using determiners when they start to produce utterances like “a doll” and “the baby”. However, the following sections will advocate that this view is at best misleading, because children do not at all seem to operate with adult categories. In the usage-based framework, early child grammar is thought of as being based on specific linguistic items. Studies of the early development of verbs have been used as evidence for this. The results suggest that children use almost all their verbs in one single sentence frame (Lieven, Pine, & Baldwin, 1997; Tomasello, 1992), that is, verbs that are similar in the target language show divergent syntactic behavior in child language. For example, in Tomasello (1992), verbs with similar semantic content displayed a great deal of variation. The verb ‘cut’ was only used in the sentence frame “cut _” (cut paper, cut dough), while the verb ‘draw’ appeared in more complex frames, such as “draw _ on _” and “draw _ for _”.

Then, to suggest that children at the beginning have abstract categories or schemas such as determiner and verb similar to adult speakers seems unwarranted and unreasonable, because they clearly base their first multi-word competence around specific items, as each item shows

idiosyncratic, non-overlapping properties. In another study, by Lieven et al. (1997), it was found that 2-3 year old children used almost all of their verbs in a single sentence frame. Furthermore, they used the determiners ‘a’ and ‘the’ with completely different nouns. In other words, rather than being members of an abstract category, each construction was in fact isolated to one lexical item. They are thus item-based constructions, and what is called “verb islands” is a special type of item-based constructions. “Island” is a fitting term, because the very first verbs function as isolated islands that are not in any way related to each other. The abstract categories come into being when the child has enough tokens of the category and is able to generalize the pattern to new tokens. Experimental studies have shown that children around the age of 2-3 are not able to apply the transitive pattern to novel verbs, but 3-4 year old children are (Tomasello, 2000d, p. 158). These findings suggest that there is no abstract linguistic knowledge in the most primitive of developmental periods.

From here, the child has to move from item-based constructions to abstract syntactic constructions. According to Tomasello (2003, pp. 144-145) analogy and functionally based distributional analysis are two processes involved in the creating of abstract syntactic constructions.

Analogy refers to recognition of patterns across linguistic units. It is a general cognitive capability, and Gentner and Medina (1998) distinguishes between two kinds of analogy: object similarity and relational similarity. The first refers to the similarity between actual phonetic units, while the latter refer to similarities between relations, or as Gentner and Medina formulates it: “correspond not because of inherent similarity but by virtue of playing like roles in the relational structure” (Gentner & Medina, 1998, p. 266). Gentner & Medina found that adults mostly concentrate on the relational similarity between two elements, while children find object similarity much easier. The case in point is that there holds little or no object similarity between constructional islands, but there is a great deal of relational similarity. Then, the transition from constructional islands to abstract schemas may be related to learning to perceive relational similarities.

Functionally based distributional analysis refers to recognition of linguistic items with similar communicative roles, and the placement of these into the same paradigmatic categories (Tomasello, 2003, p. 145). Thus, ‘pen’ and ‘pencil’ might be members of the same category with the aid of functionally based distributional analysis, because they often appear in the same contexts.

“A phrase that is experienced only once by an adult is likely to have only a minute impact on representation compared to all of the accumulated exemplars already existing. Compare this to a young child whose experience is much more limited: each new token of experience has a greater impact on his/her representations” (Bybee, 2006, p. 717).

2.3.2 The ontogeny of complex syntax

In the context of the above, a warranted question is how item-based learning is related to the acquisition of complex clauses. This will be addressed in the following.

Complex constructions are divided between coordinated constructions (parataxis) and subordinated constructions (hypotaxis). However, this section will be concerned with the development of subordination.

The very first complex constructions of English children appear between the age of 2;0 and 2;6 (Tomasello, 2003, p. 263). They are infinitival complements with the distinct characteristic that they do not have an adult-like set of matrix verbs. 95% of the matrix verbs are either ‘hafta’, ‘wanna’, ‘gonna’ or ‘gotta’. During the next four months, the other kinds of complex constructions emerge, however not until after 3;0 do the matrix verbs get more diverse.

The main hypothesis proposed by Diessel (2004) is that the most primitive of complex utterances do not resemble those adults produce, in the sense that the children’s matrix clauses are concrete lexical markers whose function is more like an epistemic marker or marker of illocutionary force (Diessel, 2004, p. 180). They are primarily an imitation of their communicative function, with no internal structure. They are item based the same way that words are, providing a frame for the rest of the utterance. Consequently, the abstract constructional schemas for subordinate clauses emerge with the same means as with the categories discussed above. A sufficiently high number of tokens must be gathered before they can be generalized upon and categorized, i.e. put in an exemplar cluster.

Bybee states that children may acquire unanalyzed pieces of languages, i.e. chunks, which gradually will lose autonomy as its analyzability increases, and ultimately become constructional schemas of their own (Bybee, 2010, p. 35). This may hold for complex clauses as well.

2.3.3 Five fundamental hypotheses to the acquisition of relative clauses

Fundamentally, five hypotheses attempting to explain how children interpret relative clauses have been proposed (Diessel, 2004, pp. 117-118). A short introduction to each of them follows below.

The non-interruption hypothesis

The non-interruption hypothesis was first formulated by Slobin (Slobin, 1973). It assumes that children have problems with external subject relative clause constructions because the matrix clause is center-embedded and thus interrupts the matrix clause.

(1)

The boy **who is eating** is sick	(Center-embedded)
I tend to the boy **who is sick**	(Right-branched)

In other words, discontinuity is assumed to be hard for children to process. Processing discontinuous elements involve holding incomplete linguistic information in working memory while constructing or interpreting intervening elements. The acquisition of right-branched constructions is thus hypothesized to precede center-embedded constructions.

The filler-gap hypothesis

The filler-gap hypothesis (Wanner & Maratsos, 1978) states that the distance between the filler (the head of the relative clause) and the gap (the empty slot which is coreferent with the head) is the variable accountable for the difficulty children display in the comprehension and production of object relative clauses (Diessel, 2004, p. 119). Undisputedly, there is a greater distance between filler and gap in internal object relative clauses than internal subject relative clauses.

(2)

I tend to the boy [that _ is sick]
I like the car [that I bought _]

This, like the non-interruption hypothesis, is an explanation based on processing limitations. The occurrence of resumptive pronouns has been used as evidence for the filler-gap

hypothesis, as there seems to be a correlation between distance between filler and gap, and the use of resumptive pronouns (Diessel, 2004, p. 121).

The NVN-schema hypothesis

The NVN-schema hypothesis was first proposed by Bever (1970). It assumes that English-speaking children develop a sentence schema that is based on a basic transitive clause, for example NP V NP. This form is linked with a specific meaning, something like "Actor Verb Undergoer".

The theory seeks to explain why internal object relative clauses have a low frequency in the earliest relative clauses. The main axiom of the theory is that children generalize the NVN structure to relative clauses as well. Internal subject relative clauses have the transitive clause structure NP V NP (Actor-Verb-Undergoer), but internal object relative clauses have the structure NP NP V (Undergoer-Actor-Verb).

(3)

NP V NP (Internal subject relative clause)

Here is [the girl] who [plays] [cards]

NP NP V (Internal object relative clause)

Here is [the car] that [the boy] [drives]

The unfamiliarity with this latter word order is what is supposed to be challenging for children acquiring English relative clauses, according to the NVN-schema hypothesis.

The parallel-function hypothesis

The parallel-function hypothesis is proposed by Sheldon (1974). It states that children have less problems with relative constructions where the internal and external syntactic functions are the same. This means that sentences such as "The boy who drives is kind" (The head of relative clause is the **subject** in matrix clause and the gap is **subject** in relative clause) and "The boy eats the apple that the girl found" (Relative clause head is the **object** in matrix clause and gap is **object** of relative clause) should be easy to interpret. On the other hand, "The boy the girl likes is kind" and "Here is the doll that has a dress" should be hard. The theory was supported by results from an experiment in which comprehension of relative clauses was tested (Sheldon, 1974).

The conjoined clause hypothesis

The conjoined-clause hypothesis is based on an observation by Tavakolian (1977), which revealed a pattern in which children performed considerably better on relative clauses where the actor of the matrix clause also was the actor in the relative clause.

(4)

The cat that ate the mouse sleeps on the table

This pattern suggested that children view sentences with relative clauses as conjoined clauses, similar to “the cat ate the mice, and _ sits on the table”. Any missing noun is assumed to be co-referential with the subject of the first clause.

2.4 Discussion

In this chapter, the usage-based framework has been outlined and placed in context with competing grammatical models, complex clauses and relative clauses. This will in the following be placed in the context of the current thesis.

The usage-based theory makes two assumptions about the primordial relative clauses. It assumes that (i) the earliest complex constructions are lexically specific constructions, and (ii) that only after a certain amount of time do these lexically specific constructions start to display a more diverse set of matrix verbs. As will be elaborated in the chapter about previous research, the first assumption holds for relative clauses in many languages as well as English, and constitutes an important characteristic of the earliest relative clauses. However, very few studies investigate children over a large age continuum (except German that will be discussed in the chapter of previous research), and the second assumption about development of a rich matrix verb repertoire has not been strengthened much. Some of the studies that will be discussed do investigate older children but they either don’t discuss the issue (Andersson & Richthoff, 1991), or don’t investigate relative clauses from children under 3 years in conjunction (Simonsen, 1983). It is thus impossible to assert whether the diverse set, or rich repertoire, of matrix verbs represents a real development, or just is a language-specific property.

The present study investigates children from 1;0 through 5;6 in a combination of a cross-sectional and developmental design. Therefore, it is possible to investigate the development of

the constructional schemas of relative clauses. According to the usage-based paradigm, (i) the earliest relative clause constructions should occur with very few matrix clause verbs, and (ii) this repertoire should increase with age. This development would then represent the emergence of a constructional schema for relative clauses.

The five different hypotheses concerning relative clauses outlined above make assumptions about the development of relative clauses. According to the Non-interruption hypothesis (Slobin, 1973), discontinuous clauses are a problem for the children acquiring relative clauses. This would then imply that (i) external subject relative clauses in its canonical form will emerge late, because they interrupt the matrix clause, and (ii) the first subject relative clauses will either not be center-embedded, or include a resumptive element.

Both the filler-gap hypothesis (Wanner & Maratsos, 1978) and the NVN-schema hypothesis (Bever, 1970) assume that internal subject relative clauses appear before internal object relative clauses. Because there is a correspondence between core argument structure in main clauses and subordinate clauses, it is difficult to strengthen or weaken only one of these. In other words, if NNV-schemas prove to be difficult, one cannot rule out the possibility that it is the distance between the filler and gap that is difficult.

The conjoined clause hypothesis (Tavakolian, 1977) assumes that the emerging relative clause constructions are interpreted as coordinated clauses, i.e. that relative clauses are main clauses. This can be tested by investigating grammatical differences between main clauses and subordinate clauses, to be described in Chapter 3.1.1, and comparing these with other subordinate clauses.

Finally, the parallel function hypothesis (Sheldon, 1974) is also within reach of testing in the current study. According to this hypothesis there should be a preference for matching between external and internal functions, i.e. external subject should occur more often together with internal subject than internal object, and external object should occur more with internal object than internal subject should.

3 Background

3.1 The grammar of Norwegian relative clauses

Norwegian is a North-Germanic language mainly spoken in Norway, with approximately 5 million native speakers. The language has much dialectal variation in all domains of the language. The variety referred to as Norwegian in the present thesis will be the variety spoken in and around the capital Oslo.

3.1.1 Main clauses and subordinate clauses

In Norwegian, there are important grammatical differences between matrix clauses and subordinate clauses. An elaboration is therefore warranted.

Main clauses

An important property of Norwegian syntax, which is also shared with neighboring languages, is the verb-second rule, which means that the finite verb occupies the second syntactic constituent slot. This goes for all kinds of constructions, with the exception of questions without question words and imperative sentences.

(1)

Forrige	uke	solgte	de	motorsagen
last	week	sell-PRET	3PL	chainsaw-DEF

‘Last week they sold the chainsaw’ (lit: ‘last week sold they the chainsaw’)

(2)

Solgte	de	motorsagen	forrige	uke?
sell-PRET	3PL	chainsaw-DEF	last	week

‘Did they sell the chainsaw last week’?

In questions without question words, as in (2), the finite verb functions as the first element of the clause. However, in wh-questions, verb second word order applies, with the question word preceding all other clause constituent, identical to English. However, this is different in the

northern dialects of Norwegian (see Westergaard (2009) for an elaboration on both structure and development). In the imperative mood, only sentence adverbials can precede the verb.

The different types of subordinate clauses in Norwegian

Norwegian has many types of subordinate clauses: infinitive clauses, nominal complement clauses, adverbial clauses, and relative clauses.

Norwegian infinitive clauses are very similar to English infinitive clauses. They are introduced by a subjunction (*å* 'to'), and their main verb is inflected for infinitive. They function as a verb complement or adjunct. Furthermore, they have no explicit subject, but a subject can usually be interpreted from the matrix clause (Faarlund, Lie, & Vannebo, 1997, p. 998).

Secondly, nominal complement clauses in Norwegian are finite subordinate clauses introduced by the subjunction *at* 'that'. They function as arguments of the verb, as in English.

Like in English, Norwegian adverbial clauses function as non-obligatory adverbials in the matrix clause, and are introduced by an adverbial subjunction such as *hvis* 'if', *når* 'when' or *så* 'so'.

The grammar of relative clauses will be dealt with in detail in its own section below.

Syntax of Norwegian subordinate clauses

There is one important and defining property of Norwegian subordinate clauses: Sentence adverbials such as *ikke* 'not', *aldri* 'never', and *alltid* 'always' precede the verb. This is different than in declarative and interrogative main clauses, in which sentence adverbials succeed the verb (Faarlund et al., 1997, pp. 890-892). This is illustrated below using the sentence adverbial *ikke* 'not' (the finite verb is in bold). The main clause word order is illustrated in (3), while the subordinate clause word order is illustrated in (4).

(3)

det **går** ikke
it works NEG
'It doesn't work'

(4)

at	det	ikke	**går**
SUBJ.	it	NEG	works

'that it doesn't work'

3.1.2 Relative clauses

A universal definition

Dixon describes the canonical relative clause construction cross-linguistically with four defining characteristics (Dixon, 2010, p. 314): (i) The relative clause construction involves a matrix clause and a subordinate clause. Diessel calls the structure of the matrix clause external syntax (2004, p. 131), while the internal structure of the subordinate clause is called internal syntax (p. 136). The term "relative clause construction" refers to the matrix clause plus the relative clause. This terminology has already been and will be adapted in the present thesis. (ii) The matrix clause and the relative clause share an argument. Diessel calls this the head of the relative clause (2004, p. 117), which it will be called here. (iii) The relative clause modifies the head of the relative clause, by either focusing or restricting. A focusing relative clause provides new information about the head, and it is often called a non-restrictive relative clause, e.g. "The children, who are very small, need attention". A restrictive relative clause on the other hand, restricts or delimits the reference of the head, for example, "I thanked the friends who came". (iv) A relative clause has the basic structure of a clause, with a predicate and its arguments.

The structure of Norwegian relative clauses

The canonical structure of the Norwegian relative clause construction is similar to that of English. The nominal head is followed by a grammatical element, which is followed by a relative clause.

One important difference in the Norwegian relative clause construction is the grammatical element. In Norwegian, relative clauses are only introduced by the subjunction *som*, which carries no inflection (Faarlund et al., 1997, p. 1054). This differs from English and German, which have several complementizers carrying inflections of humanness and restrictivity

(English) and case and number (German). The structure of the head of the relative clause plus the relative clause is described as follows:

(1)

[HEAD]	[SUBJUNCTION]	[RELATIVE CLAUSE]		
Mannen	som	kjører	bil	natten lang
man-DEF	SUBJ.	drive-PRES	car	all-night-long

"The man who drives a car all night long"

External syntax

External syntax refers to the matrix clause function of the relative clause head. Languages differ in the possibilities of this respect (Dixon, 2010, p. 321). Norwegian relative clauses can function as subject, direct object, indirect object and oblique in the matrix clause, or they can stand alone as an isolated noun phrase. The realization of subject and object is fairly straightforward, and identical to that of English. The oblique function manifests itself as complement of a prepositional phrase. See below:

(2)

Jeg	har	flyttet	til	en	leilighet	som	har	veranda
1SG	have-PRES	move-PRET	to	ART.	apartment	SUBJ.	have-PRES	porch

'I have moved to an apartment that has a porch'

Excluded from the definition of external oblique relative clauses are subordinate clauses that are headed by an adverbial, i.e. *når* 'when' or *there* 'der'. Although these include a gap in their structure, they are described as implicative adverbial subordinate clauses (Faarlund et al., 1997, p. 1050), not as relative clauses, which are also implicative.

Internal syntax

Furthermore, the relative clause contains a gap in the clause structure, and this gap is co-referential with the head of the relative clause. For example, if the gap is where the subject should be, this implies the internal function of the head of the relative clause is the subject, yielding the structure HEAD *som* VERB OBJECT. On the other hand, if the head of a transitive relative clause refers to the object, the structure is "HEAD *som* SUBJECT VERB".

The Accessibility Hierarchy by Keenan and Comrie (1977, p. 66) is a typological claim about which internal functions a given language is able to relativize:

Subject > Direct object > Indirect object > Oblique > Genitive > OCOMP

First, object of comparison (OCOMP) is not investigated in the present study. Second, the internal genitive relative clause is no longer used in spoken Norwegian. Therefore, four syntactic functions can be relativized in Norwegian. Consider the following examples, in which the gaps are marked with an underscore to stress the canonical syntactic placement of the clause elements.

(3) Sara (4;0:27) (Subject)

Noe som _ flyr

Something SUBJ. GAP flies

'Something that flies'

(4) Markus (2;8:6) (Direct Object)

Løve som jeg får _

Lion SUBJ. I get GAP

'Lion that I get'

(5) Thea (3;2:5) (Prepositional complement)

Andunger som jeg kan gi mat til _

Ducklings SUBJ. 1SG can:PRES give:INF food to GAP

'Ducklings that I can give food to'

(6) (Indirect object)

Andunger som jeg kan gi mat _

Ducklings SUBJ. 1SG can:PRES give:INF food GAP

'Ducklings that I can give food'

As shown in (6), indirect objects are available to dative alternation, i.e. alternation between indirect object and oblique prepositional phrases. According to the present author's own intuition, the indirect object is most often dative-alternated to a prepositional phrase when relativized, exactly as in the Thea's example in (5) and (6) above.

Furthermore, the subjunction is only obligatory if the subject is relativized, because it is formally identical to a declarative clause without it. Otherwise, it is optional.

(7)

*Mannen kjører bil
man-DEF drive-PRES car
'*The man who drives a car'
'The man drives a car'

(8)

Bilen mannen kjører
car-DEF man-DEF drive-PRES
'The car that the man drives'

3.1.3 Interrogative relative clauses

Interrogative relative clauses are relative clauses whose head is a question word corresponding to English wh-words. Interrogative relative clauses are used to convey non-specificity and are sometimes called embedded questions (Westergaard, 2009).

(1)

Jeg vet ikke hva jeg skal gjøre
I know not what I shall do
'I don't know what to do'

(2)

Jeg vet hvem som gjorde det
I know who SUBJ. did it
'I know who did it'

The five interrogative pronouns in Norwegian are *hva* 'what', *hvem* 'who', *hvor* 'where', *hvilke* 'which' and *hvordan* 'how'.

Westergaard (2009) investigates the acquisition of these kind of constructions, but never refers to them as relative constructions, because the standard analysis of these constructions does not view interrogative relative clauses as relative clauses, but as "embedded questions"

(Westergaard, 2009). Thus, the question pronoun is not considered a head. The clause in itself is considered to reflect canonical word order in regular interrogative clauses. However, they differ from questions in the sense that they are non-inverted: the question pronoun appears at the start of the clause, but the V2 rule is not preserved. In the first example above, the verb is the third clause element, preceded by the question pronoun and the subject.

However, in the present thesis, their similarity to relative clauses is acknowledged, on the grounds that they (i) are finite subordinate clauses, (ii) include a gap, i.e. are implicative, and (iii) can take the complementizer *som* in almost the same context as regular relative clauses: where the subjunction may be omitted in regular relative clauses, it must be omitted in interrogative relative clauses (Faarlund et al., 1997, p. 1058).

(3)

*Jeg	vet	ikke	hva	som	du	gjorde
I	know	not	what	SUBJ.	you	did

'I don't know what you did'

Because of these similarities, their developmental trajectory will be investigated and compared to that of regular relative clauses.

3.1.4 Cleft sentences

As in English, the cleft sentence in Norwegian is not considered a relative clause per se, although it shares many properties with relative clauses.

The matrix clause of a cleft sentence contains a dummy subject formally identical to the subject in presentational clauses, followed by the copula verb *være* 'to be' and the focused element, which is a relative clause. The structure is illustrated, exemplified and translated below.

(1)

Det	COPULA	[RELATIVE CLAUSE]
Det	var	Tom som begynte
It	was	Tom who started

"It was Tom who started"

Syntactically, cleft sentences are very similar to relative clause constructions. They involve a head, a finite subordinate verb, a relative subjunction and a gap. The gap may correspond to the same syntactic functions as in regular relative clauses. However, pragmatically, they function very differently. In a cleft sentence, the relative clause is the focus of the sentence: It is emphasized, and may represent new discourse information (Faarlund et al., 1997, p. 1089). This is not the case for relative clauses. However, to make the current study comparable with other observational studies, which will be discussed in Chapter 3.2, the similarities of the cleft sentence construction to the relative clause construction will be acknowledged, and the cleft sentence will be counted as a relative clause construction.

3.1.5 Related constructions

Sentences of comparison are also formally similar to relative clauses.

(1)

Den	løper	like	raskt	som	du	kjører
3SG	runs	as	fast	SUBJ.	you	drive

'It runs as fast as you drive'

Although they involve the relative subjunction *som* and a gap, they do not have a nominal head. The head is adjectival, and the communicate function of the structure is to compare two entities X and Y in terms of property Z. Furthermore, the verb in the second clause may be omitted if it is the same verb as in the first clause.

Jeg	løper	like	raskt	som	pappa	(løper)
1SG	run-PRES	as	quick	SUBJ.	dad	(run-PRES)

'I run as fast as daddy (runs)'

Consequently, very specific rules apply to comparison constructions. Therefore, although they share many properties with relative clauses, they will not be considered a sub-type of relative clauses in this thesis.

Another related construction appears when an infinitive construction functions as a post-modifier in a noun phrase. The structure is very similar to that of English.

(2)

Noe	å	tenke på _
Something	SUBJ.	think about _

"Something to think about"

These constructions have in common with relative clauses that they have a nominal head and a gap in a subordinate clause. The gap is always the object of the internal verb. However, since they have the form of an infinitive clause, making them a non-finite clause, and not a relative clause, they will not be considered a sub-type of relative clauses in this thesis.

3.1.6 Discussion

In this sub-chapter, the different characteristics of subordinate clauses generally and relative clauses specifically have been described. In this process, several sub-types of relative clauses have been identified, while some seemingly related constructions have been excluded from the definition. As will be discussed in the previous research section, extracting relative clauses with a copular matrix verb may also be fruitful.

For the purpose of this thesis, the family of Norwegian relative clauses consists of both regular relative clauses, interrogative relative clauses and cleft sentences. All of these types of relative clauses can have the same syntactic functions as gaps and their subjunction can be omitted under the same conditions. The identification of these sub-types as well as the general characteristics of subordinate clauses will constitute the basis for the coding procedure, which again will form the basis for the analysis of the material. The purpose of the study is to uncover the aspects of the Norwegian language that are relevant to acquisition of relative clauses. Hopefully, this will be even clearer in the following chapters and sub-chapters leading up to the results and discussion.

3.2 Specific language impairment and LARSP

3.2.1 Introduction

This section will review the relevant body of research done on the acquisition of relative clauses. Research from related languages, neighboring languages and Norwegian will be reviewed.

The acquisition of relative clauses has been a field of debate for thirty years. However, most research done on the acquisition of relative clauses differs in several respects from the present study. First, it has been devoted to comprehension (Andersen, 2001; Brown, 1971; Kidd & Bavin, 2002; Tavakolian, 1977), and secondly, partly as a consequence of this, much of the methodology applied is experimental. At any rate, the accumulated knowledge has given linguists a broad understanding of relative clauses, which will be made explicit through the present section.

Keenan and Comrie's Noun Accessibility Hierarchy (1977)

Keenan and Comrie formulated an implicational hierarchy about possible internal functions of a given language, based on data from around 50 languages, which they termed "the Accessibility Hierarchy". It is implicational in the sense that if function X can be an internal function, then Y can be also be an internal function. The hierarchy is relevant to the language acquisition because it makes statements about which functions that universally and cross-linguistically are easier than others are, and this might be reflected in the order and ease of acquisition in children. The hierarchy is as follows (Keenan & Comrie, 1977, p. 66):

Subject > Direct Object > Indirect Object > Oblique > Genitive > Object of Comparison

Diessel (2004)

Diessel (2004) examined five English children in the age span 1;9 to 5;2 (this paper was an elaboration of Diessel and Tomasello (2000)). His material consisted of 305 relative clauses from the CHILDES database, of which 178 came from one single child. The relative clauses were coded for (i) external syntax, (ii) internal syntax, (iii) the valence of the internal verb, and (iv) complementizer omission (Diessel, 2004, p. 130). Several discoveries were made. One of their main discoveries was the early preference of Presentational Nominal relative clause constructions and isolated NPs, such as below:

(1)
Here is a tiger that's gonna scare him
The girl that dances

The first example is a Presentational Nominal (PN) construction because its function is to present something. The second construction is an isolated Noun Phrase (NP).

In the first age category (2;0-3;0), 84.2% of the matrix clauses were Presentational Nominals (PN), while 10.6% of the relative constructions were NPs (Diessel, 2004, p. 193), together making up 94.8% of the material. The proportions decreased some throughout the sample, and in the last age category, only 36.6% of the relative clause constructions were PN constructions, and 27.2% were NP constructions. Diessel, following Diessel and Tomasello (2000), explained the high frequency of NP and PN in terms of (i) pragmatic usefulness and (ii) propositional simplicity.

Pragmatic usefulness refers to the fact that children and their interlocutors often talk about things in their immediate surroundings. The PN and NP external relative functions serve to focus the hearer's attention on these elements. Furthermore, the authors noted that the communicative function of the PN relative constructions resemble that of simple clauses, in the sense that the content of the relative clauses is "asserted rather than presupposed as in restrictive relative constructions" (Diessel, 2004, p. 144). According to Diessel, this function facilitates acquisition of relative clauses, as pragmatically presupposed information tends to be ignored by children. Furthermore, Diessel notes that matrix verbs to be used in relative clause constructions after the copula verb, such as *look*, also serve the function to focus attention. Thus, pragmatic motivations seem to facilitate learning of the relative clause constructions.

Their second point, propositional simplicity, refers to the fact that the first relative clause constructions only carry one proposition, either by having a propositionally empty matrix clause, as PN relative clause constructions, or no matrix clause at all, as NP relative clause constructions. The propositional simplicity makes the relative clauses easier to process. Consequently, the PN and NP relative clauses differ qualitatively from external subject and object relative clauses in the sense that the latter contain two propositions while the first contain only one – namely the one coming about in the relative clause.

Moving to the internal syntax of relative clauses, Diessel observed that subject relative clauses were characteristic of primitive relative clauses, accounting for 57.3% of all the relative clauses in total and 80.4% of relative clauses in the first age category (2;0-3;0). Not until the last stage recorded in the survey did object relative clauses surpass subject relative clauses in proportion. Relative clauses with an oblique gap remained infrequent throughout the time span. Furthermore, 57.9% of the mother's relative clauses contained an object gap. In other words, input did not offer any explanation of the children's preference for subject gaps

in the earliest material. Diessel thus proposed that the cause of these results is the resemblance of subject relative clauses to simple sentences, thus supporting the NVN-schema hypothesis, which was described in Chapter 2.3.3. In a subsequent experimental study by Diessel and Tomasello (2005), the children had more difficulties with internal objective and oblique relative clauses than subject relative clauses. Furthermore, the children often converted object and oblique clauses, which are NP NP V clauses, to subject relative clauses, which are NP V NP clauses. This supported Diessel's interpretation above.

Furthermore, the transitivity of the verb also proved to be significant variable, as 72.7% of the relative clause verbs in total were intransitive. 92.5 percent of the first 10 relative clause verbs were also intransitive. Diessel proposed that this variance might be due to (i) that transitive clauses are more complex, or (ii) that intransitive internal subject relative clauses function to characterize the head noun, while transitive internal subject relative clauses anchor the complex sentence in the discourse. Because very young children do not use advanced discourse structures, intransitive clauses are more frequent (Diessel, 2004, p. 147).

Finally, it was found that the earliest relative clause constructions very often were of the kind as below:

(2)

That's the doggy turn around (Nina 1;11)

These constructions, with their absence of complementizer, were considered to be precursors to PN relative clause constructions. They were called amalgam constructions because the copular clause is conflated with a verb phrase (Diessel, 2004, p. 144).

Brandt, Tomasello, and Diessel (2008)

In the second observational study, Brandt, Diessel and Tomasello (2008) conducted a case study of a German child, from the age 2;0 until 5;0. The data was coded for external and internal syntax, and the results were compared with the results from Diessel and Tomasello (2000), and Diessel (2004).

In the external syntax, they found that, as in the English study, the child's relative clause constructions were mostly propositionally simple. More than half of all the relative clauses, and over 80% of the earliest, were of this kind. However, while most of the relative clauses

were attached to a predicate nominal in the English study, most relative clauses in the German study were attached to an isolated noun phrase. Despite this, the main conclusion from (Diessel, 2004), that the most primitive of relative clauses are propositionally simple, still stood.

Another divergence between the two studies was that external subject clauses had a much larger proportion in the German study, accounting for 4.11% of the relative clause constructions, while the proportion in Diessel (2004) was only 0.7%. The authors proposed that this is because external subject relative constructions do not necessarily entail center-embedding in German. According to the non-interruption hypothesis described in Chapter 2.3.3 above, center-embedding is more difficult to process since it interrupts the matrix clause. The matrix clause must then be stored in the parser while constructing the relative clause. However, German has a more flexible word order, and external subject constructions might as well be right-branched. And indeed, only 12.5% of the child's external subject constructions were center-embedded, the rest being right-branched, just like English external object constructions.

Another explanation, following Limber (1973), is that a subject in English is often a topical element, thus not needing modification by a relative clause. On the other hand, subjects in German are less topical. The authors adds that subjects in German are only topical if they precede other clause participants, and this might affect how children use external subject relative clauses (Brandt et al., 2008, p. 338).

In the internal syntax, as in the above English study, the internal subject relative clauses dominated from the start. However, in contrast with (Diessel, 2004), the internal subject relative clauses remained dominant throughout development. There was also a certain development of oblique relative clauses (Mean: 17.5%). Indirect object and genitive relative clauses were non-occurring. The authors leaned on the NVN-schema hypothesis to explain the results: the internal subject relative clauses involve the same word order as simple main clauses. Furthermore, although the proportion of internal intransitive relative verbs decreases, they remain dominant. This was also found in the English study.

Simonsen (1983)

Simonsen investigated her son acquiring Norwegian's spontaneous speech between the age of 4;9 and 5;0. The material consisted of 48 relative clauses, which she based her analysis on. She coded her data for the variables external and internal syntax, and to which degree her son omitted the subjunction.

Of these 48 relative clause constructions, Simonsen reports 11 external predicative relative clauses, but excludes cleft sentences and presentational clauses from the category of relative clauses. Thus, this number does not correspond to PN relative clause constructions as described in Diessel (2004) and Brandt et al. (2008). Consequently, this number is probably higher when including these. She also found 17 external object relative clauses and 7 external subject relative clauses. Although Simonsen's classification differs somewhat from the English study above, the proportions are very similar.

Moving to the internal syntax of the relative clauses, the child had 23 subject gaps, 18 object gaps and 3 prepositional complement gaps. This also conforms to the studies discussed above (Brandt et al., 2008; Diessel & Tomasello, 2000, 2005), which all conclude that subject gaps are the most frequent in children's early relative clauses, although its proportion steadily decreases with age.

Andersson and Richthoff (1991)

Andersson and Richtoff investigated the development of relative clauses in a case study of a child acquiring Swedish using observational data. Swedish is a Scandinavian language sharing many of the grammatical properties with Norwegian. The child's age range was from 1;11 to 3;10. The material was divided into three periods: (i) 1;10 to 2;1, (ii) 2;2 to 2;7 and (iii) 2;8-3;11. The material consisted of 135 relative clauses in total.

Four fundamental observations were made. First, much like the investigations discussed so far, internal subject gaps are much more frequent than object gaps. This is also the case for this study. They also note that the absence of indirect object gaps does not conform to Keenan and Comrie's accessibility hierarchy, since several oblique gaps, which are lower on the hierarchy, were present in the material. Furthermore, secondly, external subject relatives are much less frequent than that of object. This harmonizes with results from previous studies. Third, conforming to the English and German studies, propositionally simple sentences

dominate over propositionally complex sentences in all three age groups. In the first period, there were only propositionally simple relative constructions, in the second the distribution was 21 propositionally simple and 10 propositionally complex, while in the third it was 36 and 14. That the propositionally simple constructions are more dominant in the third period than in the second diverges from the above-mentioned studies of English and German. Fourth, they note that the acquisition of relative clauses in Swedish is also characterized by a U-shaped learning curve, in which the isolated NP-relative appears in the first period, disappears in the second, and reappears in the third. The distribution for the three periods respectively was 11, 0 and 5. In other words, the construction is completely absent in the second period. However, the material of the first period consists of many echo utterances and sentences ambiguous between simple clauses and relative clauses. This factor might be relevant to the current author's discoveries.

Westergaard (2009)

In an article from 2009, Westergaard discusses interrogative relative constructions in three children acquiring a northern dialect of Norwegian between the ages of 1;8 and 3;3. Her material consists of almost 47 000 utterances, which yielded 108 interrogative relative constructions. Westergaard does not label these as relative clauses but as "embedded interrogative clauses". Westergaard noted that the children only used three different matrix clause verbs, *se* "look", *vite* "know", and *vise* "show". Diessel and Tomasello (2001) have found similar results for nominal complements. Furthermore, no children inverted the clauses, suggesting that they are not mentally represented as questions, but are chunks of their own (Westergaard, 2009, p. 1036). This suggested that the standard analysis of the construction, i.e. as a kind of question, does not have a psychological reality.

Experimental studies

The experimental body of research on relative clauses has often focused on the difference between internal subject and object functions. The main conclusion drawn from these studies is that there is an asymmetry between internal subject relative clauses and internal object relative clauses in both comprehension and production. This asymmetry has been found for Danish (de Lopez, Olsen, & Chondrogianni, 2014), Swedish (Håkansson & Hansson, 2000), Hebrew (Novogrodsky, Friedmann, & Novogrodsky, 2006), English (Diessel & Tomasello,

2005). To explain the asymmetry, the NVN schema hypothesis and the filler-gap hypothesis have been proposed. However, Kidd, Brandt, Lieven, and Tomasello (2007) provided evidence that when 3-4 year old German and English children are exposed to the internal object relative clauses that resemble input, i.e. with an inanimate head noun and a pronominal internal subject, the difference between the two kinds is dissolved. A similar result has been found in (de Lopez et al., 2014), in which relative clauses where the two arguments could be reversed (the grandmother kisses the girl → the girl kissed the grandmother) were found to be more difficult than irreversible (the cow eats grass → ?grass eats cow). This reasoning is in line with Goodluck and Tavakolian (1982), who claim that processing, pragmatics and grammatical competence are the three areas that may restrict the performance on relative clauses. Kidd et al. (2007) and de Lopez et al. (2014) stressed the importance of processing. Andersen (2001) examined the comprehension of various clause structures of 4 and 6 year old Norwegian children and also found the preference for internal subject to internal object.

Furthermore, many investigations have suggested a modality difference, i.e. that comprehension is superior to production. Håkansson and Hansson (2000) investigated 10 Swedish children aged 3;1 to 3;7 twice with a six month interval. They found no differences in the modalities in Time 1, but a better performance in comprehension in Time 2. de Lopez et al. (2014) found that their 4;0-6;5 Danish subjects had reached the ceiling in the production and comprehension of internal subject relative clauses, but performed considerably better on comprehension of internal object relative clauses than that of production.

3.2.2 Discussion

In this section, the literature that this thesis can relate to has been reviewed - namely observational studies of production. A selection of experimental studies has also been discussed.

The literature agrees upon two aspects of the acquisition of relative clauses: (i) Internal subject relative clauses are much more frequent than object relative clauses and oblique relative clauses, (ii) external object relative clauses are much more frequent than subject relative clauses. These cross-linguistic tendencies are explained using both pragmatic, grammatical and processing accounts.

Westergaard (2009) found that her informants did not represent interrogative relative clauses (or 'embedded questions') as wh-questions. They were chunks of their own, and were not related to wh-questions in general. From this arises the question if these clauses are represented as relative clauses.

Furthermore, several studies have found that the Presentational Nominal relative clause, i.e. relative clause constructions with a copular matrix verb, is a relevant category when investigating the acquisition of relative clauses (Brandt et al., 2008; Diessel, 2004; Diessel & Tomasello, 2005; Tomasello, 2000d). The category brings pragmatic considerations into play, in the sense that the construction has more pragmatic content than propositional content, as explained above.

Based on the previous research section, the following hypotheses about the developmental trajectory of Norwegian relative clauses can be formulated:

(i) They are propositionally simple, gradually becoming more and more complex.

(ii) Right-branching structures such as external PN, NP and O relative clause constructions appear before the center-embedding structure S.

(iii) Internal subject relative clauses emerge before internal object relative clauses.

(iv) The first internal verbs are chiefly intransitive, gradually becoming more transitive.

(v) The head of internal object relative clauses are often inanimate, and the internal subject is often pronominal.

These characteristics constitute discrete, testable and rich predictions on the developmental trajectory of relative clauses.

Furthermore, the oldest children of the English study (but not the German study) produced more internal object relative clauses than subject relative clauses. The question is then if Norwegian resembles English or German more in this respect, and why. Language-specific differences should account for the difference.

3.3 Specific language impairment and LARSP

3.3.1 Introduction

This sub-chapter addresses the nature of Specific Language Impairment (SLI) and attempts to place it in the context of relative clauses and Norwegian. General characteristics of SLI will be described first, succeeded by a description of previous research in the field of relative clauses in children with SLI and Norwegian children with SLI. Subsequently, a section about the LARSP profile will follow. To conclude the chapter, a description of LARSP and an explanation of how it should be applied in the current study, will follow.

3.3.2 Specific language impairment

Specific Language Impairment (SLI) is a deficit in language ability that cannot be attributed to other deficits, such as hearing loss, neurological damage or low nonverbal intelligence (Leonard, 2014, p. 3). It is assumed that approximately 7% of the population suffer from Specific Language Impairment (Leonard, 2014, p. 3). Although research on SLI has focused on children in the preschool years, the symptoms are observable into adulthood, if they remain untreated (Catts, Adlof, Hogan, & Weismer, 2005; Fujiki, Brinton, Isaacson, & Summers, 2001; St Clair, Conti-Ramsden, Pickles, & Durkin, 2011).

SLI can be characterized by many kinds of impairments. Although Leonard proposes a more detailed categorization, the nature of the deficit has often been discussed in terms of delay or deviance (Leonard, 2014, pp. 41-42), and should be discussed this way for the present purpose. Furthermore, the children identified as suffering from SLI constitute a very heterogeneous group (Leonard, 2014, p. 3). That is, they display a vast amount of different language difficulties and there is much individual variation. Although SLI children acquiring English most frequently have been the objects of study, much research has been dedicated to SLI in a wide range of languages for the last two decades. This work has resulted in much greater knowledge about the source of the condition, as well as methods for alleviation.

Because of the development of improved methods for alleviation, the study of SLI has clear applied motivations. However, it also has theoretical motivations, because the nature of the deficits may shed light on theoretical frameworks. For example, according to domain general theories, Specific Language Impairment should not exist, because a specific impairment of

language entails domain specificity. However, while recognizing the impairment domain general theorists hypothesize that the impairment is not as specific as first anticipated – very subtle cognitive impairments are thought to affect the language dramatically (Leonard, 2014, p. 197). Furthermore, linguistic frameworks may shed light on the nature of SLI. In other words, the study of SLI and the study of linguistics display a symbiotic relationship to each other.

How is SLI identified?

SLI is a difficult impairment to diagnose. It is not a condition that can be observed directly through for example a brain scan, or exhibit excluding symptoms. SLI is represented in the *International Statistical Classification of Diseases and Related Health Problems* (10^{th} ed.) (ICD-10) (World Health Organization, 2004). To qualify for the diagnosis of SLI, the child has to not display impairments that may facilitate language difficulties, such as hearing loss, neurological damage or physical anomalies. Furthermore, the child has to test adequately on a nonverbal intelligence test (Leonard, 2014, pp. 20-21). If these criteria are satisfied, the child's language abilities may be tested using a wide array of assessment tools, for example diagnostic markers, standardized language tests or LARSP.

Relative clauses in children with SLI

Studies of relative clauses in language impaired children have shown that the construction is very difficult for them, and this has been attested for many languages (e.g. Danish: de Lopez et al. (2014), Swedish: Håkansson and Hansson (2000), Hebrew: Novogrodsky et al. (2006), English: Frizelle and Fletcher (2014), Greek: Stavrakaki (2001)). However, there are no studies of relative clauses in Norwegian SLI children. Furthermore, none of the above are based on observational data, as this study is. For a discussion of the difference between the knowledge accumulated in different research methods, see the methodology chapter (Chapter 4.4). However, studies of relative clauses in SLI children acquiring languages similar to Norwegian will be reviewed in the following:

Frizelle and Fletcher (2014) investigated the relative clauses of SLI children acquiring English. They investigated the SLI children's ability to produce different kinds of external and internal functions, in line with the findings of Diessel and Tomasello (2000), and Diessel (2004). They found that SLI children displayed a delay in the sense that they performed

poorly on propositionally complex relative clause constructions and internal object relative clauses.

In a Danish study, the comprehension and production of relative clauses in SLI children acquiring Danish were addressed (de Lopez et al., 2014). The authors compared SLI children, aged 5;0 to 8;4, with typically developing children matched for age and language ability, aged 4;0 to 6;5. They did not find significant differences between the three groups in comprehension of subject relative clauses and production of object relative clauses, which suggested the first being too easy for all test groups and the latter too hard. However, SLI children acquiring Danish had a significantly lower performance on comprehension of object relative clauses and production of subject relative clauses, suggesting a learning delay.

A Swedish study, Håkansson and Hansson (2000), investigated the comprehension and production of 10 SLI children aged 4;0 to 6;3 acquiring Swedish. They found that the gap between comprehension and production of relative clauses was much larger in SLI children than in typically developing children. Furthermore, they found that SLI children to a much higher degree omitted the obligatory relative subjunction, suggesting a possible clinical marker.

The results of these studies cannot automatically be generalized to Norwegian and the current study for two reasons. First, they do not study Norwegian. Although at least Swedish and Danish are very similar, there still may be differences. Secondly, as was mentioned, all of the studies are experimental, and the object of study, i.e. linguistic knowledge is not the same as the one in the present study, which is language use. However, the results of these investigations in conjunction with the results of this study will be sufficient to formulate qualified guesses, or hypotheses, about the nature of relative clauses in impairment in Norwegian.

3.3.3 LARSP

Language Assessment Remediation Screening Procedure (henceforth LARSP) is a language-specific instrument of analysis, created with the purpose to identify SLI and other language impairments. The profile was initially created for English (Crystal, Fletcher, & Garman, 1976), but later adapted to many other languages such as Dutch, German, Persian, Chinese and so forth (Ball, Crystal, & Fletcher, 2012).

Content

The assessment tool LARSP measures the child's proficiency in grammar, i.e. morphology and syntax. It is formed as a chart, which in the words of David Crystal is "an attempt to summarize the most frequently occurring indices of normal and abnormal grammatical development, and to provide a sufficient basis for plotting patterns of progress in this development."(Crystal, 1979). The chart divides preschool children into age categories, or stages, as it is called in LARSP terminology. Each stage is associated with a set of morphological and syntactic properties, which then are expected to be developed in that stage. For example, "Present tense" may be placed under Stage III. This means that when the child has reached Stage III, i.e. is between the age of 2;0 and 2;6, he or she is expected to acquire the present tense. This enables the speech therapist to easily assess "where the child is", and "where the child ought to be" (Crystal, 2012, p. 5). This again enables the therapist to tailor a treatment program in order to alleviate the child's language deficiencies.

A wide array of grammatical properties is relevant to LARSP, both morphological and syntactic. Classically, the profile has been divided up into a syntactic part and a morphological part, which have been divided up into compounding, derivation and inflection. The syntactic part has been split up into clause and phrase structure, and devoted to specify when the clause elements, such as verb, noun, auxiliary, negation, word order, conjunction, relative clause and so forth are acquired. In other words, LARSP attempts to cover all aspects of morphology and syntax. Consequently, as well as being a tool for diagnosis, LARSP is also a highly detailed and rich model of grammatical development. Thus, there are both theoretical and applied motivations for constructing a LARSP profile.

Construction of the profile

LARSP is constructed using observational data. This principle is imperative, and to depart from it when adapting the profile would mean that its comparability with profiles of other languages is dissolved. Furthermore, when assessing the child, the speech therapist has to replicate the circumstances that the profile was created under, which would require more training and more equipment if LARSP were constructed in an experimental setting.

A grammatical property is considered acquired if, and only if, 50% of the sample has acquired the property (Bol, 2012, p. 94). Therefore, the grammatical properties appearing in LARSP

are the grammatical properties expected to be encountered in the child's spontaneous speech. What is measured is therefore how children use language in interaction with their peers, not what they know about their language (Crystal, 1979, p. 7). What is measured in LARSP is closer to the actual consequences of SLI than what is measured through studies of an experimental character. In other words, it is how SLI children use their language that causes the problems that are described in the SLI section, not what they know of their language. In the following methodology chapter, this will be termed "ecological validity" and elaborated on. In this respect, observational data does have some advantages over experimental data. However, experimental data is preferable in other ways, and the best method of diagnosis and research is often triangulation, i.e. different methods in conjunction with each other.

The micro-profile

The present author participated in a workshop in Reading, United Kingdom March 2014. One of LARSP's first researchers, Paul Fletcher, was one of the speakers, and he problematized the LARSP entry "Subordination" of Stage V. "Stage V is different to Stage II-IV in that we are now faced with labels for constructions rather than the specification of their internal elements" (Fletcher & Frizelle, 2014). In other words, it seems hard to generalize all subtypes of subordinate clauses into a single category, because subordination contains many different constructions that possibly could be ascribed to more than one stage, and secondly, to include the term "subordination" represents a transition from internal structure to constructions being described in the profile. It is a qualitative change in which properties of grammar that is described in the LARSP profile.

Fletcher's advocated that each subordinate construction is so complex that it needs its own full description, or micro-profile. According to Fletcher, a construction's structure, function, frequency and developmental trajectory are explicit in a micro-profile (Fletcher & Frizelle, 2014), and it is constructed with the same methods that were used to construct the LARSP chart as a whole (Crystal, 1979, p. 6). In other words, the categories of a micro-profile are validated if (i) they have a developmental reality in typically developing children, i.e. if the variables' proficiency level is a function of their developmental stage, and/or (ii) they have a pathologic reality in children exhibiting SLI, i.e. if the variables' proficiency level is a function of language impairment.

Fletcher discussed the possibility of constructing a micro-profile for relative clauses. In the literature of LARSP, micro-profiles are no recent innovation. Micro-profiles for both Stage I and the verb phrases of Stage III have been constructed in earlier works (Fletcher, 1979; Garman, 1979). They are detailed descriptions of the internal development of their respective object of study. Fletcher states that the purpose of his VP Stage III micro-profile is to "augment the information already available from the Profile Chart" (Fletcher, 1979, p. 132). The motivation for the micro-profile of Stage I is to supplement the "thin" stage of development (Garman, 1979, p. 119), in which only the syntactic categories of noun and verb are present. Furthermore, it seeks to foreshadow the developments in Stage II (Garman, 1979, p. 119).

3.3.4 Discussion

This thesis is an adaption to Fletcher's proposal, to construct a micro-profile for relative clauses. The motivation for this is (i) that the material is ideal for this purpose, cf. Chapter 4, and (ii) the fact that very little research has been devoted to the acquisition of Norwegian relative clauses (Chapter 3.2), especially within a specific theoretical framework (Chapter 2). The present author has had personal correspondence with Fletcher, who stated that the micro-profile for English was not yet ready for dissemination. Consequently, nothing more than is described here is known about his work.

Therefore, the current thesis will construct a micro-profile by testing the developmental reality of the variables that relative clauses vary upon, which are described in the grammar section (Chapter 3.1). This will constitute the basis for the micro-profile for Norwegian relative clauses. The specifics of the methodological design will be described in the succeeding methodology chapter (Chapter 4.2).

3.4 Research questions

Chapter 2 described the theoretical framework used in the present thesis. Chapter 3.1 described Norwegian grammar, Chapter 3.2 described previous research on relative clauses, while Chapter 3.4 described SLI, the LARSP profile, and the micro-profile.

The research questions of the current thesis to be answered through Chapters 5, 6, 7 (Results, Discussion, Conclusion) will now be formulated based on these chapters. They are:

1. Which properties of relative clause develop over time, and does this correspond to previous research? If not, why?

2. Can the development of relative clauses in Norwegian shed light on the five hypotheses of Chapter 2.4.4?

3. Does the development of relative clauses foreshadow clinical markers of relative clauses in SLI?

4. Is there a developmental relationship between regular relative clauses and interrogative relative clauses?

4 Methodology

4.1 Introduction

Methodology refers to the systematic procedure of a research project, and is composed of many points of variation. These variables must carefully be selected in concordance with the research questions to be answered. In this particular case, the motivations of the methodology are (i) to create a Norwegian version of LARSP (which will appear in (Kristoffersen, Simonsen, Ribu, Løver, & Strand, forthcoming)), and (ii) to map the developmental trajectory of Norwegian relative clauses, which is the purpose of the present study.

In the following, the different aspects of the methodology will be elaborated upon, discussed and justified in terms of the purpose of the study. More precisely, what will be discussed is (i) the structural design of the study, (ii) a justification of the data collection method as well as a discussion of different data collection methods in general, and (iii) a minute description of the collection, transcription and coding procedure. Finally, (iv) validity and reliability will be discussed.

4.2 The structural design

The design applied to answer the research questions of Chapter 3.4 is an adaption of Bol & Kuiken (1980), the authors of the Dutch LARSP, named GRAMAT, although with some minor modifications. In the following, this design will be described, followed by a description of the points of divergence.

4.2.1 Bol and Kuiken (1980)

		Recording 1			Recording 2		
		Lower	**Middle**	**upper**	**Lower**	**Middle**	**upper**
Stage I	Male	1	1	1	1	1	1
1;0-1;6	Female	1	1	1	1	1	1
Stage II	Male	1	1	1	1	1	1
1;6-2;0	Female	1	1	1	1	1	1
Stage III	Male	1	1	1	1	1	1
2;0-2;6	Female	1	1	1	1	1	1
Stage IV	Male	1	1	1	1	1	1
2;6-3;0	Female	1	1	1	1	1	1
Stage V	Male	1	1	1	1	1	1
3;0-3;6	Female	1	1	1	1	1	1
Stage VI	Male	1	1	1	1	1	1
3;6-4;0	Female	1	1	1	1	1	1

Table 1 - Structure of Bol and Kuiken (1980)

Bol & Kuiken's version encompassed six stages, opening the sample at 1;0 and concluding it at 4;0. Each stage interval was six months long. The sample included children of both sexes as well as three socio-economic groups: lower, middle and upper. This would give 6 children in each stage, and 36 altogether. The sample was also recorded twice with a six-month interval, ensuring that each child had reached a new stage of development at Recording 2. However, this meant that two groups, i.e. 12 children, had to be recorded only once, because the Stage 6 children at Recording 1 were outside the sample at Recording 2, and the Stage 1 children in Recording 2 were outside the sample at Time 1. This design enabled both cross-sectional and longitudinal data to be obtained.

Stage	Time I	Time II
I	A	**X**
II	B	A
III	C	B
IV	D	C
V	E	D
VI	F	E
VII	**Y**	F

Table 2 - Age transition illustrated

4.2.2 Our design

Our design differed from Bol & Kuiken in several ways.

First, although information about socio-economic status was collected from the parents, the variable was not operationalized, because finding sufficiently many informants from all socio-economic layers is a time-consuming task. However, because the information was collected, the variable was enabled to be operationalized in the future.

Second, our design encompassed seven stages, and not six. This was done because the project collaborators also wanted to assess the development of language beyond the age of 4;0. Furthermore, this is how the original LARSP (English (Crystal, 1979)) is structured.

Third, Stage VI and VII both lasted 12 months instead of 6. This also resembles the English LARSP design with the exception that the age boundaries of the last stage is 4;6-5;6 in the design of the present study, while Stage VII of LARSP is defined as “4:6 +”. The Stage VI children of Recording 1 were in the latter half of the age interval, ensuring that they had reached Stage VII by the next recording.

Fourth, two children for each combination of variables (age and gender) were recorded. This was done to obtain a larger sample for each stage. This gives eight recordings for each stage.

		Recording 1	Recording 2
Stage I	Male	2	2
1;0-1;6	Female	2	2
Stage II	Male	2	2
1;6-2;0	Female	2	2
Stage III	Male	2	2
2;0-2;6	Female	2	2
Stage IV	Male	2	2
2;6-3;0	Female	2	2
Stage V	Male	2	2
3;0-3;6	Female	2	2
Stage VI	Male	2	2
3;6-4;6	Female	2	2
Stage VII	Male	2	2
4;6-5;6	Female	2	2

Table 3 - Structure of the current study

4.3 The method of collection

4.3.1 Introduction

The following will elaborate upon and justify the choice of collection method. There are fundamentally two approaches to assess child language: spontaneous data studies (non-controlled situations) and experimental studies (controlled situations). This applies the non-controlled situation.

4.3.2 Spontaneous data collection

Spontaneous data collection (also called naturalistic observation or corpora data) is a set of sampling techniques having in common that the degree of manipulation from the observer or investigator is low or absent, and as little as possible effort is laid into manipulating the subject's behavior.

Spontaneous data collection can take place in several different ways. An obvious one is using written texts, e.g. from newspapers and the internet. Somewhat dependent on what you are examining, this method corresponds to the real world and offers the investigator huge amounts of material. However, using written texts is naturally not a viable method for child language sampling.

The first systematic studies of child language development were not spontaneous speech sampling, but diary studies. The earliest were recorded from Clara and William Stern, who documented their German children Hilde and Gunter (Stern & Stern, 1920). Consequently, this work presented for the first time a systematic investigation of child language. The method of diary sampling is effective and gives "a rich picture" (Tomasello & Stahl, 2004) of the child's linguistic knowledge. Tomasello (Tomasello & Stahl, 2004, pp. 101-102) terms this method of data collection naturalistic, as spontaneous speech sampling is. However, the method is very selective and subjective, and therefore not as reliable.

While not being related to spontaneous data collection, a more recent and modern take on parent reporting is the MacArthur-Bates Communication Development Index (K.E Kristoffersen et al., 2013; K.E Kristoffersen, Simonsen, Eiesland, & Henriksen, 2012; Simonsen, Kristoffersen, Bleses, Jørgensen, & Wehberg, 2014) where in parents were asked to report on their children's language development.

Tomasello proposes "audio and/or video recordings of children's spontaneous linguistic interactions with a parent or other interlocutor" (Tomasello & Stahl, 2004) as a methodologically superior method in spontaneous sampling of children. In such a study, the subjects would be expected to behave normally and preferably forget that the recording devices are present. The product of these studies is recordings of everyday situations, such as eating dinner, sitting at the floor playing, reading books. The method does require time and effort, since the material has to be gathered, transcribed and coded, but does exhibit a range of advantages, to be elaborated upon.

4.3.3 Experimental data collection

Spontaneous sampling contrasts with experimental data collection, in which the investigator deliberately manipulates and tries to control independent variables that effect the outcome of an experiment, in order to prove or falsify a hypothesis.

In linguistics, experimental data collection in language acquisition is often associated with specific tests with the sought end of eliciting certain kind of constructions or inflections. For example, Berko (1958) wanted to investigate which allomorphs of English inflections that were productive among English preschool children. She tested for a range of inflectional categories. For example, when testing for plural, she would construct a plural test. She would show the children a picture of a fantasy creature and tell the child “This is a wug. Now there is another one. There are two of them. There are two …” (Berko, 1958, p. 256). This prompted the children to finish his or her sentence, which demanded that they inflected a novel noun for number. This experimental research design enabled Berko to gather large amounts of reliable data from many children within an acceptable time frame.

Another example from experimental designs that is more relatable to the present thesis is the previously reviewed de Lopez et al. (2014). They wanted to assess the production of relative clauses in Danish children. In order to elicit relative clause constructions, to elicit internal object relative clauses, the investigators would do something along the lines of Berko (1958), by presenting a picture and say “There are two girls. The grandma is kissing a girl and the grandma is hugging a girl. Who would you rather be? You are to start by saying ‘I rather want to be the girl…”. The children would then ideally say, “I want to be the girl that the grandma kisses”.

4.3.4 Strengths and limitations of spontaneous measures

One of the large methodological barriers to overcome in psychological experiments is called “demand characteristics”. It refers to the situation where the participant of an experiment interprets the experiment’s purpose, and alters his or her behavior. In a naturalistic context, demand characteristics are minimalized, because there are no cues about what the investigator is looking for. However, the test subjects may nevertheless form their own interpretations about what the researcher is looking for, and consequently display an unnatural behavior. Although this is a challenge for observational studies, it is definitely more problematic in experimental designs.

Ecological validity is a term referring to the degree of which the gathered data corresponds to the real world that is being investigated. Here, spontaneous data collection is superior to experimental data collection. In a completely spontaneous setting, there is no control or manipulation, and the data itself represents the real world. The more experimental control, the

less ecological validity. However, it can be argued that the presence of the investigator himself, not to mention the recording equipment, contribute to the unnaturalness of the situation. Furthermore, toys that make a lot of noise are often very incompatible with the recording situation, especially if the audio is not accompanied by visual material, and such limitations may also affect how the children view the situation as natural or not.

In the case of N-LARSP, the point of ecological validity stands out as particularly important. One of the purposes of N-LARSP is to give speech therapists a benchmark in profiling children's grammatical competence, and the context of the data collection should thus resemble that of a screening session at a speech therapist. If N-LARSP had been formed using experimental data, the speech therapist would have to use the same methods for profiling. Although the speech therapist is familiar with speech proficiency tests resembling experimental designs, this testing requires equipment, training and the child's co-operation. A language assessment tool using spontaneous data has considerable advantages in this respect. Consequently, the imperative norm for constructing LARSP profiles is to use observational data. To give up this principle would seriously weaken the profile's comparability with the profiles of other languages. Furthermore, in language research, spontaneous speech is the only way to investigate the token frequency of a given phenomenon.

In the example above, Berko knew what she was looking for. She needed as many novel plural nouns as possible to base her analysis on. But what kinds of patterns emerge when the participants are allowed to act spontaneously? Spontaneous data is a good method for generalization over data, i.e. a bottom-up approach, as opposed to experimental designs, in which expectations, hypotheses and the premises of falsification often are clearly formulated beforehand. The difference is often formulated in terms of inductive and deductive reasoning, the first starting with observation and ending with a theory, the latter starting with a theory that seeks its confirmation through observation.

Spontaneous data collection has the limitation of being very costly. Investigating phenomena with low token frequency can be very time-consuming. For example, if the investigator was to investigate how four year olds use reflexive pronouns in subordinate clauses, he would have to record children for a very long time if he chose spontaneous data. In that case it would be more appropriate to use an experimental setting in which the investigator can actively manipulate the context, in order to elicit such utterances.

Another problem of spontaneous data collection is extraneous variables, i.e. variables that are not independent variables, but may affect the data. In experimental designs, the extraneous variables are less probable to appear, since experiments are controlled events. They are more systematic. It is also easier to replicate an experimental design, because of its systematicity.

In total, there are advantages and disadvantages of both spontaneous and experimental data collection. However, it is argued that spontaneous data collection is preferable for the purpose of N-LARSP and this thesis.

4.3.5 Multiple case study

A case study is an in-depth study of a single individual, while a group study is the study of a set of individuals. A case study is a thorough analysis of many specific details, and allows for a more detailed description than is possible in a group study (Kumar, 2005, p. 113), and enables the researcher to answer the *how* and *why* of the results (Yin, 2003, p. 9). However, a case study is difficult to generalize to the wider population, because it only studies one person. It thus has weaker external validity. A group study does not have this limitation, because it ideally includes a sufficiently large sample to generalize upon.

Because spontaneous speech sampling has been selected as the method of collection, the possibility of a group study design is excluded here, because the processing of such data would be very time-consuming. This study should be characterized as a multiple case study, because it is a close examination of the behavior of multiple cases, and the purpose is to examine similarities and differences between the different cases.

Using the multiple case design, the present study offers insights into individual children as well as generalizable tendencies between them.

4.4 The procedure

In 2014, Finestack, Payesteh, Disher, and Julien (2014) conducted a study of 726 child language related articles and concluded by proposing a checklist for information to include when reporting on a study using language samples. The sections below are based on this checklist and how the relevant points were met in the current study will be elaborated upon.

4.4.1 Sampling

The sample was required to fit along several parameters. The parents were asked to give information about these in the online enrollment survey. The criterions are as follows: quantity, gender, age and language, as well as degree of typical development.

Quantity and gender

Following the design outlined above, 32 children were included in the sample. Furthermore, to achieve results with high validity, the sample consisted of equally many boys and girls.

Age criteria

The lower age boundary was set to 1;0, starting Stage I in the profile, and the upper age boundary was set to 5;6, concluding Stage VII. The parents were asked to give exact birth dates for their children.

Clinical criteria

Only typically developing children were included in the sample. Children that suffered from disorders considered to interfere with typical language acquisition were considered disqualified. These include SLI, mental disability, anomalies in the vocal tract and audioperceptive disorders. This was because one of the purposes with the project was to create a benchmark on which typically developing children could be compared with children under the suspicion of language deficits, so that the correct methods of alleviation could be applied. This would be impossible if non-typically developing children were included in the sample.

Language criteria

The sample only consisted of monolingual children. This means that the children hear no other language than Norwegian on a daily basis. It is however unrealistic to assume that the children never hear other languages than Norwegian on television, kindergarten teachers, babysitters, etc. However, no children had parents with language background other than Norwegian. Even though bilingualism is not considered harmful to early language acquisition, there is evidence that simultaneous acquisition of two different languages can be the source of

an atypical developmental pattern. Furthermore, one of the purposes of the project was to create a benchmark on which monolingual Norwegian children could be compared with bilingual Norwegian children. This would be impossible if bilingual children were included in the sample. Furthermore, because of some syntactical dialectal differences in Norwegian, the informants were required to live in the South-Eastern parts of Norway.

In other words, our sample consisted strictly of 32 typically developing monolingual children, 16 of which were girls, and 16 of which were boys.

4.4.2 Data collection

The data collection was conducted as one-hour long play sessions using a digital H2 audio recorder, with two microphones, giving a stereo surround recording. The quality of the recordings was never lower than MP3 224 kb/s.

The participants of the recordings were the child, the investigator and one or both parents.

The session was segmented into three parts, adapting the design in the Mandarin Chinese adaption of LARSP, C-LARSP (Jin, Bee, & Razak, 2012, p. 221).

The children of the first two stages, ranging from the age of 1;0 until 2;0, were only exposed to free play for the entire session. To stimulate the children, the investigators brought with them a set of toys. These included figures of both exotic and non-exotic kinds of animals, toy vehicles and a teddy bear.

The next three stages, from 2;0 until 3;6, split the hour evenly between play, as described above, and a story-telling event involving a well-known Norwegian fairy tale, “The Three Billy Goats Gruff” (Asbjørnsen & Moe, 1841-44). The parents were first asked to read the story to the child, followed by a session in which the child was prompted to re-tell the fairy tale using pictures from the fairy tale as stimuli. Sometimes it was difficult to persuade the children to participate in the story-telling event. In these cases, the investigators let the children do whatever they liked, and play on their own premises.

The final two stages from 3;6 until 5;6, involved playing and retelling the fairy tale, as described above. They were also asked to retell a recent event, or a “significant or immediate past event within the children’s personal and cultural experience” (Jin et al., 2012, p. 221),

like a birthday, trip or something they had recently experienced in the kindergarten. The three techniques were given an equally long time.

The raw data was saved on a password-protected server, in accordance with the ethical guidelines given by Norwegian authorities. Also in accordance with these guidelines, the data was stored with fake names and thus appears in the results with fake names, in order to anonymize the children.

4.4.3 Transcription

The transcription procedure involves both segmentation and transcription. Both procedures were completed using the software ELAN (Lausberg & Sloetjes, 2009). This was chosen because it is the primary software used at the Department of Linguistics and Scandinavian Studies at The University of Oslo, which enabled the investigators to seek assistance there if problems arose.

Segmentation

The material was segmented by the current author and another MA-student, and both segmented equally many recordings.

The utterance was based on the term T-unit, or Minimal terminable unit of language, by Hunt (1965). The T-unit is defined as “one main clause plus any subordinate clause or non-clausal structure that is attached to it or embedded in it.” (Hunt, 1970, p. 4) the “shortest grammatically allowable sentence into which the theme could be segmented” (Hunt, 1965, p. 21). In other words, coordinated clauses were segmented as two T-units. Furthermore, certain kinds of utterances are excluded from the T-unit; "Elements not counted as t-units include back channel cues such as *mhm* and *yeah*, and discourse boundary markers such as *okay*, *thanks* or *good*. False starts were integrated into the following T-unit." (Young, 1995, p. 38). The utterance definition outlined above by Hunt was the one applied in the segmentation process.

Transcription

The investigators transcribed the recordings orthographically, using the Norwegian written standard Bokmål. Words that were not part of the written standard were transcribed and

marked with a tag. Words and sequences that were unintelligible or difficult to interpret were also marked with a tag, based on the transcription manual of the LIA-project (Hagen, Håberg, Olsen, & Søfteland, 2014). Both investigators transcribed equally many recordings. Furthermore, they transcribed the same recordings that they segmented.

Transcription reliability was carried out by both investigators transcribing 174 random utterances from Jan (Stage V 3;3:11). 95% of the utterances were identically transcribed, while 5% were not. Of these 5%, 40% were utterances that had no impact on the analysis. The 95% match between the transcriptions was considered satisfactory.

4.4.4 Coding

The material, i.e. the relative clauses and some other subordinate clauses, was coded by the present author. The material was coded for the relative clause head's internal and external function. The external functions were PN (predicative of copular verb), NP (no matrix clause), subject, object and oblique. The internal functions were subject, object, and prepositional complement. Indirect objects did not occur. If resumptive elements occurred, this was coded as well. Some verbs had different possible interpretations and posed a challenge to the coding process. The relative clause head could both be interpreted as an oblique and as an object. Examples from the material:

(1)

Slå av 'turn off'	(Leah Stage V 3;1:16)
Lese om 'read about'	(Markus Stage IV 2;8:6)
Jobbe med 'work with'	(Inger Stage VI 4;5:29)
Se på 'look on'	(Markus Stage IV 2;8:6)

Are these intransitive verbs followed by prepositional phrases, or particle verb constructions? If the verb had toneme 1, it was not considered a particle verb (Berntsen, 2009). Furthermore, if the verb plus preposition can form compounds, it is an indication that they are particle verbs (Faarlund et al., 1997, p. 447).

(2)

Send over boka → oversend boka
Send over book-DEF → over-send book-DEF

(3)

Jobbe med babytiger → ?medjobb babytiger

Work with baby tiger → with-work baby tiger

Some particle verbs do not necessarily take an object, such as *bli med* 'come with'. This would indicate that the verb is a particle verb, not verb plus preposition. In addition, if the child fails to recognize the internal structure of these verbs, and inflect the particle verbs as if they were one single morpheme, this would serve as proof that the child does not see the construction as a verb plus preposition. This is common for verbs such as *bli med* 'come with' and *kle på* 'put (clothes) on'. Finally, if the preposition is accented, it cannot be a particle verb (Garmann, Hansen, Simonsen, & Kristoffersen, Under review)..

Furthermore, when extra-positioned elements appeared, they would sometimes be ambiguous with other constructions. Their identity as extra-positions was confirmed on the grounds of (i) the pronoun referring to the extra-positioned clause being stressed, and (ii) the prosody of the extra-positioned clause determining sentence boundaries.

Which matrix clause verb was used in each relative clause was also coded, in order to investigate the repertoire of verbs that each child used to construct relative clauses. The valence of the internal verb was also coded, as well as whether or not the children omitted the relative clause subjunction. Furthermore, sentence adverbials were coded for grammatical and ungrammatical placement. Finally, the interrogative relative clauses were coded for which interrogative pronoun that was used.

In quantification of the data, a chi-square test (X^2 test) was used to test significance, with a level of significance of 5%

4.4.5 The target form sample

A sample of adult speech was extracted from NoTa, a corpus of spoken Norwegian ("Norsk talespråkskorpus - Oslodelen,"), in order to compare the oldest children with the target form. This material was gathered in the following way: the ten first relative clauses of ten random informants were extracted. If an informant did not have ten relative clauses, the remaining ones were extracted from an extra informant. Because of this, 12 informants were used in total. In this way, the author had no control over what kinds of relative clauses constituted the

comparison sample. Later, the target form relative clauses were coded for the same properties as those of the children.

4.5 Reliability

Reliability refers to the replicability or consistency of a measure, the degree of which the same results would occur if the study is repeated.

One challenge with the reliability of the study is the recording process itself. The story-telling event was often aborted, and this could be thought of as weakness of the finding's reliability. However, it is argued that it isn't so, because the story was primarily used as stimuli, not to elicit certain grammatical properties or constructions. Furthermore, all the grammatical constructions that were expressions from the fairly-tale were considered as formulaic and discarded from the material.

Another barrier for the reliability is the transcription. However, as was explained in section 4.4, transcription reliability was carried out, which yielded a 95% coefficient. This was deemed acceptable.

As for the coding, all of the material was coded for variables whose parameters had strict formal criteria. In other words, this posed no problem to the reliability.

4.5.1 Validity

Many of the validity issues have already been discussed in Chapter 4.3.4. This revolved around the naturalness of the recording situation, which is challenged by the presence of the author and recording device, as well as the fact that the situation demanded that noisy toys could not be used. Although it is difficult to predict how the recordings would have been without this control, the investigators do not consider it to have had a major impact on the results.

5 Results

5.1 Introduction

The whole material consists of spontaneous speech from children, sorted in 7 age stages. The children of Stage I and II did not produce any relative clauses. Thus, Stage III will be the first stage described, succeeded by Stage IV, V, VI and VII.

The agenda of this chapter is to present the results that have emerged from the coding process in order to foreshadow the penultimate chapter, the discussion chapter. The results will be placed in context and compared with each other. The chapter is divided into four parts in the following order: external syntax, internal syntax, interrogative relative clauses, and finally the relative clause micro-profile, which is based on the three first sub-chapters.

The material yielded 356 regular relative clauses and 87 interrogative relative clauses, 443 in total. This, along with 22 other subordinate clauses, which will be used in relation to the Conjoined clause hypothesis, constitutes the basis for the results chapter.

5.2 External syntax

5.2.1 Introduction

This section will present the external syntax of the relative clauses in the corpus. As described above (Chapter 3.1.2), external syntax refers to the matrix clause of the relative clause, as opposed to the internal structure of the relative clause. Consequently, the topics that will be covered in this section are (i) the function of the head in the matrix clause, and (ii) the matrix clause verbs.

Figure 1 below visualizes the proportions of external syntax related to (i) above. It is based on the entire corpus, which has yielded in total 358 external relative clauses. The acronyms refer to the same as was explained in Chapter 3.1.2: PN is an abbreviation for Presentational Nominal, i.e. predicative function of a copula verb. NP is an abbreviation for Noun Phrase, i.e. a relative clause without a matrix clause. O is an abbreviation for object. S is an abbreviation for subject. Finally, OBL is an abbreviation for oblique.

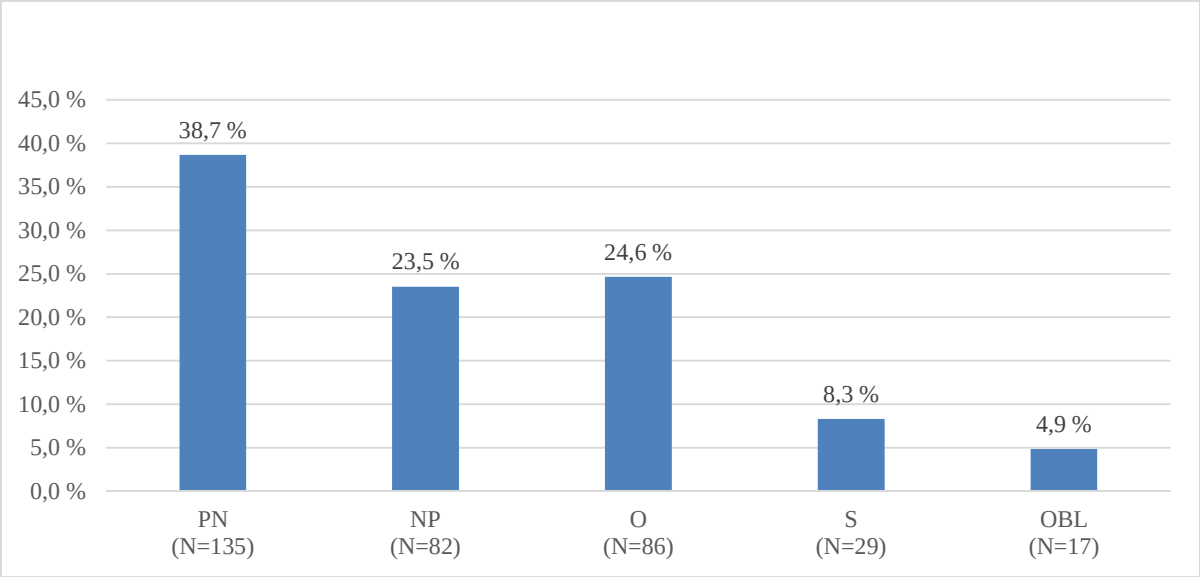

Figure 1 - Mean proportions of external functions across all ages

As can be seen, propositionally simple relative clauses, PN and NP, are dominant – the external PN relative clause construction has the highest proportion, followed by external O, followed by the isolated NP. The propositionally simple constructions make up more than 60% of the material together.

The propositionally complex external object relative clauses and the propositionally simple NP relative clause constructions are by and large equally frequent, while subject and oblique, also propositionally complex, are the least frequent. As will be demonstrated in the following chapter, the proportions of external syntax functions change during development.

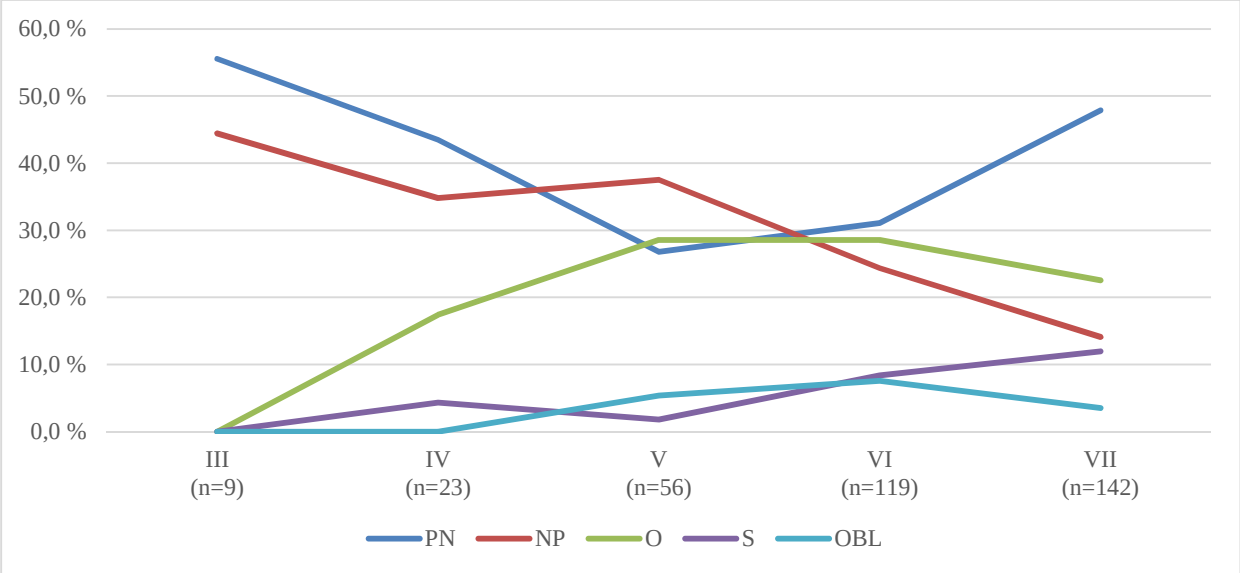

Figure 2 - Development of external syntactic functions. The data points are proportions of total amount of external relative clause constructions for each stage.

Note that the number of relative constructions increases from 9 at Stage III to 142 at Stage VII. This means that although some of the proportions of each function may decrease, the actual number of each function increases through development. There is also considerable individual variation, which also will be thoroughly elaborated upon in the following.

5.2.2 Stage III (2;0-2;6)

The very first relative clauses of the material appeared in Stage III. Only three of the eight Stage III-children produced relative clauses, in sum 9 relative clauses. This implies that the first micro-profile entry for relative clauses will not appear in Stage III, because of the criterion that at least 50% of the children have to produce a property in order for it to be included in the profile. Nevertheless, the earliest relative clauses do shed light on their developmental trajectory.

	PN	**NP**
Emil	4	3
Lucas	1	0
Kari	0	1
Total	**5 (66.6%)**	**4 (33.3%)**

Table 4 - Distribution of external functions of Stage III

The three NP clauses come from Emil and Kari. Emil's are headed by both a concrete noun and a pronoun. Of the PN relative clause constructions, one is in the interrogative mood. Lucas' only relative clause is a cleft sentence in the indicative.

(1) Lucas, Stage III, age 2;4:2

det er den som lage hus

it COP that SUBJ. make house

'It is that one that make house'

Furthermore, not considering tense marking, the relative clauses of Stage III are fairly grammatical. One construction lacks a matrix verb and another one an obligatory subjunction. They are both from Emil. However, the remaining ones are grammatical.

In other words, the external syntax of the Stage III-relative clauses is characterized by being exclusively propositionally simple – 100% of their matrix verbs are either copula verbs (PN), or they have no matrix verb (NP).

5.2.3 Stage IV (2;6-3;0)

The external syntax of the Stage IV relative clauses suggests a considerable development, in which a greater proportion of the children produced relative clause. 22 relative clauses were produced in Stage IV, by five children. This implies that the first LARSP entry for relative clauses will appear in Stage IV, according to the above-mentioned 50% criterion.

Figure 3 below is a more detailed view of the numbers in the introduction, and as can be seen, there is much variation among the children in the quantity and quality of the relative clauses produced.

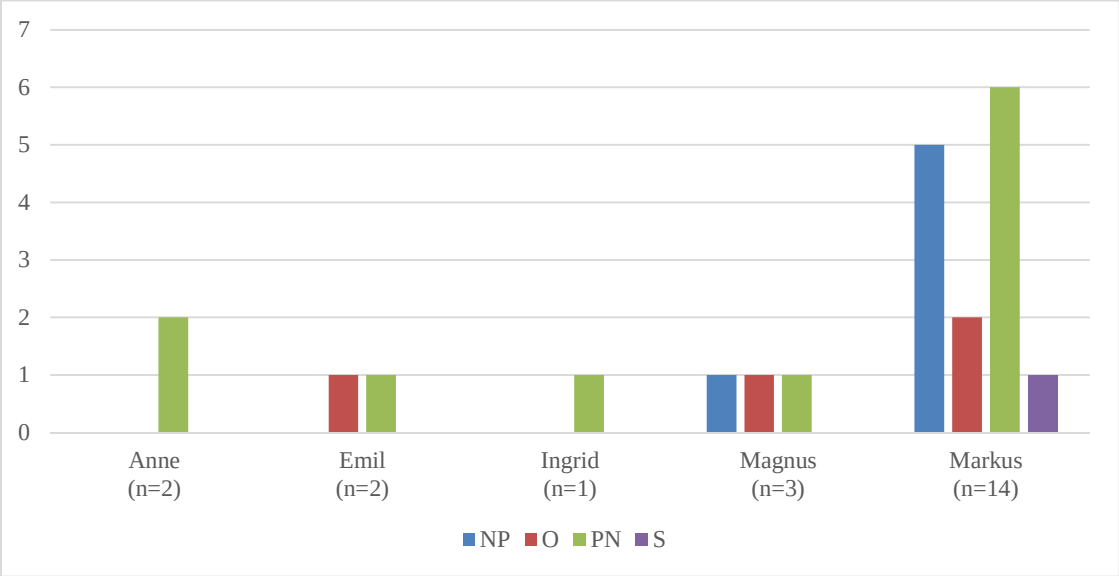

Figure 3 - Distribution of external functions in Stage IV

As seen in the above figure, Markus contributes with nearly two thirds of the relative clauses in Stage IV with 14 clauses, while the remaining four children produce 8 in total - between 1 and 3 each. This illustrates the great individual variation that can be found between children at this stage. An analysis of the relative clause proportions at Stage IV without Markus' data was carried out. The mean proportions of the two conditions with and without Markus are represented below.

	PN	NP	O	S
With Markus	50.0%	27.3%	18.2%	4.5%
Without Markus	62.5%	12.5%	25.0%	0.0%

Table 5 - Comparison of Stage IV with and without Markus

It is evident that there are differences in percentage between the two conditions. This goes to show the individual variation at this stage of development. Figure 1 and 2 above does not

reflect this. However, the difference is smaller when dividing the external functions into propositionally simple and propositionally complex functions (respectively 77.3% and 22.7% with Markus, and 75% and 25% without Markus).

NP and PN

Investigating the material, the single-propositional functions still dominate, amounting to 77.3% of the relative clauses. Furthermore, the notion of PN and NP relative constructions, i.e. single propositional relative clauses, being more basic is strengthened by the fact that no children produced object or subject relatives without producing either NP or PN relative clauses.

Object

The three external object relative clauses were produced by three children, meaning that they produced one each. External object relative clauses are considered a more advanced type of relative clause because they carry two propositions. The matrix verbs of the three clauses refer to concrete observable activities (*cut* and *call*), and a state (*lack).* An example of the first propositionally complex relative clause construction follows below.

(1) Magnus, Stage IV, age 2;9:22

Jeg	skal	klippe	denne	her	bæsjen	som	er	lang
1SG	shall	cut	this	here	poop	SUBJ	COP	long

'I'm going to cut this poop here that is long'

Here, the first proposition is I'M GOING TO CUT THE POOP, while the second proposition is THIS POOP HERE IS LONG.

Subject

The first subject relative clause of the material sees its light in Stage IV, produced by Markus (2;8:6). It is not embedded, because it includes a resumptive element "they" (however inflected for wrong number) in the matrix clause. The external subject relative clause is glossed and translated below.

(2) Markus, Stage IV, age 2;8:6

Den mannen som kjører gravemaskinen de kan kjøre
DEM man-DEF SUBJ drive-PRES digger-DEF 3PL MODAL drive
noen store gravemaskiner
some big-PL digger-PL
"The man who drives the truck they can drive some big trucks"

The resumptive, incorrectly inflected element illustrates that processing of subject relative clauses is difficult, and still poses a problem for Markus at Stage IV.

5.2.4 Stage V (3;0-3;6)

In Stage V, there were 56 tokens of relative clauses. All children produced relative clauses at this stage of development. Six children produced both PN and NP relative clauses, and five children produced object relative clauses, implying that the external object construction is qualified for an entry in the LARSP schema.

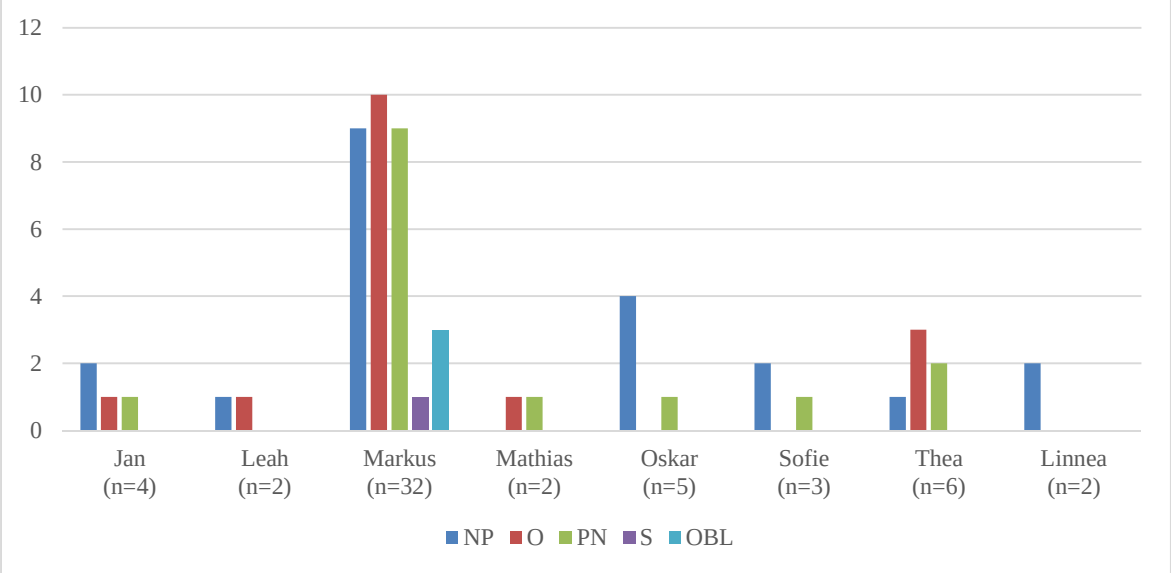

Figure 4 - Distribution of external functions in Stage V

Again, at this stage, Markus is the only child whose number of relative clauses material is sufficiently large to say anything substantial about. The other children did not produce a generalizable amount of relative clause constructions. However, this is far from saying that the material from the other children is useless. For the purpose of the relative clause micro-profile, any attestation of a relative clause from a given child is counted. And together, all the children contribute to the developmental tendencies found.

Presentational Nominals and Noun Phrases

The most interesting fact of Figure 4 above is that there is considerable variation in the proportions of NP and PN relative clause constructions for the children. The dominance of PN relative clauses is much lower than in Stage V ($X^2(1, N = 78) = 3.830$, $p = .05$), and all children produced the external NP relative clause, which was the most frequent external function for three of the children.

However, the fact that Markus accounts for nearly 60% of the relative clauses even at this stage distorts the overall picture somewhat, and also goes to show that there is clear individual variation regarding quantity and quality of the relative clauses. Markus has a varied repertoire of external syntactic functions. A comparison between the Stage V mean with and without Markus yielded the following result.

	PN	**NP**	**O**	**S**	**OBL**
With Markus	26.8%	37.5%	28.6%	1.8%	5.4%
Without Markus	25.0%	50.0%	25.0%	0.0%	0.0%

Table 6 - Comparison of Stage V with and without Markus

As can be seen, the impact Markus has on the stage in general is primarily manifested in the lower proportion of NP (however, the difference between the PN, NP and O proportions in the two conditions did not reach statistical significance. $X^2(2, N = 52) = 1.731$, $p = .421$) and the one token of external subject relative clause and oblique relative clause whose proportions disappears with him. There is only a minor difference between the PN and O proportions in the two conditions. Furthermore, the general tendencies of development are still true without Markus as a part of the sample, i.e. less propositionally simple clauses and more propositionally complex clauses. In both conditions, the single-propositional relative clauses, i.e. the sum of PN and NP, are still dominant in Stage V.

As in Stage IV, no children produced object relative clauses without also producing NP and PN relative clauses.

Object

The proportion of object relative clauses has risen from 0% in Stage III to 17.4% in Stage IV and again to 28.6% in Stage V. This possibly represents a change in the constructional schemas for relative clauses for some of the children. When looking further into the relative

clauses, it is shown that their matrix verbs are drawn from a very small set of verbs. There are 17 tokens of external object relative clauses, found in 5 of the children, and an investigation of their matrix verbs reveals the following patterns.

	Få ***'get'***	**Ha** ***'have'***	**Se** ***'look'***	**se på** ***'look on'***	**slå av** ***'turn off'***	**Ta** ***'take'***
Jan	0	1	0	0	0	0
Leah	0	0	0	0	1	0
Markus	1	6	0	3	0	0
Mathias	0	0	1	0	0	0
Thea	0	1	1	0	0	1

Table 7 - Matrix verbs of external object relative clauses in Stage V

The most frequently used matrix clause verb is *ha* 'to have'. This is an observation that makes it a candidate for a constructional island, in which a constructional schema is developed from concrete exemplars of the construction.

Once again, only Markus produced an amount of external object relative clauses sufficient for analyzing. 6 of the *ha* clauses were produced by him, and he also produced 3 *se på* clauses and one *få* clause. This suggests that Markus' relative clauses are constructional islands. It is impossible to determine whether the other children have constructional islands, because their tokens are too few.

Subject

External subject relative clauses are still lagging behind. Stage V only yielded one, from Markus, the same child that produced the only subject relative clause of Stage IV. This relative clause did not involve a resumptive element. However, it was not center-embedded, and therefore hypothesized to be easier to produce than a canonical subject relative clause. It was a wh-question, in which the question word precedes the finite verb, and the subject succeeds it. Hence, the relativized subject appeared as the final clause element.

(1) Markus, Stage V, age 3;2:13

hvor	er	de	lekene	jeg	skulle	få	låne?
Where	are	those	toys	I	shall:PRET	get	borrow

'Where are those toys that I was going to borrow '

There is nothing that suggests that subject relative clauses are mastered in Stage V. Markus has shown both in quantity and quality that he is ahead of his peers in production of relative clauses, but his results cannot be generalized upon.

Oblique

Three oblique relative clauses have made their way into the material in Stage V. They all come from a single child, Markus. They all occur with the matrix verb *lese* 'read' and are complements of the preposition *om* 'about'. A different and more appealing interpretation of these relative clauses is then that they are object relative clauses of Markus' verb *lese om* 'read about'. However, they are coded as obliques, cf. Chapter 4.1.10, in order to avoid making assumptions about a child's mental representation from a very small set of examples.

5.2.5 Stage VI (3;6-4;6)

By Stage VI, the number of external relative clauses has risen to 119, and they seem to be more randomly distributed. There are considerable individual differences between the children. Almost all children use relative clauses in four different matrix clause functions, except Thea, who only uses relative clauses in the object function. However, she only produced three tokens. In terms of both quantity and quality, her performance was poorer than in Stage V.

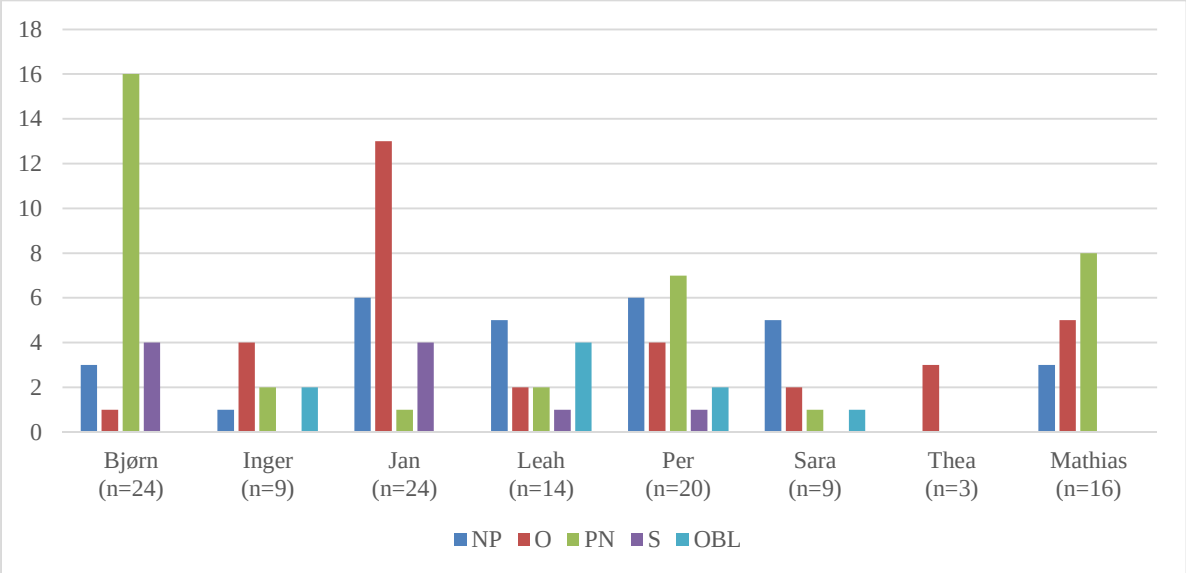

Figure 5 - Distribution of external syntactic functions in Stage VI

Presentational Nominal and Noun phrase

Compared to earlier stages, the proportion of NP relative clauses is low - only 24.6% of the relative clauses do not have a matrix clause. However, there is individual variation here as well. The NP construction is the most frequent relative clause construction for Sara, with 55.6%, while only 10% of Inger's relative clauses lack a matrix clause, i.e. are isolated NPs.

Stage VI is the stage in which the PN construction is at its lowest proportion in the material (28.9%), although it is not significantly different from Stage V (X^2 (1, N = 175) = 0.338, p = .561). It seems indeed that propositionally simple clauses are at their most infrequent, barely constituting the majority of the constructions of Stage VI with 53.5%.

Object

For the first time in the material, some (three) of the children in Stage VI exhibit a preference for external object relative clauses.

Furthermore, the repertoire of verbs used in relation with the external object relative construction has expanded. Of the 25 object relative constructions, 19 different matrix verbs are applied. This suggests that the constructional schema for relative clauses is close to the target form, with no reason to assume that any of the children have constructional islands.

Subject

Four of the children produced subject relative clauses in Stage VI, meaning that the external subject relative clauses emerge in Stage VI of the micro-profile for relative clauses. The first embedded, non-resumptive relative clause appeared in Stage VI, which is a development from earlier stages.

(1) Per, Stage VI, age 4;2:24

men sjørøveren som han blir med klarer
but pirate-DEF SUBJ 3SG comes with manages
å bære han ned men ikke opp
SUBJ carry 3SG down but NEG up
'but the pirate that he joins, manages to carry him down, but not up'

Because only one center-embedded and non-resumptive relative clause appeared in Stage VI, a completely correct use of subject relative clauses seems to represent a late stage of the development of relative clauses.

Oblique

Four of the children produced oblique relative clauses in Stage VI, implying that this function is also implemented in the micro-profile in this stage. 9 external oblique relative clauses were produced in this stage.

(2) Leah, Stage VI, age 3;7:28

Du	skal	kaste	baby	på	alle	som	kaster	baby
2SG	shall:PRES	throw-INF	baby	on	all	SUBJ	throw-PRES	baby
på	hodet	ditt						
on	head-DEF	POSS						

'You're going to throw baby on everybody who throws baby at your head'

5.2.6 Stage VII (4;6-5;6)

In the final stage, 143 relative clauses were produced. As can be seen from Figure 6 below, all the children produced relative clauses in at least three matrix clause functions. Quantity seems to be a good predictor of quality – the three children that produced three external syntactic functions had 7 or fewer tokens of relative clauses, while those that produced four different functions had at least 17 tokens. Finally, the child that produced five different external functions had 43 tokens. In other words, no children that produced many relative clauses displayed a small repertoire of external syntactic functions.

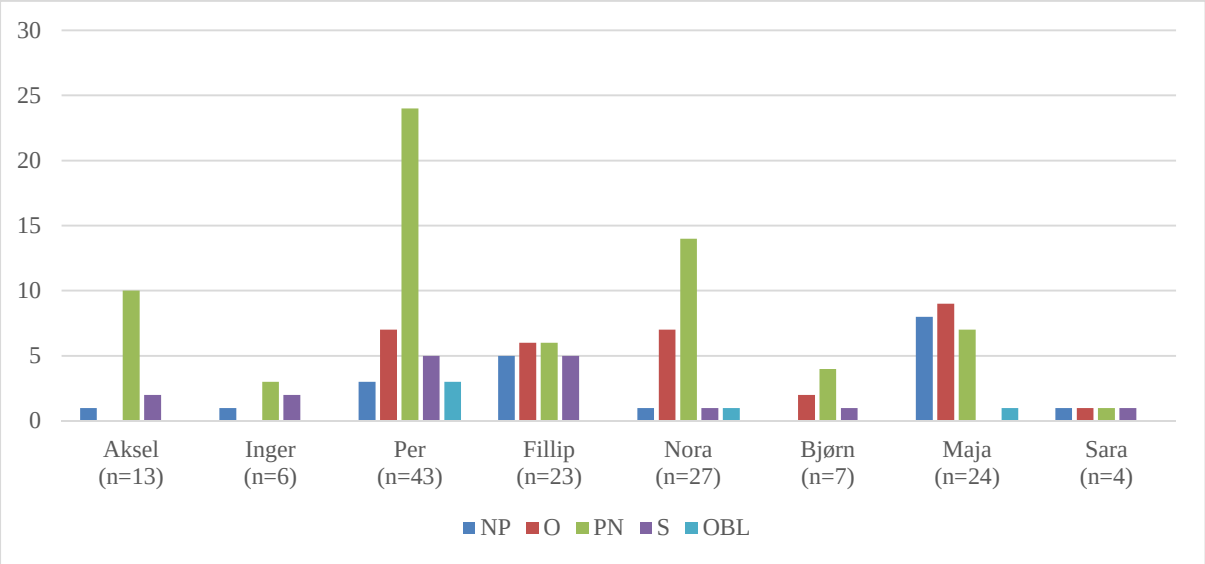

Figure 6 - Distribution of external functions in Stage VII

Presentational Nominal and Noun phrase

In Stage VII, the PN proportion is significantly higher than in Stage VI (X^2 (1, N = 262) = 7.939, p = .005). Furthermore, five of the children produced more PN relatives than any other clause function, which suggests that the trend is more than one individual with a high frequency of relative clauses having a big impact on the mean scores. The remaining three children produced most external object relative clauses. By way of explanation, the overall development of PN relatives seems to show a clear U-shaped development. This does not conform to recent results from English (Diessel, 2004) and German (Brandt et al., 2008) discussed in Chapter 3.2.

The NP relative construction proportion, on the other hand, is significantly less than in Stage VI (X^2 (1, N = 262) = 4.606, p = .032), reaching its lowest proportion of the corpus - 14.0%. There was some individual variation – from Bjørn's 0% to Maja's 32%. 5 of the children produced none or one NP relative clause in Stage VII.

Object

The proportion of external object relative clauses is exactly the same as in Stage VI. All children except Ingrid produced external object relative clauses. As with Stage VI, the repertoire of matrix verbs was varied, with few verbs being used twice as matrix verbs.

Subject

Of the 17 subject relative clauses, 6 included a resumptive element. Of the 11 remaining ones, 3 were right-branched because of a non-canonical word order, while 8 were center-embedded and did not include a resumptive element.

Nevertheless, the ability to construct external subject relative clauses displays a considerable development in Stage VII. Only Maja did not produce subject relative clauses, and 4 of the children display an ability to construct external subject relative clauses without resumptive elements and right-branching.

Oblique

In contrast with the previous stage, Stage VII external oblique clauses are not very frequent. In Stage VI, the proportion of OBL relative clauses was 7.6% compared to 3.5% in Stage VII. However, this difference did not reach statistical significance (X^2 (1, N = 261) = 2.084, p = .149). Furthermore, only three children produced them. This challenges the conclusion reached in the preceding section (Chapter 5.2.5), that oblique relative clauses are to be implemented in the profile. While they fulfilled the criteria for Stage VI, they do not for Stage VII.

5.2.7 The target form

To compare the children's relative clause constructions with those in the adult language, 100 relative clause constructions were sampled from 12 randomly selected informants from NoTa (Norwegian spoken corpus) ("Norsk talespråkskorpus - Oslodelen,") and coded for the same variables as the material. The proportions for the external syntax are illustrated in Figure 7 below:

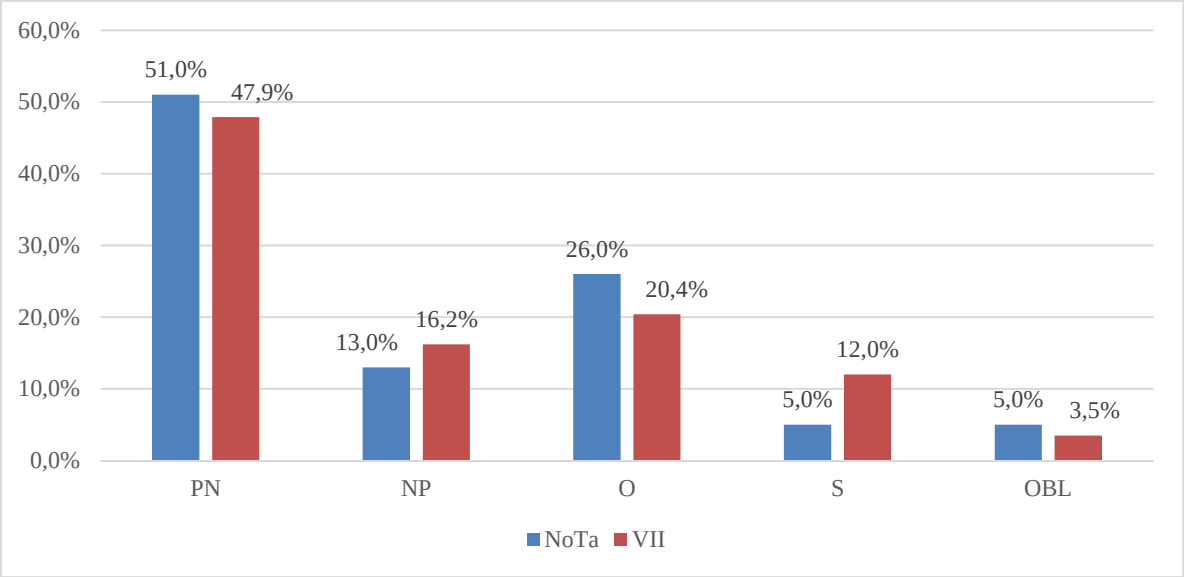

Figure 7- Comparison of external functions of Stage VII and the target form sample

NP, O and PN are still the here largest external functions, while S and OBL together constitute the minor functions.

The relative order of the proportions is the same as in Stage VII.

The proportions of the functions NP, O and PN are very similar to those of Stage VII. The differences did not reach statistical significance (X^2 (2, N = 211) = 0.257, p = .880). However, there is a statistical difference between the same external functions of the target form sample and that of Stage VI (X^2 (2, N = 190) = 8.887, p = .012) and Stage V (X^2 (2, N = 211) = 14.790, p = .001). This suggests that the Stage VII children have reached the target use of external syntax functions.

On the other hand, the target form proportions of S are more different to those of Stage VII. While the S proportion is 12.0% in Stage VII, it is 5.0% in the target form sample. However, the proportions of S in the two samples were not significantly different (X^2 (1, N = 243) = 3.391, p = .066).

Another interesting observation is that one of the external subject relative clauses in the adult material contained a resumptive element of the kind that characterized the earliest external subject relative clauses in the material. These constructions are discussed in Faarlund et al. (1997, p. 904) as a kind of extra-positions. Their status will further be discussed in Chapter 6.

5.2.8 Conclusion

The external syntax has a very clear developmental pattern. The first external functions to appear are also the ones that are most frequent throughout the time span. The primordial relative clause constructions are characterized by being exclusively PN and NP constructions, which are dominant for most of the age span. In Stage IV, external object and subject appears, and the external oblique function sees its first light in Stage V.

Furthermore, the early external subject relative clauses are characterized by having a resumptive element, or being right-branched by virtue of word order change. This is true for a very long time, until Stage VI, in which the first center-embedded external subject relative clause appears.

The external object relative clauses of Stage V showed clear signs of being characterized as verb island constructions. In Stage VI, the picture was entirely different, and a large set of different matrix clause verbs was observed

In Stage VII, it was demonstrated that the proportions were very similar to a target language sample, which suggests that external relative clause syntax is acquired by this age. However, the external subject proportion was higher than in the target language sample, which remains unexplained.

5.3 Internal syntax

5.3.1 Introduction

This section will present the internal structure of the relative clauses in the material, termed as the internal syntax.

Consequently, the topics that will be discussed are, firstly, the syntactic function of the gap in the relative clause, which may either be subject (S), object (O), prepositional complement or oblique (Prep).

Furthermore, the valence of the internal verb will also be described. This is done because earlier research (Diessel (2004, p. 139) and Brandt et al. (2008, p. 345)) found that the very first relative clauses had an internal intransitive verb. Another topic of description is whether

the subjunction is grammatically omitted. Omission of the obligatory relative subjunction was reported to be frequent in SLI children acquiring Swedish (Håkansson & Hansson, 2000), discussed in Chapter 3.1.7, as well as in the study of Diessel (2004), and was called “the amalgam construction”.

Finally, the placement of the sentence adverbial will be discussed. This is justified on the grounds that it may shed light on the Conjoined clause hypothesis discussed in Chapter 2.3.4, which suggests that children view relative clause constructions as coordinated clauses. The other sentence adverbials were extracted in the following way: When children that produced relative clauses with a sentence adverbial were found, the other subordinate clauses with sentence adverbials were extracted from the recording. This could have been done for all of the children. However, finding correctly placed sentence adverbials in the absence of relative clauses with sentence adverbials could never tell us whether the children views relative clause constructions as coordinated clauses or not. Thus, it is argued that beyond being extremely time-consuming, this is beyond the scope of the current thesis. The frequency of the different relative clause functions are illustrated in Figure 8 below.

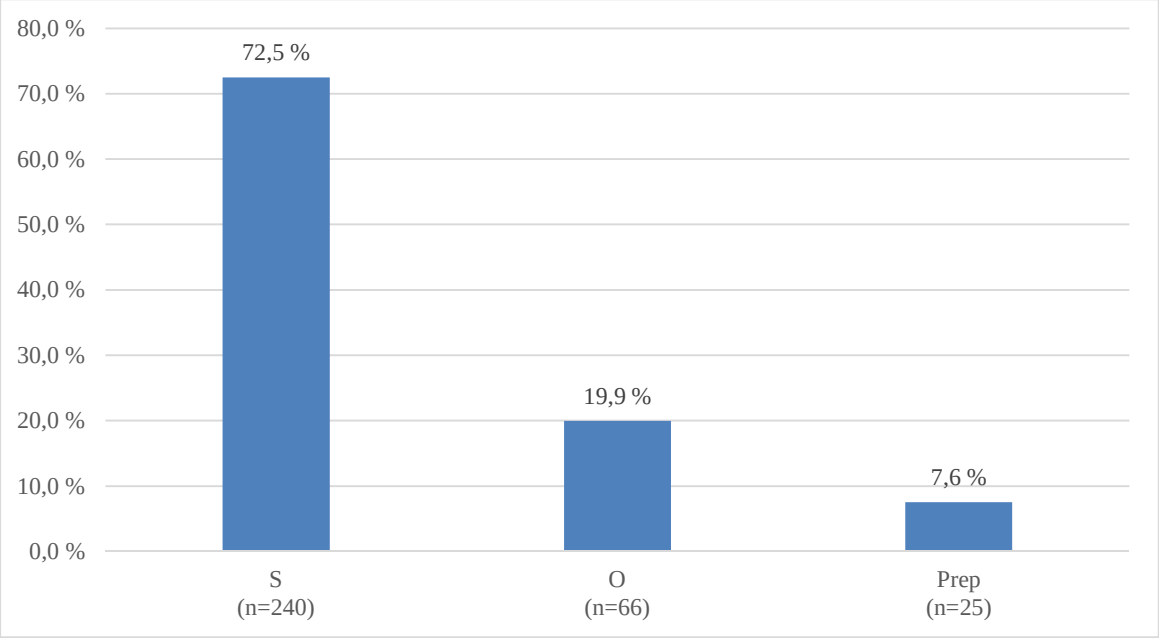

Figure 8 - Mean proportions of internal functions across all ages

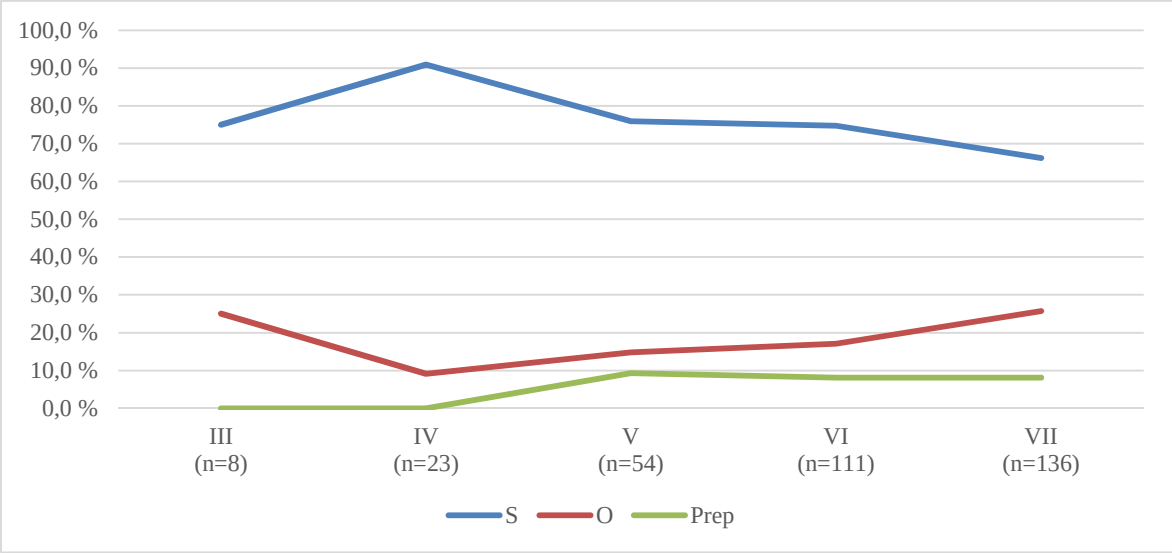

Figure 9 - Development of internal syntactic functions

As was mentioned in external syntax, the amount of relative clause constructions increases from Stage III to Stage VII, which implies that although some of the proportions of each function may decrease, the actual number of each function increases through development.

Some trends are apparent. First, and foremost, a preference for internal subject relative clauses seems to hold for every stage that is investigated. However, the proportion of object relative clauses steadily gets higher throughout the age span. An exception is Stage III, in which the proportion of internal subject relative clauses is lower than in Stage IV, and the proportion of the internal object relative clauses is higher than in Stage IV. However, see 5.3.2 below.

Although not surprising, and as in the external syntax, there seems to be a distinction between major functions, i.e. subject and object, and minor functions, i.e. prepositional complements and adverbials. While the two major functions are present from the start, the minor functions are absent from the material until Stage V. Their development is to be elaborated in Chapter 5.3.3, 5.3.4 and 5.3.5.

Valence

The valence of the internal verbs will be dealt with in the current section, for all stages. Below are the proportions for valence.

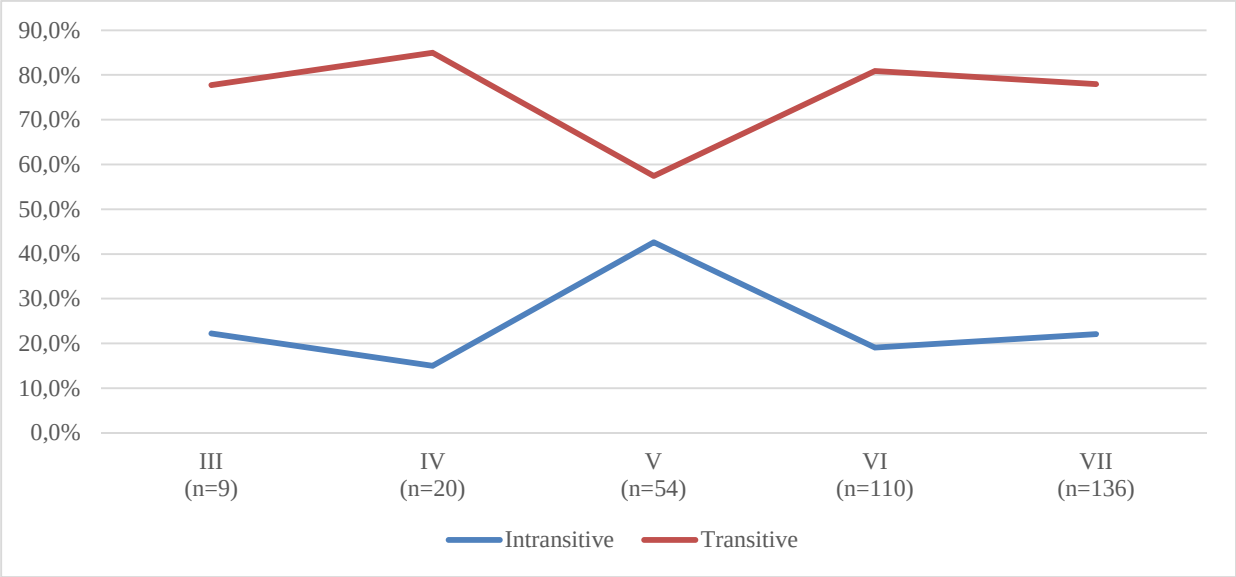

Figure 10 - Development of valence of internal verb

Figure 10 readily illustrates that very few intransitive relative clauses were found in the earliest material. This is very divergent from what is found in earlier studies, in which the relative clauses initially mostly are intransitive, and gradually becoming more and more transitive (Brandt et al., 2008; Diessel, 2004). In other words, this property seems to emerge in its target form.

5.3.2 Stage III (2;0-2;6)

Clause functions

In the external syntax section, 9 relative clauses were recorded in Stage III. In the internal syntax, one was discarded from the material on the grounds that the internal structure of the relative clause was a formula from the fairy-tale that the investigators brought with them. Of the remaining relative clauses, 6 were internal subject relative clauses and 2 were internal object relative clauses. Both object relative clauses come from the same child, Emil. The object proportion is higher than in Stage IV, which does not conform to previous research.

	Subject	Object
Emil	4	2
Lucas	1	0
Kari	1	0

Table 8 - Internal functions of Stage III

The two internal object relative clauses occur with an interval of four minutes, which is fairly long, but with some striking similarities (relative clauses in brackets).

(1) Emil, Stage III, age 2;3:29

Det	er	sånn	belte	man	skal	ha	skal	kjøre
it	COP	the-kind-of	belt	one	shall	have	shall	drive

'It is the kind of belt you need [when you're] going to drive'

(2) Emil, Stage III, age 2;3:29

det	panser	han	skal	kjøre
It	hood	he	shall	drive

'It [is] the hood he's going to drive'

The first sentence seems so include a subordinate adverbial clause within the relative clause. Emil does use adverbial clauses elsewhere in the recording, and it is thus not improbable that he is able to produce adverbial clauses within relative clauses.

Both internal object relative clauses had an internal pronominal subject, and an animate head.

Subjunction

The relative subjunction was ungrammatically omitted only once, and omitted in both object relative clauses, where it is not obligatory.

Sentence adverbial

Not unexpectedly, because of the few tokens and the low age, there were no sentence adverbials in the relative clauses of Stage III.

5.3.3 Stage IV (2;6-3;0)

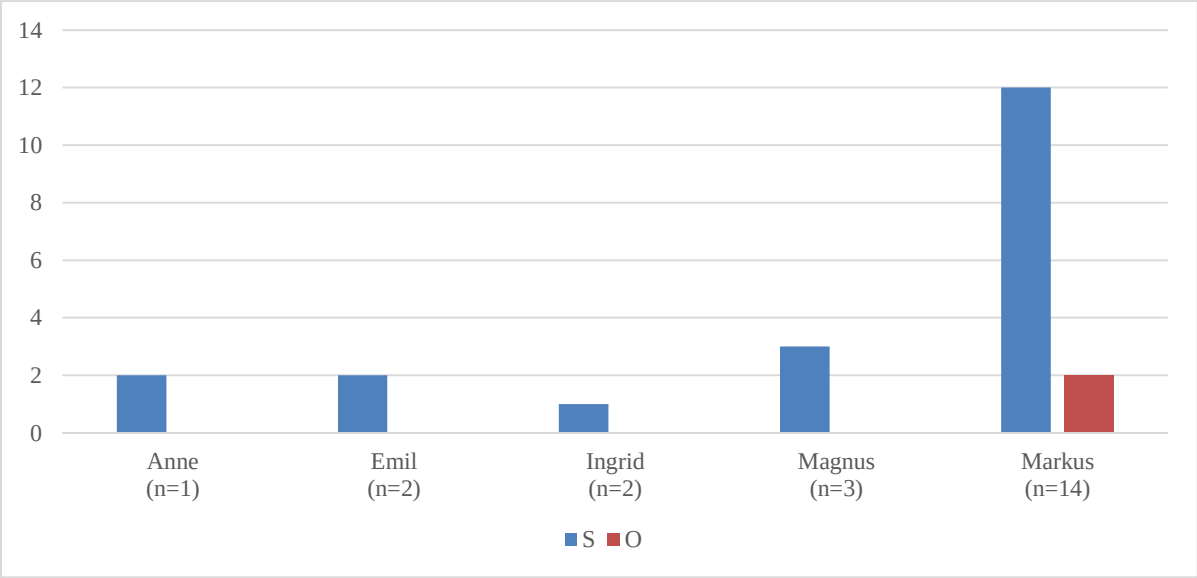

Figure 11 - Distribution of internal functions in Stage IV

Clause functions

In Stage IV, the overwhelming preference for subject relative clauses held. Furthermore, the impact of Markus' high frequency is evident from Figure 11: without him, 100% of the tokens would be internal subject, while it is 91.3% with him. Of the total 23 relative clauses, Markus produced 14, and the only two internal object relative clauses of Stage IV. His object relative clauses are target forms, with the exception of one missing relative clause head. However, this is not unconventional in the case of being an external NP relative clause. The head is mentioned in the previous conversational turn, and Markus is simply modifying it. This practice is not uncommon in target language.

(1) Markus, Stage IV, age 2;8:6

Som han kan spise

SUBJ 3SG can:PRES eat-INF

'That he can eat'

All of the internal object relative clauses in Stage IV have an internal pronominal subject. One of the heads is animate, while the second one, illustrated above, is ambiguous. However, the context suggests that the head is *kjøtt* 'meat'.

Sentence adverbials

The earliest sentence adverbial of the material appeared in Stage IV.

(2) Ingrid (2;10:28)

her er pusekatten er ikke skummel
here is kitty-DEF is NEG. scary
'Here is the kitty that's not scary'

The sentence adverbial *ikke* 'not' of the relative clause does not conform to target conventions of subordinate clause syntax – the adverbial should be placed before the main verb. However, since the clause lacks the obligatory relative subjunction, the question if it is a relative clause construction at all arises. Ingrid did not produce any other subordinate clauses with a sentence adverbial.

Subjunction

Of the 19 subject relative clauses, two subjunctions were omitted ungrammatically. Ingrid's one token of relative clause did not have the obligatory subjunction, while it was omitted in one of Magnus' three relative clauses. None of the optional subjunctions were omitted.

5.3.4 Stage V (3;0-3;6)

Clause functions

Major developments of the internal structure of relative clauses can be observed in Stage V. This is primarily manifested in that all possible internal clause functions are represented. Both internal object relative clauses and internal prepositional complement relative clauses are produced by 4 children (3 of which produced both), qualifying both constructions for an entry in the micro-profile for relative clauses. The forms of the two construction types are target-like.

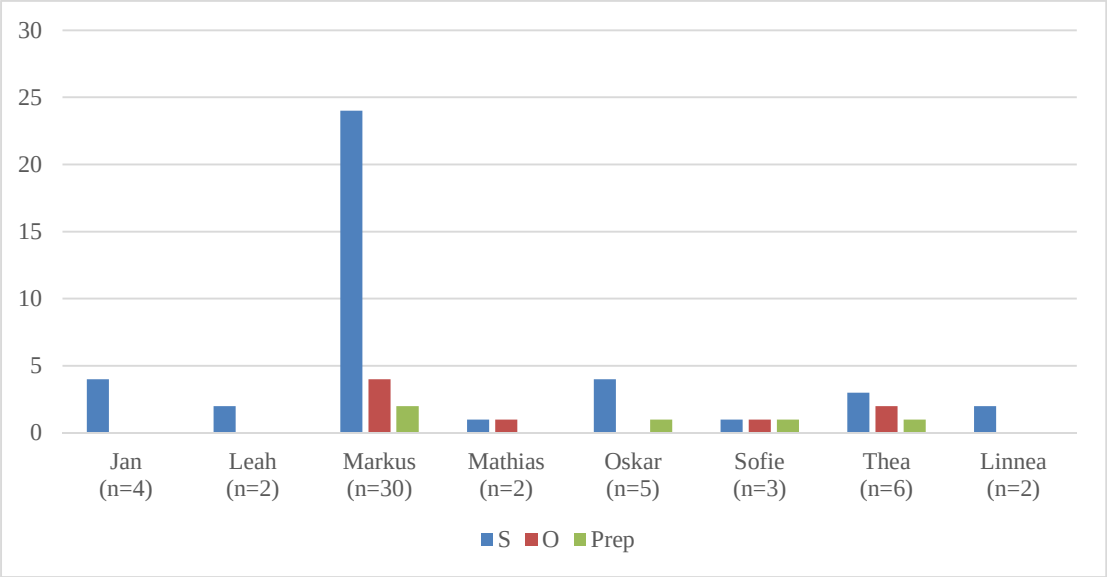

Figure 12 - Distribution of internal functions in Stage V

Parallel to what was done in external syntax, the impact of Markus should be discussed. The table below describes his impact in percentages.

	S	O	Prep
With Markus	75.9%	14.8%	9.3%
Without Markus	70.8%	16.7%	12.5%

Table 9 – Proportions of internal functions of Stage V with and without Markus

Markus impacts the group mean only slightly. The relative order of the internal functions is preserved without Markus, but with some differences. Because of the low amount of tokens of internal object relative clauses and prepositional complement relative clauses, a measurement of significance could not be carried out with a chi square test. However, the internal subject proportions of the two conditions did not reach statistical significance (X^2 (1, N = 54) = 0.613, p = .434).

7 out of 8 of the internal object relative clauses had an internal pronominal subject, while all 8 internal object relative clause heads were inanimate.

Sentence adverbials

Five of the relative clauses contained a sentence adverbial, all from Markus. All of them were ungrammatically placed, as if they were main clause adverbials.

(1) Markus, Stage V, age 3;2:13

Dinosaur	som	får	ikke	plass	inni
Dinosaur	SUBJ.	get:PRES	NEG.	space	inside

‘Dinosaur that doesn’t fit inside’

Markus had three other subordinate clauses with sentence adverbials, and it was found that all of these had the sentence adverbial placed in the correct position, before the verb.

Subjunctions

In Stage V, no obligatory subjunctions were omitted.

8 optional subjunctions were produced, five of which were from Markus, the remaining from Sofie and Thea. 5 optional subjunctions were omitted. Markus only omitted one optional subjunction, distinguishing himself from the other children, who had a much clearer tendency of omitting the subjunction.

5.3.5 Stage VI (3;6-4;6)

Clause functions

There was no clear development across the board in internal syntax in Stage VI. However, a lot of variation held, as can be seen in Figure 13 below:

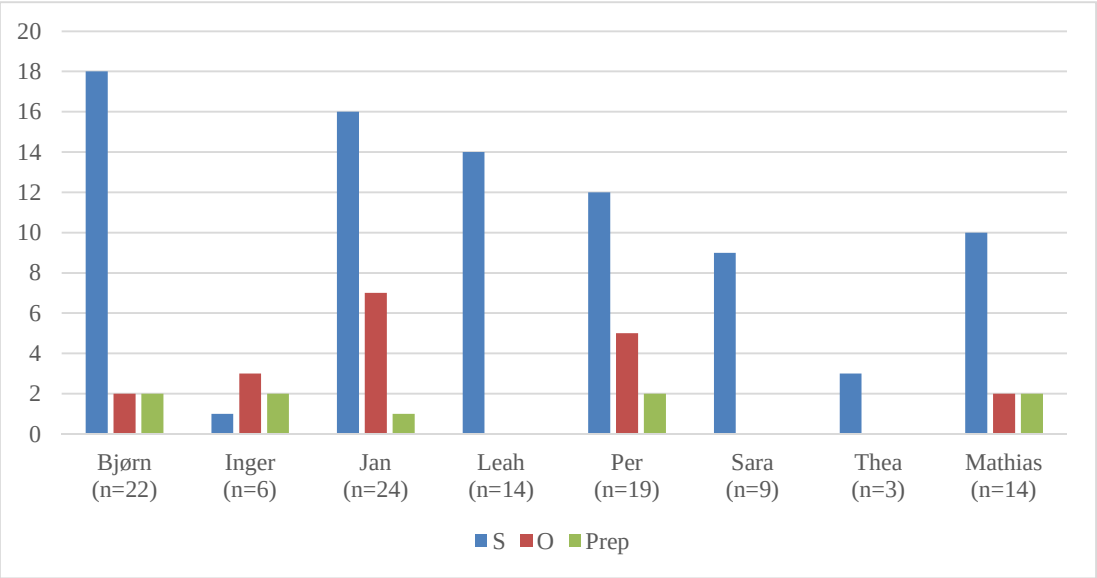

Figure 13 - Distribution of internal functions in Stage VI

That three of the children produced nothing but subject relative clauses, while the remaining children produced all functions, is the most obvious fact of the figure. Thea and Leah were also children of Stage V. While Thea was able to produce relative clauses with three different clause functions in Stage V, Leah's repertoire of internal functions is seemingly unchanged, stagnating at subject relative clauses. However, as described above, Leah's external syntax is varied, with five functions. Furthermore, Thea has a very small sample of relative clauses, arguably not enough to base any conclusions on her development on.

The remaining children display versatility and a rich repertoire of internal clause functions. Inger's internal object clauses are even more frequent than her internal subject relative clauses, and the proportion of her prepositional complement relative clauses is fairly high, 33.3%.

The form of the prepositional complement relative clauses is very target-like.

One of the relative clause constructions is non-target like. In this token, a time adverbial immediately succeeds the subjunction, which yields a very peculiar sentence. Furthermore, a stranded preposition is missing. The sentence's non-target nature makes it ambiguous between "here is the old zoo that was before the panda" and "here is the old zoo that the panda was in before". However, the context picks out the latter option.

(1) Inger, Stage VI, age 4;5:29

Her	er	den	gamle	dyrehagen	som	før	pandaen	var
here	COP.	The	old	zoo	SUBJ.	before	panda-DEF	COP.

'Here is the old zoo that before the panda was'

This example may be considered an ungrammatical case of V2 inversion in the relative clause. The inversion is furthermore an over-inversion as the above relative clause is not V2, but V3.

Of the 20 internal object relative clauses, 16 had an internal pronominal subject. Furthermore, 16 of the internal object relative clause heads were inanimate.

Sentence adverbials

There were 8 tokens of relative clauses with a sentence adverbial in Stage VI, from four different children. The first grammatical placement of subordinate clause sentence adverbial came in Stage VI, illustrated in the table below.

	Grammatical	Ungrammatical
Jan	0	2
Per	3	0
Leah	1	0
Bjørn	0	2
Total	4 (50%)	4 (50%)

Table 10 - Placement of sentence adverbials in relative clauses in Stage VI

As can be seen here and earlier, each child places the sentence adverbial either grammatically before the verb in the relative clause, or ungrammatically after the verb. Mixed results are absent from the Stage VI material. In Jan's recording, four other subordinate clauses with a sentence adverbial were found, two of which were placed before the main verb, two of which were produced after the main verb.

One nominal complement clause and four adverbial clauses with sentence adverbials were found in Per's material. Two were grammatically placed before the verb, but three *fordi* 'because' clauses had the sentence adverbial placed after the verb. However, Faarlund states that this word order "sporadically" occurs, and points out that *fordi* 'because' is formally and semantically similar to the word *for* 'because', which introduces a clause with the sentence adverbial placed after the verb (Faarlund et al., 1997, p. 868). It is thus conceivable that this subjunction poses special difficulty to the children, and it is easier for them to use the unmarked word order – with the sentence adverbial placed after the verb.

Leah's recording yielded one additional subordinate sentence adverbial, from an adverbial clause. This was placed grammatically placed before the verb.

No other subordinate clauses with a sentence adverbial were found in Bjørn's recordings.

It seems that while sentence adverbials in relative clauses remain difficult for some of the children of Stage VI, sentence adverbials in other kinds of subordinate clauses appear to be acquired sooner.

Subjunctions

There were no ungrammatical omissions of the subjunction in Stage VI. Of the non-obligatory subjunctions, 11 were omitted, while 21 were not.

5.3.6 Stage VII (4;6-5;6)

Clause functions

In the final stage of the material, the most dominant of the internal clause functions is subject, but the object proportion increases from Stage VI, amounting to 25%.

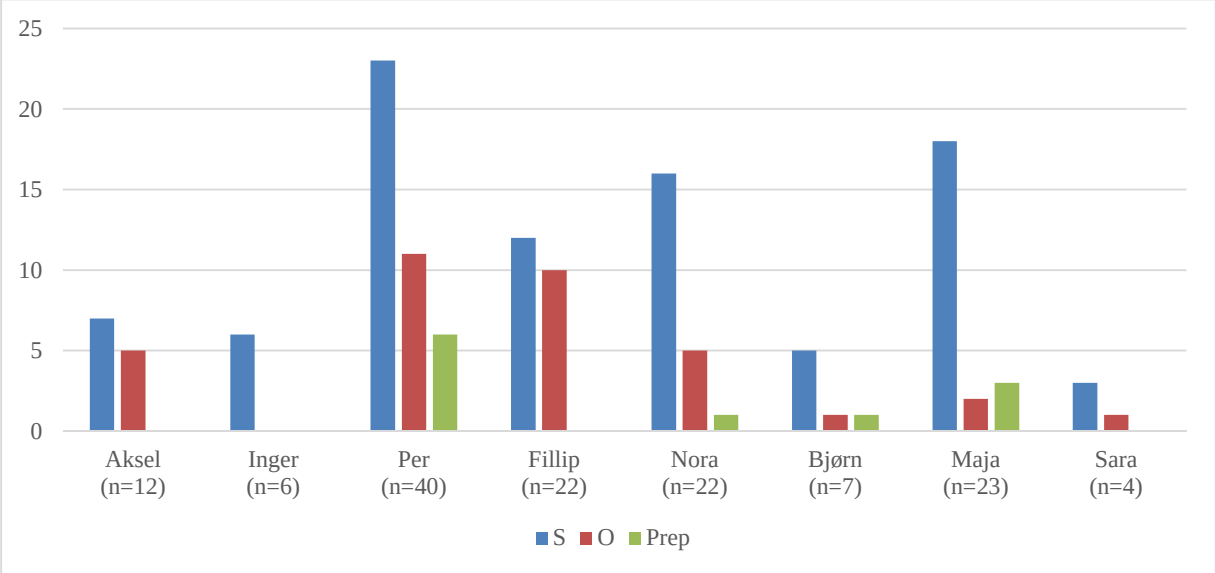

Figure 14 - Distribution of internal functions in Stage VII

Of the 48 internal object relative clauses, 42 had an internal pronominal subject, and 46 had an inanimate head.

Sentence adverbials

Stage VII yielded five relative clauses with sentence adverbials. Two of the relative clauses of the entire stage had an ungrammatical placement of the sentence adverbial.

	Grammatical	Ungrammatical
Per	1	1
Maja	0	1
Nora	1	0
Aksel	1	0

Table 11 - Placement of sentence adverbials in relative clauses in Stage VII

Nora, Per and Aksel produced one *fordi* ‘because’ clause each, with the sentence adverbial placed before the verb. This distribution was given an explanation in Chapter 5.3.4.

Per is the only child of the material that displayed mixed results in placement of sentence adverbials in relative clauses. Below follows the ungrammatical and the grammatical relative clause.

(1) Per, Stage VII, age 4;8:23

for	det	er	sånn	som	han	kan	bare	skru	på
because	that	is	the.kind	SUBJ.	3SG	can	just	turn	on

‘Because that’s the kind he can just turn on’

(2) Per, Stage VII, age 4;8:23

for	noen	tror	at	det	er	en	tunell
because	somebody	think-PRES	SUBJ.	3SG:NEUT	COP.	ART	tunell

som	ikke	er	sånn	som	tunell	på	bil
SUBJ	NEG.	COP.	the-kind	as	tunnel	on	car

‘Because someone thinks that it’s a tunnel that is not the same kind as tunnel on car’

However, *bare* ‘just’ is classified as a focusing adverb and “has more complicated rules for placement than other adverbials” (Faarlund et al., 1997, p. 915). Thus, Per might have heard this specific placement in the input. Per had three other sentence adverbials in subordinate clauses: all in nominal complement clauses, which were grammatically placed before the verb.

Aksel had no subordinate sentence adverbials other than the one in the relative clause.

Maja produced one relative clause with a sentence adverbial, which was ungrammatically placed after the verb. In an investigation of her other subordinate clauses with sentence adverbials, one nominal complement clause was found. The sentence adverbial in the nominal complement clause was placed grammatically before the verb.

Nora, who produced one relative clause sentence adverbial (which was correctly placed), had two other subordinate clauses with sentence adverbials, one infinitive clause and one adverbial clause. The infinitive clause had correct placement of the sentence adverbial. The adverbial clause had the subjunction *når* ‘when’, and was placed ungrammatically after the

verb. Thus, Maja was the only child who had grammatical placement of sentence adverbials in relative clauses, in conjunction with ungrammatical placement of sentence adverbials in other subordinate clauses.

Only three children placed the sentence adverbials grammatically before the verb in Stage VII. Thus, relative clause sentence adverbials did not satisfy the profile inclusion criterion – Consequently, the grammatical placement of sentence adverbials will not be included in the micro-profile at all.

Subjunctions

No children omitted an obligatory subjunction in Stage VII. 22 optional subjunctions were omitted, while 23 were not.

5.3.7 The target form

The target form sample from NoTa ("Norsk talespråkskorpus - Oslodelen,") introduced above yielded the following results in the internal syntax, compared with Stage VII:

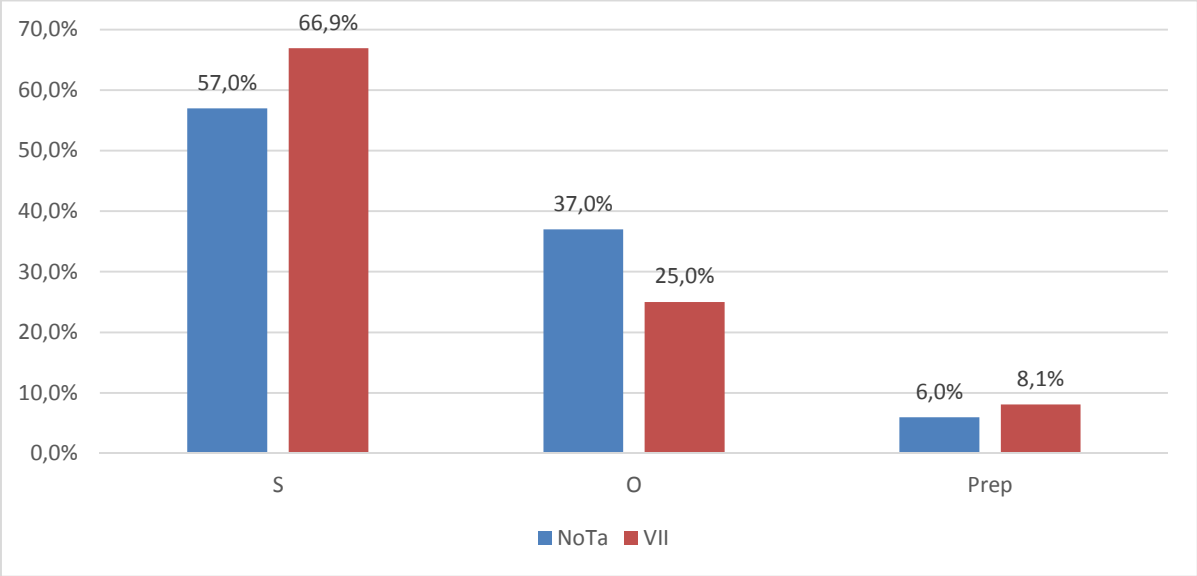

Figure 15 - Comparison of internal functions of Stage VII and the target form sample

As with the external syntax, it seems very clear that the Stage VII children are close to the target form in terms of proportions. Although the internal object relative clauses did not are not more frequent than internal subject relative clauses in the final stage in the data material (which is the case in Diessel (2004)), it can be seen from the NoTa material that internal

subject relative clauses nevertheless are more frequent than internal object relative clauses in the target form.

The differences in proportion are marginal in all functions, as in external syntax (Chapter 5.2.7): A Chi-square test revealed that no statistical significance held between the Stage VII sample and the target form sample for internal subject and object. X^2 (1, N = 219) = 3.138, p = .076.

On the other hand, the proportions of the internal subject and object relative clauses of the Stage V sample are significantly different from the target form sample (X^2 (1, N = 143) = 7.925, p = .005). This holds for Stage VI as well (X^2 (1, N = 196) = 10.305, p = .001).

33 out of 37 internal object relative clauses in the target form sample had an internal pronominal subject. Only two of the internal object relative clauses had an animate head.

Finally, 24 of the optional subjunctions were omitted, while 19 were not, in the NoTa material. This too resembles the results of Stage VII.

5.3.8 Conclusion

As the external syntax, the internal syntax has a very clear developmental pattern. The internal subject relative clauses dominate over both internal object relative clauses and prepositional complement relative clauses throughout the entire sample.

The internal prepositional complement relative clauses reach their ceiling in Stage V, and stay stable through Stage VII. It was demonstrated that the proportions of Stage VII were not significantly different from the target form sample, while those in Stage V and VI sample were. This suggests that the children's use of relative clauses at the end of the recorded development is close to the target use.

Furthermore, the children who had grammatical placement of the sentence adverbial in relative clauses usually have correct placement of sentence adverbial in other subordinate clauses (Maja was the only exception here, as explained in Chapter 5.3.5). On the other hand, the children who do not have grammatical placement of sentence adverbials in relative clauses do not necessarily place the sentence adverbial grammatically in other subordinate clauses.

The obligatory subjunctions were seldom omitted. Only a few tokens of this were found in the earliest material. The optional subjunctions displayed a more random pattern, except in Stage VI, in which 11 were omitted, while 21 were not.

Finally, throughout the entire sample, the head of internal object relative clauses were often inanimate, and the internal subject was pronominal.

5.4 Interrogative relative clauses

5.4.1 Introduction

Interrogative relative clauses are wh-questions that are “embedded” in the structure as a clause argument, exhibiting relative clause properties, described in chapter 3.1.3.

Although the first interrogative relative clauses were produced in Stage III, it was not until Stage VI that at least four children produced them.

All of the interrogative relative clauses were coded for external syntax. However, 100% of the interrogative relative clauses functioned externally as objects. This was expected because external subject interrogative relative clauses are very infrequent due to their non-specificity (Faarlund et al., 1997, p. 1058), while subjects tend to be specific in Norwegian (Faarlund et al., 1997, pp. 691-693).

The internal structure of interrogative relative clauses, as well as the form of the relative pronoun and the matrix verbs used are particularly interesting and will be described in the following.

5.4.2 Internal structure

All developmental stages of the current thesis have interrogative relative clauses, although limited to only a few children. Consequently, the very earliest appear in Stage III. The most diverging aspect of interrogative relative clauses as opposed to regular relative clauses is the overwhelming preference of internal objects; 81.7% of all interrogative relative clauses were not internal subject relative clauses.

(1) Linnea, Stage V, age 3;3:22

Vet	ikke	hva	du	heter
know-PRES	NEG.	what	2SG	is-name-PRES

'I don't know what your name is'

18.3% were internal subject relative clauses. Consider the following:

(2) Thea, Stage VI, age 3;7:26

Dere	vet	ikke	hvem	som	får	pepperkake
2PL	know:PRES	NEG.	who	SUBJ.	get-PRES	gingerbread

'You don't know who'll get gingerbread'

While the ability to construct regular object relative clauses represent some kind of developmental milestone, or feat, in the acquisition of regular relative clauses, this represents the most basic stage in the acquisition of interrogative relative clauses. In fact, no interrogative internal subject relative clauses were produced until Stage VI, cf. Figure 16 below:

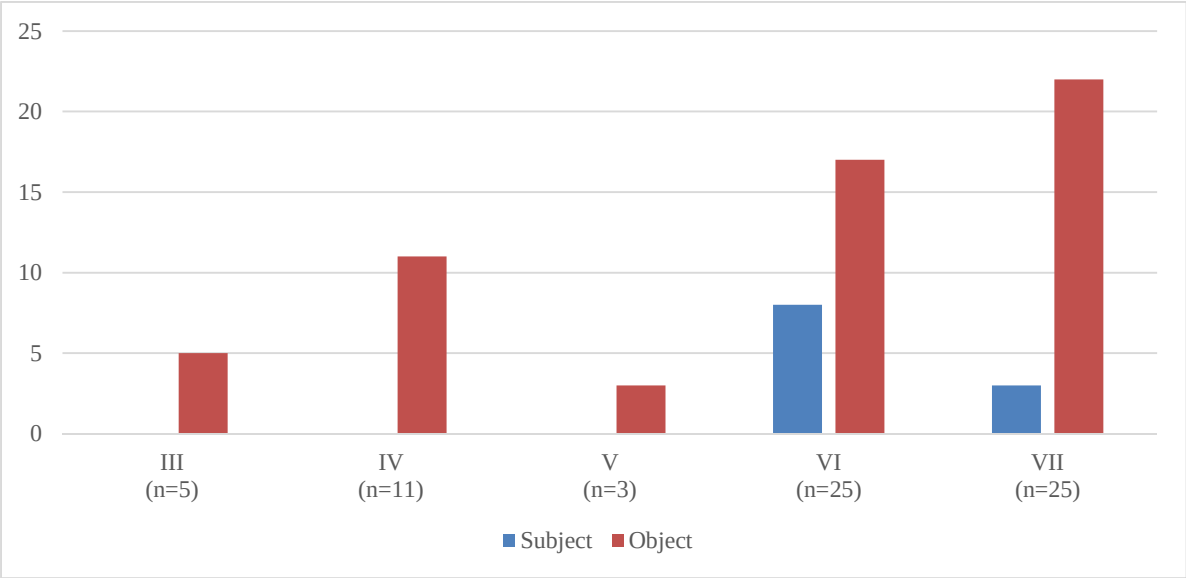

Figure 16 - Development of internal functions of interrogative relative clauses

5.4.3 Question words

Four different question words are used by the children of the material: *hva* 'what', *hvem* 'who', *hvor* 'where', *hvordan* 'how', *and hvilken* 'which'.

	Number of different question words used
III	2
IV	2
V	2
VI	3
VII	5

Table 12 – Number of different questions words used for each stage.

There is a gradient increase in the number of question words the children use when constructing interrogative relative clauses. In the first two stages, 12 of 16 question words were *hva* 'what', while 4 were *hvor* 'where'.

There is a certain pattern in how they appear. The majority of the interrogative relative clauses use the question word *hva* 'what'. In Stage III, it seems that the production of interrogative relative clauses is limited to *hva* 'what' clauses, and *hvor* 'where'. Stage IV contained two of five question words, while Stage V only contained three tokens of interrogative relative clauses, and they all head the relative pronoun *hva* 'what'. Stage VI contained the three question words of the previous stages, while the last question word used in a relative clause, *hvordan* 'how', saw its light in Stage VII, in which all question words were produced.

5.4.4 Matrix clause verbs

A particularly interesting property of the interrogative relative clauses is which different verbs the children used as matrix verbs.

	Number of different verbs used
III	1
IV	2
V	1
VI	5
VII	8

Table 13 - Number of different matrix verbs used for each stage.

Initially, the children only used the verb, *å vite* 'to know' in its negated form when constructing interrogative relative clauses. In Stage IV, one child also used the matrix verb *se* 'to see'. As can be seen from the above table, the number of different matrix verbs increased

gradually in the following stages. A considerable development in this respect can be observed between Stage V and VI.

5.4.5 Conclusion

The developmental trajectory of interrogative relative clauses is described in terms of their internal functions, matrix clause verbs, and use of question word. It was shown that in the first domain, the relative clauses were primordially characterized by being internal object, although some internal subjects appeared after Stage V, the internal objects remained dominant. As for the matrix clause verbs and question words applied, they both displayed a gradual development from a narrow set to a broader set.

5.5 The micro-profile for relative clauses

The analysis above describes the different aspects of acquisition of Norwegian relative clauses. An explicit purpose of the current thesis is to construct a micro-profile for relative clauses. This micro-profile follows below. The micro-profile is very rough, and does not debate the problems that have been described in the current chapter, i.e. the external oblique relative clauses (Chapter 5.2.6) of Stage VII, which have been removed in the micro-profile. However, any assessment device should be kept short for the sake of simplicity. Any elaboration on the different stage developments will be found in the current thesis.

Furthermore, the current micro-profile makes no assumption as to which properties that are deviant in children with SLI. Consequently, the micro-profile is not complete per se, because it needs to be supplemented with data from children exhibiting SLI.

	Internal syntax		**External syntax**	
	Functions	**Other**	**Functions**	**Other**
Stage IV **2;6-3;0**	Subject		Presentational clauses in the form of 'her/der/det VÆRE X *som* Y" Relative clauses without a matrix clause	
Stage V **3;0-3;6**	Object Prepositional complement		Object relative clauses, where the matrix verb is lexical.	Small set of matrix clause verbs (up to three).
Stage VI **3;6-4;6**			Subject with a resumptive pronoun	A wider repertoire of matrix clause verbs.
Stage VII **4;6-5;6**			Subject without a resumptive pronoun	

Table 14 - The micro-profile for relative clauses

6 Discussion

6.1 Introduction

The discussion chapter will be structured as follows. First, the research questions as presented in Chapter 3.4 will be repeated and, subsequently, answered in turn. Where the answers raise new questions, they will be answered, if the material will allow to do so.

6.1.1 Research questions once more

The research questions outlined in Chapter 3.4 of the thesis had their basis in Chapters 2 and 3, and were the following:

1. Which properties of relative clause develop over time, and does this correspond to previous research? If not, why?

2. Can the development of relative clauses in Norwegian shed light on the five hypotheses of Chapter 2.4.4?

3. Does the development of relative clauses foreshadow clinical markers of relative clauses in SLI?

4. Is there a developmental relationship between regular relative clauses and interrogative relative clauses?

6.2 The case of the interrogative relative clauses

Although the case of interrogative relative clauses is the fourth and last research question, it will be answered first. This is because the answer has implications for how the remaining research questions should be answered.

It was found that interrogative relative clauses have a very different developmental trajectory than regular relative clauses, which initially are constructions with a copula clause verb and an internal subject gap. This is despite the fact that the two constructions share many properties (Chapter 3.1.3). The differences were primarily manifested in the high proportion

of internal objects, the frequency of which is considerably lower in regular relative clauses. The appropriate question then should be why.

The primordial interrogative relative clauses displayed characteristics of a chunk (described in Chapter 2.2.4): Those of Stage III and IV appeared with an internal object gap, and only two matrix clause verbs were used – *å ikke vite* 'to not know' (it was always in the negative until Stage V) and *å se* 'to see' (one child). Furthermore, the matrix clause subject was almost always a first person singular pronoun (it was plural once). Finally, the question word applied was either *hva* 'what' (12 of 16 tokens) or *hvor* 'where' (4 of 16 tokens).

Thus, the emergent interrogative relatives should be considered chunks. They should not be considered as verb islands, because verb islands are individual patterns, whereas this pattern can be recognized in all the children. The chunk is structured as follows:

(1)
First person pronoun – Don't know/look – What/where - X

Below follows an instantiation example:

(2) Sofie, Stage IV, 2;9:8

jeg	vet	ikke	helt	hva	jeg	gjorde	mere
1SG	know	not	entirely	what	1SG	do:PRET	more

'I don't entirely know what I did more'

Then, repeating the above, they are fairly concrete matrix clause constructions that display no variation in their matrix clause subject (*jeg* 'I'), some variation in which matrix verb they use (either *å ikke vite* 'to not know' or *å se* 'to see') and which question word they use (either *hva* 'what' or *hvor* 'where'). The structure of the interrogative relative clause itself seems to be fully schematic, i.e. it contains no pre-specified elements.

These observations lead the current author to conclude the following about interrogative relative clauses:

(i) Interrogative relative clauses are not mentally represented in the same way as relative clauses, at least not to the youngest children. This is because they emerge as concrete chunks, in the form in (1) above. Furthermore, their internal function is by default object,

the subject emerging later, with a very low frequency (Chapter 5.4.2). In regular relative clauses, the internal subject is the default, the internal object emerging later.

(ii) Despite (i), the very first interrogative relative clauses are also propositionally simple, as regular relative clauses. The interrogative relative clauses with *to not know* are used to direct the attention away from the speaker, while the ones with *to see* are used to direct attention towards an object outside the joint attentional frames, or the context. Thus, they are deemed propositionally simple on the same grounds as regular relative clauses, having little propositional content, and are facilitated by the same pragmatic usefulness.

(iii) It seems plausible that the children's caretakers use these constructions as well fairly often, because they as well often introduce new participants to the discourse, and that their recurring structure thus is entrenched in the children as a function of input. In light of the illocutionary force of the two first verbs described above, it is conceivable that children pick up this communicative intention through imitative learning. However, what is conceivable is of no interest until it is tested empirically.

These findings conform to Westergaard (2009), who found that the constructions (recall that she called them 'embedded questions') appeared with a small set of matrix verbs (the same as in this study) and did not resemble other wh-questions, although the standard analysis (Faarlund et al., 1997, p. 989) assumes that it is a kind of wh-question. The current research question was posed to investigate if the construction should instead be considered a kind of relative clause, given their similarities. This was not the case, and it appears that the interrogative relative clause is a construction of its own.

Now that the interrogative relative clauses are described as something different from regular relative clauses, the findings in the developmental trajectory of regular relative clauses can be discussed.

6.3 The developmental trajectory and previous research

6.3.1 Introduction

The current research question should be considered the main research question and is therefore the question that will take most space in the discussion chapter. It is structured as

follows: first, external syntax will be discussed. Under external syntax, agreement with previous research will be discussed first, followed by the results' divergences with previous research and expectations. Internal syntax will be discussed in the same manner. Finally, the relative frequency of relative clauses will be discussed, concluding the research question.

The developmental trajectory of relative clauses is encapsulated in the micro-profile of Chapter 5.5, and is constituted by external and internal syntax. External syntax refers to the relative clause's relationship to the matrix clause, while internal syntax refers to the relative clause's internal structure. The developmental trajectory outlined in the preceding chapter can be summarized as follows:

External syntax: PN, NP > O > S, Oblique

Internal syntax: S > O, Prep

These are all of the properties that showed a clear development throughout the age span. A clear development here refers to the inclusion criterion of LARSP, which is that 50% of the children used a given grammatical property. The rest of the variables can be grouped in two categories: (i) those that did not reach target form in the course of the development, e.g. the correct placement of sentence adverbials, and (ii) those that emerged in the earliest relative clauses in their target form, e.g. subjunctions and valence. Goodluck and Tavakolian (1982) state that there are three domains that may restrict the acquisition of relative clauses: grammatical competence, pragmatics and processing. This view will be supported in the following, exploring all domains and their role in the acquisition of relative clauses.

6.3.2 External syntax

Convergence with previous research and expectations

In the external syntax, the first relative clauses were Presentational Nominal (PN) and Noun Phrase (NP). As the children grew older, they started to use external object relative clauses, and later external subject relative clauses and external oblique relative clauses.

These findings harmonized with a proposition from Diessel (2004) and Diessel and Tomasello (2000) (both English) and Brandt et al. (2008) (German), whose primary conclusion was that propositionally simple relative clauses, external PN and NP relative clauses, represent an

earlier stage of development in the sense that they only carry one proposition, namely the one in the relative clause. The propositionally complex relative clause constructions develop later in the following specific order: O, S and Oblique. In conjunction, also along the lines of Diessel (2004) and Brandt et al. (2008), the PN and NP relative clause constructions seem to have a high pragmatic usefulness despite their propositional simplicity, in the sense that they have the illocutionary force of introducing new discourse participants. This could also be said of many of the first external object relative clause constructions as well, whose matrix verbs are more specific than copula, yet fairly abstract and polysemic and used with the communicative purpose of introducing a new participant in the discourse. This is exemplified below:

(1) Markus, Stage V, age 3;2:13

også	har	den	blad	som	den	kan	spise	også
and	have	3SG:NEUT	leaf:PL	SUBJ.	3SG:NEUT	can:PRES	eat-INF	too

'And it has leaf that it can eat too'

Similar examples can be procured from constructions with matrix verbs as *se* 'to look' and *få* 'to get' as well. In conclusion, the concepts of propositional simplicity and pragmatic usefulness, which were used to explain the material of Diessel (2004) and Brandt et al. (2008), are also highly relevant to the material in this thesis, as they are properties that characterize the primordial relative clause constructions. Furthermore, they are separable as the propositional simplicity is restricted to PN and NP relative clause constructions, while the pragmatic usefulness extends to other external functions.

The material also illustrates the usage-based notion of verb island constructions (or 'item based learning'), which refers to that constructions are isolated to a single lexical item, described in Chapter 2.3.1. It was shown that the earliest external object relative clause constructions had a small repertoire of matrix clause verbs. This was most evident in Markus, the child who produced most relative clauses in Stage V. He was the only child who produced enough relative clauses to be generalized upon in Stage V, and where constructional islands could be identified. His matrix verbs were for the most part *ha* 'to have' and *se på* 'look on', cf. 4.4.4). This observation conformed to Tomasello's verb constructional island (Lieven et al., 1997; Tomasello, 1992). Furthermore, it harmonizes with the observation from Kidd, Lieven, and Tomasello (2006) that high frequency verbs are easier to use with complex structures. In the same line of argumentation, the copula verb is also a high frequency verb,

which is the first verb used in the construction of relative clauses (through PN relative clauses). Thus, the frequency of the matrix verbs seems to be a major factor in how the children acquire relative clause constructions.

Consequently, two reasons as to why Markus uses *ha* 'to have' when constructing relative clauses have been suggested: (i) *ha* 'to have' and *se på* 'look on' are pragmatically useful to introduce new discourse participants, (ii) they are high frequency verbs, which is considered easier, cf. Kidd et al. (2006), and central for building constructional islands.

By Stage VI, among the 35 external object relative clause constructions, 25 different matrix verbs were applied. Furthermore, in spite of many tokens of *ha* 'to have' and *stå* 'to stand', the constructions include such verbs as *selge* 'to sell', *skrelle* 'to peel', *kjøpe* 'to buy', *slå* 'to hit'. In other words, the matrix clause verbs of Stage VI are not characterized by being particularly frequent. In Stage VII, the same holds – only a few verbs were repeated, and many infrequent, specific verbs were produced.

These results suggest that relative clause constructions develop in line with the usage-based assumptions, (i) that the primordial ones are verb-island constructions, and (ii) that the first verbs are frequent.

Divergence from previous research and expectations

In English (Diessel, 2004; Diessel & Tomasello, 2000), the external PN relatives decreased throughout the entire age span to make room for more complex constructions, for example external objects. However, in the present study, the proportion of external PN relative clause constructions was characterized by a U-shaped curve, decreasing until Stage V, and then rising again. It was also demonstrated that the proportions of the external syntax of Stage VII resembled the target form more than any other stage, suggesting that this is progress toward the target form. The results through the entire age span also differed from German (Brandt et al., 2008), in which external NP relative clause constructions were dominant. However, the development of external NP relative clause constructions in the German study resembles that of external PN relative clause constructions in the current study in the sense that both construction types reach their lowest proportion between 3;0 and 3;6, i.e. Stage V, then rise (Brandt et al., 2008, p. 338).

It is clear that this shift in developmental trend in this study comes at the expense of external NP relative clauses, because the NP relative clause is the only function that decreases between Stage VI and VII. This development seems peculiar, and might be related to a maturation of the relative clause constructional schema.

External object relative clauses, on the other hand, seem to be stabilized from Stage V. Recall from Chapter 5.2.4 that external object relative clauses in Stage V have a very narrow set of matrix clause verbs. Markus employs the verbs *å få* 'to get' (once), *å ha* 'to have' (6 times) and *å se på* 'to look on' (3 times). It was suggested that this indicates that his constructional schemas are not mature, but constructional islands. The current author suggests that the generalizing upon these, i.e. the schematization of the constructional islands is the cause for stabilization in the proportion of external object relative clauses. In Chapter 5.2.5, it was shown that Stage VI had 19 different matrix clause verbs in the 25 tokens of external object relative clause. These data suggest that a constructional schema has developed for relative clauses, because no verbs seem to function as verb islands.

Furthermore, the proportion of external subject relative clauses across all age categories of the material in this thesis is twice large as in German and 12 times as large as in English. As explained in Chapter 3.2.1, Brandt et al. (2008) explains the difference between German and English in terms of the freer word order in German that enables right-branching in external subject relative clauses. However, these explanations cannot explain why Norwegian subject relative clauses are twice as frequent as those in German are. The current author suggests that this may be related to the distribution of relative clauses across the age categories of the studies. Consider the following:

The material of Diessel (2004) for English is distributed as follows: there are 30 relative clauses in the age category "<3", 117 relative clauses in the category "3;0-4;0" and 140 relative clauses in the category "4;0-5;0".

On the other hand, the material of Brandt et al. (2008) for German is distributed differently across the age span. This is shown in the below table:

	English (Diessel, 2004)	German (Brandt et al., 2008)
2;0-3;0	10.1%	43.9%
3;0-4;0	42.8%	27.1%
4;0-5;0	47.1%	29.0%

Table 15 - Distribution of relative clauses across age categories in the English and German study

The table shows that there are clear differences between the materials of the English and the German study, in that the relative clauses in English are overwhelmingly found in the age span 3;0 -5;0, while the majority of the German relative clauses are found in younger children, from 2; 0-3;0. The results of this study resemble the English study in having most of its material in the later end of the age continuum, which is shown in the table below:

Stage III	2;0-2;6	2.6%
Stage IV	2;6-3;0	6.6%
Stage V	3;0-3;6	16.0%
Stage VI	3;6-4;6	34.1%
Stage VII	4;6-5;6	40.7%

Table 16 - Distribution of relative clauses across age categories in the present study

As can be seen, in the current material, the youngest children produced the fewest relative clauses, while the eldest produced the most. This is far more similar to the English material than that of German. These tables show that the difference between Norwegian and English cannot be accounted for in terms of skewed data, while the difference between Norwegian and German can.

In fact, according to the graph in Brandt et al. (2008, p. 338), external subject relative clauses are found in all stages of development in German. It is thus conceivable that external subject relative clauses are more frequent in the different developmental stages in German than Norwegian. The skewed distribution of relative clauses only makes the external subject relative clauses look more infrequent in German.

Brandt et al. give two explanations on why there are more external subject relative clauses in the German study than in the English study: (i) the free word order of German causes almost all of the external subject relative clauses to be right-branched. Furthermore, (ii) Brandt et. al also suggest that the high proportion in German comes about because subjects in English are mostly topical, and thus less available for modification, while German subjects may not be. The current author views these explanations are also applicable to the Norwegian-German

difference. Faarlund et al. (1997, pp. 691-693) states that Norwegian subjects often convey old information, which is closely related to topic (Bates & MacWhinney, 1982, p. 180). Brandt et al.'s argument thus also applies to Norwegian.

The current author proposes that there are two grammatical properties of Norwegian that make external subject relative clauses easier to acquire than those of English. (i) Norwegian has a more flexible word order than English, at least in the sense that subjects may be right-branched when the object is emphasized, see (2) below:

(2)

bilen	kjørte	mannen
car-DEF	drive-PRET	man-DEF

'the man drove the car' (lit: '*the car drove the man')

Secondly, (ii) Norwegian can use resumptive pronouns, or extra-positions (Faarlund et al., 1997, p. 904). This is not possible in English, as is shown below.

(3)

*People who exercise every day, they live a happy life

Looking at the material, 17 of the material's non-canonical external subject relative clauses had a resumptive pronoun, while the four remaining had changed word order, thus right-branching them. External subject relative clauses will be further discussed at a later point, in Chapter 6.4.2.

In other words, external subject relative clauses appear earlier in the Norwegian material because of language-specific properties: subjects may be right-branched, and the extraposition construction (left-dislocation), which has a resumptive pronoun, is possible.

6.3.3 Internal syntax

Convergence with previous research and expectations

In the internal syntax, the internal subject relative clauses dominate from the beginning. This conforms to German (Brandt et al. (2008), English (Diessel, 2004) and Swedish (Andersson and Richthoff (1991).

Furthermore, the acquisition order of internal syntax above partially reflects The Accessibility Hierarchy of Keenan and Comrie (1977, p. 66), which is a claim about internal functions that a given language can realize (Keenan and Comrie make no claim about external syntax of relative clauses). The reduced hierarchy (as explained in Chapter 3.1.2) is as follows:

Subject > Direct object > Indirect object > Oblique

It is clear that the results correspond to the hierarchy in the two first functions. However, not one single internal indirect object relative clause was found. The proposal put forward in Chapter 3.1.2 that indirect objects had a tendency to be dative alternated in relative clauses, i.e. that RECIPIENT noun phrases is alternated to a complement of a prepositional phrase, seems to be confirmed. However, just one RECIPIENT role was found in the material, by Thea (3;7), which means that the claim is supported by a very sparse material:

(1) Thea, Stage VI, age 3;7:26

da	så	jeg	andunger	som	jeg	kan	gi	mat	til
then	see:PRET	1SG	duckling-PL	SUBJ.	1SG	can:PRES	give	food	to

'Then I saw ducklings that I could give food to'

This result conforms to a study by Anderssen, Rodina, Mykhaylyk, and Fikkert (2014), who found that Norwegian children prefer to express the RECIPIENT role as prepositional phrases.

Furthermore, the internal object relative clauses by and large corresponded to the schema presented in Kidd et al. (2007), illustrated below:

X – inanimate head – SUBJUNCTION – pronominal subject – Y

In the material, 89% of the internal object relative clauses had an inanimate head, and 88.5% had a pronominal subject. Below follows an instantiation:

(2) Thea, Stage V, 3;2:5

jeg	har	en til	som	jeg	kan	hente	til	deg
1SG	have-PRES	another	SUBJ	1SG	can:PRES	get-INF	to	2SG

'I have another one that I can get for you'

For the youngest children, this schema seems to be entrenched as a function of input. Two sources of evidence are found for this: (i) the target form sample described in Chapter 5.3.6 uses this pattern in internal object relative clause constructions. Furthermore, (ii) the internal object relative clauses of the input that were extracted in order to investigate omission of the optional subjunctions (discussion in the current chapter below) show the same results: 32 of 37 had an inanimate head, and 30 had an internal pronominal subject.

However, the current author will also lean on Fox and Thompson (1990), who argue that there are clear discourse-pragmatic motivations for these particular properties of internal object relative clauses: (i) objects are more often inanimate than animate, and (ii) subjects are preferably referred to using pronouns (Du Bois, 1987). This makes sense on the grounds that subjects tend to refer to known information (Faarlund et al., 1997, pp. 691-692). Thus, it could be argued that the earliest internal object relative clauses follow the schema above, because of the input, but that they continue being realized as such after becoming fully schematic, because of the above-mentioned discourse-pragmatic factors.

Although conforming to previous research in many respects, there were several points of divergence. This will be discussed and elaborated upon in the following.

Divergence from previous research and expectations

Some differences hold in the internal syntax of the different studies as well. As mentioned above, in all mentioned studies, internal subject relative clauses dominate from the beginning. However, in the English study, the internal object relative clauses surpass the internal subject relative clauses between the age of 4;0 and 5;0. This is not true for the German study nor the present study. The Swedish study did not investigate the child after 3;10. Simonsen's Norwegian informant, who was between the age of 4;9 and 5;0, also produced more internal subject relative clauses than those of internal objects (Simonsen, 1983, p. 142).

It is argued by the current author that the proportion of internal object relative clauses surpassing those of internal subject in the English study comes about as a virtue of language specific properties. English has larger possibilities for modifying the NP than Norwegian has. First, consider the two following English complex clauses, the first of which has a relative clause, the second of which has a present participle clause.

(3)

So they went on, with the boy that rode a horse (Relative clause)

So they went on, with the boy riding the horse (Present participle)

These two nominal modifications are naturally not synonymous, but the point is that Norwegian only has one of these, the relative clause. Consequently, it is clear that the Norwegian use of internal subject relative clause corresponds semantically to two different English constructions. This model of explanation is supported by German grammar. German, resembling English, indeed has participial constructions, as in (4) below.

(4)

Der	das	Auto	fahrende	Junge
ART:DEF:MASC.	ART:DEF:NEUT.	car	drive-PRES.PART	boy

'The boy driving the car'

However, as the example shows, they precede the noun they modify, i.e. often appear as center-embedded, and are more common in the written register (Sæbø, personal communication, April 21st, 2015). The English participle construction cannot be said to be more related to the written register, as Diessel (2004, p. 129) found 95 tokens of these clauses. Consequently, it is not likely that children acquire the German structure as early as English children acquire the post-modifying participial.

Furthermore, 192 of the non-finite relative clauses in Diessel (2004) were infinitive clauses. Norwegian has infinitive clauses as well. However, Norwegian infinitival relative clauses have a "very limited distributional pattern" (Faarlund et al., 1997, p. 1063). They are often objects of matrix verbs as *være* 'to be', *få* 'to get' and *skaffe seg* 'to get hold of', and they are always headed by an indefinite noun. While the first restriction, that the set of possible matrix verbs is very small, to the current author's knowledge applies to English, the two latter do not: Infinite relatives can function as external subjects: "The first to come is the winner", and they can be headed by definite noun: "He was the first man to land on the moon". Furthermore and most importantly, while in English the head may correspond to the internal subject, it always corresponds to the internal object in Norwegian. The two constructions are thus very different from each other. The same holds for German: infinitive relatives are very uncommon and their head cannot correspond to the internal subject (Sæbø, personal communication, April 23rd, 2015).

Thus, the current proposal is strengthened and maintained by the current author: the reason why internal object relative clauses do not surpass internal subject relative clauses in Norwegian and German is that they do not have the English post-modifying participial clause and infinitive clause.

Valence

First, both Diessel (2004, p. 139) and Brandt et al. (2008, p. 345) reported that the very first relative clauses in English and German, respectively had mostly internal intransitive verbs, and that the transitive verbs became more and more frequent. However, in the current study, most internal verbs were transitive from the start, and throughout the entire sample.

Diessel's suggestion as to why intransitive relative clauses are more frequent relies on a claim by Fox and Thompson (1990), that intransitive internal subject relative clauses function to characterize the head noun, while transitive internal subject relative clauses anchor the complex sentence in the discourse. Because very young children do not use advanced discourse structures, intransitive clauses are more frequent. While Diessel's argumentation is appealing, it does not seem to be supported by the results from the current thesis.

In the light of other previous research, not related to relative clauses, the preference for transitive clauses is not improbable. Many studies point in the direction that children possess a transitivity bias, meaning that children often over-generalize intransitive verbs and nonce verbs to the transitive clause pattern (Brooks, Tomasello, Dodson, & Lewis, 1999; Brooks & Zizak, 2002; Maratsos, Gudeman, Gerard-Ngo, & DeHart, 1987). While this is not directly related to the finding under this discussion, it shows that children do not necessarily consider transitive clauses more difficult than intransitive clauses. Secondly, transitive clauses often denote dynamic concrete events where one clause participant often does something towards another participant (Hopper & Thompson, 1980; Kittilei, 2000), such as *hit, throw* and *kill*, while intransitive clauses more prototypically convey states, like *sleep* and *die*, and to a much lesser degree, actions. It is conceivable that concrete and dynamic events are easier to process for small children than internal states, because they are more perceptually available than states.

Third, the subject in transitive clauses most often corresponds to the agent, while the subject of an intransitive clause can be both agent and patient. As a virtue of this, transitive clauses

might be less difficult to acquire because the correspondence between syntactic functions and semantic roles is more consistent than in intransitive clauses.

Another proposed reason for the early high proportion of internal transitive clauses may be that the first two stages have very few relative clauses, and that the proportions thus are difficult to generalize upon, i.e. that there is a possibility that the result is due to coincidence.

Subjunctions

The use of subjunctions, which have no allomorphic variation, (in contrast to the relative pronouns of English and German, which have allomorphic variation) was largely mastered from the start of the sample. Diessel (2004, p. 144) reports that the use of relative pronouns often is absent from the early material. In other words, the amalgam-construction that Diessel found in their earliest material, i.e. PN relative clauses in which the subjunction is missing, is almost absent from the material of the current thesis. It is found once in Stage III, twice in Stage IV and never again. The overwhelming proportion of explicit use of subjunction in the earliest stages strongly suggests that the amalgam construction is *not* a characteristic of early relative clauses in Norwegian, as Diessel suggests for English.

There is no discussion of omission of relative pronouns in the German study (Brandt et al., 2008). In the Swedish study (Andersson & Richthoff, 1991), there are many subjunctions from the start, although there are some cases of missing subjunctions up to the age of 2;4 (corresponding to Stage III). However, some of these are isolated NPs and thus ambiguous between simple clauses and relative clauses. In sum, the results of Andersson and Richthoff (1991) are not very different from the result of this study. de Lopez et al. (2014) show that the Danish children do not omit the obligatory subjunction, and the same goes for the Italian subjunctions in Volpato and Vernice (2014, p. 58).

A question that arises is if languages that have variation in the words that introduce relative clauses develop in a different manner than those that only have subjunctions. Danish, Swedish and Norwegian are languages that have subjunctions, and they are acquired from the start.

On the other hand, English and German have relative pronouns, and it is shown at least for English that relative complementizers are more difficult and acquired at a later stage. A hypothesis would then be that the allomorphic variability causes the grammatical element to be more difficult to acquire.

This would make sense on the grounds that linguistic expressions, whose form varies after which context it is put in, are more difficult to acquire than expressions that always appear in a single form.

Another interesting observation in the domain of subjunctions is the optional subjunctions, i.e. subjunctions in relative clauses that are not internal subject relative clauses. In Stage V, the children had equally many explicit subjunctions as omissions in the optional context, except Markus. Markus by and large produced the subjunction, except in one question clause (which is structurally very different from his other relative clauses). To investigate how this distribution came about, an input analysis was carried out. The analysis showed that all parents that actively participated in the recording both produced and omitted the subjunction in optional contexts, seemingly at chance level. The exception to this is Markus' mother, who never omitted the subjunction in all of her 6 opportunities to do so.

The children of Stage VI and VII produced equally many optional subjunctions as optional omissions, which was found to resemble their input. Thus, the facts that (i) Markus is ahead of his peers in production of relative clauses, and (ii) Markus' mother always produces the optional relative clause subjunction, may be causally related, but it is beyond the scope of the current thesis to investigate this further.

6.3.4 The relative frequency of relative clauses

Finally, another property that differed from at least the English study was the relative frequency of relative clauses. The English CHILDES database contains 160,643 utterances (Diessel, 2004, p. 9), but Diessel's material only consists of 305 relative clauses. On the other hand, the material of the present study consists of 356 relative clauses. The exact number of utterances in the material is not known, but those recordings that were segmented from start to finish contained 7-800 utterances. If one assumes that this holds for the rest of the children and only count the children that are likely to produce relative clauses, i.e. from Stage III to VII, this would be 40 recordings and give around 30,000 utterances in total. Consequently, relative clauses appeared with a 1:84 ratio in the present material, a 1:526 ratio in the English material, and a 1:231 ratio in the German material. Why is this?

The present author suggests two explanations: (i) the three materials may be skewed in their age distribution. As explained above, the material of Brandt et al. (2008) is concentrated in

2;0-3;0 (Stage III and IV), in which children produce relative clauses with a lower frequency (cf. the amount of relative clauses in this study's Stage V). The material of Diessel (2004) resembles the current material far more, but there are also differences that suggest that there are more relative clauses from older children in the material of this study, e.g. the eldest children in the present study are older than in the English study. (ii) In conjunction with this, the differences can be explained in terms of the same language specific properties as described above in 6.3.3, i.e. English's other possibilities of nominal post-modification – the participle and infinitive clause. As was mentioned, Diessel (2004) found 287 of these clauses. Therefore, it is argued that English has more possibilities of nominal clause modification than Norwegian has, and that this has a decreasing effect on the relative frequency of relative clauses.

6.4 The five hypotheses

6.4.1 Introduction

This section will use the results of the study to shed light on the five hypotheses outlined in Chapter 2.4.4. To repeat - they are respectively (i) the non-interruption hypothesis, (ii) the filler-gap hypothesis, (iii) the NVN-schema hypothesis, (iv) the parallel-function hypothesis, and (v) the conjoined clause hypothesis.

6.4.2 The non-interruption hypothesis

The fundamental claim of the non-interruption hypothesis is that discontinuous structures are hard to process. According to the non-interruption hypothesis, external subject relative clauses should be difficult, because the relative clause would be center-embedded in the matrix clause. The discontinuous matrix clause is illustrated below.

MAT [RELATIVE CLAUSE] RIX CLAUSE

The results in the present study are clear: the first external subject relative clauses were in one way or another not center-embedded. There were two kinds of non-canonical clause patterns for external subject relative clauses that caused them not to be center-embedded: (i) those containing a resumptive element (these are left-dislocated, as in (1) below), and (ii) a

(grammatical) divergence from canonical SVO word order, causing the relative clause to be right-branched, as in (2) below.

(1) Aksel, Stage VII, age 5;1:9

og	den	tingen	som	jeg	lagde
and	the	thing-DEF:SG	SUBJ.	1SG	make-PRET
i dag	den	er	til	deg	pappa
today	3SG:NEUT	COP	for	2SG	dad

'And the thing that I made today, it is for you daddy'

(2) Markus, Stage V, age 3;2:13

hvor	er	de	lekene	jeg	skulle	få	låne?
where	COP.	3PL	toy-DEF-PL	1SG	shall:PRET	get:INF	borrow-INF

'Where are those toys that I was going to borrow?'

Although the first external subject relative clause appeared in the same stage as the first external object relative clause, in Stage IV, there was only one of the external subject relative clauses, and it was characterized by containing a resumptive pronoun. The next one, in Stage V, had a change in word order, which made the relative clause right-branched. In Stage VI, the first center-embedded external subject relative clause appeared:

(3) Per, Stage VI, age 4;2:24

men	sjørøveren	som	han	blir	med	klarer	å	
but	pirate-DEF	SUBJ	3SG:MASC	come-PRES	with	manage-PRES	SUBJ.	
bære	han	ned	men	ikke	opp			
carry-INF	3SG:MASC	down	but	NEG.	up			

'But the pirate that he joins manages to carry him up, but not down'

However, the remaining external subject relative clauses in Stage VI, 7, were in one way or another not center-embedded. In Stage VII, four children produced center-embedded external subject relative clauses, as can be seen in the micro-profile. However, out of 17 external subject relative clauses in Stage VII, only 11 were center-embedded, the rest being not center-embedded in one of the two ways explained above.

These results suggest that the discontinuity of the matrix clause indeed poses a considerable difficulty for children when acquiring external subject relative clauses. In Chapter 5.2.7, it

was noted that the adult material also contained resumptive elements of the same kind that is presented here, which were termed extra-positions. Rahmany, Marefat, and Kidd (2014) also found that resumptive elements aided children in comprehending relative clauses.

The present thesis has shown that many or all of the early external subject relative clauses contain a resumptive element. It does not mean that these external subject relative clauses are ungrammatical. They are indeed a possible target form, but as they characterize all of the earliest external subject relative clauses, it is evident that the children use this construction to make the production of external subject relative clauses easier. As was showed in Chapter 5.3.6, no significant difference held between the external subject relative clauses of Stage VII and that of the target form sample.

A possible problem for the hypothesis in the current study is the early stage at which children produce internal prepositional complement clauses, because the prepositional phrases are discontinuous in these clauses, and the complement even appears before the preposition. However, this result is given a different interpretation, as will be shown in Chapter 6.4.3.

In other words, the findings of the present study support the non-interruption hypothesis outlined by Slobin (1973), because truly center-embedded relative clauses appear late and are preceded by external subject relative clauses that in some way or other are not center-embedded. Several studies have failed to support the non-interruption hypothesis (Brown, 1971; Hakes, Evans, & Brannon, 1976), in which no significant differences were found between center-embedded and right-branched structures. However, the current author argues that their results are not comparable to the current results because what they measured was comprehension in an experimental setting, while this study measures spontaneous production. Furthermore, the participants in Hakes et al. (1976) were adults.

6.4.3 The filler-gap hypothesis

The filler-gap hypothesis is the claim that the distance between the filler (the head of the relative clause) and the gap in the relative clause determines the processing difficulty for relative clauses. The output for this constraint is that internal subject relative clauses should precede internal relative clauses whose gap succeed the verb, e.g. internal object relative clauses and internal prepositional complement relative clauses.

This is a claim that is entirely consistent with the results presented here. Internal subject relative clauses were dominant from the start and remained so throughout the age span. Internal object relative clauses appeared for the first time in Stage IV, but were not frequent enough to make the micro-profile before Stage V. Furthermore, internal prepositional complement clauses made the profile in the same stage, despite being much less frequent than internal object relative clauses in the target language (Chapter 5.3.7). The present author suggests that the relatively early acquisition of internal prepositional complement relative clauses is related to the stranded preposition. The stranded preposition may function as a resumptive element, which makes the processing of internal prepositional complement clauses easier. In the following example, the stranded preposition and its complement is in bold:

(1) Bjørn, Stage VI, age 4;2:17

det	er	**sånn**	man	kan	bruke	den	**med**
it	COP	**the-kind**	one	can	use	it	**with**

'It's **the kind** you can use it **with**'

One might have expected that the construction of internal prepositional complement relative clauses to be more difficult than that of internal object relative clauses, because the children would have to construct a discontinuous phrase, cf. the non-interruption hypothesis. However, this does not seem to be so. In fact, of the 5 prepositional relative clauses, only one relative clause lacked the stranded preposition. The present author argues that the presence of the stranded preposition makes the processing of the construction easier. This claim is strengthened by the conclusion of the preceding section (Chapter 6.4.2), and the already mentioned investigation of resumptive elements in internal object relative clauses in Persian (Rahmany et al., 2014).

6.4.4 The NVN-schema hypothesis

The NVN-schema hypothesis posits that children follow the unmarked Noun-Verb-Noun constructional schema when constructing internal relative clauses. As illustrated in Chapter 3.1.2, internal subject relative clauses follow this schema, while internal object and prepositional complement relative clauses do not. According to the NVN-schema hypothesis, the latter should appear later than the first. Consequently, both the NVN-schema hypothesis and the filler-gap hypothesis predict the same output in Norwegian, i.e. that internal subject

relative clauses precede internal object and prepositional complement clauses. As pointed out above, the findings of the present study supports this prediction.

In other words, the results of the current study support both theories equally well in terms of why internal subject relative clauses emerge first. The present author believes that they are not mutually exclusive, and it is probable that they are simultaneously at work.

6.4.5 The parallel-function hypothesis

According to the parallel-function hypothesis (Sheldon, 1974), there is often a match between the external and internal functions of relative clause constructions. This function matching should be a characteristic of the earliest relative clauses.

This proposal is refuted on the already discussed grounds that the first relative clauses constructions prototypically are external objects relative clauses and internal subject relative clauses. Furthermore, for the oldest children, no indications of co-occurrence of matching functions in external and internal syntax are observed.

Thus, this hypothesis seems to bear no substance in the findings of this study.

6.4.6 The conjoined clause hypothesis

The conjoined clause hypothesis assumes that relative clause constructions in children are mentally represented as coordinated clauses. This hypothesis had its basis in an act-out study by Tavakolian (1977), in which children showed a preference for relative clause constructions in which the external subject had the same reference as the internal subject (Diessel, 2004, pp. 124-125), thus resembling coordinated clauses.

While the results of this act-out study are not replicable from spontaneous data, there is evidence from the material that indicates that the first relative clause constructions are mentally represented as coordinated clauses. To test this hypothesis, the present author investigated the placement of sentence adverbials in subordinate clauses. Recall that sentence adverbials are postverbal in main clauses, but preverbal in subordinate clauses. Ungrammatically placed sentence adverbials in relative clauses were looked for. When found, the child's placement of sentence adverbials in other subordinate clauses was looked for. If the child placed the sentence adverbial ungrammatically in relative clauses, but not in other

subordinate clauses, this would indicate the presence of the category of subordinate clauses, but the exclusion of relative clauses from that category.

The results support the conjoined clause hypothesis. Many of the children that placed the sentence adverbial ungrammatically placed the sentence adverbial grammatically in other subordinate constructions. Also of interest is the consistency of the children: only one child varied the placement of sentence adverbial in the same type of subordinate clause. The first sentence adverbials in relative clauses were produced by Markus in Stage V and were ungrammatically placed, although he demonstrated a very high proficiency skill in other subordinate clauses, e.g. the construction of the "if X, then Y" construction (illustrated in Chapter 5.3.4), in which the if-clause is subordinate, and the then-clause is a main clause, and Markus used sentence adverbials correctly in both.

(1) Markus, Stage V, age 3;2:13

Men	hvis	jeg	bare	tar	den	hånden	min	høyt	opp	der
but	if	1SG	just	take	that	hand-DEF	POSS	high	up	there,
så	faller	den	bare	ned						
then	fall-PRES	3SG:NEUT	just	down						

'but if I just take my hand high up there, it'll just fall down'

This speaks in favor of the idea that Markus' if-construction is represented as a subordinate clause, while the relative clause construction is not. In Stage VI, the children always placed the sentence adverbials grammatically in other subordinate clauses if it was placed grammatically in relative clauses. In other words, in terms of sentence adverbial placement in subordinate clauses, relative clause competence entailed competence generally. In Stage VII, the same pattern held with one single exception – Nora placed a sentence adverbial grammatically before the verb in a relative clause, but ungrammatically after the verb in an adverbial subordinate clause:

(2) Nora, Stage VII, age 4;5:04

når	det	blir	egentlig	varmt
SUBJ.	it	become:PRES	actually	hot

'When it actually gets hot'

The sentence (2) may also be a case of using *egentlig* ‘actually’ ungrammatically as a modifier for *varmt* ‘hot’. The two interpretations are equally possible.

Furthermore, the children placed the sentence adverbial in the postverbal position in *fordi* ‘because’ clauses. In Chapter 5.3.4, this was justified on the grounds that both placements occur in the target language and its likeness to the formally and semantically similar word *for* ‘because’, which has main clause word order.

Nevertheless, with the possible exception of (2) above, the results support the claim that early relative clause constructions are represented as coordinated clauses by children, and that they are represented as coordinated clauses longer than other subordinate clauses. This is because the relative clauses exhibit main clause properties while other subordinate clauses do not. These properties refer to placement of sentence adverbials relative to the finite verb. Although the hypothesis is assessed using different kinds of evidence than Tavakolian (1977), the conjoined clause hypothesis is supported in the results of the current thesis.

6.4.7 Conclusion

In the present section, the results of this thesis were tested against the five hypotheses presented in Chapter 2.3.3. The only hypothesis that was not supported was the parallel-function hypothesis, which advocated that there is function matching between external and internal syntax of relative clause constructions.

The remaining four hypotheses were supported. Their relation to the usage-based theoretical framework will be discussed below.

The NVN schema corresponds to the usage-based paradigm in the sense that the children must override an entrenched clause schema in order to successfully construct internal object and prepositional complement relative clauses. The conjoined clause hypothesis also conforms to the usage-based theory, in the sense that it advocates that children need time and exemplars of relative clause constructions to be able to recategorize relative clauses from the coordinated clause category to the subordinate clause category. This difficulty is thought to be because of relative clause constructions’ shared properties and similarities with coordinated clauses. As was demonstrated through sentence adverbial placement in other subordinate

clauses, the children do have a category of subordinate clauses before relative clauses are a member of this category.

As mentioned above, the parallel-function hypothesis was not supported. This hypothesis is not particularly usage-based because it is a claim about matching of syntactic functions, and does not take factors of language use into consideration, which is the main tenet of usage-based theory, cf. Chapter 2.2.4.

The non-interruption hypothesis and the filler-gap hypothesis are essentially claims about processing limitations. More specifically, the immature short-term memory limits the acquisition of the external subject relative clause in the non-interruption hypothesis, and the internal object and prepositional complement relative clauses in the filler-gap hypothesis. Processing limitations are a part of the usage-based paradigm because the theory is domain general, and short-term memory is a domain general skill. However, the role of short-term memory has been up to debate (Tomasello, 2003, pp. 312-313), and the generative school must also consider processing limitations. However, processing limitations is not considered a part of the innate language system, Universal Grammar.

As mentioned, Goodluck and Tavakolian (1982) claim that both grammar, processing and pragmatic factors contribute to the acquisition of relative clauses. These hypotheses address grammar and processing, but none of them address how pragmatic factors are related to relative clause acquisition. However, the role of pragmatic factors has been described in both Chapter 6.2 and 6.3, in which pragmatic usefulness of presentational constructions and discourse-pragmatic considerations of internal object relative clauses was discussed.

6.5 Significance for applied linguistics

The final research question was whether the results could foreshadow any clinical markers. This question will be answered under the broad topic of the overall significance of the current thesis for applied linguistics. The present study does not investigate SLI children, so all it can do is to make qualified assumptions or speculations as to which variables are relevant for testing, and likely clinical markers.

First and foremost, the knowledge accumulated in the current study, e.g. the micro-profile in Chapter 5.5, gives the speech therapist a detailed description of the developmental trajectory

of Norwegian relative clauses as well as several variables that are mastered from the start, e.g. subjunctions and valence. This gives the speech therapist the ability to assess any given child with a confirmed diagnosis of SLI and determine which specific property of relative clauses that is impaired and is in need of a therapy program. The speech therapist is also enabled to state whether the property represents a deviance or delay. In the case of a delay, he or she can also describe where the child is, and where it ought to be.

In conjunction with the developmental trajectory of Norwegian relative clauses, clinical markers of relative clauses in Norwegian SLI children would be helpful for the therapist. In the following, hypotheses about potential clinical markers based on the current study's results and previous research will be presented.

As discussed in Chapter 3.3.2, previous research of children with SLI shows that relative clauses are particularly difficult.

Håkansson and Hansson (2000) found that 4-6 year old Swedish SLI children to a significantly higher degree than typically developing children omitted the relative subjunction in obligatory contexts. Similar findings were also reported for 5-8 year old English SLI children (Schuele & Tolbert, 2001) and 4-5 year old Italian SLI children (Contemori & Garraffa, 2010). On the other hand, de Lopez et al. (2014) found no significant differences between the Danish SLI children (whose age were 5;0 to 8;4; mean age: 6;3) and their controls in terms of subjunction omission. In other words, the literature diverges in relation to obligatory subjunction omission. The children in this study by and large mastered subjunctions from the very start. Based on this, omission of obligatory subjunctions in SLI children would constitute a deviance (as opposed to delay), and a very powerful clinical marker. Judging from the SLI literature above, omission is far from improbable.

Furthermore, the investigation of Danish points in the direction that internal object relative clauses are mastered considerably later in SLI children than in typically developing children (de Lopez et al., 2014). However, Frizelle and Fletcher (2014) reports that this asymmetry disappears when the internal object relative clauses follows the schema that also dissolved the difference in typically developing children, namely "X - inanimate head – relative pronoun – personal pronoun – Y" (Kidd et al., 2007). However, as long as SLI children perform differently than typically developing children, the variable is justified.

Turning to external syntax, Frizelle and Fletcher (2014) tested the conclusions of Diessel (2004), in which propositionally simple relative clause constructions were acquired earlier than propositionally complex relative clause constructions. They found that the effect of propositional complexity was greatest for the 6-8 year old SLI children, favoring the propositionally simple relative clause constructions. As the current study reaches the same conclusion as Diessel (2004), with the same research design, the hypothesis that Norwegian SLI children also may perform poorer on propositionally complex relative clause constructions can be formulated.

To conclude, three hypotheses are formulated about SLI children's performance of relative clauses:

(i) SLI children omit the subjunction to a much higher degree than typically developing children

(ii) SLI children have more problems with internal object relative clauses than typically developing children

(iii) SLI children perform much better on prepositionally simple relative clause constructions than on propositionally complex clauses, to a higher degree than typically developing children.

SLI children matching the children in this study in age, and the method of data collection should be spontaneous sampling, in order to make the investigation as comparable to this study as possible.

7 Summary and conclusion

7.1 The knowledge accumulated from the current thesis

The overarching purpose of the current study has been to study relative clauses in typically developing children aged between 1;0 and 5;6. This purpose can be segmented into three main goals: (i) to formulate a detailed model of acquisition for relative clauses in Norwegian, i.e. a micro-profile. Furthermore, (ii) to contribute to the research field and discourse of usage based linguistics, syntax acquisition generally, and relative clause acquisition specifically, and (iii) to give future research of relative clause acquisition in Specific Language Impairment (SLI) children a basis of knowledge to formulate hypotheses on.

The thesis is a contribution to the Language Assessment Remediation Procedure (LARSP) framework. LARSP is a clinical tool for speech therapists. Thus, one specific output of the thesis has been a micro-profile. A micro-profile is a model of acquisition for a specific grammatical property that a clinician can use when diagnosing children with SLI. As has been explained, previous research points in the direction that relative clauses are a domain of special difficulty for language-impaired children. Thus, a detailed description of the ontogeny of relative clauses in typically developing children is warranted.

Naturally, every study should choose the research design most suitable for its goals. The material that was chosen in the current study was 56 one-hour long recordings of 32 children aging from 1;0 to 5;6, and the method of data collection chosen was spontaneous data. This was done to make the results comparable to previous research, and to make a micro-profile within the LARSP framework. As was explained, spontaneous measures are imperative when constructing a LARSP profile.

To explain the results, the theoretical framework that was used was the usage-based framework, which much research has been devoted to the acquisition of relative clauses within. The usage-based framework is a domain-general framework, i.e. a framework that attempts to describe the development in terms of general cognitive abilities. This framework contrasts with the generative framework, which presupposes that the child possesses cognitive abilities that are specific to language acquisition.

Unfortunately, the existing literature on the acquisition of Norwegian relative clauses is sparse. Some strands of knowledge were found in Simonsen (1983) and Westergaard (2009), but the current thesis is mainly based on cross-linguistic studies. Because of this, differences that were found between studies have been given explanations that relate to grammatical differences between languages.

The results show that the first relative clause emerged at the age of 2;2:7. Its form was reduced and simple, as expected - it was propositionally simple and the relativized argument was the subject. All relative clause constructions in this stage of development were of this kind. However, from this point, development could be observed throughout the age span, which was related to variables in the dimensions of grammar, processing and pragmatics. Relative clauses were used in increasingly more external functions, such as oblique, subject and object, and internal functions, such as prepositional complements and objects. Later in development, the children produced constructions that require sophisticated processing skills and demand them to store unfinished clauses and arguments in the short-term memory. Based on these results, the micro-profile was formulated.

Furthermore, the findings answered the expectations given by the usage-based framework, which were mainly related to the schematicity of the earliest relative clause constructions. Exactly as expected, they emerged as fairly formulaic expressions with only a few points of possible variation. This was manifested in the matrix clause verbs, which initially were the copula verb. Later, one child, Markus, showed clear signs of having the relative clause construction entrenched as a verb-island construction. Not until Stage VI could a diverse set of matrix clause verbs be observed. This development was taken as a clear sign that an abstract constructional schema for relative clause constructions had emerged.

The findings also corresponded with earlier research showing that pragmatic and propositional factors facilitate the development of relative clauses – the very first ones emerge because they are simple to process, in the sense that they only contain one proposition, and pragmatically very useful, in the sense that they identify discourse participants. It was also suggested that the earliest internal object relative clauses follow a fairly specific schema, which is entrenched because of its discourse-pragmatic properties.

The status of the interrogative relative clause was tested, and it was found to have a completely different developmental trajectory than the regular relative clause, although being

facilitated by the same propositional and pragmatic factors. It emerged in a very specific form, a chunk of the form “I don’t know what X”, which gradually lost its autonomy. The specific elements of the chunk, i.e. the matrix subject, matrix verb and question word, thus gradually became the subject of more and more variation. Interestingly enough, the emergence of a varied set of matrix clause verbs was found in Stage VI. The emergence of a varied set of matrix clause verbs of regular relative clauses was also found in Stage VI.

Furthermore, the five hypotheses outlined in Chapter 2.3.3 were tested. They were the non-interruption hypothesis, the NVN schema hypothesis, the filer-gap hypothesis, the parallel-function hypothesis and the conjoined clause hypothesis. Only the parallel-function hypothesis was not supported. The four remaining hypotheses confirmed that grammatical and processing factors contribute to and restrict the acquisition of relative clauses.

Finally, hypotheses about possible clinical markers of SLI in relative clauses were formulated, based on the developmental trajectory and the available knowledge about relative clauses in SLI children in other languages. First, the children mastered the subjunction from the start. In the cross-linguistic literature, the relative subjunction has proved to cause problems for children with SLI, with the exception of a Danish study (recall that the test subjects in that study were relatively old). At any rate, there is good reason to hypothesize that the relative subjunction might be problematic for Norwegian SLI children. If this is the case, it would constitute a powerful clinical marker. Second, the effect of propositional complexity is demonstrated to be considerable in English children with SLI. According to previous research, the developmental trajectory of Norwegian relative clauses is similar to that of English. Thus, it is conceivable that propositionally complex constructions are difficult for Norwegian children as well.

7.2 Further research

Proposals for future research will conclude the current thesis. The present author views the accumulated knowledge as a valuable foundation for further research in many domains. The most obvious project for further research would be the applied one - to test the hypotheses about SLI formulated above. As mentioned above, this should be done with spontaneous data sampling, because it would be under the same conditions as the children in the current study – namely spontaneously.

The material could be used to uncover how the other domains of complex syntax relate to each other. It was shown that although regular relative clauses and interrogative relative clauses develop differently, they are facilitated by the same mechanisms. The current study very minimally tapped into the development of other subordinate clauses. This could be done more broadly and systematically. The present author is of the impression that more could be understood about the development of relative clauses if more is known about the constructions that it shares properties with.

Finally, the results could be tested in a generative framework, in which there also are acquisition accounts of relative clauses (de Lopez et al., 2014; Novogrodsky et al., 2006). The current author has suggested that the current material does meet the expectations given by the usage-based framework, but will generative theory shed further light on the development of relative clauses, and is the material able to shed light on generative theory?

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Appendix A: The informants that produced relative clauses and their ages

Stage(s)	Informant	Age time I	Age time II
II and III	Kari	1;6:12	2;2:7
II and III	Lucas	1;9:23	2;4:2
III and IV	Magnus	2;3:10	2;9:22
III and IV	Emil	2;3:29	2;10:2
III and IV	Anne	2;4:2	2;11.17
III and IV	Ingrid	2;4:28	2;10:28
IV and V	Oskar	2;6:4	3;0.18
IV and V	Markus	2;8:6	3;2:13
IV and V	Linnea	2;9:15	3;3.22
IV and V	Sofie	2;9:28	3;3.23
V and VI	Leah	3;1:16	3;7.28
V and VI	Mathias	3;2:27	3;8.25
V and VI	Thea	3;2:5	3;7.26
V and VI	Jan	3;3:11	3;9:4
VI and VII	Sara	4;0:27	4;7.22
VI and VII	Bjørn	4;2:17	4;8:28
VI and VII	Per	4;2:24	4;8:23
VI and VII	Inger	4;5:29	4;11:26
Only VII	Nora	5;5:04	
Only VII	Maja	4;8:13	
Only VII	Filip	5;0:25	
Only VII	Aksel	5;1:9	

Appendix B: The relative clause material

Legend	
§u and +u	Incomprehensible (independent and dependent)
#, ## and ##	Short pause, medium long pause and long pause
+r	Repetition
+z	Repair
+t	Restart
+x	Non-norm form
§n	Sensitive material
§o	Onomatopoeia
…	Interrupted utterance
-	Interrupted word

Informant	Phase	Part	Start time	Utterance
Emil	III	B	12:45	det er +u (den lille bukken bruse) stange trollet ned
Emil	III	A	8:23	pennen som skal kjøre
Emil	III	A	19:43	det er ... veit ikke hva heter
Emil	III	A	18:11	det panser han skal kjøre +r (det panser han skal kjøre)
Emil	III	B	9:36	han som stange han
Emil	III	A	8:53	er det +t var det han mannen som kjører traktor ?
Emil	III	B	8:16	det er trollet som # +f (hva er det som tramper på min bro)
Emil	III	A	14:35	det er sånn belte man skal ha skal kjøre
Emil	III	A	13:00	han ... vet ikke han sier # jeg
Emil	III	A	12:17	jeg veit ikke han sier
Emil	III	A	11:34	jeg veit ikke elgen sier
Kari	III	A	0:22:59	den som henge fast
Lucas	III	A	0:27:20	det er den som finne +z lage hus
Lucas	III	B	0:03:55	ja nei vi veter ikke hvor lastebilen min
Anne	IV	B	0:45:00	nei ingen som er rar
Emil	IV	A	0:04	men vi mangler en §u som skal være der
Emil	IV	B	0:24:14	mamma # er det mange som skal ha den ?
Inger	IV	A	0:29	bare jeg som er sterk her
Ingrid	IV	A	11:24	her er pusekatten er kke skummel
Magnus	IV	B	30:37	det er sånn der kjører traktoren
Magnus	IV	B	31:26	han som kjører han til skogen
Magnus	IV	B	58:36	jeg skal klippe denne her bæsjen som er lang
Markus	IV	B	1:18	+r og så +z (og så er den store elgen) ## og så er den store bukkene-bruse +z (som dro) +r som +r som som tramper over brua
Markus	IV	A	11:49	+z (jeg) +r (det v-) det var elgen som bomba seg
Markus	IV	B	18:17	der var den bittelille reven som er litt lei
Markus	IV	B	2:22	det er bukken-bruse som går over §u her
Markus	IV	A	9:51	også er det en elg som er elget sitt hus
Markus	IV	A	5:21	+z (mot-) der var motoren # som kan ...
Markus	IV	B	22:45	en kanin som kan hoppe
Markus	IV	B	3:19	som sa please ?
Markus	IV	B	8:36	som ville spise han der
Markus	IV	A	4:06	løve som jeg får §u da
Markus	IV	A	6:17	som han kan spise
Markus	IV	B	24:52	jeg har stått +t jeg har ringet anda som står i vannet
Markus	IV	A	1:59	den mannen som kjører den bitt- ... +t kjører gravemaskinen de kan kjøre noen store gravemaskiner
Markus	IV	B	16:31	han ## jeg vet ikke hvor han +r han ...
Markus	IV	B	16:36	han ## jeg vet ikke hvor han gjør
Markus	IV	A	5:54	ja jeg vet ikke hva den heter
Markus	IV	A	15:31	jeg vet ikke +u hvem han heter

Markus	IV	B	26:16	jeg vet ikke hvor han har i munnen sin
Sofie	IV	A	16:08	ja jeg vet ikke helt hva jeg gjorde mere
Sofie	IV	A	6:29	kan jeg se hva annet du har med ?
Sofie	IV	A	0:43	kan jeg se hva annet du har oppi ?
Sofie	IV	A	1:11	kan jeg se hva annet du har oppi ?
Sofie	IV	A	1:36	kan jeg se hva annet du har oppi ?
Sofie	IV	B	10:46	se nå hva jeg drikker nå
Jan	V	B	12:14	her er §u som fløy der
Jan	V	B	11:29	og han som sitter fast
Jan	V	A	5:26	og han som kjører §u traktoren
Jan	V	A	5:32	har du brannbi- ... +t har du +r (har du) brannma- ... +t har du gravemaskiner som ikke sånn der ?
Leah	V	B	14:26	det er §n (name of friend) som sklir
Leah	V	A	25:06	men vi må bare slå av det som er oppå der
Linnea	V	A	29:04	bukkene bruse som lekte # der
Linnea	V	B	31:55	en som kan prøve
Linnea	V	B	41:13	vet ikke hva du heter
Linnea	V	A	03:51	vet ikke hva det heter jeg
Linnea	V	A	17:53	jeg vet ikke hvilken skuff
Linnea	V	B	41:36	jeg vet ikke hva ...
Markus	V	A	23:14	der er en elg som den kan klatre opp +z høyt opp i trærne
Markus	V	A	23:31	og der er noen ørner som flyr høyt i luften
Markus	V	B	46:59	og dette er dinosaur ## som kan bite
Markus	V	B	55:07	det der er sjøslangemoren som sier istendenfor sjø- +z sjø +z sjøslangen istedenfor sjø også sier den sjømoren at den sjø- +z sjøormen der er så flink at den kan si +r si sjøslangen den
Markus	V	B	30:04	men nei # det er vingene ### som er veldig +r veldig +r veldig +r veldig lange
Markus	V	B	54:30	den var den # +t det var den som var §u
Markus	V	A	16:34	for løven spis- ... +t der er løven som liker kjøtt
Markus	V	B	56:23	men det der er den store sjøslangen som kan bite seg i halen
Markus	V	A	14:09	er de hjula til gravemaskina som kan være ?
Markus	V	A	08:24	dinosaur som +z er får ikke plass inni
Markus	V	A	08:30	som får ikke plass inni
Markus	V	A	29:19	ja som flyr der oppe
Markus	V	B	30:38	og den ørn- +z den ørnen som flyr oppi himmelen
Markus	V	B	56:09	som svømmer
Markus	V	A	05:11	en borg som var en ring
Markus	V	A	18:15	ja # som han kan rekk- ...+t som gravemaskinen kan rekke opp til
Markus	V	A	19:22	ehm # kjøtt som han kan spise
Markus	V	B	40:17	lyselykter sånn +z sånn som +z sånn som +z sånn som denne her ## traktoren og har og
Markus	V	A	03:09	du kan få denne som kan grave

Markus	V	B	51:24	kanskje ## jeg har en bok +u som handler om de sjørormene
Markus	V	B	43:14	jeg har også en sånn # +t jeg har ikke en sånn traktor men jeg har en sånn traktor som er +r er også ødelagt også
Markus	V	A	22:54	også har jeg en +r en ørn som er redd for å fly opp
Markus	V	B	51:08	men jeg har bare to sånne her som er +r (som er) §u ... +t jeg kan vise noen av dem da
Markus	V	A	09:37	også har den blad som den kan spise også
Markus	V	B	32:07	der flyr den +t der er ikke fly +t sitte på stubben sin og se på §u +t der sitter den +t der går den og ser på de andre fugl +z ørnulf +z ørnulf +z ørne +z ørn +z ørne +z ørnulfene som flyr over himmele
Markus	V	A	28:21	og da sier ørnulf nei jeg vil opp på stubben min og se på de andre ørnene som flyr over himmelen
Markus	V	A	25:26	klatrer opp på stubben sin og se på ørnen som flyr over himmelen
Markus	V	A	22:34	har du en til som man kan ta på seg på ?
Markus	V	A	3513	hvor er de lekene jeg skulle få +r få +r få låne ?
Markus	V	B	53:33	men nå jeg lese om den sjøslangen som kan bite seg i halen si +z sin
Markus	V	B	54:13	nei jeg lese om den som biter seg i halen for ... rundt omkring +r (rundt omkring)
Markus	V	A	23:57	nå jeg lese om ørnulf som er redd for å fly nå
Mathias	V	A	2:15	det er sånn man kan bøye ned og +r og finne ting §u
Mathias	V	C	7:30	ja # jeg ser ikke flere oppe på himmelen som pleier å gå til barnehagen altså
Oskar	V	A	28:58	vet du er det oppi ...?
Oskar	V	A	08:17	det var traktor ## som +r bråk- bråka på veien
Oskar	V	A	07:23	som kan snurre sånn
Oskar	V	A	22:11	en gutt som har vinger
Oskar	V	B	39:55:00	en panda ## som spiser bambus
Oskar	V	A	26:21	nei +r sånn ## sånn kan kjøre med +r på på jorda
Sofie	V	B	48:16	det er sånn man kan klistre her # merken
Sofie	V	A	16:30	hm # en telefon ## ordentlig telefon ## som jeg kan ringe pappaen min
Sofie	V	A	22:42	en katt # som er søt
Thea	V	B	4:46	+f (hvem er det som tramper på min bro ?)
Thea	V	B	1:29	nei +f (det er bare den lille bukkene som skal til seters og gjøre seg fet)
Thea	V	A	15:05	ja da så jeg andunger som jeg kan gi mat til
Thea	V	A	13:49	sånn jeg gjorde der borte
Thea	V	B	3:02	+r jeg +r (jeg har en) jeg har en til # som jeg kan hente til deg
Thea	V	B	2:02	§n (older sister) tatt +u kjeksen som var igjen der
Aksel	VI	A	16:13	også klarer å vise de +z hva de heter
Aksel	VI	C	53:12	vet du hva jeg skal klippe ?

Aksel	VI	C	57:46	jeg vet hva det er
Aksel	VI	C	58:33	jeg vet hva det er
Aksel	VI	C	59:52	ogs- +t jeg vil +t vet du hva jeg vil ha ## i g- +z julegave ? sånn
Bjørn	VI	B	15:51	den som jeg +z vi fant
Bjørn	VI	C	14:03	den +z de som var alene i skogen der som det er ingen folk har # ingen bestemor og # ingen # pappa og mamma og ## ingen biler og ## ingen busser og # ingen ### i huset bare dinosaurer
Bjørn	VI	A	19:46	men ikke de store guttene som vokser
Bjørn	VI	B	4:55	kan jeg få ballong som kan pumpe opp ?
Bjørn	VI	A	2:25	det er som bruker som kan sitte med # men det er ikke der
Bjørn	VI	C	14:00	men vet hvem som er enda skumlere
Bjørn	VI	A	2:25	det er som bruker som kan sitte med # men det er ikke der
Bjørn	VI	C	18:17	men det er mat dere kan spise her
Bjørn	VI	A	16:02	ja det er sånn man kan bruke den med
Bjørn	VI	A	16:05	det er sånn man skal ta opp §u med
Bjørn	VI	A	8:27	det er en fin pistol # som kan også ødelegge ## og den har ikke jeg brukt lenge siden
Bjørn	VI	A	16:34	er det noe som kan henge fast sånn og sånn +r sånn
Bjørn	VI	C	15:53	dette her er sånn §u som kan finne alle slags ting
Bjørn	VI	A	12:16	det er de som klarer det
Bjørn	VI	B	11:44	det er sånn som kan finne veien
Bjørn	VI	B	17:29	det er sånn du er ikke
Bjørn	VI	B	15:48	hvor # den som kommer her er ?
Bjørn	VI	A	2:54	det er fargeball som kan henge fast i en som ...
Bjørn	VI	a	3:00	det er som er litt stor som kan henge fast på ball
Bjørn	VI	a	3:00	det er som er litt stor som kan henge fast på ball
Bjørn	VI	c	4:51	hvor er den +r (hvor er den) som må ta vekk ?
Bjørn	VI	c	8:53	den løv- +r (den +r (den) lø-) ### +z løveleke den som er bak §u den har bruk- +z brukket foten sin den +r der der
Bjørn	VI	a	17:37	denne som holder på falle ned kan jeg knuse den ?
Bjørn	VI	a	2:31	den som kan ... de som kan være der # de er borte
Bjørn	VI	c	4:59	men en traktor som var liten # den klarer det +r (den klarer det)
Inger	VI	a	0:23	ee den som §u
Inger	VI	b	11:11	kan ikke ha løve som ... +t løve kan spise
Inger	VI	c	5:05	men +z (det fins) noen fins som §v
Inger	VI	c	11:39	også # jeg jobber med en babytiger # som dere må lære dere å vaske babytiger ## når han har # i vask
Inger	VI	c	16:13	også nå # må du vaske en # mammatiger som er kjempestor # prøve veldig hardt # også så skal du §u
Inger	VI	a	23:40	nå ... ### +t faktisk # pandaen skal spise opp blad +r blad han bare vil også skal han til den andre # som han skal

Inger	VI	b	13:34	men denne ... +t pandaen skal flytte til den # som løven skal
Inger	VI	b	1:00	her er den gamle dyrehagen som før pandaen var
Inger	VI	a	23:20	nå skal vi late som at +r at dette var den nye dyrehagen # som dem kom til
Jan	VI	a	01:09	litt sånn der jeg trodde
Jan	VI	b	25:18	sånn her som du har
Jan	VI	a	06:09	sånn som han har
Jan	VI	a	10:45	en hest som klarer å falle
Jan	VI	c	47:11	han som har lang hals
Jan	VI	c	48:39	som er frukt
Jan	VI	c	49:26	gjøre noe jeg syns er kult
Jan	VI	a	01:41	da har du sånn vanlig gravemaskin jeg hadd- +z trodde
Jan	VI	a	01:03	den har sånn +t den har ikke sånn jeg trodde
Jan	VI	a	05:02	han kan +z har så lange bein # han kan trampe med
Jan	VI	c	53:30	nei jeg kan hente en bok til ### som er liten
Jan	VI	c	47:57	kan vi det som er det fruktet
Jan	VI	c	48:10	pappa kan +r kan vi kjøpe sånn +r sånn juicet som er det på ny glass
Jan	VI	b	22:54	jeg klarer bare de som har ### politi og brannmenn
Jan	VI	b	32:39	vil du slå §u andre # som klarer egentlig å få au
Jan	VI	b	34:28	jeg tar bare det som var på dansk
Jan	VI	c	53:36	pappa jeg trenger noe som er liten bok
Jan	VI	c	48:46	som vi kunne kjøpe det som er +z var med frukt
Jan	VI	b	29:33	så +u ville jeg egentlig mange de som er ikke grønne og ingen røde
Jan	VI	b	21:07	mamma # +z det det her er en helikopter som gjør det
Jan	VI	c	22:03	han jeg skal kjøre det er bare den og bare den og den og den
Jan	VI	b	28:10	katten som kiler han henger
Jan	VI	b	30:02	han spiser egentlig halen han som mangler noe
Jan	VI	b	28:56	den +r den som er med +x green den må jeg vise fram
Jan	VI	c	48:24	men jeg husker ikke # hva det heter
Jan	VI	a	05:54	jeg vet hva du heter
Leah	VI	b	23:05	og en dame ## som skal trille vogna
Leah	VI	c	42:47	cecilie som er på kontor- ....
Leah	VI	b	26:09	en elg som sover her i natt
Leah	VI	c	42:52	det som er i barnehagen min
Leah	VI	c	56:57	som måtte på do
Leah	VI	c	46:57	han hører på en musikk som er fotballbrille
Leah	VI	c	41:56	her står det ### ehm ## sjiraffer # ville ha ballonger som er friket
Leah	VI	c	50:41	ehm ### bæer går på ulver som er slemme
Leah	VI	a	05:19	du skal +u kaste baby på ## +r på alle som kaster baby på hodet ditt

Leah	VI	c	45:44	dammer på dammer de er i søledammer ## +x klakrer +u (i en) snøbanan ## som er flat ### og ikke gjør seg klar
Leah	VI	c	48:00	ehm # katter ### tar å +x kneffer +r (på # +r datter) ### +r datt- ### på datter som fiser +z på # +z på # her på +x 1knuta si
Leah	VI	c	42:29	men det er # ee # +r ho # ho [hun] som er på kontoret ### ho sin bokstav
Leah	VI	b	30:54	den kan sikkert være igjen # for det er bare lillesøster som skal bli med
Leah	VI	c	48:33	og kommer en rev som vil spise han opp
Leah	VI	b	31:43	det kan ... +t se hva jeg gjør
Leah	VI	b	32:51	vil du se hva jeg oppi
Leah	VI	b	33:00	+u (se ## hva jeg har)
Leah	VI	c	55:32	ikke se hva jeg ...
Leah	VI	c	58:17	se hva jeg har fått i gave !
Leah	VI	b	37:40	+z (jeg f-) vet du hva jeg fikk i julegave ?
Leah	VI	a	02:53	vet ikke sin bokstav
Mathias	VI	a	13:01	ee smukk som §n (little sibling) bruker
Mathias	VI	c	42:58	håper at tilhenger som passer til traktoren sin
Mathias	VI	c	42:53	§u og en traktor som må ...
Mathias	VI	a	06:54	en utetraktor som har skuff det har jeg
Mathias	VI	c	43:05	han har sånn traktor som kan være ute og inne
Mathias	VI	c	44:19	i dag skal jeg lete etter den tyven som har +z heng- tatt tilhengeren til denne traktoren
Mathias	VI	a	03:35	jeg ser mannen som styrer
Mathias	VI	c	48:27	jeg ønsker meg et verktøyhus som er ...
Mathias	VI	a	14:46	men den må være der grønnsak ...
Mathias	VI	c	48:38	med sånn som +r jeg jeg kan være inni
Mathias	VI	a	06:00	det er den skuffen som den graver med
Mathias	VI	b	28:16	det er han som passer på at alle har tatt a §u og tatt på badebukse
Mathias	VI	a	06:50	+u (men den er) utetraktor som har skuff
Mathias	VI	a	07:52	han er nabo +r (som bor) som bor der oppe
Mathias	VI	a	11:42	han tyven som var oppi +r he- # her
Mathias	VI	c	48:47	ja det er en typisk som er ## bøyd
Per	VI	b	19:43	sånn som vi skal ta stigen på
Per	VI	c	0:28	de slemme som kommer på denne sjørøverskuta §u
Per	VI	b	8:45	ja sånne tiger som sier ... ja ## som sier sånn §o
Per	VI	b	9:18	men ikke sånn apekatter som ikke kan snakke
Per	VI	c	11:36	det som er så rart med emil
Per	VI	a	17:30	som ikke e- ...
Per	VI	c	11:25	han har sånne der som +r (han har sånne der som) ser ut som strømgjerde da
Per	VI	b	17:44	jeg har sjørøverduplo som skal være oppå den sjørøverbåten

Per	VI	a	19:12	på den butikken selger de masse kuer som sier sånn §o
Per	VI	a	09:25	skreller noe som ikke er noe godt
Per	VI	a	5:05	men han flytter opp på taket til +r lillebror lillebroren som han er bestevenn med
Per	VI	c	13:18	men jeg tok det i bare sverige det som ikke heter liseberg
Per	VI	b	19:08	det er sånn han skal ha når han # skal +t når han lager +t +r når når vi skal badebass- +t når vi skal ha badebassenget opp
Per	VI	b	17:53	også er det dør her som jeg åpner når de skal inn
Per	VI	b	17:02	det er ikke en sånn der som vi kan åpne med disse her
Per	VI	a	17:22	+x melko det er sjokolade som +r som det er melk i
Per	VI	b	15:59	ja han skyter pinky med den # nei han har ikke ekte pistol det er bare han som sier sånn ... +t som skyter §u når de skyter
Per	VI	c	16:13	det er sånn som detter uti havet
Per	VI	a	1:02	men sjørøveren som han blir med klarer å bære han ned men ikke opp
Per	VI	c	13:45	vet du hva # som skal inni h- +z her ?
Per	VI	c	13:51	vet du hva som skal inni her ?
Per	VI	c	03:39	det er jeg som får gjøre sånn at denne §u
Sara	VI	a	11:11	ikke hun som er i barnehagen
Sara	VI	a	16:33	noe som flyr
Sara	VI	a	11:06	eh nei [hun] som er hjemme
Sara	VI	c	3:33	eh ordentlige som sier §o men de sa ingenting
Sara	VI	a	10:09	nesten som er på +x labra
Sara	VI	a	9:59	mamma jeg har +r (jeg har) det som nesten +t som er på §u
Sara	VI	c	1:58	jeg tok av gjerdet som har strøm i seg
Sara	VI	c	1:54	hesten må bak gjerdet som hadde strøm i seg igjen
Sara	VI	c	1:17	mamma nå er hesten bak det gjerdet som har strøm i seg
Sara	VI	a	18:01	men husker ikke hva jeg lekte da
Thea	VI	b	28:52	jeg kom på noen som vil se på rommet mitt
Thea	VI	b	28:27	rekk opp hånda dem som vil se på rommet mitt +r (rekk opp hånda dem som vil se på rommet mitt)
Thea	VI	b	25:55	der står det ### §n (name of sister) som får pepperkake
Thea	VI	b	32:11	du kan få lov t- ... +t du +r du kan få lov til å se hva det er ## under det teppet
Thea	VI	b	27:06	vil du se på bildet hva jeg har fått på butikken ?
Thea	VI	b	26:07	kan vi let- +z se +z lete og se hva +z hvem som får nå ?
Thea	VI	c	42:19	du vet jo hva som få- ... +t du må si hvem som får pepperkake
Thea	VI	b	25:18	kan jeg let- ... +t kan jeg finne en lapp og §u vet du hva en se- +z (hva det) +r (hva det) står på en pepperkake
Thea	VI	a	04:41	dere vet ikke hvem som får pepperkake
Thea	VI	a	04:06	vet du hvem som får # pepperkake ?
Aksel	VII	b	26:16	sånne som lyser om mørket
Aksel	VII	b	31:04	det var ikke de jeg skulle vise deg

Aksel	VII	c	50:48	ja fordi du har ### +t fordi det er sånn den skal være
Aksel	VII	c	51:13	pappa ikke sant det her er en av de første legoene jeg fikk ?
Aksel	VII	c	51:20	det her er en av de første legoene jeg fikk
Aksel	VII	b	32:51	da ko- ... +t skal jeg si deg hva som de bruker når det er tauebil som har havarert ?
Aksel	VII	b	38:27	det er sånne som bestemmer
Aksel	VII	b	38:30	så bestemmer jeg §u +z (vet jeg) når det er noen tyver som skal +r (som skal) bli fanget
Aksel	VII	c	46:23	pappa hvor er den som +r (hvor er den som) skal sitte der
Aksel	VII	b	30:57	ja men her er det sånne legoer som ikke er bygget
Aksel	VII	c	41:52	og den tingen som jeg lagde i dag den er til deg pappa
Aksel	VII	b	36:32	pappa # på julaften ... +t den julaften som skal ## være # den skal ## den julaften skal jeg faktisk være i barnehagen fordi vi skal sette opp juletre i barnehagen og pynte det juletreet
Aksel	VII	a	2:06	jeg skal si deg hva vi +t skal vise deg hva vi skal gjøre
Aksel	VII	a	3:34	jeg vet det ### +z (hva den heter) +z (hva det er i den)
Aksel	VII	b	32:51	da ko- ... +t skal jeg si deg hva som de bruker når det er tauebil som har havarert ?
Aksel	VII	b	27:38	du skal lese hva som står der
Aksel	VII	c	40:44	men du må jo se hvordan denne ser ut
Bjørn	VII	a	17:32	jeg vet hva en hest
Bjørn	VII	a	25:11	jeg vet hva det er
Bjørn	VII	b	44:12	fordi ## +r at ### at §n (name1) visste kke hvor var jeg.
Bjørn	VII	b	46:07	vi vet ikke hvor er boka
Bjørn	VII	a	32:28	jeg vet hvordan man ...
Bjørn	VII	b	33:00	hvem heter det han jente som [bor hjemme der +u (du bor)]?
Bjørn	VII	a	23:42	men jeg har +x størrelsesglass [forstørrelsesglass] som +u kan vi +r se ## se maur
Bjørn	VII	a	22:48	jeg tror det er sånn der som slå
Bjørn	VII	b	51:18	+u (men det var en tak som kan være der §u §u §u)
Bjørn	VII	b	54:15	her er mannen # som skulle være inni den her
Bjørn	VII	b	54:31	men hvor er han som kan være der ?
Bjørn	VII	b	33:00	[hvem heter det han jente som bor] hjemme der +u (du bor)?
Fillip	VII	b	16:11	det du gjør da
Fillip	VII	b	16:49	og derfor ## det du gjør nå
Fillip	VII	a	03:04	sånne turbosnegler som ballene hører til
Fillip	VII	b	01:27	de som er anderledes enn de der
Fillip	VII	a	05:58	sånn kull som er inni turbosneglene
Fillip	VII	b	06:28	+r (jeg leit-) jeg leter etter en liten pengebit vi har
Fillip	VII	a	06:38	skal jeg vise deg de kortene vi spiller med ?
Fillip	VII	a	05:08	også liker jeg sånne pandaer som hopper §u
Fillip	VII	a	03:16	ja men jeg har en film som handler om turbo
Fillip	VII	a	05:21	fordi kurt # som er en angrybirds han har [sånn der bambus som er §o]

Fillip	VII	a	02:35	også ### liker jeg ganske mye ## sånn derre miniboller som er turbosneglene sine
Fillip	VII	a	02:01	det er noe jeg fant på
Fillip	VII	b	04:24	det er det meste jeg kan ta
Fillip	VII	b	08:00	men det er noe [du gjør] som er viktig da
Fillip	VII	a	03:46	det er en som heter turbo
Fillip	VII	a	05:34	turbotornadoer er noen hvite tornadoer ### som gjør at andre kommer i andre verdener
Fillip	VII	b	08:00	men det er noe du gjør [som er viktig] da
Fillip	VII	b	15:22	men det du gjør da # er å legger ut en ny
Fillip	VII	b	09:14	er disse to terningene her som jeg fant i denne skuffen dine ?
Fillip	VII	a	05:21	fordi [kurt # som er en angrybirds] han har sånn der bambus som er §o
Fillip	VII	a	03:38	også en gang sto +z turbo han ekte turbo som heter turbo
Fillip	VII	a	03:48	han som heter turbo slo en gang hundre racerbiler
Fillip	VII	b	04:04	men ser du hva det der er ?
Fillip	VII	b	11:31	fordi da vet du hva jeg skal gjøre
Inger	VII	c	51:28	jeg vet hva du har fj-
Inger	VII	c	52:49	som spiser gress
Inger	VII	b	28:12	det er barnekaniner som hopper sammen
Inger	VII	b	29:07	er det katt # som kommer
Inger	VII	c	41:10	det er så mange som skal ha
Inger	VII	b	30:11	de som spiser planter skal med i plantene
Inger	VII	b	30:17	de som spiser planter # skal med i plantene
Maja	VII		42:04	gull sånn som man har her
Maja	VII		11:22	at henne kan skli ned der og at noen kan skli +t at den dumme heksen +z som som lar rapunzel aldri gå ut
Maja	VII		13:11	balletsko som var rosa som var magiske ballettsko som var rosa [som glitret]
Maja	VII		00:00	det røde som var hvitt og ### og et rødt hjerte inni
Maja	VII		13:11	balletsko [som var rosa] som var magiske ballettsko som var rosa som glitret
Maja	VII		13:11	balletsko som var rosa [som var magiske ballettsko] som var rosa som glitret
Maja	VII		13:11	balletsko som var rosa som var magiske ballettsko [som var rosa] som glitret
Maja	VII		15:42	men ikke de pirajaene eller de haiene som er slemme
Maja	VII		28:11	henne rullet ned en is ## en ### snøklump som var stor [som henne kunne hoppe på]
Maja	VII		43:55	jeg kan løfte et helt hus som det er hundre hester i og hundre mennesker
Maja	VII		47:10	jeg må ha +x (little pony)-strømpebukse ### som er grå
Maja	VII		52:52	henne har faktisk tryllestav ## som er lagd av gull
Maja	VII		48:25	henne hadde faktisk på +z en +z en en # mørkelilla og en lyselilla +z s- +z en en # tight som er stripete

Maja	VII		37:00	leket ### med en ## gutt som heter # §n (name of friend)
Maja	VII		01:04	jeg lekte med en jente som heter §n (name of friend)
Maja	VII		28:11	henne rullet ned en is ## en ### snøklump [som var stor] som henne kunne hoppe på
Maja	VII		37:20	jeg vil ta blå # som er elsafarge
Maja	VII		13:39	også kommet henne til et skog som alle de prinsessene danset i
Maja	VII		36:11	det var henne jeg mente
Maja	VII		02:33	og det er du som teller
Maja	VII		41:35	det er en prinsesse +z (som alt er) som har gult hårbøyle # gul kjole gule sko ## +z (og gu-) og gule ## ingenting
Maja	VII		53:29	det er en jente som heter rosa på kaptein sabeltann
Maja	VII		56:06	dette er klistremerkene mine som ser ut som øredobber
Maja	VII		30:18	det er sånn rustning som henne kom # som hen- ... +t og henne kom seg ut # av den rustningen
Maja	VII		02:37	jeg skal si deg hvor mange du skal ## +t hvor # mange du skal telle til # tolv
Maja	VII		21:26	vet du hvor §n (name of friend) bor ?
Maja	VII		23:49	vet du hva henne heter ?
Maja	VII		33:07	jeg vet ikke hvor badstu er
Maja	VII		41:22	du vet ikke hvilken prinsessefarge det er
Maja	VII		54:11	jeg vet hva som heter ## rosa på engelsk
Nora	VII	b	26:26	da vet hva de er
Nora	VII	b	26:21	også bare lukter de på bakken # også vet hva det lukter
Nora	VII	c	01:50	jeg skjønner hva henne sier
Nora	VII	c	05:53	ja som er mer
Nora	VII	c	51:45	blir det sånn +r som som +z han strekker seg
Nora	VII	c	56:44	også hadde vi +z han han katten som kunne +u (luske) # hva het han
Nora	VII	b	26:03	to politihunder # sant det finnes politihunder som er to
Nora	VII	c	12:51	jeg skjønner ikke hva den mener
Nora	VII	b	21:29	eh # fordi at # de må # ha mange dyr som bor her
Nora	VII	c	16:55	du må jo se henne som er minni da ser vi vingene hennes
Nora	VII	a	19:40	også bare # tar de av +r de de trærne som har alle pinner
Nora	VII	b	22:43	for gnage # det betyr å egentlig ta bort noen mennesker som er litt slemme
Nora	VII	c	49:06	sånn # også ser den sånn ut ## med en sånn rygg som er veldig runde
Nora	VII	a	0:19:47	det er det de gjør
Nora	VII	b	0:20:30	mm # det er det de gjør
Nora	VII	c	41:38	det er sånn katter gjør
Nora	VII	c	44:32	det er sånn vi gjør i barnehagen
Nora	VII	c	56:29	det er sånne +z fingre # +z finger fingreleker som vi kunne ha på fingre

Nora	VII	a	11:59	det er bare hun som gråter
Nora	VII	c	41:09	det var jeg som nøys
Nora	VII	b	32:06	også var det en hest som nesten ramla ned
Nora	VII	a	05:50	også er det en dame som har hun
Nora	VII	b	25:01	da var vi politier # for §n (name of friend) var +z polit- egentlig politien som var +z kj- politisjefen
Nora	VII	b	26:09	+r det det er to politihunder som er på jakt # sant det
Nora	VII	b	39:23	men hva er det der +z (det som er der)
Nora	VII	c	57:23	også er jeg en robot # som +t robot er §u robot robot
Nora	VII	b	31:00	jeg tror det er +x mørkthesten som rote- ... +t jeg tror du trodde at det var en politihest # men det var det ikke # det var mørkthesten
Nora	VII	b	0:29:40	han # emil som er storesøsteren til anton # storebroren til anton # han har hatt veldig langt hår som meg
Per	VII	c	56:16	du visste jo +t det vet du jo hva brannmenner er
Per	VII	a	06:07	og vet du hva den +z de to er +z (denne traktoren) ?
Per	VII	b	39:39	da annik og han +t og hun kan +t og vet du hva han sier han sier at ikke pippi kan bære en så stor hest som det
Per	VII	b	34:20	og de +t vet du hva de gjorde da de +r de bare +t harry han kasta §u ut sånn her på gråtass
Per	VII	c	43:41	og vet du hva de gjør de +z da +z de kommer de og knuser bilene for han er så sterk og han +t sånn at han kan knuse store biler
Per	VII	b	38:30	og du gjetta hvem vi skal så du får premie
Per	VII	b	38:43	nei han for han gjetta hvor det var og da får han premie
Per	VII	b	29:14	hun +r hun li- +t hun bærer hesten sin akkurat som det som vi +r vi pusla
Per	VII	b	32:00	egentlig så gjør det ikke skraphandler §u sånn §o bare slemme +t bare de som er slemme
Per	VII	c	50:13	ja # akkurat som de bildene som er med brann +z brann +z +x branns på skapet mitt # på rommet
Per	VII	c	58:20	og vi ja da kan de stjel- +z stjele en båt fra sjørøverne og ta skatten den som sjørøverne +t også tar de den også må politiet komme og arrestere dem igjen
Per	VII	b	32:56	nei han ble til noe som de skal ha med brødgjær
Per	VII	c	44:43	men §u vi har to biler **en som er grå** og en som er hvit
Per	VII	c	44:43	men §u vi har to biler en som er grå og **en som er hvit**
Per	VII	c	56:54	også har han to øyne som stikker ut også st- også er de sånn her
Per	VII	b	31:37	og herman +t jeg har en fetter som heter herman og han +t vet du hva han +t han var +t han satt på taket på trikke- +z trikken
Per	VII	c	57:29	pelle politibil han er +r (han er) veldig god og asster- +z arrestere de som # tyven
Per	VII	c	43:31	egentlig så er dette en tunnel til en bilbane som jeg har
Per	VII	c	56:35	den er litt dum for sånne som jeg er +r (sånne som jeg er)

Per	VII	c	52:50	det har jeg sett på kino at han vant +r vant med en som heter bjørn ba- +z barsk
Per	VII	c	52:50	og det er sånn +z sånne +z sånn +r sånn de vinne- +z vinner +r vinner for sjørøverne i hvert fall
Per	VII	c	49:06	det er det de viser
Per	VII	b	25:38	det er sånn som de har på sjørøverbåten
Per	VII	b	39:05	det var samme puslespillet som vi tok §u
Per	VII	b	27:36	det er sånn de kan spille på
Per	VII	b	23:35	for det er sånn som han kan bare skru på
Per	VII	c	49:56	og der er det sete som jeg syk- +z sykler bak
Per	VII	c	46:44	det er en tunell som begynner å skal kjøre inni
Per	VII	c	49:06	og derfor må det være sånn skilt som det står **det er egentlig bare en garasje som biler kan være inne i**
Per	VII	c	49:06	og derfor må det være sånn skilt som det står det er egentlig bare en garasje som biler kan være inne i [på]
Per	VII	b	21:24	han er en pinne som kan snakke
Per	VII	a	04:59	nei det er ikke han som vil ta sjørøverene for det er en i gråtass
Per	VII	a	05:09	det er noen som prøver å ta gråtass og det jeg mener er harry
Per	VII	a	06:34	nei det er goggen og gamlefar som bor der
Per	VII	b	26:04	og de er skraphandlere som vil ta gråtass
Per	VII	b	26:43	det er de som tar ting
Per	VII	b	32:23	nei det var de slemme som tar gråtass # og de +r (og de) prøver og +r og der var traktoren med +z (gråtass med) og der tror jeg vi kjørte §u +z blei med hjem og da tok de fra gråtass §u og da +r (og da) var han +r (var han) +t og da smelta de ham om til stål
Per	VII	c	43:41	bilbane det §l det er leker som er en sånn bilvei
Per	VII	c	59:13	dette er to det er [en to som +r som blir baker på sirkus viktor] og en som blir brannmann
Per	VII	c	59:13	dette er to det er en to som +r som blir baker på sirkus viktor og [en som blir brannmann]
Per	VII	c	49:06	for noen tror at det er en tunell som +r som ikke er sånn som tunell på bil
Per	VII	b	28:56	men det er det samm- +t det er det samme puslespillet som jeg +t dette er +t dette jeg fikk jeg til julaften
Per	VII	c	41:33	det er gratis som du +r du skal +r skal kjøpe premie
Per	VII	c	42:34	for dette er jo sånn butikk som ... takk ## og da §u i den butikken så må vi alltid ødelegge pengene
Per	VII	c	01:15	men en ting jeg vil +z har glemt er å snakke li- +z litt om bilbanen
Per	VII	c	52:29	og dem som gjør sånn at na- +z na- +z et annet sverd detter de vinner av å sloss med sverdet
Per	VII	b	38:30	de som +t de +z de som gjetter hvor de skal de får pre- +z premie
Per	VII	c	40:07	og han er så glad i bananer tror jeg så han tror jeg er hodebananer for det het- +t ho +t ja for det heter sånne aper

				som er veldig glad i banan vet du
Per	VII	c	40:07	sånn ape som er så veldig glad i bananer kaller de for hodebananer
Per	VII	c	42:22	ja så +z som vi skal kjøpe med en annen butikk enn dette
Per	VII	a	16:07	også lurer han dem langemann for +z sånn at han +z en som heter kaptein sabeltann og han døde og da skal han lure langemann at han er kaptein sabeltann
Sara	VII	b	13:02	men jeg tør ikke for # hva jeg sier
Sara	VII	b	33:27	vet dere krona §u er stjelt hen er
Sara	VII	a	20:27	nei jeg går og sjekker hva som er med pinky
Sara	VII	b	20:16	vet du hva pinky §u +u driver med ?
Sara	VII	a	22:00	jeg vet ikke hva som er galt med pinky
Sara	VII	b	21:06	vet du hva pinky skal nå ?
Sara	VII	b	20:26	se hva skrevet da
Sara	VII	a	09:09	jeg vet ikke hvor pinky skal hen
Sara	VII	b	25:28	jeg vet ikke hvor hun skal nå
Sara	VII	b	32:41	+x nightmare moon +u som er §u nå
Sara	VII	b	37:13	også har jeg svart røykmagi som kommer ut # fra krona
Sara	VII	b	19:42	det er sånn vi lager det
Sara	VII	b	33:27	vet dere hvor [krona §u] er stjelt hen er

Appendix C: The subordinate clause material

V	Markus	a	28:11	det å ikke angre så høyt
V	Markus	a	31:44	men hvis jeg +z tar bare tar den hånden min høyt opp der så faller den bare ned
V	Markus	a	48:36	den lukka munnen sin # så den ikke biter fingeren sin
VI	Jan	a	16:48	jeg tror det kommer egentlig sånn
VI	Jan	a	19:27	så klarer gravemaskinen å ikke komme opp hit
VI	Jan	a	25:00	så den må jeg bare bruke
VI	Jan	a	46:25	så bare han faller
VI	Leah	a	41:31	de går og gjemmer seg # i vannet så ikke noen kan ta meg
VI	Per	a	14:48	+r vi vi så først at det ikke var flaggstang og ikke suppebolla §u §u bolla
VI	Per	b	8:21	fordi tigeren og den sorte dame er ikke +z sier ikke §o på ekte
VI	Per	b	4:28	+z nå- nårr di skal bade men ikke kommer i bade- ...
VI	Per	c	0:49	fordiat det er ikke lov å bade
VI	Per	c	16:48	fordi det er ikke lov å komme i et badeland
VII	Aksel	a	25:02	det er fordi det er jo et helikopter
VII	Nora	a	29:40	som er fordi han elsker egentlig jenter # for han så ut som en jente
VII	Nora	a	22:42	for gnage # det betyr å egentlig ta bort noen mennesker som er litt slemme
VII	Nora	a	49:55	når det blir egentlig varmt og sånt noe da blir det gjørme
VII	Per	a	59:40	nei fordi det va- +t jonathan var der ikke
VII	Per	a	39:39	da annik og han +t og hun kan +t og vet du hva han sier han sier at ikke pippi kan bære en så stor hest som det
VII	Per	a	48:38	skilt for å vise at det ikke er lov å kjøre bil
VII	Per	a	57:52	at han ba- +z ikke kan bli slippa ut av fengselet

Appendix D: The NoTa material

1	så det er vel kanskje noe av det aller første # første jeg husker
1	ja # jeg er da født og oppvokst e på [et lite sted som heter Svelvik] # som *+[pron=uklart]* ligger i nordre Vestfold # ganske tett opp til Drammen
1	ja # jeg er da født og oppvokst e på et lite sted som heter [Svelvik # som *+[pron=uklart]* ligger i nordre Vestfold # ganske tett opp til Drammen[
1	så første første året på videregående så gikk jeg på Sande # videregående skole # som e da er nabobygda
1	først så bodde jeg i et rekkehus # som e ja # ble vel sikkert bygd en eller annen gang på slutten av sekstitallet tenker jeg
1	hvor vi da hadde en e [en skoledag som var da # en skoledag for hundre og femogtretti år siden]
1	e det første jeg husker fra barndommen det er e når vi bodde da på et sted i Svelvik som heter Svarstad
1	men så flytta vi opp til et sted som heter Mariås
1	nei da var det den klassen som var først ute
1	var vel to to fotballbaner som kunne brukes i skolegården
6	det var alltid ## e noe som jeg v- husker veldig godt
6	tror det er noe av det billigste stedet du kan bo
6	ellers så er det jo sånne ting som du # kanskje ikke husker men du har fo- f- hørt dem fortalt så mange ganger at at e du tror du husker det så da
6	det er jo sånn du må regne med når du bor i byen
6	det var en li- bitteliten ettromsleilighet som den gang i nittiseks tror jeg det var ## ikke var sånn kjempedyr ennå
6	det er en treromsleilighet # som er e ja er det rundt sytti kvadratmeter da
23	noe jeg har gjort ?
23	det er en sånn jeg begynner å snakke til daglig liksom
23	mange utenlandske ord som kommer inn i # språket og sånt da
23	jeg har en hendelse da men den er ganske flau *[leende-]* fra jeg var *[-leende]* liten så # som jeg har hørt fra mor og far da
23	bruker ord som jeg trur jeg ikke hadde brukt hvis jeg hadde vokst opp på bondelandet liksom
23	vi har sånn # noen høyttalere i klassen da som vi bruker å høre på
23	en do og så har vi en kjeller da som vi skal innrede mye i
23	det er en s- tre som er # har kongler
23	men # siden det er ikke så mange som skal høre det her så kan jeg sikkert si det
23	det er folk som ikke bodde der før oss men før det igjen
45	ja ## så der e # har jeg *+[lex=je]* m # to som e flytta til Elverum
45	og har tre inni Oslo her en ved siden av meg på oppå *+[pron=uklart]* Romsås og så en som bor her nede
45	det var jo det jeg sa den ganga
45	det er liksom en *+[pron=uklart]* mer g- *[latter]* grøtete språk som vi kalte det

45	det er så mye som jeg *+[lex=je]* har glemt att
45	"det er ikke sånn som dem prater her inne" # sier dem
45	men så var det en som kom ifra m # ifra Oslo
45	som hadde bekjente akkurat i det huset vi bodde da
45	og det er jo ikke noe som skjer akkurat oppå det *+[pron=uklart]* på toppen der jeg *+[lex=je]* bor da
45	da vi var unger så og *+[pron=uklart]* kå- var det noen ifra Oslo som var på ferie akkurat i e *+[pron=uklart]* et hus nedenfor oss da
50	som er i Tonsenhagen # ved Bjerkebanen
50	det gjorde jeg til jeg # bare er hjemme # som jeg er nå
50	da flyttet jeg over til # [en skole som het] N2 privatskole som i dag er Elisenberg
50	men da # e # ble jeg den eneste som tjente penger i min familie
50	da flyttet jeg over til # en skole som het N2 privatskole som [i dag er Elisenberg]
50	og så giftet jeg meg og flyttet fra Oslo og bor # der # jeg bor i dag
50	jeg husker fra Vestheim # e kommunale som det het
50	og da # er det en park like ved som vi brukte mye i fritiden
50	da satt vi og luktet den maten som de stekte i tran
50	men det var noe som het # AT-tjeneste
105	ja det var den første kaffen jeg smakte
105	det eneste jeg husker fra Majorstua er at jeg sa "jeg vil ikke hjem fra Majorstua"
105	og så sier han hvem som er i den gruppa
105	og re- gjette alt som er feil og så
105	sånn du kverner sjøl og sånn?
105	det er det sånn pingler begynner med
105	ja det var det det var?
105	og så var det det de hadde da
105	er ikke det hun som er i "Frustrerte fruer"?
105	ja men det er også det som lærerne sa i hvert fall
106	men det er noe jeg ikke har skjønt med den der eksamenen
106	ja men ikke hvem du kommer opp sammen med det velger du selv?
106	som ikke har kommet opp
106	å den filmen med hun derre *+[lang=X]* som spiller i "Vanity fair"
106	da så jeg en mor som var # Bree Van De Kamp
106	det huset vi bor i det er litt ## trangt da
106	ja det var fin tur vi hadde i dag da
106	det er noe vi ikke snakker om nå
106	men hvis du kommer opp med noen hvem er det som bestemmer det da?
106	det veit jeg tror jeg faktisk er den serien som har engasjert meg mest
115	som lå der ja
115	klart at folk # fra den delen av byen sa "avisa" og "banan" # som jeg ser i avisa nå at e # folk har gått vekk fra
115	jobber i et firma som heter Lovdata
115	og det er en # som jeg noen gang har e # truffet

115	det var sånn det så ut da jeg var barn
115	og så e # var jeg første kullet som begynte på Haugerud ungdomsskole
115	e jeg var e en av de som e løp bort til stallen
115	og da var det noe e # stallhjelpere og sånn som # som var tørrlagte da
115	som sku- m skulle ha *+[pron=uklart]* hånd om hestene og sånn så vi var jo alltid der borte i friminuttene
115	nei # så etter hvert så e holdt på si flytta jo en del # *[sukking]* som ikke ti- klarte å tilpasse seg andre klasser
129	jeg syns det ser # hyggelig ut med det *[sukking]* # store antallet # ko- kollegaer som skal reise
129	det jo *+[pron=uklart]* mange godt voksne damer som prøver seg
129	det er jo absolutt forebyggende for oss som jobber i dette faget her så
129	jeg så det var veldig mange som hadde skrevet seg opp så
165	han som var på tv i går eller
165	det var den første telefonen jeg fikk
165	husker du de som ble solgt på 7-Eleven
165	mm # og så # men han legen han hadde noen som pasienter da # som hadde blitt # utsatt for han morderen
165	så er det sånn sånn mobiltelefon som alle kommer til å ha
165	nå er det en helt ny leilighet som er bygd for et par år sia
165	og så våkner med å opp at av at # det var en som skrudde på lyset
165	og så er det en der *+[pron=uklart]* som slår på lyset
165	det er sånn liten # dings som du kobler til
165	har du sånne som stjerner har på seg og sånn?
166	den som er så lang eller sånn
166	siste filmen jeg har sett er # Snatch
166	fineste værdama jeg noengang *+[pron=uklart]* har sett der altså
166	det er skatefilmer *+[lang=X]* som blir laget på sånn som blir gitt ut på sånn skatebutikker og sånt
166	jeg skal være med en kompis som heter F1
166	det er skatefilmer *+[lang=X]* som [blir laget på sånn som blir gitt ut på sånn skatebutikker og sånt]
166	det som er chill *+[lang=X]* er de derre *+[lang=X] +[pron=uklart]* nye mp3-spillerne
173	som *+[pron=uklart]* man pleier å gjøre
173	sånn # akebakker og steder barn kan være og
173	ja ## det er jo # flere stykker som bor i samme # bygning da i hvert fall

Appendix E: The input from parents of Stage V

Father Leah	men vet du hva vet du hva jeg kan hente §n (name of child) som du og morten og pappa kan se på
Father Leah	eller så kan du gjøre sånn her ## sånn du gjorde på # piratskute ikke sant ?
Father Leah	hva er det du driver med der da ?
Father Leah	det er den permen som du fikk med fra barnehagen i dag
Father Leah	hva er det han brannmannen holder på med ?
Father Leah	hva var det vi gjorde for noe ?
Father Leah	ja for det er jo en bok vi pleier å lese
Father Leah	bygde et stort pepperkakehus # som vi slo med hammer på
Father Leah	hva er det dere driver med der da ?
Father Leah	hva er det dere gjør når det er diskotek da ?
Father Leah	men du hva er det dere har fått med dere ut her ?
Father Leah	er det sånn smurfesang her som dere danser til eller
Father Leah	det var sånn pappa var istad
Father Leah	her er jo det som morten snakka om
Mother Markus	også var du bare opptatt av gravemaskinen som du lekte med
Mother Markus	har du noen ting som du har lyst til å vise til morten §n (name of child) ?
Mother Markus	tror du morten har lyst til å se noen av lekene som du har eller ?
Mother Markus	kanskje du kan vise morten noen av lekene som du har ?
Mother Markus	det er vel noen sånne rør som egentlig den traktoren skulle bruke til å heise opp grabben sin med
Mother Markus	og den har ikk- nei den har ikke sånne lykter som traktoren har nei
Mother 802666	det er noen iser du er allergisk mot
Mother Sofie	er det det eneste du heter ?
Mother Sofie	er det noe du har på deg eller ?
Mother Sofie	husker du hva du fikk første pakken du åpnet ?
Mother Sofie	når er det du pleier å ha på deg det du har på deg nå ?
Mother Sofie	vet du ikke hva slags leker du har ?
Mother Sofie	men du kanskje du kan vise eventyret som du liker best ?
Mother Sofie	husker du den høye gule som vi har sett før da ?
Mother Jan	det er dyr du snakker veldig om
Mother Jan	er det det man sier når elgen blir lei seg ?
Mother Jan	det er noe som brannvesenet trenger for å slokke
Mother Oskar	det var den du åpna i stad
Mother Oskar	skal du ha en sånn en som du kan holde med fingeren din selv ?
Mother Oskar	jo det er sånn du har på bilen din
Mother Thea	han tar opp det som du og jeg og alle andre sier

Mother Thea	hva slags mat var det vi ga til de andungene da ?
Mother Thea	hvilken historie er det vi pleier å lese på kvelden her §n (name of child) ?

Appendix F: Tables

Stage III

External syntax

	NP	PN	
Emil	3	4	7
Lucas	0	1	1
Kari	1	0	1
	4	5	9

Internal syntax

	S	O	
Emil	4	2	6
Lucas	1	0	1
Kari	1	0	1
	6	2	8

Stage IV

External syntax

	NP	O	PN	S	
Anne	0	0	2	0	2
Emil	0	1	1	0	2
Ingrid	0	0	1	0	1
Magnus	1	1	1	0	3
Markus	5	2	6	1	14
Sofie	0	0	0	0	0
	6	4	11	1	22

Internal syntax

	S	O	
Anne	2	0	2
Emil	2	0	2
Ingrid	1	0	1
Magnus	3	0	3
Markus	12	2	14
Sofie	1	0	1
	21	2	23

Stage V

External syntax

	NP	O	PN	S	OBL	
Jan	2	1	1	0	0	4
Leah	1	1	0	0	0	2
Markus	9	10	9	1	3	32
Mathias	0	1	1	0	0	2
Oskar	4	0	1	0	0	5
Sofie	2	0	1	0	0	3
Thea	1	3	2	0	0	6
Linnea	2	0	0	0	0	2
	21	16	15	1	3	56

Internal syntax

	S	O	Prep	
Jan	4	0	0	4
Leah	2	0	0	2
Markus	24	4	2	30
Mathias	1	1	0	2
Oskar	4	0	1	5
Sofie	1	1	1	3
Thea	3	2	1	6
Linnea	2	0	0	2
	41	8	5	54

Stage VI

External syntax

	NP	O	PN	S	OBL	
Bjørn	3	1	16	4	0	24
Inger	1	4	2	0	2	9
Jan	6	13	1	4	0	24
Leah	5	2	2	1	4	14
Per	6	4	7	1	2	20
Sara	5	2	1	0	1	9
Thea	0	3	0	0	0	3
Mathias	3	5	8	0	0	16
	29	34	37	10	9	119

Internal syntax

	S	O	Prep	
Bjørn	18	2	2	22
Inger	1	3	2	6
Jan	16	7	1	24
Leah	14	0	0	14
Per	12	5	2	19
Sara	9	0	0	9
Thea	3	0	0	3
Mathias	10	2	2	14
	83	19	9	111

Stage VII

External syntax

	NP	O	PN	S	OBL	
Aksel	1	0	10	2	0	13
Inger	1	0	3	2	0	6
Per	3	7	24	5	3	42
Fillip	5	6	6	5	0	22
Nora	1	7	14	1	1	24
Bjørn	0	2	4	1	0	7
Maja	8	9	7	0	1	25
Sara	1	1	1	1	0	4
	20	32	69	17	5	143

Internal syntax

	S	O	Prep	
Aksel	7	5	0	12
Inger	6	0	0	6
Per	23	11	6	40
Fillip	12	10	0	22
Nora	16	5	1	22
Bjørn	5	1	1	7
Maja	18	2	3	23
Sara	3	1	0	4
	90	35	11	136

Interrogative relative clauses

Internal syntax

	Subject	Object	
III	0	5	5
IV	0	11	11
V	0	3	3
VI	8	17	25
VII	2	18	20

Matrix clause verbs

	gjette	Huske	lese	Se	Si	vise	vite	sjekke	skjønne
III							5		
IV				5			6		
V							5		
VI		2		8	1	1	13		
VII	3		2	4	2	1	13	2	1

Question words used

III	hvor	Hva				2
IV	hvor	Hva				2
V		Hva		Hvilken		2
VI		Hva	hvem		hvordan	3
VII	hvor	Hva	hvem	Hvilken	hvordan	5

Internal syntax

Internal subject of internal object relative clauses

	III	IV	V	VI	VII	TOTAL	
1sg	0	1	3	6	13	23	29.5%
2sg	0	0	0	1	5	6	7.7%
3sg	1	1	2	5	4	13	16.7%
1pl	0	0	0	2	13	15	19.2%
2pl	0	0	0	2	0	2	2.6%
3pl	0	0	0	0	6	6	7.7%
unbounded	1	0	2	0	1	4	5.1%
noun	0	0	1	1	3	5	6.4%
proper noun	0	0	0	2	2	4	5.1%
TOTAL	2	2	8	19	47	78	100.0%

Animacy of head of internal object relative clauses

	Inanimate	Animate	Ambiguous	
III	2	0	0	2
IV	0	1	1	2
V	8	0	0	8
VI	16	3	1	20
VII	46	2	0	48
	72	6	2	80

Valence of internal verbs

	Intransitive	Transitive	
III	2	12	14
IV	3	29	32
V	25	35	60
VI	22	107	129
VII	30	107	137
	82	290	372

Presence of optional subjunctions

	Subjunction	Omission
III	0	2
IV	2	0
V	8	5
VI	17	13
VII	24	22