Raising-Verbs in Dutch: Structure and Acquisition

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CHAPTER 1: INTRODUCTION

Language as a biological system is partly determined by the genome (Marcus & Fisher 2003). Different neural pathways are underlying human language and one of the endeavours of linguistics is to map particular aspects of language to neurocognitive processes. In order to enable such a mapping, we need a thorough understanding of the architecture of language. The combination of investigating language structure and research in language development provides a tool in the mapping task as the distinct language components can develop separately. Unravelling the complex neural pathways underlying human language is still way ahead, but this thesis hopes to contribute by investigating the verbal domain from both the theoretical side as well as the development thereof.

The focus of this thesis is on the verbal domain and on structure and acquisition of raising-verbs – verbs such as *schijnen* and *lijken* 'seem' – in Dutch in particular. Current research as presented in the first part of chapter 2 has shown that children until the age of seven have difficulties interpreting seem-type verbs (Wexler 2004). Wexler proposes to relate this to phase-theory as developed in Chomsky (1999) and subsequent work. Chomsky proposes that the derivation of sentences proceeds in chunks that are called phases (roughly corresponding to proposition-like units). In the adult language seem-type verbs do not project their own full phase; rather what they project is a defective phase which is always associated with another full phase in their complement. Wexler proposes that children have particular problems processing defective phases because their brain cannot support these. This hypothesis makes the prediction that interpreting defective phases is problematic for children acquiring any language, leading to one of the research questions addressed in this work: are defective phases acquired extraordinarily late in Dutch as well? In order to test the hypothesis in Dutch, it must be investigated where defective phases are in Dutch raising-constructions. Therefore, the second part of chapter 2 will be devoted to a discussion of various theories that deal with the syntax of different types of verbs. Cinque (2000) will be discussed, claiming that functional verbs are inserted in a functional projection in the extended projection of the verb. The order of functional projections is universally fixed. This thesis will not adopt the idea of a fixed functional hierarchy, but will attempt to explain ordering phenomena to follow from semantic properties. However, then again, it is an open question as to what functional verbs project.

Chapter 3 will present a study of semantic and syntactic properties of the Dutch raising-verbs *schijnen* and *lijken* and will reveal that the verbs differ greatly in properties although they both translate to English 'seem'. *Schijnen* seems to be a functional verb, whereas *lijken* is more similar to lexical verbs. This thesis argues that most differences in properties boil down to a difference in speaker-indexicality, which *is* a property of *schijnen* but not of *lijken*. The question that arises is whether these verbs have a different underlying structure or not. That is, do both verbs project a defective vP, or is it only *lijken*, which has much in common with lexical verbs, that projects a defective phase? The current study will contribute to this debate by combining results from the syntactic and semantic analysis of *lijken* and *schijnen* with results from an acquisition experiment.

The acquisition experiment on children's comprehension of *lijken* and *schijnen* will be presented in section 3.3. In this section, predictions with respect to the experiment will be discussed as well as the items and procedure of the experiment. Furthermore, it consists of the results obtained, conclusions and a critical discussion of the interpretation and the methodology. It will be shown first of all that acquisition of *lijken* is late, which supports the hypothesis that defective phases are problematic for children until the age of seven in Dutch as well. Furthermore, results indicate that acquisition of *schijnen* shows the same pattern as *lijken*. This is taken as evidence that constructions with *schijnen* and *lijken* both involve the representation of a defective phase.

Section 3.4 proposes a minimalist analysis of the syntactic structure of *schijnen* and *lijken*. It is claimed that these verbs can be distinguished in the flavor of v with which they are associated. The flavor of v encodes semantic properties in which way they are legible for the Inference system. Now what distinguishes *schijnen* from *lijken* is that little v associated with *schijnen* encodes speaker-indexicality which is not the case for *lijken*. Finally, this thesis concludes with a summary of the main results and contributions of this work in chapter 4.

CHAPTER 2: PHASES

In this chapter, I will provide an overview of acquisition and theory of phases. First, data with respect to language acquisition will be discussed. Experiments will be described that deal with acquisition of raising in particular as this is the main objective of the thesis. Our findings will be embedded in the theoretical framework this thesis takes up, which is the minimalist program (Chomsky 1995 and subsequent work). Finally, findings in the existing literature with respect to Dutch raising-verbs will be considered

2.1 Data from Language Acquisition

An intriguing phenomenon observed in child language is that verbal passives as well as unaccusatives and raising structures are acquired extraordinarily late (Wexler 2004). Late acquisition of verbal passives[1] as in (1) has been discussed in Borer & Wexler (1987) for English and Hebrew. Furthermore, Sano et al. (2001) show data that verbal passives are acquired late in Japanese[2]. More data supporting the delay in acquisition of verbal passives comes from Terzi & Wexler (2002) for Greek as cited in Wexler (2004).

(1) The cat was seen (by John)

Also for the late development of unaccusatives as in (2) there is a great deal of evidence. Babyonyshev et al. (2001) show that children fail to apply genitive-of-negation in contexts where adults do. Genitive of negation is the phenomenon in Russian that an NP bears genitive case in a negated sentence. As cited in Babyonyshev et al. (2001), Pesetsky (1982) claims that "the genitive of negation is restricted to underlying direct objects" (Babyonyshev et al. 2001: 11). This genitive case hence appears on base-generated objects of passives and unaccusatives. These objects are said to move covertly to subject position. Results of a sentence-completion task show that children in the age range of 3;0-6;6 years fail to use genitive case in unaccusatives. This is taken to support the claim that unaccusatives are bad for children. More precise claims with respect to effect of age on performance cannot be made on the basis of their data as the sample size of children is too small (38) according to them. More data showing that children have trouble with unaccusatives comes from Lee & Wexler (2001) for Korean and Ito & Wexler (2002) for Japanese as cited in Wexler (2004).

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[1]Children especially have difficulties with non-actional passives, and not so much with actional passives. This has been accounted for in Borer & Wexler (1987) by the claim that children analyze actional verbal passives as adjectival passives. Therefore, interpretation does not involve an A-Chain and hence, children show adult-like comprehension of these passives. For non-actional passives, such an analysis is impossible. Therefore, interpretation of these passives does involve an A-Chain and is thus problematic for children.

[2] Sano et al. (2001) also show that the acquisition of unaccusatives is early in Japanese. This is in contrast to the claim following from A-Chain Delay Hypothesis (ACDH), as proposed in Borer & Wexler (1987) now replaced with UPR which will soon be discussed, that unaccusatives are acquired late by children as well. However, Machida et al. (to appear) examine the data as found by Sano et al (2001) again and claim that unaccusatives in Japanese appear to be early because they can be misanalyzed as unergatives to prevent a violation of ACDH. Therefore, the data do not argue against ACDH or UPR.

(2) The glass broke

Finally, raising structures as in (3) have been shown to be problematic for children in experiments by Hirsch & Wexler (to appear), Hirsch et al. (in preparation a) and Hirsch et al. (in prep.b). Children are not able to interpret the subject of the raising-verb to be the subject of the embedded sentence.

(3) John seems to Mary to be driving a car

It is not only surprising that the acquisition of these different constructions is delayed; it is also astonishing that the growth curve of these constructions shows the same pattern. This has been pointed out for passives and raising (Hirsch & Wexler to appear) (for unaccusatives there is no data showing an acquisition pattern over the years as far as I know). If we have a look at figure 1 in which the growth curve of passives as well as raising structures is presented, it is noticeable that the pattern is very similar. Even more, the acquisition pattern of passives and raising shows a sudden increase in performance between the ages of six and seven. It is not the case that performance gradually increases over the years; it rather is the case that only from the age of seven children perform above chance (Hirsch & Wexler to appear). To summarize, three interesting observations have been made with respect to passives, unaccusatives and raising structures:

i) acquisition of these structures is extremely late
ii) acquisition pattern is similar (at least for raising and passives)
iii) growth curve shows a sudden increase in performance (at least for passives and raising)

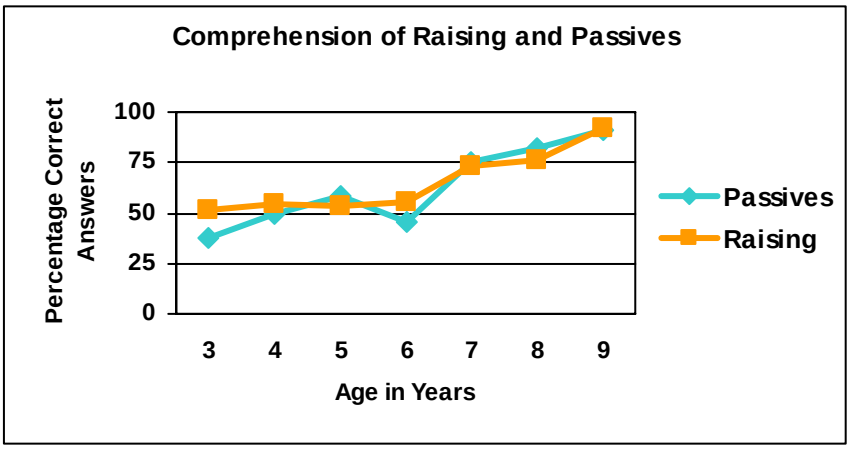


Figure 1: Graph of growth curve of passives and raising (adapted from Hirsch & Wexler to appear)

Taking these data into account, the question arises as to what these constructions have in common which is troublesome for children. The answer to this question is: they all lack an external argument. Therefore, the object in these constructions is said to move from the object or embedded subject position to the subject position of the matrix clause, forming an A-Chain. So, for sentence (1), the structure actually looks as in (4) in which

the cat has been moved from the object position of *seem* to the subject position. For unaccusatives the underlying structure is as in (5) and for raising as in (6).

(4) $[_{IP}$ [the cat]$_i$ was $[_{VP}$ seen $t_i]]$
(5) $[_{IP}$ [the glass]$_i$ $[_{VP}$ broke $t_i]]$
(6) $[_{IP}$ John$_k$ seems$_i$ $[_{vPdef}$ t_i to Mary $[_{IP}$ t_k to be $[_{VP}$ driving a car]]]]]

On the basis of this, Borer & Wexler (1987) proposed the A-Chain Delay Hypothesis (ACDH) as in (7). As the child is not able to form an A-Chain, she cannot interpret the subject in its base position, like it should be interpreted.

(7) The child is not capable of forming an A-chain (Borer & Wexler 1987: 149)

However, why isn't the child able to represent an A-Chain and why do children acquire this principle all at the same age? Borer & Wexler (1987) claim that the answer lies in maturation. They argue that language, being a biological system, matures with age. That is, not all principles that the language system is subject to are readily present at birth, just as is the case for other systems in our brain. They claim that development of linguistic principles is guided by a biological program. Hence, as the brain matures, linguistic principles will grow.

Apart from the empirical evidence, there are conceptual arguments in favor of a maturation hypothesis. In general, Lenneberg (1967) argues that language growth is maturationally controlled as each child passes the same stages in the same order in development. These stages, or milestones, are correlated with age and other physical milestones. Moreover, the input does not change significantly during development, although the child at different developmental points makes different use of the input. Hence, at some point the child fails to learn a construction in the presence of data, but at a later point she manages to learn it on the basis of the same data (Borer & Wexler (1987) called this the triggering problem). Furthermore, there is no effect of intensive training, that is, you cannot speed up language development by training (Lenneberg 1967). Babyonyshev et al. (2001) refer to the argument of "abundance of the stimulus" to support a maturation hypothesis. Abundance of the stimulus says that maturation must play a role in language development as particular constructions are delayed, whereas there is ample evidence in the input. Why would the child fail to acquire a construction for such a long time, although it is commonly used by adults? These conceptual arguments all support the hypothesis that language grows biologically. To conclude, Borer & Wexler (1987) claim that the ability to represent A-Chains has to mature in the brain. It thus accounts for the observation that passives, raising and unaccusatives are acquired by all children late and around the same age. It also explains that the growth curve shows a sudden increase.

However, ACDH is empirically inadequate in that it cannot account for the observation that raising of a subject out of a VP does *not* create a problem for children, although it does form an A-Chain. This has led Wexler (2004) to replace ACDH with the Universal Phase Requirement (UPR) as in (8). With UPR, the problem of raising a subject has

finally been solved and moreover, it accounts for the data in a way compatible with minimalist considerations (Wexler 2004).

(8) *Universal Phase Requirement:*
(holds of pre-mature children, until around age seven)
v defines a phase whether v is defective or not
(Hirsch & Wexler to appear: 2)

UPR is based on the hypothesis proposed by Chomsky (1999) that derivation proceeds phase-wise. The main claim of UPR is that when adults take some phases to be incomplete, or defective in Chomsky's terms, children consider these to be complete phases. Therefore, they cannot perform the operations which are available for adults. How this explanation works in detail will be discussed in the next section, when I will also set out the framework this thesis adopts. As for ACDH, the failure of children to represent defective phases is claimed to be due to brain maturation (Wexler 2004). That implies that defective phases cannot only be distinguished linguistically from complete phases, but they are also neurologically distinct. Hence, the neurocognitive systems subserving defective phases differ from the ones subserving full phases. This is an adventurous hypothesis with interesting predictions which this thesis will evaluate.

We will take UPR as our hypothesis and aim to evaluate this hypothesis by an investigation of Dutch. That is, find out whether constructions in which an element is moved out of the complement of a defective phase are also acquired around the age of seven by Dutch children as would follow from a maturation hypothesis. In order to investigate this, a new experiment will be carried out to test children's comprehension of raising in Dutch. Only recently, researchers started to conduct experiments on acquisition of raising. I will discuss three of the experiments here.

Hirsch & Wexler (to appear)

To start, let's discuss an experiment which compares children's comprehension of raised and unraised structures. Important to understand is that Wexler's UPR predicts failure in comprehension of raised structures, but on the other hand it predicts unraised structures with the same verb to be perfectly parsable for children. That is, it claims that moving an element out of a defective phase is impossible for children, because they take the phase to be complete. Unraised structures however, do not involve movement of an element out of a defective phase. As such, it is not problematic for the child to take the phase to be complete; the task does not involve the operation of subject-raising. This analysis will be made more precise in the next section, for now, we should keep in mind that UPR predicts unraised sentences with *seem* to be fine for children.

Hirsch & Wexler (to appear) tested comprehension of raising in a two choice sentence picture matching task which involves the child to select the picture that best matches a sentence provided orally. The test sentences were raised structures as in (9) and unraised structures as in (10). Furthermore, active transitive sentences as in (11) were added to control for attention and sentences with the verb *think* as in (12) to control for cognitive complexity of the verb. To represent *seem* in the pictures shown, they used thought-

bubbles. To clarify this: the matching picture for (9) would be a picture in which Maggie thinks that Homer is bowling a ball, e.g. the thought-bubble contains Homer bowling a ball. These thought-bubbles were used to represent *think* as well.

(9) Homer seems to Maggie to be bowling a ball
(10) It seems to Homer that Maggie is pushing a cart
(11) Homer is eating a sandwich
(12) Lisa thinks that Bart is playing an instrument
(Hirsch & Wexler to appear)

As explained in Hirsch & Wexler (to appear), the non-matching pictures used could be either of three different foil types; the matrix-reversal (MR) foil in which the matrix subject was switched (e.g. the one who is doing the thinking). Thus for sentence (9), this picture would contain Homer who is bowling a ball, thinking about Maggie. For the embedded reversal (ER) foil, the character performing the action was switched. That is in this case the picture involves Maggie who is bowling a ball, thinking about Homer. And the double-reversal (DR) foil involved a picture in which the character doing the thinking *and* the character performing the action were switched. This is for our sentence a picture in which Homer is thinking about Maggie who is bowling a ball.

Seventy children participated in this study in the age range from three to nine years, of which every one-year interval consisted of ten children. Results show that children performed adult-like on both control conditions. This indicates that the children understood the task and were paying attention. Even more, good performance on the *think* condition shows that cognitive complexity of the verb cannot account for bad performance on raising. More importantly, results show that children do not have problems with unraised sentences, although they are showing major difficulties with raised sentences up to the age of seven as follows from UPR. Children below the age of seven score around chance-level on raised structures. At the age of seven, children suddenly perform above-chance. Interestingly, children below the age of 7 perform at-chance on MR and ER foils, but below-chance on DR foils. This indicates that children prefer DR foils over the correct picture. An explanation given by Hirsch & Wexler (to appear) is that children analyse *seem* as if it were *think*. This means that in the raising structure, the first NP is the thinker and the second NP is performing the action, instead of the adult-reading which is the exact opposite. Therefore, the correct picture for children is actually the DR foil, which is confirmed by below-chance performance. At-chance performance on MR and ER foils is explained by the fact that the picture that would be correct for the child is not present; they are thus guessing.

These results confirm predictions that follow from UPR. Children cannot interpret the subject in its base position as they take the defective phase to be complete. The availability to represent the relevant syntactic structure will only arise around the age of seven as this is the age at which the neurological pathways subserving defective phases will mature. However, a problem for the current experiment is that all raised sentences include an experiencer. Now, the bad performance of children might not be due to raising itself, but to raising over an experiencer. In many languages, raising over an experiencer

is ruled out (Hirsch & Wexler to appear). That means that the child's grammar might contain a ban on raising over an experiencer. On the other hand, such an analysis would not explain the sudden increase in performance at the age of seven. The next experiment includes raised sentences both with and without an experiencer.

Hirsch et al. (in prep.a)

In another experiment conducted by Hirsch, Orfitelli & Wexler (in prep.) children's comprehension of raised sentences with experiencer as well as without experiencer has been tested. They used an acted-out truth value judgement task in which the child had to judge whether a sentence presented orally matched an acted-out scene or not. The test sentences were sentences with the verb *think* as in (13), unraised sentences with an experiencer as in (14), raised sentences without experiencer as in (15) and finally, raised sentences with experiencer as in (16).

(13) Barbie thinks she is wearing a hat
(14) It seems to Ken that Barbie is wearing a hat
(15) Barbie seems to be wearing a hat
(16) Ken seems to Barbie to be wearing a hat

As described in Hirsch & Wexler (to appear), in a scene, there is always a character (Barbie) who is not aware of something which is the case. For example, Barbie is wearing a hat, but she doesn't know she is wearing a hat. Barbie starts looking for her hat and notices that it is not on Ken's head. Ken on the other hand, is looking at Barbie from a distance and is not sure what is on Barbie's head, but it looks like it is her hat. A third character is observing the scene and is asked to give a comment about the scene. He will use one of the sentences above. The child will determine whether this statement is true or false.

Preliminary results show that children perform adult-like on *think* and unraised structures (Hirsch & Wexler to appear). However, children perform poorly on raised sentences with an experiencer, they score below chance (Hirsch & Wexler to appear). This supports the idea proposed in the previous experiment that children analyze *seem* as if it were *think*. If sentence (16) is presented with the acted-out scene just described, the adult answer would be 'no' as Barbie does not think that Ken is wearing a hat. However, a child who analyzes *seem* as *think* will answer 'yes' as it is true that Ken *thinks* that Barbie is wearing a hat. Preliminary results on raised sentences without experiencer show that there is a group of children who have difficulties with these structures and a group performing adult-like, resulting in an overall performance of 41.3% (Hirsch & Wexler to appear). Now this can be explained by assuming that the first group analyzes *seem* in this case as *think* as well. Adults presented with sentence (15) will answer 'yes' with the scene described here as it appears to be the case that Barbie is wearing a hat. However, a child would answer 'no' as it is not the case that Barbie *think*s she is wearing a hat. The other group, performing adult-like might ignore the raising-verb in sentences without experiencer, which leads to good performance on raising without experiencer, but not because they are able to parse the raising structure (Hirsch & Wexler to appear). In sum,

these results again confirm the prediction that raising is delayed in children, also without an experiencer.

Hirsch et al. (in prep.b)

Hirsch et al. (in prep.b) investigate children's comprehension of raising without an experiencer. Their design is comparable to experiment 2 of Becker (2005)[3]. The task is a picture truth value judgement task, where the children were asked to judge whether the sentence they were read matched a picture or not. The child is shown two pictures subsequently. In the first picture, a state of affairs *is* the case, in the second picture, a state of affairs *appears* to be the case. For example, a white dog is shown in the first picture. In the second picture, the dog is standing under a purple lamp. Therefore, in this picture it appears to be the case that the dog is purple, although he is *not* and the child knows that the dog is really *not* purple. Then the child is read a raised sentence as in (17) and has to judge the truth of the sentence. The adult answer to (17) would be 'true' as it is the case that the dog *appears* to be purple in this picture. Preliminary result show that children get these sentences wrong, resulting in below-chance performance. They consistently answer 'false' to (17), which indicates that children analyze *seem* as if it were *is*. In this case, (17) is false as it is not the case that the dog *is* purple. This further supports that raising structures are problematic for children.

(17) The dog seems to be purple

In this section, we have adopted UPR as the hypothesis this thesis will evaluate. UPR predicts that raising structures are problematic for children until the age of seven. Studies have been addressed that confirm this prediction, although some of the results might have been influenced by the presence of an experiencer. Therefore, it is important to conduct more experiments on acquisition of raising. Even more, UPR predicts that raising causes trouble for children acquiring any language. Universally, children up till the age of seven should perform bad on sentences which require an element to be raised out of a defective phase. This thesis will design and discuss an experiment set up to test children's comprehension of raising in Dutch. In order to make predictions with respect to Dutch raising constructions, we must investigate where, if any, defective phases are found in Dutch. To be able to make claims in this context, let's first set out the theoretical framework this thesis adopts.

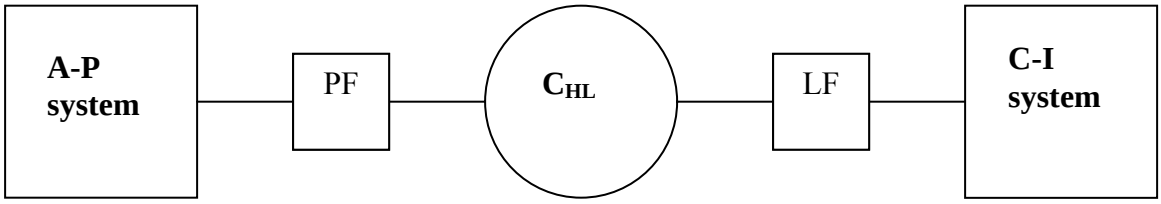
[3] Becker (2005) actually shows that children of 4 years of age perform significantly above chance on raising. She concludes that there is no problem whatsoever with parsing raised structures. However, in her experiment, the child was presented with sentences in the past tense as in (i). Now, she assumes that if a child is not able to parse *seem*, she would end up with 'the dog…to be purple' and answer 'false' to sentence (i) as the dog *is* actually white. However, as Hirsch & Wexler (to appear) note, children might detect past tense morphology. If this is the case, the child ends up with the following string: 'the dog was purple'. Now the child should answer 'true' as it is the case that the dog *was* purple when standing under a purple light. So, the child will derive the right answer, although for the wrong reason. This means that it cannot be concluded on the basis of her data that 4-year-old children understand raising. Even more, as discussed in this section, Hirsch et al. show that children do have problems with the same sentences in present tense.

(i) The dog seem*ed* to be purple

2.2 Theoretical Framework

In order to test UPR in different languages it is important to define the theoretical framework we are working in. That is, we must specify the tools we use to be able to make claims about (defective) phases in different languages. The framework we will adopt is the minimalist program as proposed in Chomsky (1995).

The minimalist program takes language to be a system which connects the articulatory-perceptual system to the conceptual-intentional system. The only relevant levels of representation are the interface level with the articulatory-perceptual system, called Phonetic Form (PF) and the interface level with the conceptual-intentional system, called Logical Form (LF). This is presented graphically in figure 1. What the computational system of human language (C_{HL}) does, is delivering pairs of instructions to the external systems where these instructions are interpreted. The question which guides research within the minimalist program is: 'How 'perfect' is language?' (Chomsky 1995: 221). The hypothesis is that language is perfect in that it optimally interacts with the interfaces. Interaction is optimal if economy conditions are satisfied; hence, computations should be as economical as possible. Thus the only conditions C_{HL} is subject to are interface conditions and general conditions on natural systems.



Figrue 1: Language in a broad sense

Let's find out how syntactic structure is constructed in the minimalist framework. In order to combine elements we need the operation *Merge*. Merge is asymmetric in that the combination of two elements results in an ordered pair that contains instructions about which element projects (Chomsky 1995), (Zwart 2004). In this analysis, structure is created bottom-up, which means that the structure is the *result* of merging elements. This contrasts with previous top-down analyses, which assume that syntactic structure is generated first with open positions in which elements are inserted subsequently (Zwart 2004). Within the minimalist framework, syntactic positions are only created by merger of elements. This means that vacuous projections or other irrelevant material do not exist. Hence, the minimalist hypothesis underlying this is that "phrase structure representation is "bare," excluding anything beyond lexical features and objects constructed from them" (Chomsky 1995: 245). The elements that enter into a merge relation are available from the numeration, a selection of lexical and functional elements (Chomsky 1999), (Zwart 2004). This numeration contains all and only the elements that are necessary for the particular construction, in which way processing load is reduced (Chomsky 1999).

Another reduction of computational load is proposed first in Chomsky (1998), and is based on the assumption that "the derivation […] proceeds by phase" (Chomsky 1999: 9). This means that a sentence is processed in chunks instead of the whole. This chunk, or phase in Chomsky's terms, has particular linguistic properties by which it can be identified as a phase. Once a phase has been identified, it is shipped off to the external systems, e.g. C-I and A-P. Therefore, the computational system can forget about this part of the derivation and it can thus no longer be used in C_{HL}. However, the head and edge (the specifier and adjoined material) of the phase remain visible for further computation (Chomsky 1999). This is stated in Chomsky (1999) as the Phase Impenetrability Condition (PIC) in (18).

(18) *PIC for HP and its H:*
The domain of H is not accessible to operations outside HP, but only H and its edge.

But what are these phases? Phases are taken to be propositional (Chomsky 1999), (Chomsky 2005). That is "verbal phrases with full argument structure and CP with force indicators", hence, v*P and CP respectively (Chomsky 1999: 9), (Chomsky 2005). These phases should contain exactly one label by which they can be identified, thus either v* or C. Besides these strong phases, as Chomsky names them, also weak or defective phases exist. For example TP which is not selected by C. T inherits features from C and cannot constitute a phase on its own (Chomsky 2005). Other examples of weak phases are VPs without an external argument (Chomsky 1999). So for now, we can define defective phases as in (19). The difference between strong and defective phases is that the latter do not form a unit for spell-out; hence they remain accessible in further computation.

(19) *Defective Phases*:
TP alone or "weak" verbal configurations lacking external arguments (Chomsky 1999: 9)

Given this theory, we can further explain the results Wexler (2004) found on children's comprehension of passives, unaccusatives and raising. This will be illustrated with an example of a raising structure as in (6), repeated here in (20). In the adult analysis, *John* is first merged with VP [driving a car], where it is interpreted. As merging proceeds, *John* moves to spec IP1, e.g. it is merged with IP1 [to be driving a car]. From this position, *John* should be merged with IP2 [seems to Mary to be driving a car]. Note that this movement crosses the defective vP phase of *seem*. For the adult this is possible; as vP is defective, its complement is still visible for further computation. For a child who is obeying UPR on the other hand, this operation poses problems. The child takes vP of *seem* to be a complete phase. According to PIC, this means that on the higher phase only the head of vP (seem) and its edge are visible. The complement is no longer available in the derivation. This means that at IP2, *John* is no longer visible and cannot be merged with this IP. Unraised structures as in (21) on the other hand, are predicted to be grammatical for the child on the basis of UPR. Also in this case, the child takes vP of *seem* to be a complete phase. However, this is not problematic as *John* remains in its base position. There is no movement of an element over the defective vP phase and therefore

the fact that the child takes the phase to be complete does not pose any problems. Hence, UPR exactly predicts which structures are problematic for children and which are not, regarding our theory of defective phases.

(20) $[_{IP2}$ John$_k$ seems$_i$ $[_{vPdef}$ t_i to Mary $[_{IP1}$ t_k to be $[_{VP}$ driving a car]]]]]
(21) $[_{IP2}$ It seems$_i$ $[_{vPdef}$ t_i to Mary $[_{CP}$ that $[_{IP1}$ John is $[_{VP}$ driving a car]]

However, the definition of defective phases in (19) is a rather loose definition. What exactly is a weak verbal configuration? Is it all verbs that lack an external argument? And what about verbs that lack an internal argument but have an external argument as we see with motion, causative and perception verbs in Italian (Cardinaletti & Shlonsky 2004). Do they project a strong vP phase? The definition does not provide a clear answer about how to analyze different types of verbs, that is, lexical *and* functional verbs. Functional verbs differ in many respects from lexical verbs, as will be discussed in the next section. So, what do functional verbs project? Do they project a vP or not? For example, if we take sentence (22), the question arises whether this sentence contains three vPs, associated with the three different verbal elements where two of the vPs are defective due to the lack of an external argument for *has* and *been*. Another possibility might be that both *has* and *been* are instances of little v in the extended projection of the verb and do not project a vP themselves.

(22) John has been sleeping

Also note that in a true bare phrase structure account, we cannot talk about positions anymore. It does not make sense to refer to vP as there is no rigid description of its structure. However, we may still ask whether functional verbs project functional structure, call it vP or not, where the structure can differ from verb to verb.

To conclude, the framework this thesis adopts is the minimalist program. The minimalist program hypothesizes that phrase structure is bare and arises by merger of elements. Within this framework we have defined defective phases as 'weak verbal configurations'. However, this definition is not clear with respect to functional verbal elements. It remains an open question what the syntactic structure of functional verbs is. This is a problem if we want to investigate UPR in other languages. That is, we have to come up with an analysis about where we find defective phases in Dutch to make predictions about language acquisition. The next section will discuss the properties of lexical vs functional verbs in detail and will show what is claimed about the syntax of functional verbs by Cinque (2000). The section will finish with an overview of the problems associated with this theory.

2.3 Functional and Lexical Verbs

Already since the earliest studies in linguistics, researchers have noticed the dichotomy between functional and lexical elements (Corver & van Riemsdijk 2001). There are many differences to observe between functional and lexical elements. In Corver & van

Riemsdijk (2001) we can find a definition of functional versus lexical words as in (23) and (24) respectively.

(23) *Definition of Function Words:*
"Function words have a […] 'non-conceptual' meaning and fulfill an essentially 'grammatical' function". (Corver & v. Riemsdijk 2001: 1)

(24) *Definition of Lexical Words:*
"Content words are […] characterized as being those lexical items which have a relatively 'specific or detailed' semantic content and as such carry the principal meaning of the sentence." (Corver & v. Riemsdijk 2001: 1)

Furthermore, Corver & v. Riemsdijk (2001) claim that function words and lexical words can be divided on properties as for example openness of the class; is it possible to add new members, or do the elements constitute a closed class? Another distinguishing property is the syntactic category of the complement the element can take. Lexical words can take many different syntactic types of complements, whereas functional words are rather restricted in syntactic category of their complement (Corver & van Riemsdijk 2001).

Cinque (2000), (2001) makes a clear proposal with respect to the distinction between lexical and functional verbs by claiming that all restructuring verbs are functional[4]. Restructuring turns a biclausal structure into a monoclausal structure, which is a requirement for transparency effects, like clitic climbing, to obtain (Cinque 2001), (Wurmbrand 2001)[5]. Cinque (2001) has observed that restructuring verbs are rigidly ordered with respect to each other, which is the main argument for the claim that they are functional. This ordering resembles the ordering of adverbs as proposed in Cinque (1999). An example of the ordering restrictions can be found in (25), where in (25a) obligation modal *dovere* precedes the ability modal resulting in a grammatical sentence. In contrast, (25b) where *dovere* follows the ability modal is ungrammatical.

(25) a. Per quel posto Gianni si *dovra poter* dedicare al lavoro 16 ore al giorno
'For that job G. will have to be able to devote 16 hours to work'
b. *Gianni si *potra dover* dedicare di piu al suo lavoro
'G. will be able to have to devote himself more to work'
(Cinque 2001: 150)

As just mentioned, the hierarchy of restructuring verbs resembles the hierarchy of adverbs, but it can be articulated in even more detail and Cinque (2001) ends up with the hierarchy as in (26). Each restructuring verb is inserted as a particular functional head, based on its meaning (Cinque 2000). Hence, restructuring verbs are functional because they are an instantiation of a particular functional head (Wurmbrand 2004).

[4] This means that restructuring verbs are also functional when transparency effects do not obtain.
[5] In minimalist terms of Wurmbrand (2004): transparency effects can only occur within one phase, e.g. it cannot cross phase-boundaries.

(26) $MoodP_{speech\ act} > MoodP_{evaluative} > MoodP_{evidential} > ModP_{epistemic} > TP(Past) > TP(Future) > MoodP_{irrealis} > ModP_{alethic} > Asp_{habitual} > AspP_{habitual} > AspP_{repetitive(I)} > AspP_{frequentative(I)} > ModP_{volitional} > AspP_{celerative(I)} > TP(Anterior) > AspP_{terminative} > AspP_{continuative} > AspP_{retrospective} > AspP_{proximative} > AspP_{durative} > AspP_{generic/progressive}\ AspP_{prospective} > ModP_{obligation} > ModP_{permission/ability} > AspP_{completive} > VoiceP > AspP_{celerative(II)} > AspP_{repetitive(II)} > AspP_{frequentative(II)}$
(Wurmbrand 2004: 998)

What the analysis above implies is that restructuring verbs are inserted directly in a functional projection instead of in VP. That is, the structure of a clause looks like (27) where functional verbs are not taken to project vP. The functional part of the clause contains this rigidly ordered set of functional projections, present in every sentence. That is, each sentence contains this articulated set of functional projections which is ordered the same in every language.

(27) $[_{CP}\ldots[_{FP}\ldots[_{FP}\ V_{restr}\ [_{FP}\ldots[_{VP}\ V]]]]]$
(Cinque 2000: 2)

Hence, Cinque (2000) distinguishes lexical verbs from functional verbs in their syntax. Lexical verbs are inserted in V, functional verbs in F. Functional verbs are not just stipulated, but properties exist by which they can be classified as functional. These properties are: (Cinque 2000), (Wurmbrand 2004)
i) functional verbs do not assign any θ-roles
ii) functional verbs are rigidly ordered
iii) functional verbs only allow one type of complementation
To conclude, Cinque makes a rather clear distinction between functional and lexical verbs. Furthermore, he makes a proposal about the syntax of functional verbs, which is an open question in the minimalist framework. An interesting property of his proposal is that it accounts for the ordering restrictions functional verbs are subject to.

However, as has been pointed out by various researchers (Corver & van Riemsdijk 2001), (Cardinaletti & Giusti 2001), (Wurmbrand 2004) among others, the distinction between functional and lexical words is not as clear-cut as Cinque proposes. There are elements that share both properties associated with function words and properties associated with lexical words. This indicates the existence of semi-lexical categories (Corver & van Riemsdijk 2001). Cardinaletti & Giusti (2001) argue that there cannot be defined one semi-lexical category as a fixed set of properties for this class cannot be determined. Wurmbrand (2004) claims that the assumption that restructuring verbs are functional cannot hold. She shows on the basis of German data that verbs exist which differ in properties of functional verbs, e.g. they have argument structure, and are not subject to ordering restrictions, but they still trigger restructuring. Hence, she concludes that lexical restructuring verbs co-occur with functional restructuring verbs. Furthermore Nilsen (2003) argues that a linear ordering as proposed in Cinque implies that if a can precede b and b can precede c, than a can precede c. However, he shows that this transitivity does not always follow. This means that the order of elements cannot be described using a linear hierarchy. Finally, the analysis proposed by Cinque is a top-down analysis (Zwart

2004). That is, it is based on the assumption that there exists a universal sentence structure, in which elements of a particular sentence are filled in. So in every sentence, even the sentences which do not contain adverbs or functional verbs, the articulated functional structure is present. The positions in the tree are absolute position, the same for each case. The existence of a range of functional projections would be compatible with the minimalist program if elements subcategorize for their syntactic complement. Furthermore, the assumption should be made that all functional heads would be in the numeration as null forms if they are not pronounced. Recent research has shown, as taken up by Marelj, that for verbs, subcategorization can be derived from thematic feature clusters together with linking rules (as used in Reinhart 2003). Hence, which type of argument (syntactically) a verb projects depends on the feature clusters in its θ-grid and the information this provides for syntax rather then from pre-determined selectional properties. Thus on the basis of the hypothesis that elements do not select syntactically for a particular type of complement, it is claimed that the existence of a fixed hierarchy of functional projections is incompatible with the minimalist program.

In a bare phrase structure approach as for example taken up by Nilsen (2003) and Zwart (2004), syntactic positions are relative, created by merger of two elements. There is no reason to include a whole range of functional projections if not all these elements have been merged. Even more, from this perspective we do not expect syntax to impose ordering restrictions on elements. Building a structure is based on the operation merge. Merge is in principle blind and can combine any two elements. However, not all combinations deliver interpretable sentences. That is, it could be very difficult or even impossible for the conceptual-intentional system to provide an interpretation for a particular string generated in the computational system. So the difference is that from a bare phrase structure perspective, ordering restrictions would not follow from syntax. Restrictions rather follow from semantics in that not every string gives rise to a meaningful combination (Zwart 2004). Hence, although the cartography as proposed by Cinque (2001) is of great descriptive value, it does not explain so much (Zwart 2004).

On the other hand, as discussed in the previous section, within the minimalist framework it is an open question as to what syntactically the difference between lexical and functional elements is. Furthermore, we just concluded that semantics should pose restrictions on ordering rather than syntax, but for the moment, there is no decisive answer as to what exactly the semantic properties are that play a role. The ordering restrictions still form a puzzle in our framework. Therefore, this thesis will attempt to shed light on the issue of how to represent functional verbs in a minimalist framework and how to account for the distributional restrictions. We will investigate these questions by focussing on verbal elements in Dutch, in particular the raising-verbs *schijnen* and *lijken*.

2.4 Dutch

As this thesis concerns the syntax and acquisition of raising-verbs in Dutch, and especially of the verbs *schijnen* and *lijken*, this section will discuss properties of Dutch

syntax as well as provide an overview of what we know about *schijnen* and *lijken*. So why is it so interesting to investigate these verbs in particular? As we learned from section 1, the English raising-verb *seem* is acquired only around age seven, due to a defective vP phase. Interestingly, English *seem* translates to both *schijnen* and *lijken* in Dutch. For the moment, I will not specify their semantics in greater detail. This will be part of chapter 3 for *lijken* and of the current section for *schijnen*. It would be interesting to find out what acquisition patterns the Dutch raising-verbs show. In order to make predictions about acquisition patterns of *schijnen* and *lijken* on the basis of UPR, we have to investigate how phases manifest themselves in these two verbs. We will see in this section that an answer to this question is not at all obvious. Let's first discuss some Dutch syntax.

An interesting property of Dutch is that particular types of verbs force infinitival verbs to form a cluster at the end of a sentence (as observed first by Evers 1975, and later by Rutten 1991, Broekhuis et al. 1995 among others). This is illustrated in sentence (28), created by Rutten.

(28) Ik zou jou daar wel eens naar *hebben willen zien blijven staan kijken*
I would you there too once at have want see remain stand watch
(Rutten 1991: 9)

Evers (1975) has argued that verb-raising leads to clause union. That is, verb-raising turns a biclausal structure into a monoclausal structure (Evers 1975). Rutten (1991) on the other hand argues that monoclausality is a necessary condition for verb-raising to apply and that if verb-raising is triggered, the verb is an auxiliary verb[6]. In either case, restructuring takes place, similar to restructuring in Italian (Rutten 1991). Hence, verb-raising is a diagnostic for restructuring in Dutch (Rutten 1991).

It has been observed that *schijnen* and *lijken* both trigger verb-raising (Rutten 1991, Broekhuis et al 1995, Haegeman 2006 and for *schijnen* only: Zwart 2001). Example (29) shows that in these sentences both the object of *read* (*the book*) and the temporal modifier (*already before*) precede the verb-cluster *seem to have read*. Therefore, it can be concluded that *schijnen* and *lijken* are auxiliaries (Rutten 1991), or functional verbs along the lines of Cinque (2000), (2001).

(29) a. dat Jan *het boek al eerder* lijkt te hebben gelezen
that John the book already before SEEMS<L> to have read
'…that John seems to have read the book already before'

[6] The distinction made in Rutten (1991) is that auxiliaries trigger verb-raising; whereas for lexical verbs only extraposition is possible. However as Rutten (1991) observes, there are verbs which both allow verb-raising and extraposition, which means that the distinction is not as evident as it has been proposed. Broekhuis et al. (1995) on the other hand argue that although these verbs seem to trigger both verb-raising and extraposition, they actually only allow extraposition. The observed verb-raising is the result of remnant extraposition and only looks like verb-raising.

b. dat Jan *het boek al* *eerder* schijnt te hebben gelezen
that John the book already before SEEMS$_{<S>}$ to have read
'…that John seems to have read the book already before'

If we adopt the Cinquean view, we are led to conclude that both *schijnen* and *lijken* are inserted in a functional projection and as such subject to ordering restrictions. Remarkably, both Haegeman (2006) and Wurmbrand (2004) have pointed out that it is at this point where *schijnen* and *lijken* differ. Whereas *schijnen* cannot be embedded under modals or auxiliaries, *lijken* can,[7] although they are both assumed to be epistemic raising-verbs (Wurmbrand 2004). This is shown in examples (30) and (31). Hence, although *schijnen* does behave as expected in a Cinquean analysis, it is problematic in this view that *lijken* triggers restructuring, but is not subject to ordering restrictions. Wurmbrand (2004) therefore argues that *lijken* should be analyzed as a lexical restructuring verb.

(30) a. * Het postmodernisme *heeft* de grond onder de wetenschappelijke
the postmodernism has the ground under the scientific
traditie schijnen te willen wegvagen
tradition SEEM$_{<S>}$ to want away-sweep
'it seems as if postmodernism has tried to demolish the foundations of the scientific tradition.'
b. Het postmodernisme *heeft* de grond onder de wetenschappelijke traditie
The postmodernism has the ground under the scientific tradition
lijken te willen wegvagen
SEEM$_{<L>}$ to want away-sweep
'it seems as if postmodernism has tried to demolish the foundations of the scientific tradition.'

(Haegeman 2006: 497)

(31) a. * Hij *kan* soms erg aardig *schijnen*, maar dan opeens wordt hij.
He can sometimes very nice SEEM$_{<S>}$ but then suddenly becomes he
afstandelijk
distant
'At times he may seem very nice, but then all of a sudden he becomes distant.'
b. Hij *kan* soms erg aardig *lijken*, maar dan opeens wordt hij
He can sometimes very nice SEEM$_{<L>}$ but then suddenly becomes he
afstandelijk
distant
'At times he may seem very nice, but then all of a sudden he becomes distant.'

(Haegeman 2006: 497)

To conclude, precise claims with respect to the syntax of *schijnen* and *lijken* cannot be made at this point. Their properties can best be accounted for in a Cinquean analysis, with the assumption that lexical restructuring verbs exist to account for properties of *lijken*. *Schijnen* would be inserted as a functional head which accounts for its

[7] Note that (as Haegeman 2006 also did) *lijken* shows the IPP effect, which is expected since *lijken* also triggers verb-clustering.

distributional properties. The functional head which corresponds to the semantics of *schijnen* is $Mood_{evidential}$ according to Haegeman (2006), which is a position high in the hierarchy (see (26)) accounting for its restricted ordering possibilities. *Schijnen* would not project a vP in this framework, thus also no defective vP. *Lijken* on the other hand, being a lexical verb, *does* project a vP. However, we do not want to adopt a fixed functional hierarchy and this makes the status of functional verbs unclear again. It would both be possible to hypothesize that functional verbs project a vP as well as to hypothesize that they do not project vP. For *lijken*, as it shows more properties of lexical verbs, we will hypothesize that it does project a vP. This vP is defective due to the lack of an external argument. In this thesis I hope to combine data on acquisition of the raising-verbs and results from an extensive study on semantic and syntactic properties to enhance our understanding of the syntactic distinction between functional and lexical elements.

About epistemic modality and evidentiality

A major component of this thesis concerns the semantics of *schijnen* and *lijken* compared to the semantics of epistemic modals. Therefore, I will give a short overview of the relation between evidentiality and epistemic modality here.

Above it has been mentioned that Wurmbrand (2004) claims that both *schijnen* and *lijken* are epistemic raising verbs. However, this is not clear from a semantic analysis. Let's first discuss the notions of modality and evidentiality and find out how they are related. Modality has to do with concepts of possibility and necessity (von Fintel 2006). It can be encoded in elements of many different categories (von Fintel 2006), but in this paper we will focus on modal auxiliaries such as *can*, *must*, *might* etc. Modals can express different types of modality. For this thesis, only the distinction between root and epistemic modality is of importance. Root modals refer to concepts of obligation, permission or volition (Eide 2005). Epistemic modality on the other hand "concerns what is possible or necessary given what is known and what the available evidence is" (von Fintel 2006: 2). That is, it indicates the degree of certainty a speaker has for the proposition (De Haan 1999), (De Haan 2001). Therefore, Papafragou (1998) claims that epistemic modality is a metacognitive process in which the speaker performs a mental operation on the content of the proposition. An example of a root and epistemic reading of Dutch modal *kunnen* 'can' is to be found in (32), where reading (i) indicates the root reading and (ii) the epistemic reading.

(32) a. Jan kan in zijn kantoor zijn
John can in his office be
(i) John is able to be in his office
(ii) It is possible that John is in his office (given that he is not at home and he was supposed to finish some work)

In contrast to epistemic modality, evidentiality is concerned with indicating the source of information a speaker has for a proposition (De Haan 1999), (De Haan 2001), (Aikhenvald 2004). Sources of information can be divided into two types; direct and indirect sources (De Haan 2001). When the speaker has observed the action, the evidence is direct; when the speaker has learned about the action through someone else or inferred

it, the evidence is indirect. Direct evidence can be for example that the speaker has seen or heard the action. Indirect evidence can be divided in inferential evidence, where the speaker deduces the proposition from available evidence; and reported evidence, where the speaker has heard about the action from someone else (De Haan 2001). Now not all elements that indicate type of evidence are categorized as evidentials. Evidentials are further defined as grammaticalized elements, although the notion of grammaticalized is unclear as evidentiality is coded in different elements among languages (De Haan 2001), (Aikhenvald 2004). So we can conclude that evidentials are grammaticalized elements that indicate source of information as their primary meaning. In evidentiality there are two sources for language variation. First of all, languages differ in type of evidence they encode (Faller 2002), (Aikhenvald 2004). Another source of variation is how evidentiality is marked (Aikhenvald 2004). Evidentiality can be marked with inflections or clitics (Faller 2002), for other languages the main source to indicate type of evidence is through modals (De Haan 2001).

Many researchers have claimed that a necessary relation exists between evidentiality and epistemic modality (De Haan 2001). However, in this thesis I will adopt the hypothesis as stated in Faller (2002) and also claimed by De Haan (2001), (2005) that evidentiality and epistemic modality are distinct categories. The most important argument to make this assumption is that conceptually indicating source of information and indicating degree of certainty are distinct (De Haan 2001), (Faller 2002). Furthermore, there are elements which indicate either one of the two meanings, although in many languages one and the same element can express both concepts (Faller 2002).

Regarding the information just discussed, we will reconsider the analysis of *schijnen* and *lijken* as epistemic raising-verbs. *Schijnen* has as its primary meaning that of indicating source of information (De Haan 2001). The source of information referred to is indirect reported evidence (hearsay) (De Haan to appear). In sentence (33) for example, *schijnen* indicates that the proposition (p), that John is a good soccer player, has been reported to the speaker. Furthermore, *schijnen* is a grammatical element as it is deverbalized (De Haan 2001, to appear). Hence, *schijnen* satisfies the requirements to be classified as an evidential as De Haan (to appear) does.

(33) Jan schijnt een goede voetballer te zijn
John SEEMS$_{<S>}$ a good soccer-player to be
'John seems to be a good soccer player'
Proposition (p) = John is a good soccer player
Evidentiality (EV) = Speaker (s) has heard p

For *lijken*, a semantic analysis is less clear and has not been proposed in the existing literature to my knowledge. Therefore, an analysis of the semantics of *lijken* will be part of the investigation of semantic properties in the next chapter.

The issues raised in this chapter will form the basis of the current study on Dutch *schijnen* and *lijken* and will be reconsidered in the next chapter: the acquisition of defective phases in Dutch, the syntactic analysis of functional verbs in a minimalist framework, and related, the manifestation of defective phases in Dutch. The next chapter will first present the objectives taken up in this thesis, followed by an extensive analysis of the semantic and syntactic properties of *schijnen* and *lijken*. The second half will discuss an acquisition experiment which compares acquisition of *schijnen* and *lijken*.

CHAPTER 3: A STUDY ON DUTCH RAISING

3.1 Objectives of the current study

The goal of this thesis is twofold. First of all, we want to test UPR in Dutch. That is, we want to investigate whether Dutch children take a defective phase to be a complete phase, just as English children do. Furthermore, this thesis aims to shed more light on the issue as to what the structure of functional verbs is.

So, how do we investigate these issues? In order to contribute to answering the questions, we will study Dutch raising-verbs. In chapter 2 the English raising-verb *seem* has been shown to be problematic for children in various experiments and it has been claimed that what is problematic is moving the subject out of the complement of a defective vP to the subject position of the matrix clause (Wexler 2004). Now if we take Dutch into consideration, we find that *seem* translates to two different verbs; *schijnen* and *lijken* (Wurmbrand 2004, Haegeman 2006). As has been concluded from previous studies, *schijnen* is an evidential indicating reported evidence (De Haan to appear). A semantic analysis of *lijken* has not been proposed yet and will be part of the study on the semantics of *lijken* in the next section. With respect to the syntax of *schijnen* and *lijken*, it has been discussed in chapter 2 that at this point, the data follow best from a Cinquean analysis. That is, an analysis in which *schijnen* is a functional head, inserted in the corresponding functional projection. This derives the distributional restrictions on *schijnen*. An additional assumption that should be made to account for data with respect to *lijken* is that lexical restructuring verbs exist.

However, Cinque's analysis of a rigid functional sequence is not compatible with minimalism given the hypothesis that subcategorization can be derived from other properties of lexical items as discussed in the previous chapter. But, we also learned that within a bare phrase structure account, the status of functional verbs is unclear and even more, that we do not have an account for the distributional properties of *schijnen*. By investigating *schijnen* and *lijken* we hope to provide insight into the question of what the syntactic structure of functional verbs is in a minimalist account. This leads to the first research question this thesis will address:

> *Research Question 1*:
> What syntactic structure do *schijnen* and *lijken* project?

In order to find an answer to this question we will study the syntactic and semantic properties of *schijnen* and *lijken* in-depth in section 3.2. However, we do not base our answer solely on the study of semantics and syntax; we will also use data on acquisition of *schijnen* and *lijken* to provide an account. That is, we want to investigate whether acquisition patterns of *schijnen* and *lijken* are similar or not. If they are, this is reason to hypothesize a similar underlying syntactic structure for the two verbs; if they are not, we will hypothesize that the structure of *schijnen* and *lijken* significantly differs.

Moreover, our study on acquisition of *lijken* will enable us to test Wexler's UPR in Dutch as in chapter 2 we found that *lijken* shows many properties of lexical verbs and as such we hypothesized that it projects a vP which is defective because of the lack of an external argument. If we see the same acquisition pattern for *lijken* as has been found for *seem* this is taken to support UPR. Hence, our next research questions are:

> *Research Question 2*:
> Do we find the same acquisition pattern for Dutch *lijken* as has been found for English *seem*?
>
> *Research Question 3*:
> Do acquisition patterns for *schijnen* and *lijken* look the same, or do we find differences?

For answering research questions 2 and 3 we have set up a new experiment on comprehension of *schijnen* and *lijken*. This experiment is designed to test if children are able to comprehend *schijnen* and *lijken* on the basis of its syntactic structure. Section 3.3 will describe the experiment. It will provide specific information on the set-up, the procedure and materials used, as well as the participants. Furthermore, the results will be described and discussed in this section.

To conclude, this study aims to gain insight in both syntax and acquisition of (functional) verbs in Dutch. We do not only want to test UPR on the basis of Dutch sentences, we also want to combine acquisition data with results from a syntactic and semantic analysis to shed light on the syntactic structure of functional verbs. Hence, this study will combine theory and experiment which will help us to refine our theory of the syntax of verbal elements. In the final section of this chapter, we will propose a minimalist analysis of Dutch *schijnen* and *lijken* which attempts to account for both the results of our in-depth study on syntactic and semantic properties and the results from our acquisition experiment.

3.2 Schijnen and Lijken: a comparison

This section will investigate the semantic and syntactic properties of *schijnen* and *lijken* in order to find out at what points the verbs are similar and where the differences can be found. We will show that *schijnen* is more defective as a verb than *lijken*. Furthermore, a comparison is made with modals to find out whether there are any similarities or differences. The examples I will give in this section are the result from a questionnaire, judged by 10 native speakers of Dutch, as well as searches on the internet with Google.

3.2.1 Semantic Properties

As discussed in chapter 2, s*chijnen* can be categorized as an evidential. It indicates as its primary meaning the source of information and in particular, indirect, reported evidence

(De Haan to appear). For convenience, I will repeat example (33) from chapter 2 here in (1).

(1) Jan schijnt een goede voetballer te zijn
John SEEMS$_{<S>}$ a good soccer-player to be
'John seems to be a good soccer player'
Proposition (p) = John is a good soccer player
Evidentiality (EV) = Speaker (s) has heard p

Lijken also encodes evidentiality, although this is not its primary function and it is also not hypothesized that *lijken* is grammaticalized. *Lijken* is comparable in meaning to the Quechua clitic *chu hina*. According to Faller (2002), Cusihuaman (1976) claims that "*chu hina* indicates that the speaker conveys approximate information, which has to be confirmed at a later point by the speaker or someone else" (p. 173). *Chu hina* has a meaning similar to *appear*, *look like* or *seem* (Faller 2002)[8]. This is also true for *lijken*. Hence, it indicates that there is some type of evidence (type of evidence is irrelevant), but the evidence is rather unclear[9]. This is shown in the following example, translated and adapted from Faller (2002).

(2) Jan lijkt het huis te schilderen
John SEEMS$_{<L>}$ the house to paint
'John seems to be painting the house'
p = John is painting his house
EV = speaker sees something and it looks to the speaker like John is painting his house

Besides its evidential meaning, *lijken* also indicates that the speaker is less than 100% certain about the proposition. This would lead to the conclusion as Wurmbrand (2004) and Haegeman (2006) claim, that *lijken* is epistemic in this sense. However, unlike true epistemic modals (Faller 2002), *lijken* can also be used when the speaker is either 100%

[8] Faller (2002) does not decide in her dissertation whether or not to classify *chu hina* as an evidential. She explains that "comparison of *chu hina* with –mi and –chá also suggests that *chu hina* is an evidential". She thinks it is a reasonable hypothesis and refers to *chu hina* in the remaining part of the dissertation as an evidential.

[9] Faller (2002) claims that *chu hina* also conveys reasoning, but in contrast to the evidential *cha*, which indicates reasoning, the focus for *chu hina* is on the evidence instead of the mental process of reasoning. For *cha*, the focus is on the mental process. This corresponds to the difference between Dutch *lijken*, similar to *chu hina* and *lijken* used with the experiencer *mij* 'me'. For the latter case, the focus is on the mental process. This can be made clear by using an example adapted from Faller (2002). In a context in which the doorbell rings and we guess who it is at the door, the speaker can either utter (i) or (ii).

(i) Dit lijkt Maria te zijn
This SEEMS$_{<L>}$ Maria to be
p = this appears to be Maria
EV = speaker has unclear but direct evidence for p, e.g. the speaker recognizes Maria's footsteps (whether or not the speaker is expecting Maria)

(ii) Dit lijkt *me* Maria te zijn
This SEEMS$_{<L>}$ to-me Maria to be
p = this is probably Maria
EV= speaker conjectures that p, e.g. speaker is expecting Maria to arrive at that moment

or 0% certain about the proposition. This is shown in example (3) where denial of the speaker's belief in p does *not* lead to Moore's paradox[10].

(3) Jan lijkt een aardige jongen te zijn, maar dat is hij niet
John SEEMS<L> a nice boy to be, but that is he not
'John seems to be a nice boy, but he's not'

To conclude, *lijken* is not a pure evidential. It does encode both epistemic modality and evidentiality. The implications of this semantics for the properties of *lijken* are yet to be investigated.

Contribution to Propositional Content

As discussed in Faller (to appear) and Papafragou (to appear), the standard tests to determine whether an element contributes to the propositional content of a sentence (as in Drubig (2001), Faller (2002)) do not suffice. On the other hand, Faller (to appear) argues that even if these tests cannot show that an element does *not* make a contribution to the propositional content, they can show that an element *does* make a contribution, if it passes the tests. Moreover, these tests make a distinction between two different uses of elements: m-performative vs. descriptive uses[11] (Faller 2002, 2006, to appear). If an element is used m-performatively, it means that the evaluation of the proposition is highly dependent "on the speaker, the here and the now" (Faller 2006: 7). In contrast, if an element is used descriptively, it is not indexed to the speaker. The evaluation of the proposition is somebody else's evaluation and based on "objective facts available to anybody" (Faller 2006: 8).

1. Conditionals

If an element can occur in the scope of a conditional, it is truth-conditional (Faller to appear). Example (4) shows that *lijken* is truth-conditional. It can appear within the scope of a conditional.

(4) Als Jan ziek lijkt te worden, dan moet hij vitamine pillen
If John ill SEEMS<L> to become, than must he vitamin pills
gaan slikken
go swallow
'If John seems to get ill, he must take vitamins'

[10] Note that if we use *lijken* with *mij* instead of only *lijken*, denial of the speaker's belief of p *does* lead to Moore's paradox. Faller (2002) also argues for *–cha* that it cannot be rejected within the same sentence.

(i) #Jan lijkt me een aardige jongen te zijn, maar dat is hij niet
John SEEM<L> to-me a nice boy to be, but that is he not
p = 'John seems to me to be a nice boy
EV = I conjecture that John is a nice boy

[11] Papafragou (to appear) does not make a distinction between m-performative and descriptive, but rather claims that there is a distinction between speaker-indexical elements and elements that are not speaker-indexical. With speaker-indexical elements she means that "the possible worlds in the conversational background are restricted to what the *current* speaker knows *as of the time of utterance*" (p. 9).

Sentence (5) on the other hand, in which *schijnen* appears in the scope of a conditional is ungrammatical[12]. This means, following Faller (2002), (to appear), that it can be concluded that *schijnen* in this sentence is not used descriptively, but m-performatively, rather than that it does not contribute to the truth of the proposition.

(5) *Als Jan ziek schijnt te worden, dan moet hij vitamine pillen
If John ill SEEMS$_{<S>}$ to become, than must he vitamin pills
gaan slikken
go swallow

However, there are cases in which *schijnen* can occur in the scope of conditionals. In sentence (6), it is acceptable to use *schijnen*[13]. Interestingly, *schijnen* is used descriptively in this sentence. The evaluation of the proposition is not the speaker's (writer's) evaluation; it is rather the advice of the writer to the reader that if *the reader* hears (for example on the weather forecast) that it's going to rain at night, he (the reader) should take inside his laundry. Hence, *schijnen* is not indexed to the speaker. This is the same observation as Faller (to appear) makes for German *sollen*, which also loses its m-performative use in conditional contexts.

(6) Als het 's nachts schijnt te gaan regenen, dan moet je je
If it at-night SEEMS$_{<S>}$ to go rain, than must you your
was binnenhalen
laundry take-inside
'If it seems to be going to rain at night, you have to take your laundry inside'

To conclude, both *schijnen* and *lijken* can occur in the scope of a conditional. This means that they are both truth-conditional, e.g. make a contribution to the propositional content of the proposition.

2. Assent/Dissent
The assent/dissent test is another standard test used to determine whether an element contributes to the propositional content. It is based on the observation stated in (7).

(7) *Assent/Dissent Test*
If an element can be questioned, doubted, rejected or (dis)agreed with, it contributes to the truth conditions of the proposition expressed. Otherwise it does not contribute to the truth-conditions or it is inscrutable.
(Faller to appear: 11)

[12] That *lijken* (SEEM$_{<L>}$) can be in the scope of a conditional whereas *schijnen* (SEEM$_{<S>}$) cannot has already been shown in Haegeman (2006) with different examples.
[13] However, there seems to be speaker-variation in acceptance of this example. There are speakers who disagree on acceptability of this sentence, although there are also speakers who do find it an acceptable sentence. This might have to do with the ease with which speaker can switch to a non speaker-indexical interpretation. However, at this point this issue is left open to future research.

If we apply this test to *lijken*, we see that this element can be disagreed with, which means that it *does* make a contribution to the truth-value of the proposition, see (8). In (8) speaker B, disagreeing with speaker A, can disagree with the fact that it *seems* to be the case that John is home. For example, speaker B points to the fact that the lights are off and that there is mail in John's mailbox. This indicates that it does not *seem* to be the case that John is home (irrespective of the fact whether he actually is at home or not). Speaker B can also disagree with the embedded proposition, as shown in (ii). Thus, also the assent/dissent test shows that *lijken* makes a contribution to the propositional content.

(8) A: Jan lijkt thuis te zijn
John SEEMS$_{<L>}$ home to be
'John seems to be at home'
B: Nee, dat is niet waar
No, that is not true
(i) It does not *seem* to be the case that John is home
(ii) John is not at home

For *schijnen* on the other hand, things appear to be different. If speaker B in example (9) disagrees with the sentence, he means that he disagrees with the proposition *John is at home*. He cannot claim to disagree with the fact that speaker A *has heard* that John is at home. However, as stated in (7) above, this does not mean that *schijnen* does not make a contribution to the propositional content. It could also mean that *schijnen* is externally inscrutable. In order to disagree with *schijnen*, one must have access to the speaker's mind to check all reports available to the speaker on which the proposition is based. I do not know of any context in which *schijnen* is open to scrutiny[14].

(9) A: Jan schijnt thuis te zijn
John SEEMS$_{<S>}$ home to be
'John seems to be at home'
B: Nee, dat is niet waar
No, that is not true

In sum, *lijken* passes the test for challengeability, whereas *schijnen* fails this test. This means for *lijken* that it does make a contribution to the propositional content. For *schijnen* failing the test is not enough to claim that it is non truth-conditional. It rather shows that *schijnen* is externally inscrutable.

[14] Faller (to appear) claims to have constructed a context in which German *sollen*, also indicating reported evidence, is open to scrutiny, see example (i) (her (27)). However, I have my doubts about whether this example is really showing scrutability of reported evidence. In my view there is still no disagreement on the fact that the source of evidence is a report. There is rather disagreement about the source of the report.
(i) A: Laut Polizei soll die Gärtnerin die Juwelen gestohlen haben.
'According to the police, the gardener is said to have stolen the jewels.'
B: Nein, das stimmt nicht. Das ist die Presse, die das behauptet.
'No, that's not true. It is the press who is claiming this.'
(Faller to appear: 12)

3. Factive Predicates

It has been claimed that if an element cannot be the complement of a factive predicate, it is non-truth-conditional. As already pointed out by Haegeman (2006), *lijken* can be embedded under factive predicates whereas *schijnen* cannot. This is further supported by the contrast observed between (10) and (11)[15], adapted from Papafragou (to appear).

(10) Het is verassend dat Superman jaloers lijkt te zijn op Lois
It is surprising that Superman jealous SEEMS<L> to be of Lois
'It is surprising that Superman seems to be jealous of Lois'

(11) ?? Het is verassend dat Superman jaloers schijnt te zijn op Lois
It is surprising that Superman jealous SEEMS<S> to be of Lois
'It is surprising that Superman seems to be jealous of Lois'

However, Papafragou (to appear) shows that epistemic modals that cannot occur within the scope of a factive predicate are not necessarily non-truth-conditional; they are rather indexical to the speaker. Factive predicates do not allow for a speaker evaluation within the current belief set of the speaker (Papafragou to appear). The same is true for *schijnen*. It cannot be embedded under a factive predicate as it is speaker-indexical.

To summarize, the standard diagnostics to determine whether an element makes a contribution to the propositional content have shown that *lijken* is truth-conditional. For *schijnen* it has been shown that it also contributes to the propositional content, but that it is speaker-indexical and as such fails particular tests. In this way, *lijken* resembles root modals and *schijnen* resembles epistemic modals. Root and epistemic modals can also be distinguished on behavior in the tests above (Papafragou to appear). However, according to Papafragou (to appear) this does not show a difference in contribution to propositional content; it rather shows that epistemic modals are externally inscrutable, whereas root modals are not.

Interaction with Propositional Operators

Another, related battery of tests to study whether an element makes a contribution to the proposition or not, deals with the interaction of an element with operators such as negation, questions and tense. These tests will be applied to *schijnen* and *lijken* in this section to see whether they behave the same or different.

1. Negation

Researchers have argued that if an element is truth-conditional, it can be in the scope of negation. This is stated in Hara (2006) as follows:

[15] If in example (11) *schijnen* is not interpreted speaker-indexical, the example gets better. That is, if we take (11) to mean that in the belief set of the film we are watching, we can infer that it is surprising that a character has the report of another character that Superman is jealous of Lois.

(12) If the semantic meaning of a lexical item is part of the propositional content, the meaning should be able to be under the scope of a negation.

(Hara 2006: 14)

Results from a questionnaire revealed that *lijken* can occur in the scope of negation. Sentence (13) is ambiguous between a reading in which *lijken* is within the scope of negation and one in which *lijken* takes wide scope over negation. The former reading indicates that it doesn't *seem* to be the case that John is home, irrespective of the fact whether he actually is home or not. The latter reading is one in which it seems as if John is not at home.

(13) Jan lijkt niet thuis te zijn
John SEEMS$_{<L>}$ not home to be
'John doesn't seem to be at home'
(i) Neg > lijken: It doesn't seem to be the case that John is home
(ii) Lijken > Neg: It seems to be the case that John is not at home

If we apply the test to *schijnen*, we see that only one of the readings is available (14). The reading in which *schijnen* is within the scope of negation is ruled out as has been claimed to be the case for all evidentials (De Haan 1999). The difference between *schijnen* and *lijken* with respect to negation gets even clearer if we compare (15) to (16). Where the same speaker in (15) can negate the proposition made within the same sentence, this is impossible in (16). In (15) the only reading available is the one in which negation has scope over *lijken*.

Following Hara (2006) we should draw the conclusion that *schijnen* does not contribute to the propositional content. However, Faller (to appear) claims that this conclusion does not follow immediately, as there also exist modals which are propositional and yet cannot occur in the scope of negation.

(14) Jan schijnt niet thuis te zijn
John SEEMS$_{<S>}$ not home to be
'John doesn't seem to be at home'
(i) #Neg > schijnen: It is not the case that the speaker has heard that John is home
(ii) Schijnen > Neg: It is the case that the speaker has heard that John is not at home

(15) Jan lijkt niet thuis te zijn, maar dat is hij wel
John SEEMS$_{<L>}$ not home to be, but that is he
'John doen't seem to be at home, but he is'

(16)[16] #Jan schijnt niet thuis te zijn, maar dat is hij wel
John SEEMS$_{<S>}$ not home to be, but that is he
'John doen't seem to be at home, but he is'

[16] # indicates pragmatic anomaly throughout the paper, whereas * indicates ungrammaticality.

The reason that *schijnen* cannot be negated is the same as for why it cannot be disagreed with, e.g. *schijnen* is externally inscrutable. Furthermore, for one and the same speaker to deny his own source of evidence is not informative. You would either give a different source of information, or you would not provide the source of evidence.

2. Questions

According to Hara (2006), elements that are propositional can occur within the scope of a question operator, as stated in (17).

(17) If the semantic meaning of a lexical item is part of the propositional content, the meaning should be able to be under the scope of a question operator
(Hara 2006: 16)

Sentence (18) shows that *lijken* can occur in the scope of a question operator. Sentence (18) is acceptable for example in a context where person A is looking at John's house. The speaker (B) is unable to see the house and asks A if it looks like John is at home.

(18) Lijkt Jan thuis te zijn?
SEEMS$_{<L>}$ John home to be
'Does John seem to be at home?'

Schijnen cannot occur within the scope of a question operator. Sentence (19) was ruled out by all of the respondents. We can conclude with Hara (2006) that *schijnen* does not make a contribution to the propositional content. However, according to Papafragou (to appear), elements that are inscrutable cannot be questioned. The only way in which they can be questioned is when the inscrutability restriction is bypassed (Papafragou to appear). A way in which this can be accomplished is the interrogative flip as in (20). In this example, speaker A tells B that he's heard that B was drinking last night. Then, speaker B asks back what it was that he has been drinking according to A's sources[17]. So, once again the test has not proven to us that *schijnen* does not make a contribution to the propositional content. It has rather been shown that *schijnen* is externally inscrutable.

[17] This example is based on the example Faller (to appear) gives for German *sollen*, here in (i) (her 30), which is taken from a novel by Karl May (http://karlmay.leo.org/kmg/primlit/roman/sohn/sohnl096.htm).

(i) D: So besinnen Sie sich also auf gar nichts, betreffs des gestrigen Abends?
'So, you can't remember anything about yesterday evening?'
P: Nicht auf das Geringste.
'Not the least.'
D: Sie sollen einmal getanzt haben.
'You're said to have danced once.'
P: Getanzt? Das wäre fast ein Wunder. Ich pflege nicht zu tanzen. *Wer soll denn meine Tänzerin gewesen sein*?
'Danced? That would almost be a miracle. I don't normally dance. *Who is said to have been my dance partner*?'

(19) *Schijnt Jan thuis te zijn?
SEEMS$_{<S>}$ John home to be
'Does John seem to be at home?'

(20) A: Je schijnt gister flink te hebben gedronken!
You SEEM$_{<S>}$ yesterday a-lot to have drunk
'I've heard you have been drinking a lot last night'
B: Ik? Gedronken? Wat schijn ik dan te hebben gedronken?
Me? Drinking? Wat SEEM$_{<S>}$ I then to have drunk?
'Me? Drinking? What is it that they've told you I have been drinking?'

3. Tense

Faller (to appear) claims that if an element makes a contribution to the propositional content, it is able to scope under tense. Evidential clitics are said to always scope *over* tense (Faller to appear) and the same is claimed for epistemic modals (Abusch 1997, Stowell 2004). Scope properties of *schijnen* and *lijken* with respect to tense will be investigated below.

Lijken can both structurally as well as semantically occur within the scope of past tense. Whereas (21a) means that John seems to be at home right now, (21b) means that at some previous time it seemed to be the case that John was at home. Hence, the present-past distinction is transparent.

(21) a. Jan lijkt thuis te zijn
John SEEMS$_{<L>}$ to be at home
b. Jan leek thuis te zijn
John SEEMED$_{<L>}$ to be at home

The interaction of *schijnen* with past tense is not so clear. First of all, if *schijnen* is used in past tense (*schenen*), its meaning can change. In sentence (22) (found in Google), *schijnen* no longer indicates source of evidence, it rather has a meaning close to *appear*.

(22) Maar niet gaan was minstens een pijnlijke nalatigheid, omdat zij toen althans werkelijke belangstelling *scheen* te hebben
'But not to go was at least a painful negligence, because, at that time, she appeared to have true interest'
(http://www.nikhef.nl/~a17/romans/KlaasDorusRas_II.htm)

Furthermore, past tense *schijnen*, in this meaning is compatible with an experiencer (23 from Google). This is not the case for present tense *schijnen* as we will discuss in the following section. This shows that there is no overt meaning contrast in morphological present tense and past tense form, just as is the case for epistemic modals (Abusch 1997).

(23) Het *scheen* **mij** alsof ik op een kerkhof liep om de begrafenis van mijn gezagvoerder bij te wonen
'It appeared to me as if I was walking on a cemetery to attend the funeral of my captain'

Abusch (1997) claims, on the basis of the non-transparent present-past distinction among other things, that modals are tenseless and pick up the local evaluation time, which is the utterance time in extensional contexts. At first sight, this seems to be at stake for Dutch *schijnen* too. For example, in sentence (24b), *schijnen* is structurally within the scope of past tense; however, it scopes *over* tense on the level of interpretation[18]. What past tense *schijnen* does in this example is locating the event time denoted by the complement in the past[19].

(24) a. Er schijnt minstens 100 man te zijn in paradiso
'They say there is a hundred people in paradiso'
b. Er scheen minstens 100 man te zijn in paradiso
'They say that last night there were a hundred people in paradiso'

Now we could conclude, along the lines of Stowell (2004) and Abusch (1997) for epistemic modals, that *schijnen* cannot scope under past tense at the level of interpretation. On the other hand, we can find contexts in which *schijnen* in its evidential meaning can scope semantically under tense. That is in narratives, *schijnen* can be within the scope of past tense as in sentence (25). This means that in the particular story, it is told that some proposition is true, and this is not related to the here and now.

(25) a. Jack's vrouw schijnt rijk te zijn
They say Jack's wife is rich
b. Jack's vrouw scheen rijk te zijn
They used to say Jack's wife is rich
Narrative: in this story it is said that Jack's wife is rich

Furthermore, *schijnen* can occur under the scope of past tense when it is interpreted counterfactually. This was first observed by Condoravdi (2001) for metaphysical modals and is also possible for Dutch *schijnen* as shown in (26)[20]. In (26) there was previously evidence that it would be extremely cold in December, although now we are in December, it turns out to be false. This shows that *schijnen* can be both structurally and semantically within the scope of past tense.

[18] Note that in this case, in contrast to examples (22) and (23), *schijnen* does have its evidential meaning.
[19] Stowell (2004) has made the same observation for English 'had to'.
(i) There has to be at least a hundred people here
(ii) There had to be at least a hundred people here
(Stowell 2004: 10)
[20] According to Stowell (2004) and Condoravdi (2001), the counterfactual interpretation is only possible with metaphysical modals and *not* with evidential modals. This contrasts with (26), where the evidential *schijnen* receives a counterfactual reading.

(26) In oktober scheen december nog de koudste maand van het jaar te zullen worden
'In October, December SEEM$_{<S>}$ to become the coldest month of the year'
Natural in a context in which the weather man forecasted an extremely cold December, but now the speaker is in December, it is actually quite warm.

Interesting to observe about these examples is that in these cases *schijnen* is not speaker-indexical. That is, *schijnen* is not restricted to the speaker's here and now; hence, inscrutability is again bypassed. In (25) it is not the writer's report that Jack's wife is rich, it is rather that the characters in the narrative have heard this. Furthermore, in example (26), the weather forecast said that December would be cold. However, at the utterance time, the speaker has a new source of evidence, a direct source, which falsifies the forecast of the weatherman.

To conclude, *schijnen* can structurally as well as semantically occur within the scope of past tense. However, the present-past distinction is not transparent because *schijnen* is externally inscrutable. *Schijnen* is similar to epistemic modals in the lack of a transparent present-past distinction (Abusch 1997), (Stowell 2004). Whether the non-transparent present past distinction of epistemic modals is related to speaker-indexicality has not been investigated yet. However, analysis of *schijnen* and the similarities in behavior of epistemic modals with *schijnen* make this a plausible hypothesis.

4. Temporal Adverbs

Another point of investigation is the scope-properties of *schijnen* and *lijken* with respect to temporal adverbs. Whereas *lijken* can be modified by a temporal adverb, *schijnen* cannot. This is shown in example (27a-b). Sentence (a) is ambiguous between a reading in which *today* modifies the proposition and a reading in which *today* modifies *lijken*. Sentence (b) on the other hand, has only a reading in which *today* modifies the proposition. Hence, *schijnen* has scope over temporal adverbs.

(27) a. Jan *lijkt* vandaag een goede slag te gaan slaan
Meaning 1: It seems (SEEM$_{<L>}$) as if John is going to take his chance today
Meaning 2: Today it seems (SEEM$_{<L>}$) as if he's going to take his chance some time (unspecified)
b. Jan *schijnt* vandaag een goede slag te gaan slaan
Meaning: It seems (SEEM$_{<S>}$) that John's going to take his chance today

However, as we have seen in (26), there are contexts in which modification by a temporal adverb is allowed. This is possible when *schijnen* is not used speaker-indexical and hence open to scrutiny.

In sum, the interaction with operators provides the same result as the tests for the contribution to propositional content. *Schijnen* and *lijken* behave differently with respect to negation, question and tense operators. This results from the semantics of *schijnen*, which makes it externally inscrutable, rather than from a difference in contribution to propositional content.

Complements

In this section we will investigate whether particular types of complements are ruled out with *schijnen* or *lijken* and whether this is similar to the restrictions on complements modals have. Various researchers have concluded that root modals can only have a complement of the type [+dynamic, +future], whereas epistemic[21] modals prefer complements of the type [+stative, +present] (Barbiers (1995), Bybee et al. (1994), Dyvik (1999), Eide (2005)). This difference is explained to follow from their different communicative functions (Eide 2005). According to Eide (2005), the function of root modals is that "they state what is required, needed, allowed or intended to hold at some point in time" (p. 377) and the function of epistemic modals is that "they grade or modify the truth value of the proposition encoded by their complements" (p. 379). As it is only possible to require a situation in the future and it is easier to grade a situation that took place in the past/present, root modals prefer future complements and epistemic modals prefer present complements. Now let's have a look at Dutch *schijnen* and *lijken*.

1. Dynamic vs. Stative

If we have a look at *lijken*, it does not seem to have a preference for either [+stative, +present], or [+dynamic,+future][22]. It is perfectly fine with both these types of complements as shown in (28a-b)[23]. However, a closer look at the [+dynamic, +future] complements reveals that although *lijken* is compatible with a change of state, it does not prefer a complement with the feature [+future]. For example (28a) is interpreted as if John is climbing the fence right now. It is slightly more difficult to come up with a context in which (29)[24] would be uttered. This is not a selectional restriction of *lijken*; it rather follows from its semantics. As *lijken* means that there is some type of direct evidence for the proposition, this must be available in some way. If the context is set up in such a way that there is direct evidence for the proposition, the sentence is fine. For sentence (29) this could be achieved for example by creating a context in which John, against all expectations, picked up on his study to become an architect again. That the feature [+dynamic] is not problematic also follows from (30). Sentence (30) is ambiguous between a reading in which *understood* denotes a state and one in which it denotes an event[25]. It can mean that it seems as if the person referred to by *he* is in a state of understanding. Or it can mean that it looks like the state of this person is at this moment changing from not understanding to understanding (as in: *nou lijkt ie te begrijpen wat we willen* 'finally, he seems to understand what we want').

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[21] In this section I use the term epistemic modals in contrast to Eide (2005) who refers to non-root modals. Her reason to adopt the term non-root modals instead of epistemic modals is that in many studies the term epistemic modals also includes evidential modals, which should be distinguished. However, as her term 'non-root modals' also includes epistemic modals, her data is taken as evidence to show that epistemic modals have certain properties.

[22] What is meant by dynamic is that the proposition involves a change of state, that there is a switch in truth value (e.g. a polarity transition in the sense of Barbiers (1995)).

[23] The sentences in this section are mostly translated and adapted from Eide (2005).

[24] The symbol ♦ indicates throughout this thesis that the example needs a particular context to be interpreted. In these contexts, the example is fine.

[25] In contrast to what Eide (2005) argues for root modals, the feature [+future] is not a necessary feature of the complement to get the dynamic interpretation in this example. I claim that [+future] is not available here, but that the dynamic interpretation has come about by a polarity transition at the evaluation time.

Lastly, a complement with the features [+stative, +future] as in (31) gives an odd sentence if it is not embedded in a special context, although the feature [+stative] with different tense features is perfectly acceptable as complement of *lijken* (as in (28b)).

(28) a. Jan lijkt over het hek te klimmen
John SEEMS$_{<L>}$ over the fence to climb
'John seems to climb the fence'
b. Jan lijkt van pannenkoeken te houden
John SEEMS$_{<L>}$ of pancakes to love
'John seems to love pancakes'

(29) ♦Jan lijkt architect te worden
John SEEMS$_{<L>}$ architect to become
'John seems to become an architect'

(30) a. Hij lijkt te begrijpen wat we willen
'He SEEMS$_{<L>}$ to understand what we want'
i) He seems to be in the state of understanding what we want
ii) Finally, he seems to reach the state where he understands what we want

(31) ♦Jan lijkt voor morgen zijn kamer te hebben opgeruimd
John SEEMS$_{<L>}$ before tomorrow his room to have cleaned
'It seems that John will have cleaned his room before tomorrow'

If we investigate *schijnen*, there seems to be a preference for [+stative], irrespective of tense. This follows from the contrast between (32a) and (32b). Sentence (32b) which has a [+stative] complement is easier to process than (32a), which has a [+dynamic] complement. Sentence (32a) can only be interpreted as if the action is a regular action without beginning or end (which makes it a state according to Eide (2005)). Another argument in favor of a preference for [+stative] is that sentence (33a) is not ambiguous. The verb 'understand' can only denote a state. The reading where *understand* denotes an event, which is available for *lijken*, is not a possibility here. However, it does not seem to be the change of state in itself which is unacceptable for *schijnen*, it rather seems to be a *perceptible* change of state which *schijnen* does not like to have in its complement. This is clear from example (33b) which is perfectly fine. Now what makes this a good sentence is that the change of state (the change of the climate) cannot be inspected by the hearer as it is not an observable change. There is no restriction on the feature [+future] as (34ab), in which the complement is [+stative, +future] for both sentences, is grammatical. The dislike of *schijnen* to have a perceptible change of state in its complement is again not a syntactic selectional restriction. It is rather the semantics of *schijnen* which facilitates the feature [+stative] over the feature [+dynamic]. As *schijnen* only indicates reported evidence, it is difficult to imagine why a speaker would use a report for a dynamic event of which the effect is readily perceivable by speaker and hearer.

(32) a. ?Jan schijnt over het hek te klimmen
John SEEMS$_{<S>}$ over the fence to climb
'John seems to climb the fence'
b. Jan schijnt van pannenkoeken te houden
John SEEMS$_{<S>}$ of pancakes to love
'John seems to love pancakes'

(33) a. Hij schijnt te begrijpen wat we willen
'He seems (SEEMS$_{<S>}$) to be in a state of understanding what we want'
b. Het klimaat schijnt te veranderen
The climate SEEMS$_{<S>}$ to change

(34) a. Jan schijnt architect te worden
John SEEMS$_{<S>}$ architect to become
'John seems to become an architect'
b. Jan schijnt te hebben gegeten voordat hij aankomt.
John SEEMS$_{<S>}$ to have eaten before he arrives
'They say that John will have eaten before he will arrive'

In sum, I do not want to claim that there are selectional restrictions posed by either *schijnen* or *lijken* on the semantic type of their complement. It rather seems to be the case that the semantics of those verbs facilitates particular aspectual and tense features of the complement as is also argued for modals by Eide (2005). As *lijken* means that there is some type of direct evidence for the proposition, it prefers past and present complements, both [+stative] and [+dynamic]. Future complements require a special context. *Schijnen*, on the other hand means that the proposition has been reported to the speaker and as such is compatible with present, past and future complements. It has a preference for [+stative] over [+dynamic] complements, just like epistemic modals. This follows from the semantics of *schijnen* as it is difficult to see how a speaker can report about a perceptible change of state at the time of utterance.

2. Non-verbal Complements

A property of epistemic modals is that they cannot have small clause complements. This is explained in Eide (2005) by arguing that epistemic modals need a proposition with a truth value[26] in their complement, otherwise there is nothing to grade or modify, which is the communicative function of epistemic modals. Root modals on the other hand, can take a small clause as their complement.

If we investigate *lijken* we see that there is no general ban on non-verbal complements.[27] Although *lijken* is not compatible with directional complements as in (35), *lijken* does combine with locatives (36ab).

[26] Eide (2005) makes a distinction between propositions and assertions. A proposition is "a subject-predicate relation"; an assertion is "a proposition with a (potential) truth value", due to the presence of finiteness (p. 386).

[27] Barbiers (1995) convincingly argues that non-verbal complements are really verbless. An analysis in which the verb is taken to be present at all syntactic levels and deleted at PF raises problems, as he shows,

(35) *Jan lijkt naar huis
John SEEMS$_{<L>}$ to home
'John seems home'

(36) a. Jan lijkt thuis
John SEEMS$_{<L>}$ home
'John seems at home'
b. De drijfveer lijkt weg
The motive SEEMS$_{<L>}$ gone

Furthermore, *lijken* can be combined with any AP[28]. There is no restriction such as is found with epistemic modals on bounded vs. unbounded scale (Barbiers 1995). In his view, adjectives like *intelligent* denote a value on an unbounded scale (37b); whereas adjectives like *full* denote a value on a bounded scale (37a).

(37) a. De fles lijkt vol
The bottle SEEMS$_{<L>}$ full
b. De jongen lijkt intelligent
The boy SEEMS$_{<L>}$ intelligent

In addition, *lijken* can be combined with DPs as in (38acdf). However, what must be noted is that without an affirmative particle the sentences are not acceptable. Moreover, adding *niet* 'not', the negative counterpart of *wel*, does not have this effect[29]. An explanation for this observation is material for future research.

(38) a. Digitaal ticket lijkt de toekomst
Digital ticket SEEMS$_{<L>}$ the future
'A digital ticket seems to be the future'
b. ??Je lijkt een tomaat
You SEEM$_{<L>}$ a tomato
'You look like a tomato'
c. Je lijkt wel een tomaat
You SEEM$_{<L>}$ aff-particle a tomato
'You look like a tomato'
d. *Je lijkt niet een/geen tomaat
You SEEM$_{<L>}$ not a tomato

---

if a broader empirical domain is investigated. Therefore, I will follow his analysis in which the complements do not involve a silent verb.

[28] Whether these constructions with AP or NP complements involve subject-raising is a matter of debate. Hirsch & Wexler (to appear) argue that English *seem* with AP and NP complements significantly differs in structure from *seem* with verbal complements in that the former does not involve raising, whereas the latter does.

[29] According to Barbiers (1995) *wel* (the affirmative particle) and its negative counterpart *niet* 'not' introduce a bounded scale. Therefore, DPs with either *niet* or *wel* are compatible as complements of modals, which require a complement denoting a value on a bounded scale. This cannot be the explanation for sentences in (35) since *niet* 'not' does not have the same effect as *wel*.

'You don't look like a tomato'

d. Je lijkt de kaasboer wel
You SEEM$_{<L>}$ the cheese man affirmative-particle
'You seem to be the cheese man'

e. *Jan lijkt voorzitter
John SEEMS$_{<L>}$ chair
'John seems to be the chair'

f. Jan lijkt wel voorzitter
John SEEMS$_{<L>}$ aff-particle chair
'John looks like a chair'

Schijnen behaves more like English epistemic modals. It cannot be combined with non-verbal complements at all. PPs, as well as APs and DPs are ruled out (39abc). Apparently, just like epistemic modals, *schijnen* needs a proposition with a truth-value in its complement.

(39) a. *Jan schijnt naar huis
John SEEMS$_{<S>}$ to home
'John seems to have gone home'

b. *De fles schijnt vol
The bottle SEEMS$_{<S>}$ full
'The bottle seems to be full'

c. *Digitaal ticket schijnt de toekomst
Digital ticket SEEMS$_{<S>}$ the future
'Digital ticket seems to be the future'

Summary and Explanation of Properties

What this study reveals is that *schijnen* and *lijken* differ in semantic properties. These differences have been shown in conditionals, factive predicates and challengability. Furthermore, these differences are found in the interaction with operators such as negation, question and tense. Finally, the elements differ in the semantic type of complements they prefer. *Schijnen* is similar in semantic properties to epistemic modals. *Lijken* on the other hand has a different behaviour than both evidentials and epistemic modals, although it encodes both evidentiality and epistemic modality as mentioned above.

It has been argued that there is no difference in contribution to propositional content between *schijnen* and *lijken*, e.g. they are both propositional operators. The reason for a different behavior in propositionality tests follows from the fact that *schijnen* is externally inscrutable whereas *lijken* is not. For *schijnen*, the speaker is always the link between the hearer and the evidence. Hence, to scrutinize *schijnen* as a hearer, one must have access to the speaker's mind. This is not the case for *lijken*. Since *lijken* indicates direct evidence, the evidence is available to both speaker and hearer. Therefore, we can conclude that the observable differences between *schijnen* and *lijken* boil down to a difference in speaker-indexicality. That is, although *lijken* also encodes evidentiality, it is

not speaker-indexical. Furthermore, we can conclude that *schijnen* differs from evidential clitics, which are characterized as illocutionary modifiers (Faller to appear).

Finally, the difference in preference for semantic type of complement also follows from a different semantics. As *lijken* indicates direct evidence, it is better compatible with [-future] complements than [+future] complements. *Schijnen* on the other hand has no preferences with respect to tense features. It rather has a preference for the aspectual feature [+stative] over [+dynamic]. This is best compatible with the meaning of *schijnen*, e.g. indirect reported evidence.

3.2.2 Syntactic Properties

Now we have seen that the differences between *schijnen* and *lijken* in semantic properties can be brought back to a difference in speaker-indexicality, it is interesting to investigate what structural differences there are to observe between *schijnen* and *lijken* and whether we can find an explanation for the differences found. To start, let's have a look at the morphosyntactic properties.

Morphosyntax

1. Morphological Form

First of all, both *schijnen* and *lijken* show subject-agreement. They inflect for person and number, just like lexical verbs in Dutch. At this point, *lijken* and *schijnen* differ from modals as modals obligatorily inflect for number, but non-obligatorily for person. For particular modals, both forms with and without inflection for person exist.[30] Furthermore, *schijnen* and *lijken* both show inflection for tense. However, as discussed in the previous section, the present-past distinction is semantically not transparent for *schijnen*. Past participle forms as for example *geschenen* or *geleken* 'seemed' only marginally occur in raising constructions[31]. Interestingly though, *lijken* shows the infinitivus pro participio (IPP) effect. The phenomenon observed in many West Germanic languages that the

[30] Note that modals which have two forms, one showing person inflection and one that does not show person inflection as in (i), differ slightly in meaning depending on whether or not person agreement is visible (http://taaladvies.net/taal/advies/vraag/442/). The inflected form indicates that the expression is directed to a particular person and the uninflected form indicates that the speech is not directed to someone in particular.

(i) ik kan, jij kan/kunt, hij kan, wij kunnen, jullie kunnen, zij kunnen
ik wil, jij wil/wilt, hij wil/wilt, wij willen, jullie willen, zij willen

[31] Note that a past participle of *lijken* is available when the complement is of type AP as in (i). But as Hirsch & Wexler (to appear) argue, these constructions are not taken to involve subject-raising.

(i) Dat had me lekker geleken
That had me nice SEEMED$_{<L>}$
'To me it seems that that would have been nice'

For *schijnen* a past participle can marginally be used for example in construction (ii). In this case, it is close in meaning to *lijken*.

(ii) Dat heeft mij raar toe geschenen.
That has me strange to SEEMED$_{<S>}$
'That appeared to me to be strange'

infinitive form occurs there where you would expect the past participle[32] (Rutten 1991, de Schutter 2000, Haegeman 1998, 2006). This is in traditional literature associated with the phenomenon of verb-clustering (Rutten 1991, Haegeman 1998, 2006, de Schutter 2000). *Schijnen* also has a non-finite form, however, this form can only be used in particular contexts as it can only be embedded under auxiliaries if it is not used speaker-indexical, which will be discussed in more detail below. In this respect, *schijnen* and *lijken* behave the same as modals, as modals show IPP as well. However, if modals appear in an IPP construction, the interpretation it gets is a root reading.

2. Complements

In section 3.2.1 we have investigated the semantic properties of the complements *schijnen* and *lijken* can take and we are yet to investigate the syntactic type of the complement. Both *schijnen* and *lijken* select a to-infinitival complement. Only a bare VP as complement gives an ungrammatical result, see examples (40a-d). In this respect *schijnen* and *lijken* differ from modals as these take bare VP complements (Stowell 2004). Although, there also exist modals which *do* take an IP complement (Stowell 2004).

(40) a. Jan lijkt te slapen
John SEEMS$_{<L>}$ to sleep
b. *Jan lijkt slapen
John SEEMS$_{<L>}$ sleep
c. Jan schijnt te slapen
John SEEMS$_{<S>}$to sleep
d. * Jan schijnt slapen
John SEEMS$_{<S>}$ sleep

However, can we conclude from the fact that the complement of *schijnen* and *lijken* contains *te* 'to', that it is an IP? It is not at all clear that 'te' is an infinitival marker and as such generated in I (Zwart 1993, 1994). First of all, 'te' is not present on all infinitives as its occurrence is ruled out in a number of contexts like in infinitival main verbs, infinitival imperatives, infinitivals used as subjects or objects, nominal infinitives, complements of modal verbs and complements of perception and causative verbs (Zwart 1993: 99). Furthermore, all infinitives end in *–en*, which might be a better candidate for infinitival marker (Zwart 1993, 1994). So what is *te* then? Zwart (1993) argues that *te* might have started out as a preposition that signals the presence of an infinitive and that it has been reduced to a clitic in Modern Dutch. This is a plausible assumption as there cannot intervene any material in between *te* and the verb, e.g. no past participles, no adverbs, no PPs as shown in (41). This is in accordance with Reuland's (2003) observation that merger of *te* must be early in order for *te* and the verb to be adjacent.

[32] IPP effect: Normally, an auxiliary selects a past participle. However, in the case that the complement of the auxiliary is headed by a verb which selects an infinitival complement, the verb selecting the infinitive (complement of aux) is itself an infinitive instead of a participle (Haegeman 1998). According to Rutten (1991), IPP is lexically encoded instead of syntactically derived.

(41) a. *Jan schijnt het boek te *gelezen* hebben
b. Jan schijnt het boek *gelezen* te hebben
c. Jan schijnt het boek te hebben *gelezen*
d. Jan schijnt het boek te (**snel*) hebben gelezen
e. Jan schijnt het boek *snel* te hebben gelezen
f. Jan schijnt het boek te (**in de bib*) hebben gelezen
g. Jan schijnt het boek *in de bib* te hebben gelezen

Another argument against the analysis of the complement of *schijnen* and *lijken* as an independent IP or CP comes from a syntactic rule, as proposed by Zwart (2004) in (42). If we consider infinitival complements to be IPs, it is not clear what the spell-out is of the highest head-position. It cannot be the verb, as the verb is too low. Another element which might fill the head-position is a complementizer. The only element that qualifies for this is *te*, however, as well as the verb, *te* is too low. Hence, IP complements would violate this syntactic rule.

(42) *Syntactic Rule for V2*: The highest head-position must be filled
(Translated from Zwart 2004: 14)

To conclude, I do not take infinitival complements with *te* to be IPs, they rather should be analyzed as VPs, just like infinitival complements without *te*. Hence, it is not the case that *schijnen* and *lijken* select for an IP in their complement. They take a VP complement instead, where *te* is cliticized to the embedded verb.

Distributional Properties

1. Restructuring

In chapter 2, verb-raising has been shown to be a diagnostic of restructuring in Dutch. We also showed that, *lijken* and *schijnen* both trigger verb-raising (Rutten 1991), (Broekhuis et al 1995), and (Haegeman 2006) and (Zwart 2001) for *schijnen*. Example (29) is here repeated in (43).

(43) a. dat Jan *het boek al* *eerder* lijkt te hebben gelezen
That John the book already before SEEMS$_{<L>}$ to have read
'That John seems to have read the book already before'
b. dat Jan *het boek al* *eerder* schijnt te hebben gelezen
That John the book already before SEEMS$_{<S>}$ to have read
'That John seems to have read the book already before'

2. Ordering restrictions

Recall from chapter 2 that restructuring is taken to be a property of functional verbs in Cinque (2000). That is, restructuring verbs are subject to rigid ordering restrictions based on the position they take in Cinque's functional hierarchy. In chapter 2 we found that whereas *schijnen* cannot be embedded under auxiliaries, *lijken* can, see example (30) repeated here in (44-45). But, regarding our semantic analysis in the previous section, which has shown that *schijnen* cannot occur under past tense if it is speaker-indexical, the fact that *schijnen* cannot be embedded under auxiliaries, is not unexpected. The only way

for *schijnen* to escape from the ban to scope under past tense for *schijnen* is not being used speaker-indexically. And, what we find in Google is that if *schijnen* is not indexed to the speaker's here and now, it is acceptable to embed *schijnen* under an auxiliary, see (46).

(44) * Het postmodernisme *heeft* de grond onder de wetenschappelijke traditie
the postmodernism has the ground under the scientific tradition
schijnen te willen wegvagen
SEEM<S> to want away-sweep
'it seems as if postmodernism has tried to demolish the foundations of the scientific tradition.'
(Haegeman 2006: 497)

(45) Het postmodernisme *heeft* de grond onder de wetenschappelijke traditie
the postmodernism has the ground under the scientific tradition
lijken te willen wegvagen
SEEM<L> to want away-sweep
'it seems as if postmodernism has tried to demolish the foundations of the scientific tradition.'
(Haegeman 2006: 497)

(46) Hoewel de partijleiding hem van dat laatste nog *heeft*
Although the party leadership him of that last still has
schijnen te weerhouden trad Willem Aantjes de volgende dag af
SEEM<S> to restrain resigned Willem Aantjes the next day
'Although the party leaders seemed to restrain him thereof, Willem Aantjes resigned the next day'

Also in chapter 2 we found that *schijnen* cannot be embedded under modals, whereas *lijken* can as shown in example (31) repeated here in (47-48) and example (49-50) for modal *moeten* 'must'. The only modal I found under which *schijnen* can be embedded is *zou* 'would be' as in (51).

(47) * Hij *kan* soms erg aardig *schijnen*, maar dan opeens wordt hij
He can sometimes very nice SEEM<S> but then suddenly becomes he
afstandelijk.
distant
'At times he may seem very nice, but then all of a sudden he becomes distant.'
(Haegeman 2006: 497)

(48) Hij *kan* soms erg aardig *lijken*, maar dan opeens wordt hij
He can sometimes very nice SEEM<L> but then suddenly becomes he
afstandelijk
distant
'At times he may seem very nice, but then all of a sudden he becomes distant.'
(Haegeman 2006: 497)

(49) Naar buiten *moet* er een eenheid *lijken* te zijn tussen de bedrijven
To outside must there a unity SEEM<L> to be between the businesses
van opdrachtgever en opdrachtnemer
of client and accepter
'For the outside, it should appear to be the case that there is a unity between the businesses of clients and accepters'

(50) * Naar buiten *moet* er een eenheid *schijnen* te zijn tussen de bedrijven van opdrachtgever en opdrachtnemer

(51) Jack's vrouw *zou* rijk *schijnen* te zijn
Jacks's wife would rich SEEM<S> to be
'Jack's wife would seem to be rich'

These ordering restrictions on *schijnen* would lead in a Cinquean framework to the conclusion that *schijnen* is inserted very high in the hierarchy[33], in $Mood_{evidential}$ as discussed in chapter 2. Now we can try to derive the distributional properties of *schijnen* with respect to modals from its semantic properties and it seems as if such an analysis works. *Schijnen* means that in the current belief set of the speaker there exists a report about a proposition; it is restricted to the speakers here and now. As such, *schijnen* is incompatible with modal operators, as they "enable speakers to talk about affairs *beyond* the actual here and now" (von Fintel 2006: 1, my italics). The accessibility relation for *schijnen* gives only worlds to evaluate in which a report about p exists. This implies that necessary and possibly *schijnen* are always true, since it is always the case that in all accessible worlds there is a report and hence it is always true that there is at least one world in which there is a report. But, because *schijnen* is speaker-indexical, one cannot reason about possible worlds in which there would *not* be a report. Therefore, it does not make sense to embed *schijnen* under a modal operator. In the case that *schijnen* is not indexed to the speaker, the speaker is allowed to reason about possible worlds, different from the actual world. This is the effect of modal *zou* in (51). In sentence (51) it is not the case that the speaker has heard p, but it is the case that there is an accessible world in which somebody else has heard p. Importantly, in this case there are also worlds to imagine in which there does not exist a report about p.

To conclude, both *schijnen* and *lijken* trigger restructuring, which follows from the observed verb-raising pattern in embedded sentences. *Schijnen* and *lijken* differ with respect to distributional restrictions. Where *lijken* can be embedded under modals and auxiliaries, this is not possible for *schijnen*. We have claimed that the distributional properties of *schijnen* can be derived from the fact that it is speaker-indexical. *Schijnen* resembles epistemic modals which cannot be embedded under auxiliaries and modals either. If a modal is embedded under a modal or auxiliary, it always receives a root reading (Eide 2005).

[33] Note that this means that *zou* is inserted even higher in the hierarchy. At this point I do not have a description of the semantics of *zou* that would match a particular functional head.

Argument Structure

Functional and lexical elements differ from each other in their argument structure. That is, Cinque (2000) proposes that functional heads, as opposed to lexical heads, do not assign θ-roles to their arguments and hence all functional verbs are raising verbs. This section will study the thematic relation between *schijnen* and *lijken* and arguments.

1. External Argument

In previous sections, we have already mentioned a couple of times that *schijnen* and *lijken* are raising-verbs, which implies that they do not have an external argument. However, let's find out on the basis of what data this conclusion has been made. One diagnostic is the possibility to passivize the verb. If a passive can be formed, an external argument is present (Wurmbrand 2004). Applying the passives test to *schijnen* and *lijken* shows that netiher of these verbs can be passivized[34] and hence lack an external argument (52a-d & 53a-d).

(52) a. Jan lijkt de auto te repareren
John SEEMS$_{<L>}$ the car to fix
'John seems to fix the car'

b. *De auto wordt geleken/lijken te repareren
The car is SEEMED$_{<L>}$ / SEEM$_{<L>}$ to fix

c. *dat er wordt geleken/lijken de auto te repareren
that there is SEEMED$_{<L>}$ / SEEM$_{<L>}$ the car to fix

d. *de auto wordt geleken/lijken gerepareerd te worden
the car is SEEMED$_{<L>}$ / SEEM$_{<L>}$ fixed to be

(53) a. Jan schijnt de auto te repareren
John SEEMS$_{<S>}$ the car to fix
'John seems to fix the car'

b. *De auto wordt geschenen/schijnen te repareren
The car is SEEMED$_{<S>}$ / SEEM$_{<S>}$ to fix

c. *dat er wordt geschenen/schijnen de auto te repareren
that there is SEEMED$_{<S>}$ / SEEM$_{<S>}$ the car to fix

d. *de auto wordt geschenen/schijnen gerepareerd te worden
the car is SEEMED$_{<S>}$ / SEEM$_{<S>}$ fixed to be

Another test to see whether or not a verb assigns a θ-role to its external argument is the possibility of non-thematic subjects (Wurmbrand 2004). Verbs without external argument should allow weather-*it* in their subject position (Wurmbrand 2004). This is true for *schijnen* and *lijken*, shown in examples (54-55).

(54) Het lijkt te gaan regenen morgen
It SEEMS$_{<L>}$ to go rain tomorrow
'It seems to be going to rain tomorrow'

[34] This is in accordance with Rutten's (1991) observation that all long passives are ungrammatical in Dutch.

(55) Het schijnt te gaan regenen morgen
It SEEMS<S> to go rain tomorrow
'It seems to be going to rain tomorrow'

2. Internal Argument
If a verb does not assign a θ-role to its external argument, this does not say that the verb completely lacks argument structure. Hence, we want to check whether *schijnen* and *lijken* are able to assign a θ-role to an internal argument. As already observed in Haegeman (2006), *lijken* is compatible with a dative argument[35], whereas *schijnen* is not as is clear from the contrast between (56a) and (57). However, it should be noted that the use of an experiencer argument with *lijken* is rather restricted. The experiencer cannot be a full DP as in (56b).

(56) a. Jan lijkt *mij* een aardige jongen te zijn
John SEEMS<L> to-me a nice boy to be
'John seems to me to be a nice boy'
b. *Jan lijkt de buurvrouw een aardige jongen te zijn
John SEEMS<L> to-the neighbor a nice boy to be
'John seems to the neighbor to be a nice boy'

(57) *Jan schijnt *mij* een aardige jongen te zijn
John SEEMS<S> to-me a nice boy to be

In sum, both *schijnen* and *lijken* have a defective argument structure. They both lack the ability to assign a θ-role to their external argument. Interestingly, *schijnen* seems to be even more defective than *lijken* as it not only lacks an external argument, but also lacks an internal argument. *Lijken* in itself is more defective than English *seem* in that it only allows pronouns as a dative argument. *Schijnen* has no argument structure, which is also true for modals if we follow Wurmbrand (1999), (2001) and Cinque (2000).

Summary and Explanation of Properties
On the basis of morphosyntactic properties, distributional restrictions and argument structure of *schijnen* and *lijken* we can conclude that *schijnen* has more in common with functional heads and *lijken* is more similar to lexical verbs. That is, although *lijken* is already more defective than a lexical verb, *schijnen* is even more defective as a verb.

3.2.3 Syntactic and Semantic Properties: a Summary

The study of semantic properties of *schijnen* and *lijken* has shown that there is one main difference to observe between *schijnen* and *lijken* and that is that *schijnen* is indexed to the speaker and as such externally inscrutable. As a consequence, *schijnen* behaves differently from *lijken* in particular contexts and in its interaction with operators. At this point *schijnen* resembles epistemic modals. On the syntactic side, it has been shown that

[35] As has already been noted before; if *lijken* (SEEM<L>) is used with an experiencer, the interpretation is different. *Lijken* with an experiencer receives an inferential reading.

schijnen differs from *lijken* in distributional properties and argument structure. A comparison with epistemic modals reveals that *schijnen* is similar to these elements in speaker-indexicality as well as argument structure. All syntactic and semantic properties of *lijken*, *schijnen* and modals can be found summarized in table 1.

	Root Modals	Epistemic Modals	Schijnen	Lijken	Lexical V
External Argument[36]	-	-	-	-	+
Internal Argument	-	-	-	+	+
Restructuring[37]	+	+	+	+	-
Inflection person	+/-	+/-	+	+	+
Complement (syntax)	VP	VP	VP	VP	CP
Transparent pres-past	+	-	-	+	+
Infinitive form	+	-	+/-	+	+
Speaker-indexical	-	+	+	-	-
Embedding aux	+	-	-	+	+
Embedding modals	+	-	-	+	+
Embedding operators	+	-	-	+	+
Complement (semantics)	+dynamic	+stative	+stative	-future	both

Table 1: properties of verbal elements

If we look at the summary of properties, it is observable that *schijnen* has more in common with epistemic modals than it has with *lijken*. *Lijken* can only be distinguished from lexical verbs in that it lacks an external argument, triggers restructuring and takes a VP as its complement. In this respect, *lijken* resembles both *schijnen* and modals. However, modals and *schijnen* are also unable to assign a θ-role to an internal argument. Now if we have a look at the properties below 'complement (syntax)', it is noticeable that *schijnen* and epistemic modals form a group as opposed to *lijken* and root modals. Our study has revealed that it is one property which is responsible for this range of differences in behavior and that is speaker-indexicality. Speaker-indexicality poses restrictions on interaction with operators, embedding under modals and auxiliaries and is also the reason for a lack of a transparent present-past distinction.

On the basis of these results, I will make a proposal about the syntactic structure of both *schijnen* and *lijken*. The analysis attempts to connect the observed properties. However, the analysis will integrate this data with data from an acquisition experiment. The next section will discuss the experiment on acquisition of *schijnen* and *lijken*. Two questions will be addressed in the experiment as discussed in section 3.1. The first addresses the question whether we can find evidence for UPR in Dutch, the other question regards whether or not *schijnen* and *lijken* show similar acquisition patterns. We will study the data in light of Wexler's Universal Phase Requirement, which predicts that if verbs

[36] There is a debate on the issue whether or not root modals assign a θ-role to their external argument. I follow Pullum & Wilson (1977), Wurmbrand (1999), (2001) and Cinque (2000) and assume that root modals do not have an external argument.

[37] There do exist lexical verbs which trigger restructuring such as *horen* 'to hear', *zien* 'to see', *staan* 'to stand'. However, overall lexical verbs do not allow restructuring.

project a defective vP phase and raise a subject out of the complement of this phase, they are problematic for children up till the age of seven.

3.3 An Acquisition Experiment

3.3.1 Introduction and Predictions

In this section, I will present an experiment that will provide insight into the research questions as stated in section 3.1. We have claimed in section 3.1 that our experiment will serve two goals. It will test UPR on the basis of a study on acquisition of *lijken*. As discussed in chapter 2, constructions with a defective phase are acquired extremely late by children (Wexler 2004), (Hirsch & Wexler to appear), (Babyonyshev et.al. 2001). The explanation given is that children treat a defective phase as if it is complete as stated in UPR, here repeated in (58). Children obey UPR as their brain is not developed as such that it can support defective phases. Therefore, we should find universally the same acquisition pattern for constructions which require an element to be extracted out of a defective phase. Our analysis of *lijken* so far has led to the hypothesis that *lijken* is a lexical verb and thus projects a defective vP. Hence, our prediction is that *lijken* will only be acquired around the age of seven.

(58) *Universal Phase Requirement (UPR)*
(holds of children, until around age 7)
v defines a phase whether v is defective or not
(Hirsch & Wexler to appear: 2)

The other goal of this experiment is to shed more light on the issue of what the syntactic structure of functional verbs is. Recall from the previous sections that there is no consensus on the question whether or not *schijnen* projects a defective vP. If we follow Cinque, which is the analysis that accounts best for the properties of *schijnen*, we hypothesize that *schijnen* is inserted in a functional projection and does not project a vP. However, in a bare phrase structure account it is an open question what functional verbs syntactically look like. Therefore, we will specify our predictions with respect to different analyses of *schijnen*. In this way, an acquisition experiment will provide support for either one of the two analyses. Let's state our predictions for *schijnen*. If *schijnen does* constitute a defective phase the pattern of acquisition for *schijnen* and *lijken* will be similar based on their syntactic structure. If *schijnen* does *not* constitute a defective phase on the other hand, acquisition of *schijnen* should come in earlier than of *lijken*. Important to bear in mind is that *schijnen* is argued to be conceptually complex as it requires one to reason about the source of information (Papafragou et al. 2007). In this way it resembles epistemic modality which requires one to "reflect on the content of one's own beliefs, to take into account the reliability of those beliefs" (Papafragou 1998: 383). Papafragou (1998) argues that development of epistemic modals as such is linked to development of theory of mind. On the other hand, recent results show that children of already 3 years of age can reason about the source of information someone else has as well as remember their own source of information (Papafragou et al. 2007). Furthermore, Korean children

of age 2 have been shown to be successful in producing evidential markers (Papafragou & Li 2001), (Papafragou et al. 2007), which means that mapping of the concept to the linguistic marker does not seem to pose problems either (Papafragou et al. 2007). Therefore, we do not expect the conceptual complexity of *schijnen* to pose difficulties in comprehension of *schijnen* in the age range we aim at which is 5-9 year-olds. Finally, this experiment will test UPR on the basis of our investigation of acquisition of *lijken*. A comparison of results on *lijken* with findings for *schijnen* will help us to define our syntactic theory of functional verbs.

So, how do we investigate children's comprehension of constructions with *schijnen* and *lijken*? Dutch raising-verbs are not compatible with a full NP as experiencer argument as has been shown in chapter 2. Recall from chapter 2 that this experiencer argument was used in the experiment by Hirsch & Wexler (to appear) to create sentences that could be ambiguous for children, as discussed in section 2. Regrettably, due to the impossibility of an experiencer in Dutch, a replication of this experiment is not possible. The set-up used in Becker (2005) and adapted by Hirsch et al. (in prep.b) in which they used sentences without experiencer, as discussed in chapter 2, *is* suitable to test comprehension of *lijken*. This experiment used pictures to make a distinction between what *is* the case and what *appears* to be the case. However, replicating this experiment poses the problem that we would need to use a completely different design to test *schijnen*. Within the context as set up in the Becker-experiment, it would be pragmatically anomalous to use *schijnen*. As we want to make a comparison of acquisition patterns of *schijnen* and *lijken*, this is not favourable. The set-up to test both *schijnen* and *lijken* should be as similar as possible. In the current experiment, the test items differ only with respect to the raising-verb used and are as such minimal pairs. The set-ups slightly differ to make sure that the context created is a natural context to use *schijnen* or *lijken*. To conclude, we have created a design in which *schijnen* and *lijken* can be compared as optimally as possible. To avoid confusion for the child, it has been decided to test the different raising-verbs with different groups of children. Now we do not have to change the set-up of the experiment during the experiment and even more, we do not give away what our interest is, e.g. our test items.

3.3.2 Experiment

3.3.2.1 Procedure: *schijnen*

The task used in the *schijnen* experiment is a truth-value judgement task in which the child's task is to judge whether a statement matches a picture or not, resulting in data consisting of yes/no responses. How do we create a context in which it is natural to use *schijnen* combined with looking at a picture? As we saw in chapter 2, *schijnen* is an evidential indicating indirect reported evidence (e.g. the proposition made has been reported to the speaker). It is not appropriate to utter *schijnen* in a context where the speaker can directly observe what is going on. Therefore we introduced a hand puppet, Mister Wolf, who is not able to observe what is in the picture as he is blindfolded. The experimenter made sure that the child understood that Mister Wolf was blindfolded and as such unable to see what was in the picture. Furthermore, a second character was

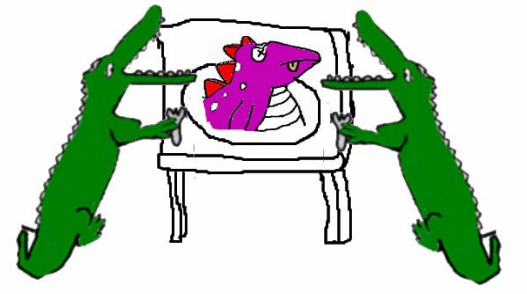
introduced; Bear, who is also unable to observe what is in the picture as he finds himself behind the laptop. The child and the experimenter are seated in front of a laptop, looking at pictures shown on the computer screen. The experimenter controlled the hand puppet, using a different voice.

The pictures used always show transitive actions with one character acting as object and multiple characters acting as a subject, or the other way around, see for example picture (1) in which two crocodiles are eating a dinosaur. The experimenter and the child report to Mister Wolf what is shown in the picture. After listening to the child and the experimenter, Mister Wolf will report to Bear what is happening in the picture according to him. Doing this Mister Wolf will use a sentence with *schijnen*, see example 1. However, as Mister Wolf is not the best listener, it is possible that he makes a mistake. That Mister Wolf has listening problems is made clear to the child. The child's task is to decide whether what Mister Wolf said is true or false, with the report of the experimenter and child always being truthful. The child was only allowed to give an answer after hearing the report twice. It was also explained to the child that Mister Wolf especially made mistakes in reporting who is the subject and who is the object. That is, the child was told during the warm-up session, while looking at picture 1 for example, that Mister Wolf would sometimes mistakenly say that the dinosaur is eating the crocodiles instead of the other way around. The reason to explain this is to make sure that the child is paying attention to subject-object reversal instead of the selection of the right verb. The child's response is coded on an answer sheet by the experimenter, see appendix 1. The child is tested in a single session of about 15 minutes. The experimental sentences were preceded by eight warm-up items in order to familiarize the child with the task and the pictures used. Six out of eight warm-up items consisted of OVS structures (none of them with the target word *schijnen*). The idea is for the child to get used to OVS structures (which will be used in the current experiment as explained below). After having finished the experiment, the child was rewarded with a sticker.

Example (1)

Experimenter and child:
Mister Wolf listen what's happening, we see crocodiles and the crocodiles are eating a dinosaur!
Mister Wolf to Bear:
Bear, listen to me:

De krokodillen schijnen de dinosaurus op te eten
The crocodiles SEEM$_{<S>}$ the dinosaur to eat
'The crodcodiles seem to be eating the dinosaur'



Picture 1

However, if this would be the complete experiment, we might find the result that the child perfectly understands raising sentences in Dutch as the child might derive the right answer by simply ignoring *schijnen*. Ignoring the raising-verb leaves the child with the ungrammatical string:

> *De krokodillen de dinosaurus op te eten*
> The crocodiles the dinosaur to eat

Now what the child could do is apply a default strategy which says that the first NP is the subject and the second NP is the object, as this is the case in most sentences the child hears. Hence, if the child would show an adult-like comprehension of those sentences, this does not provide conclusive support for the claim that the child really *understands* these sentences. It rather says that the child's default strategy leads her to the correct answer. Therefore, apart from the SVO raising sentences, we wanted to include sentences in which the default strategy NP-subject < NP-object will not give the child the right result. And fortunately, Dutch is exactly the right language to change the default order SVO. Since Dutch is a V2 language, we can create contexts in which the object is moved to the first position of the sentence, creating the order OVS[38]. However, moving the object to first position does not sound natural in the context set up for SVO sentences. Therefore, pictures have been added in which the context is such that OVS does sound natural. This has been achieved by creating pictures in which two different actions are shown at the same time, with two different objects as in picture (2). Now we can make a contrast between pointing at a monkey and eating a crocodile. This contrast is supported by stressing the object and verb for both actions. A pilot study with adults revealed that OVS sentences in this context still sound odd, unless the second subject is replaced by the pronoun as in example 2 where 'the dinosaurs' is replaced by 'they'.

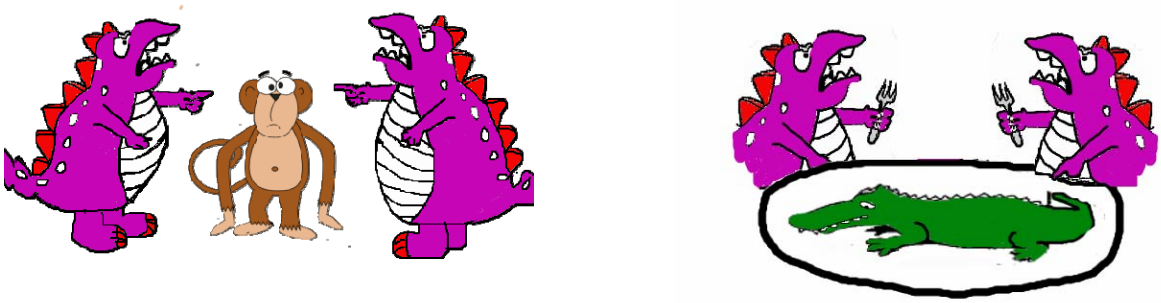
Example picture 2:

Experimenter and child:
Listen Mister Wolf, we see dinosaurs and first they are pointing at a monkey and then they are eating a crocodile.

Mister Wolf to Bear:
You know what I've heard?!

> *De ááp schijnen de dinosaurussen aan te wijzen en de krokodíl schijnen ze op te eten*
> The monkey SEEM$_{<S>}$ the dinosaurs to point at and the crocodile SEEM$_{<S>}$ they to eat
> 'The dinosaurs seem to be pointing at the monkey and they seem to be eating the crocodile'

[38] Yang (1999) claims that acquisition of V2 is relatively late; around age 3. However, although this is relatively late compared to the acquisition of other grammar components, it is still before the relevant age in this experiment.



Picture 2

If the child would ignore *schijnen* this time (as she is not able to parse it), the child is left with the ungrammatical string:

> *De aap de dinosaurussen aan te wijzen en de krokodil ze op te eten*
> The monkey the dinosaurs to point at and the crocodile the dinosaurs to eat

Applying a default strategy NP-subject < NP-object will yield the wrong result. In this case, the answer to the question whether what Mister Wolf said is true or false, is 'false' for the child ignoring *schijnen*, although it is true for adults. This means that we would predict below-chance performance on OVS items if they cannot parse *schijnen* but above-chance performance if they *can* parse *schijnen*. However, we are not sure what strategy the child would follow if she is not able to parse the construction. Previous research as discussed in chapter 2 does not give a clear answer on this issue either. In Hirsch et al. (in prep.b), children might have replaced *seem to be* with *is*. In the experiment of Hirsch & Wexler (to appear), children probably analyzed *seem* as if it were *think*, since they prefer the Double Reversal foil (where both the character who is doing the thinking as well as the character performing the action have been switched for a sentence as *John seems to Mary to be wearing a hat*) over the correct picture, resulting in a below-chance score on these items. However, this could be a result of the pictures shown, as these pictures indicate *seem* with thought-bubbles. In chapter 2 we also found that in the experiment by Hirsch et. al. (in prep.b), which was an acted-out truth value judgement task, children differ in performance. Some children seemed to analyze the raising-verb as *think*, resulting in below-chance performance, although other children performed adult-like on the same constructions, which has been claimed to be due to the fact that they ignored the verb and interpreted the sentence as a copular construction (Hirsch & Wexler to appear). Let's reason about what the child would answer if she replaces the raising-verb with something else instead of ignoring it. If the child analyzes *schijnen* as if it were *think*, it is unclear how the child would respond. The string the child is left with in example 2 is:

De aap denken de dinosaurussen aan te wijzen en de krokodil denken ze op te eten
The monkey think the dinosaurs to point at and the crocodile think they to eat

This seems to be a very confusing string, given the picture, and we therefore would predict chance performance, showing confusion of the child.

If the child replaces *schijnen* with a form of 'to be', the sentence the child has to parse in example 2 is the following:

De aap zijn de dinosaurussen aan te wijzen en de krokodil zijn ze op te eten
The monkey are the dinosaurs to point at and the crocodile are they to eat

Also in this case it is unclear what the child's response would be. The string left is ungrammatical as the action verbs *aanwijzen* 'point to' and *opeten* 'eat' are infinitive, whereas the verbs should be in the progressive form. The child could either guess what the correct answer is, resulting in chance-performance, or the child could apply the default strategy, resulting in below-chance performance. Note that I assume that the child recognizes subject agreement on *schijnen*, just as the English child recognized past tense morphology on the verb in Experiment 2 of Becker (2005) as claimed by Hirsch & Wexler (to appear). However, this would also mean that the child could rely on subject-agreement only to determine which argument is the subject and which is the object. Therefore, if the child performs above-chance, it is important to compare results on performance on *schijnen* with results on *lijken* for which the prediction is that children do not perform above-chance. This is to rule out agreement as a clue to derive the correct answer.

3.3.2.2 Items

The experimental conditions for this task are both the SVO raised structures as well as the OVS raised structure as in (59) and (60). However, as we do not expect to learn much from SVO raised structures, we included only 3 items.

(59) De krokodillen schijnen de dinosaurus op te eten
The crocodiles SEEM<S> the dinosaur to eat
´The crocodiles seem to eat the dinosaur´

(60) De dinosáurus schijnen de krokodillen op te eten en de
The dinosaur SEEM<S> the corcodiles to eat and the
áap schijnen ze aan te wijzen
monkey SEEM<S> they to point at
´The crocodiles seem to eat the dinosaur and to point at the monkey´

Performance on raised OVS structures should also be compared to non-raising OVS structures as in (61). This is to make sure that the children are able to understand object topicalized structures.

(61) De dinosáurus zijn de krokodillen aan het opeten en de
The dinosaur are the crocodiles eat+progressive and the
áap zijn ze aan het aanwijzen
monkey are they pointing at
'The crocodiles are eating the dinosaur and pointing at the monkey'

For all three conditions, there are pictures that match the experimental sentence and pictures that do not match the sentence. The mismatch condition consists of pictures in which the subject and the object are reversed[39]. That is if picture 3 is shown, the experimental sentence is as in (62).

Picture 3

(62) De hónd schijnen de katten te bekijken en de ézel schijnen ze te schoppen
The dog SEEM$_{<S>}$ the cats to watch and the donkey seem they to kick
'The cats seem to watch the dog and kick the donkey'

This amounts in a total of six conditions. The SVO raised structure match condition consists of one item and the mismatch condition of two items. For both OVS raised and OVS non-raising sentences, there are three match and three mismatch items. This results in a total amount of 15 items. The verbs used for each condition involve a transitive action. The verbs selected are *opeten* 'to eat', *bekijken* 'to watch', *redden* 'to save', *schilderen* 'to paint', *wassen* 'to wash', *beschieten* 'to shoot', *stompen* 'to punch', *schoppen* 'to kick', *optillen* 'to lift', *aanwijzen* 'to point at', *likken* 'to lick', *achterna zitten* 'to chase', and *begroeten* 'to greet'.

The fillers used are constructions of the type ´I have heard that p' as in (63). There will also be 6 filler items, of which two sentences are true and four are false. Hence the complete experiment consists of 21 test sentences, preceded by eight warm-up items.

[39] What is observable from these examples is that one might be able to recognize that all sentences that require a 'yes' response are sentences in which the character or characters that are shown in both pictures are the subject and the sentences that require a 'no' response are sentences in which the character or characters that are shown in both pictures are the object. However, none of the eight adult respondents was able to discover this strategy and we therefore concluded that this would not be observed by children either.

(63) Ik heb gehoord dat de krokodillen de dinosaurus aan het opeten zijn
I have heard that the crocodiles the dinosaur +prog eating are
'I've heard that the crocodiles are eating the dinosaur´

The coloured pictures used in the experiment are partially taken and adapted from the picture set created by Hirsch & Piantadosi and used in Hirsch et al. (in progress). Additional pictures in the same style have been created. The characters in each picture were animals to make sure that subject and object for the transitive actions were reversible.

3.3.2.3 Procedure: lijken

The task used in the *lijken*-experiment is the same truth-value judgement task as used for *schijnen*. However, now we have to create a context in which it is natural to use *lijken*. Previous sections have pointed out that *lijken* indicates direct but unclear evidence (e.g. the speaker can see what's happening, but not very clearly). Therefore, we introduced a hand puppet (Mister Wolf), who has unclear vision. In this experiment the hand puppet is wearing sunglasses and the child is told that he has to wear them according to the docter, because his eyes hurt, but now he cannot see very well. The hand puppet is controlled by the experimenter in front of the computer screen. The pictures shown on the screen are the exact same pictures as in the *schijnen*-experiment. Also the sentences used are the same, only *schijnen* is substituted with *lijken*. The experimenter and the child help the hand puppet by already revealing which characters and which action the picture is showing. This is to make sure that the child will not reject the experimental sentence on the basis of the verb or nouns used. Then, the hand puppet will say what's happening in the picture, using a sentence with *lijken*, see example 3. The child is explicitly told that the hand puppet sometimes makes mistakes, because of his unclear vision. Even more, as in the *schijnen*-experiment the child is told that the mistakes the hand puppet sometimes makes is that he mixes up who is the one who is doing the action. The child's task is to decide whether what the hand puppet said is true or false. The child's response is again coded on an answer sheet by the experimenter, see appendix 2. The child is tested in a single session of about 15 minutes. The experimental sentences are preceded by the same eight warm-up items as in the *schijnen* experiment in order to familiarize the child with the task and the pictures used and OVS structures.

Example 3

Experimenter and child:
Well Mister Wolf, let's help you with this picture. We see a cat and we see dogs, and it is about watching.

Mister Wolf:
Mmmm, let's see, a cat and dogs. Yes, I can see what's happening:

De kat lijkt de honden te bekijken
The cat SEEMS$_{<L>}$ the dogs to watch
'The cat seems to watch the dogs'

Picture 4

Again we do not only want to include SVO sentences as they might enable the child to derive the right answer by applying the default strategy NP-subject < NP-object, while ignoring *lijken*. Therefore, we also included OVS raised sentences. In these sentences, the default strategy will not give the child the right answer.

Example 4:

Experimenter and child:
Well Mister Wolf, let's help you with this. We see a dog and we see cats, and first, it is about watching, then we see the cats and a donkey and this is about kicking.

Mister Wolf:
Mmmmm, let's see, difficult, what do I see:

> *De muizen lijkt de kat achterna te zitten en de honden lijkt ie te bekijken*[40]
> The mice SEEM$_{<L>}$ the cat to chase and the dogs SEEM$_{<S>}$ he to watch
> 'The cat seems to be chasing the mice and the cat seems to be watching the dogs'

Picture 5

[40] Note that in contrast to sentences in which the subject is plural, in this sentence 'case' might provide a clue to give the right answer. A singular subject is replaced by *ie* the weak version of pronoun 'he' bearing nominative case. However, it is also possible in Dutch to replace the object by the demonstrative *die* 'that' as in sentence (i). There is no difference in sound between *lijkt die* or *schijnt die* and *lijkt ie* or *schijnt ie*. Therefore, the strength of this clue is not considered to be very important.

(i) Hij eet die op
He eats that up
'He is eating that'

The strategies the child might apply to circumvent analysis of *lijken* are the same as for *schijnen*. This means that either the child could ignore *lijken*, resulting in a below-chance performance on OVS. The child could also substitute it with a form of 'to be' or 'think', resulting in chance performance as it is unclear what the string that is left would mean.

3.3.2.4 Items: *lijken*

For this experiment the same conditions and items are used as for the *schijnen* experiment to be able to make a comparison. This means that the conditions involved in this case too are raised SVO and OVS structures as in (64) and (65) respectively.

(64) De dinosaurussen lijken de krokodil op te eten
The dinosaurs SEEM$_{<L>}$ the crocodile to eat
´The dinosaurs seem to be eating the crocodile´

(65) De krokodíl lijken de dinosaurussen óp te eten en de ááp
The dinosaur SEEM$_{<L>}$ the dinosaurs to eat and the monkey
lijken ze áán te wijzen
SEEM$_{<L>}$ they to point at
´The dinosaurs seem be eating the crocodile and pointing at the monkey´

Again the condition non-raised OVS as in (66) is included.

(66) De krokodil zijn de dinosaurussen aan het opeten en de
The crocodile are the dinosaurs eating and the
aap zijn ze aan het aanwijzen
monkey are they pointing at
'The dinosaurs are eating the crocodile and pointing at the monkey´

This experiment makes use of the same pictures and same items per condition which means that there are two items in the mismatch condition of SVO raised and one in the match condition. For OVS raised and OVS non-raising there are three pictures that match the sentence and three pictures that do not match the experimental sentence. The test will be filled up with sentences of the type 'I think that the crocodiles are eating the dinosaur' as in (67) to a total of 21 test sentences.

(67) Ik denk dat de dinosaurussen de krokodil opeten
I think that the dinosaurs the crocodile eats
'I think that the dinosaurs are eating the crocodile´

3.3.2.5 Participants

For both experiments, children in the age range of 5;0 – 9;0 years old are recruited as this is the age range in which defective phases are acquired according to UPR. The children participating are recruited from two schools around Utrecht. The children have a normal IQ, no behavioural problems, no known neurological disorders and are native speakers of

Dutch according to teacher's judgements. For one school, we tested comprehension of *schijnen* and for the other school *lijken* was tested. For the *lijken*-group, twelve children for the age groups 5;0- 6;0, 7;0-8;0 and 8;0-9;0 were tested and thirteen in the range 6;0-7;0. For the *schijnen*-group, ten children in the age group 5;0-6;0 and 8;0-9;0 were tested, twelve children in the age range 6;0-7;0 and eleven in the range 7;0-8;0 were tested, due to the fact that this was the total amount of children available at the school. This results in a total amount of 91 children, see participant details in Tables 2 and 3. One child from the *lijken*-group in the age range 6;0-7;0 was excluded from analysis as this child only responded with 'yes'. Additionally, a control group of 8 Dutch adults was recruited. Four of them were tested on comprehension of *schijnen* and four on comprehension of *lijken* in the same way as Dutch children were tested.

Group	Number	Age Range	Mean Age
5 year-olds	12	5.17-5.92	5,69
6 year-olds	12	6.08-6.92	6,56
7 year-olds	12	7.00-7.92	7,51
8 year-olds	12	8.08-8.92	8,65
Total	**48**	**5.17-8.92**	7,10

Table 2: Participants *lijken*

Group	Number	Age Range	Mean Age
5 year-olds	10	5.00-5.83	5,34
6 year-olds	12	6.00-6.92	6,5
7 year-olds	11	7.17-7.92	7,48
8 year-olds	10	8.17-8.92	8,66
Total	**43**	**5.00-8.92**	7,0

Table 3: Participants *schijnen*

3.3.3 Results

Tables 4 and 5 show the percentages of correct answers (the score) for each age group on the experimental conditions OVS-schijnen and lijken match (YES-schijnen & YES-lijken resp.), OVS-schijnen and lijken mismatch (NO-schijnen & NO-lijken resp., this condition is called NO-raising), OVS-non-raising match (YES-control), OVS-non-raising mismatch (NO-control), SVO-schijnen and lijken match (YES-SVO) and SVO-schijnen and lijken mismatch (NO-SVO). These results, except for results on SVO-conditions, are represented graphically in figures 1 and 2. In addition, performance of Dutch adults is scored in tables 4 and 5. As we can see, control adults scored at ceiling on all conditions.

Age Group	NO-schijnen	NO-control	YES-schijnen	YES-control	NO-SVO	YES-SVO
5 year-olds (1)	13%	63%	60%	83%	88%	100%
6 year-olds (2)	28%	72%	72%	86%	96%	100%
7 year-olds (3)	36%	58%	70%	94%	100%	100%
8 year-olds (4)	60%	90%	67%	80%	100%	100%
Total	**34%**	**71%**	**67%**	**86%**	**95%**	**100%**
Control adults	92%	92%	92%	100%	100%	100%

Table 4: Percentage correct answers on test and control conditions per age group for the schijnen-experiment

Age Group	NO-lijken	NO-control	YES-lijken	YES-control	NO-SVO	YES-SVO
5 year-olds (1)	22%	56%	50%	94%	100%	100%
6 year-olds (2)	14%	69%	78%	83%	92%	96%
7 year-olds (3)	47%	69%	69%	86%	100%	100%
8 year-olds (4)	78%	83%	86%	94%	100%	100%
Total	**40%**	**69%**	**71%**	**90%**	**98%**	**98%**
Control adults	83%	100%	100%	92%	100%	100%

Table 5: Percentage of correct answers on test and control conditions per age group for the lijken-experiment

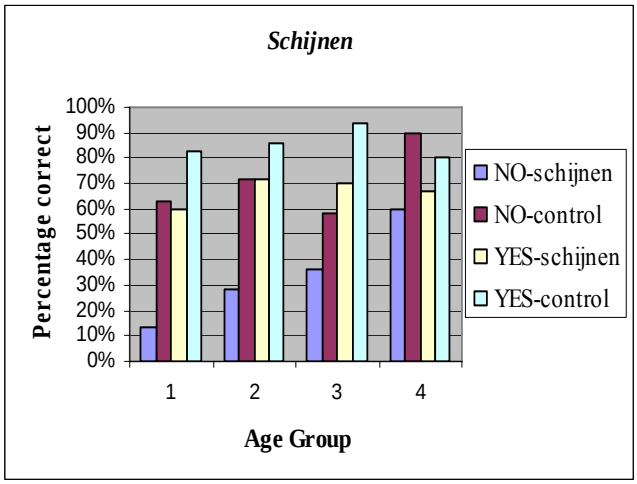


Figure 1: Comprehension of schijnen

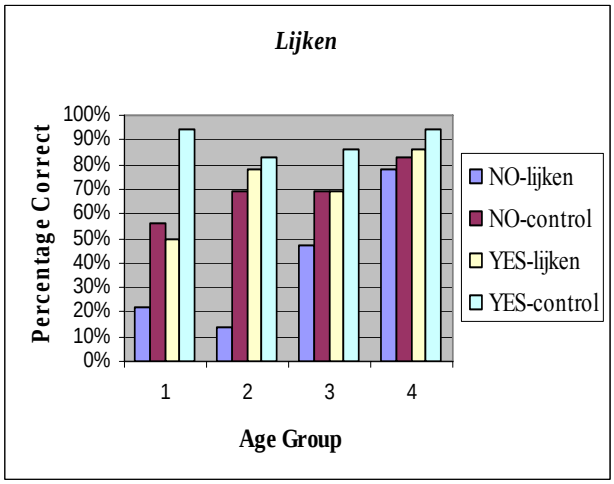


Figure 2: Comprehension of lijken

The first noticeable observation in tables 4 and 5 is that all age groups perform at-ceiling on the conditions YES and NO-SVO, for both *schijnen* and *lijken*. This stresses the importance to include OVS sentences as results on only SVO conditions would have led to the impression that Dutch children perform adult-like on subject-raising sentences. However, the children could have ignored the raising-verb and relied on a default strategy of taking the first NP to be the subject and the second NP to be the object. Therefore, we do not take these results to be informative. Furthermore, scores on YES-raising are higher than scores on NO-raising for 5,6 and 7 year-olds which is due to a yes-bias; that is, people tend to respond with 'yes' if the test sentence is difficult to understand or when

they are confused (Crain et al. 1996). I therefore take only the comparison between NO-control vs. NO-raising to be informative. Another important observation is that the acquisition patterns of *schijnen* and *lijken* are very similar. The blue bars indicating acquisition of NO-raising for both *schijnen* and *lijken* are increasing in height with age group, getting closer to performance on the other conditions.

Within Group Analysis

What is important if we want to investigate raising with OVS-structures is that the child is able to understand non-raising OVS-structures. That means that they should perform above-chance on NO-control in order to be able to make claims about raising. In order to carry out analyses on the data I have transformed the total number of correct responses into the proportion of correct responses on all conditions. A one-sample t-test (α=0.05, two-tailed) shows that for both the *schijnen* and *lijken* 5 year-olds, there is no evidence to reject H_0, which states that performance is at-chance (with a score of 56% and 63% resp.), see table 5 for t and p-values. Therefore it is not informative to analyze the performance on raising of 5 year-olds[41]. For all other age groups, H_0 can be rejected, so these groups have been shown to perform above-chance on NO-control as revealed by a one-sample t-test (two-tailed, $\alpha = 0.05$), for t and p-values see table 6. The 7 year-olds in the *schijnen*-group form an exception as their performance has not been shown to differ from chance, see table 6. At this point I have no explanation for the poor performance of 7 year-olds in this group on NO-control.

	LIJKEN		SCHIJNEN	
Age Group	t	p	t	p
5;0-6;0	$t_{(11)}$=1.393	**p=.191**	$t_{(9)}$=1.272	**p=.235**
6;0-7;0	$t_{(11)}$=2.548	P=.027	$t_{(11)}$=2.766	p=.018
7;0-8;0	$t_{(11)}$=2.244	p=.046	$t_{(10)}$=.593	**p=.567**
8;0-9;0	$t_{(11)}$=3.830	p=.003	$t_{(9)}$=7.856	p<.001

Table 6: t and p-values per age group for NO-control on a One Sample T-test (n.s. values are in bold)

Furthermore, I have conducted a one-sample t-test to find out how children in the age groups that differ from chance on NO-control score on NO-raising. This test reveals that the 6 year-olds perform with a score of 14% and 28% in the *lijken* and *schijnen* group resp. below chance at the 5% level (two-tailed), see table 7. Another important observation is that even the 7 year-olds still have problems parsing *lijken* and *schijnen* as for both groups there is no evidence that performance on NO-raising with a score of 47% and 36% resp. differs from chance at a 5%-level (two-tailed). But although 7-year-olds perform poorly on NO-raising there seems to be a change in strategy between 6 and 7 years of age as performance increases from below-chance to chance. 7 year-old children are no longer ignoring the raising-verb (which according to the predictions above would result in below-chance performance); they show confusion, resulting in chance performance.

[41] Of course it is very interesting to investigate why non-raising OVS structures pose problems for 5 year-olds as the acquisition of V2 is around age 3 (Yang 1999). We will further elaborate on this issue in the discussion.

Interestingly, children seem to have even more problems with *schijnen* than with *lijken* as for 8 year-olds in the *schijnen*-group (with 60% of correct answers) there is still no evidence that performance differs from chance if we adopt an α-level of 0.05 (two-tailed). For *lijken* performance on NO-lijken (with a score of 78%) is above chance.

	LIJKEN		SCHIJNEN	
Age Group	t	p	t	p
6;0-7;0	$t_{(11)}$= -5.613	p < .001	$t_{(11)}$= -2.766	p = .018
7;0-8;0	$t_{(11)}$= -.266	**p=.795**	$t_{(10)}$= -1.632	**p=.134**
8;0-9;0	$t_{(11)}$= 2.932	p=.014	$t_{(9)}$= 1.272	**p= .235**

Table 7: t and p-values for NO-raising on a One sample T-test (n.s. values are in bold)

Between Groups Analysis

I also investigated the effect of age group on score as well as the effect of condition on score. That is to test whether performance increases over the years and whether children perform significantly different on NO-raising than on NO-control. Therefore, I conducted a repeated measures analysis of variance for both the *lijken*- and the *schijnen*-group on the score, with the factor condition (NO-raising vs. NO-control) and the factor age group (children are nested within age group). Results for both groups show that there is a significant effect for condition on score as well as a significant effect for age group on score (for F and p-values see table 8). That is to be interpreted that children overall score significantly better on NO-control than on NO-raising. Furthermore, children's performance significantly increases with age. The interaction between age group and condition has shown to be significant only in the *lijken*-group (see table 8). That is, the difference in score between NO-control and NO-raising is not the same for all age groups. No such effect is found in the *schijnen*-group. Interesting to test for the *lijken*-group is in which age group(s) there is a significant difference in condition. Therefore, I conducted a Bonferroni post-hoc comparison. Results show that there is a significant effect for condition in five-, six- and seven–year-olds (see table 9). There is no evidence that there is an effect in 8-year-olds. In the *schijnen*-group however, condition has a significant effect on all age groups. Hence, this indicates that children increase in performance both on *schijnen* as well as on *lijken*. For *lijken*, 8-year-olds perform as good on NO-raising as on the control condition. This is not true for *schijnen*. In order to see whether this difference is an effect of the raising-verb will be studied with another repeated measures analysis of variance.

	LIJKEN		SCHIJNEN	
Factor	F	p	F	p
Condition	$F_{(1,44)}$=70.868	p<.001	$F_{(1,39)}$=64.856	p<.001
Age Group	$F_{(1,3)}$=6.668	p=.001	$F_{(1,3)}$=3.710	p=.019
Interaction	$F_{(3,44)}$=8.930	p<.001	$F_{(3,39)}$=2.431	**p=.080**

Table 8: F and p-values on a repeated measures ANOVA factors age group and condition (n.s. values in bold)

	LIJKEN		SCHIJNEN	
Age Group	F	p	F	p
5-year-olds	$F_{(1,44)}$=25,909	p<.001	$F_{(1,39)}$=29.957	p<.001
6-year-olds	$F_{(1,44)}$=61,324	p<.001	$F_{(1,39)}$=28.403	p<.001
7-year-olds	$F_{(1,44)}$=9,812	p=.003	$F_{(1,39)}$=5.931	p=.020
8-year-olds	$F_{(1,44)}$=.613	**p=.438**	$F_{(1,39)}$=8.521	P=.006

Table 9: F and p-values for post-hoc Bonferroni analysis (n.s. values in bold)

A second repeated measures analysis of variance was conducted with the factor condition and the factor raising-verb where the children are nested within raising-verb. This analysis has been carried out separately for each age group. Results reveal that there is no evidence that raising-verb has an effect on score (for F and p-values see table 10). That is, on both the NO-raising and NO-control condition, the *lijken*- and *schijnen*-group have not been shown to differ in performance. Interaction has not been shown to have an effect for 5, 6 and 7-year-olds (see table 10). That is, the difference in score between NO-raising and NO-control has not been shown to be different for the *lijken*- and the *schijnen*-group. However, for 8-year-olds there *is* a significant effect of interaction on score. That is, in the *lijken*-group the difference in score between NO-raising and NO-control significantly differs from the difference in score in the *schijnen*-group. Hence, there is no evidence that choice of raising-verb has an effect on score of NO-raising, which indicates that development of *lijken* and *schijnen* does not differ. However, we do find that 8-year-olds in the *schijnen*-group still differ in score on the raising-verbs compared to control verbs, which is absent in the *lijken*-group. Future research should elaborate on this issue.

	5-YEAR-OLDS		6-YEAR-OLDS		7-YEAR-OLDS		8-YEAR-OLDS	
Factor	F	p	F	p	F	p	F	p
Raising-verb	$F_{(1,1)}$=.040	.843	$F_{(1,1)}$=.805	.397	$F_{(1,1)}$=.754	.395	$F_{(1,1)}$=.114	.739
Interaction	$F_{(1,20)}$=1.229	.281	$F_{(1,22)}$=1.100	.306	$F_{(1,21)}$=.007	.933	$F_{(1,20)}$=4.722	**.042**

Table 10: F and p-values on a repeated measures ANOVA, factors raising-verb and condition (sign. values in bold)

3.3.4 Conclusions

As stated above, the first goal of this experiment is to test whether we find the same pattern of acquisition for *lijken* as we find for English *seem* as predicted on the basis of UPR. Results show that, as English *seem*, *lijken* is acquired extraordinarily late, e.g. only at the age of 8, which supports UPR. These results are not attributable to a difficulty with OVS-structures in general as performance on NO-raising significantly differs from performance on NO-control till the age of 8. However, what was also expected is a sudden increase in performance between the age of 6 and 7 as observed in English. This sudden increase has not been replicated in this experiment. Although there is an increase in performance from 14% to 47% on NO-lijken, 7 year-olds still do not perform above chance as was the case for English children. However, what we *do* see is a change in

strategy between 6 and 7 years of age. In the discussion we will come back to the issue of the relatively bad performance of 7-year-olds in this experiment.

Furthermore, a comparison of acquisition patterns of *schijnen* and *lijken* will help us defining our syntactic theory of functional verbs. As is clear from the results described above, the acquisition of *schijnen* and *lijken* show very similar patterns. Results from an analysis of variance reveal that there is no significant effect of raising-verb. That is, development of comprehension of *lijken* and *schijnen* is the same. Adopting UPR, this leads to the conclusion that also *schijnen* projects a defective vP phase. Moreover, *schijnen* tends to be acquired even later than *lijken*, an issue on which we will elaborate further in the discussion. For the current study, the interesting finding is that two verbs that differ in so many syntactic and semantic properties, as discussed in section 3.2, show such a similar growth curve.

3.3.5 Discussion

One of the main questions that arises based on the findings of our experiment is why even 7 year-olds seem to have difficulties with the interpretation of *schijnen* and *lijken*. As discussed in section 2, English children score above-chance on raised *seem* constructions when they are 7. Is the difficulty Dutch children show due to a difference in structure between Dutch and English raising verbs? As we learned from section 3.2, Dutch raising-verbs cannot take a full DP as experiencer argument whereas *seem* can. Or is the performance difference due to methodological differences in testing Dutch and English raising? As shown above, OVS in itself *does* pose problems for the children as the 5 year-olds are not even able to correctly understand non-raising OVS sentences. The reason that the OVS non-raising sentences are better for children than the raised sentences, could lie in the fact that number agreement, which is the disambiguating clue, is easier to detect on *zijn* 'to be' than on *schijnen* and *lijken* (a difference between *is - zijn* vs. *schijn**t**-schijn**en**/lijk**t** – lijk**en***). However, research has shown that children from age 5 are sensitive to third person /s/ to indicate subject agreement and to contrast between a verb and a noun in Mainstream American English and that children are not only sensitive to, but are also able to use this information reliably from age 6 (Johnson et al. 2005) (de Villiers & Johnson 2007). This means that Dutch children from age 5 should be sensitive to subject agreement in both forms and from age 6 should be able to use subject agreement to disambiguate between OVS and SVO, irrespective of the phonological form of agreement. Hence, agreement cannot provide an explanation for the bad performance of 7 year-olds.

What this *does* indicate however, is that agreement can explain the poor performance of 5 year-olds on NO-control. As shown by Johnson et al (2005) and de Villiers & Johnson (2007), children cannot rely on agreement as disambiguating clue until age 6. De Villiers & Johnson (2007) explain this by arguing that the task given in their experiment was a metalinguistic task. In a picture selection task by Johnson et al (2005), the child was given two pictures, one in which the subject was plural and one in which the subject was singular. The sentence provided was either one of the two in (68) for example. On the

basis of the noun, you cannot derive whether the subject is singular or plural, as both forms are phonologically the same in this context. Hence, one should use the third person /s/ on the verb to make a decision. This requires the participant to reason about how to disambiguate the sentence relative to the pictures given. An adult might compare it to his own production and decide that third person agreement will lead him to the correct answer (de Villiers & Johnson 2007). As the task involves this type of reflection, only 6 year-olds will be able to perform the task correctly (de Villiers & Johnson 2007).

(68) a. The duck swims
b. The ducks swim
(Johnson et al. 2007: 156)

For Dutch, something similar might be happening. Let's have a look again at the NO-control condition. Along with picture 3, repeated here in 6, the child hears sentence (69). Important is that this sentence would require a 'yes' answer if the verb would agree with the first noun which would then be the subject. Now the task of the participants is to reason that the sentence given is not an ungrammatical SVO sentence, but that agreement is used to indicate OVS-structure and hence the sentence does not match the picture. As just discussed, the 5 year-old child who *is* sensitive to agreement cannot use this agreement as disambiguating clue (de Villiers & Johnson 2007). Hence, the child is not able to reason that this is not an ungrammatical SVO sentence, but an OVS-structure, so she will find herself with an ungrammatical SVO sentence and show confusion (at-chance performance). This contrasts with the results on NO-raising in which the child simply ignores the raising-verb, resulting in below-chance performance.

(69) De hónd zijn de katten aan het bekijken en de ézel zijn ze aan het schoppen
The dog are the cats watching and the donkey are they kicking
'The cats are watching the dog and kicking the donkey'

Picture 6

This might also explain the disparity in results on YES vs NO-control. If the picture matches the OVS sentence, the sentence cannot be an ungrammatical SVO sentence, as the sentence would not match the picture if agreement is changed. In this case the participant is led to OVS interpretation by the context. That is, the default order in this context would not be SVO, but rather OVS. So, apart from the fact that answering 'no' is

in general taken to be more difficult than providing a 'yes' answer, in this case the participant must in addition reason about the meaning of the agreement in order to provide a 'no' answer.

However, the question we were trying to answer was why 7 year-olds perform poorly on NO-raising. With the information above, we could argue that the poor performance is due to the high demands of the task. Besides parsing a raising structure, which is also difficult for English 7 year-olds although they score above chance, the child also has to detect subject agreement as an indicator of OVS structure. Therefore, the combination of the two tasks might lead to a non-optimal performance on raising. But, future research on this point is necessary to find out what is really going on. Dutch and English children's comprehension of raising needs to be compared in exactly the same experimental setting in order to make hard claims on this matter.

Another finding that raises a question is the chance performance of 8 year-old children on *schijnen*. These children score only 60%, whereas 8 year-olds score 78% for *lijken*, although this difference does not turn out to be significant. Can we attribute this difference to semantic and syntactic differences between the two verbs as discussed in section 3.2? That is, is the syntactic construction for *schijnen* acquired even later than 8 years of age? Or could we claim that the difference in frequency can account for the difference in performance? A search in the CHILDES database reveals that *lijken* occurs much more frequent in the Dutch corpora than *schijnen*[42]. Hence, maybe the 8 year-olds are in principle able to parse the raised structure; however, connections to *schijnen* in their lexicon are not very prominent as they haven't heard the verb that often. Even more, they sometimes might confuse it with the lexical verb *schijnen* which means 'to shine'. For the moment we can only speculate on this issue and we need to explore this further to find a decisive answer.

Finally, testing the two different raising-verbs at two different schools is a weakness of the current experiment. In this way the effect of raising-verb cannot be confirmed without claiming that the two groups are equal on any other factor. The raising verbs can only optimally be compared if the same group is tested on both *schijnen* and *lijken*. However, this is a practical issue as no school has been found willing to have their children tested twice or have their children tested longer than 15 minutes. Even more, a possible problem with a set-up in which the same group is tested on *schijnen* and *lijken* is that carry-over effects might develop.

3.3.6 Suggestions for future research

The study on comprehension of Dutch raising-verbs by children provides an interesting tool for future research. The interaction between language acquisition and theoretical linguistics might be enlightening in our understanding of, and explanation for the

[42] In CHILDES only child speech and child-directed speech can be found of children between 1;05.02 – 6;0 years of age. Therefore, I can only assume that also 7 and 8 year-old children hear *lijken* more frequent than *schijnen*.

syntactic structure of functional verbal elements, also related to evidentiality. However, due to time limitations, it was impossible to gather more data or design new experiments in order to be able to draw solid conclusions. This section will discuss different lines of research that are interesting to explore on the basis of the findings of the current experiment.

First of all, a comparison of *lijken* and *schijnen* must be made in a similar experiment with raised SVO sentences. As mentioned above, it might be asking too much of the child to parse both a raising-verb and at the same time rely on agreement to disambiguate the sentence. In future research we must think of a clever experiment in which the child is not distracted by any other material and can perform optimally. A possible experiment for *lijken* would be the experiment as in Hirsch et al. (in prerp.) for which a distinction is made in what *appears* to be the case and what *is* the case.

As we discussed above, there tends to be a difference in acquisition pattern between *lijken* and *schijnen*. That is *schijnen* even poses problems for 8 year-old children. However, we do not know what causes this difference. Moreover, if we compare the 8 year-old *schijnen* group with the 8 year-old *lijken* group, this difference does not turn out to be significant. In order to shed light on this issue it would be interesting to compare the acquisition pattern of *schijnen* with the acquisition pattern of modals. As discussed in previous sections, *schijnen* shows many similarities both in syntax and semantics with epistemic modals. If we find the exact same pattern for modals as for *schijnen*, we can argue that this acquisition pattern is due to a particular underlying syntactic construction and not attributable to methodological flaws. Even more insight could be gained from comparison of modals and *schijnen* with *lijken* to see if there is a division in acquisition pattern or not.

Another interesting line of research is to investigate the acquisition pattern of the semantics of *schijnen* and *lijken* compared to epistemic modals. Above it was mentioned that evidentiality is a cognitively complex concept in that it involves reasoning about the source of information for a proposition (Papafragou et al. 2007). In the same way it has been argued that epistemic modality is complex as it involves reasoning about the degree of certainty for a proposition (Papafragou 1998). It would be interesting to investigate the acquisition patterns in younger children of these concepts and find where there are similarities or differences. Even more, it will be fruitful to carry out both linguistic and non-linguistic tasks to study the relationship between linguistic and conceptual capacities as is done in Papafragou (2007).

Finally, acquisition of *lijken* with an experiencer should be investigated. According to Wexler's Universal Phase Requirement, the presence or absence of an experiencer does not influence children's comprehension of constructions with a raising-verb. That is, the problem raising-verbs pose is related to the presence of a defective phase, irrespective of raising over an experiencer. On the other hand, for Dutch the use of an experiencer causes a slight change in interpretation. Comparing children's comprehension of *lijken* with and without experiencer might provide insight into the question whether or not the difference we find in interpretation also exists at the structural level.

3.4 A Minimalist Analysis

In the previous sections syntactic and semantic properties of *schijnen* and *lijken* have been investigated. It has been shown that *schijnen* is more defective as a verb than *lijken*. Even more, *schijnen* has more in common with epistemic modals with respect to argument structure, distributional restrictions and interaction with operators than with *lijken*. In chapter 2 we have discussed different syntactic theories. One of the theories dealt with is Cinque (2000) who makes a clear distinction between functional and lexical verbs and accounts for the distributional properties of functional verbs. So in this analysis, the properties found for *schijnen* immediately follow from the assumption that it is inserted as a functional head in the relevant functional projection. This functional head is in the extended projection of the lexical verb with which it is combined and is not taken to project a defective vP itself. For *lijken* on the other hand, an additional assumption should be made that not all restructuring verbs are functional as it triggers restructuring, but can be embedded under modals and auxiliaries. However, in chapter 2 it has been argued that given the hypothesis that subcategorization is not in our minimal set of tools, the proposal of a fixed functional hierarchy is not compatible with the minimalist program. In a bare phrase structure account on the other hand, it is an open question as to what functional verbs project and how to account for ordering restrictions. *Lijken* is in this framework hypothesized to be a lexical verb that lacks an external argument and hence projects a defective vP.

In addition to the study on properties of *schijnen* and *lijken* in adult language, we have carried out an acquisition experiment on comprehension of *schijnen* and *lijken*. The data show that, despite of the differences in syntax and semantics, the verbs have a very similar acquisition pattern. Both verbs are acquired extraordinarily late. This indicates that *schijnen* and *lijken* are similar in their underlying syntactic structure. If we take the late development of subject raising verbs to be dependent on the presence of a defective vP, hence follow Wexler's UPR, we are led to conclude that both verbs project a defective vP phase. Therefore, these data are not compatible with a Cinquean analysis. As such, the acquisition data provide insight into the discussion as to what the structure of functional verbs is in a minimalist framework. In this section I will make an attempt to account for the properties of *schijnen* and *lijken* within a minimalist framework and claim that the current analysis enables us to account for a number of observations shown and relates the adult and child language data. I will pose two hypotheses which will jointly account for our findings in previous sections.

In order to propose the first hypothesis we need to discuss Cardinaletti & Shlonsky (2004) who bear on the issue of what syntactically the difference between lexical and functional verbal elements means. Cardinaletti & Shlonsky (2004) argue that functional elements differ from lexical verbs in the amount of functional structure they project. That is, where lexical verbs project a full vP-shell; functional elements lack this shell (Cardinaletti & Shlonsky 2004). Moreover, "verb classes seem to be arrayed on a scale of impoverished ancillary functional structure" (Cardinaletti & Shlonsky 2004: 548). This

captures the finding that the division in lexical vs. functional elements is too sharp (Cardinaletti & Giusti 2001, Cardinaletti & Shlonsky 2004). Furthermore, Cinque's hierarchy can be said to reflect the amount of functional structure an element projects; the higher in the hierarchy, the less there is left of the vP-shell. This follows from the correlation between the position in the functional hierarchy and the presence (or absence) of different properties shown by Cardinaletti & Shlonsky (2004).[43] I will follow Cardinaletti & Shlonsky in their assumption that functional verbs differ from lexical verbs in the amount of functional structure they project and hence depart from Cinque in the assumption that functional verbs are inserted as a functional head. Given this, the first hypothesis can be stated.

(70) *Functional-Lexical Hypothesis:*
Functional verbs project less functional structure than lexical verbs. That is, merger of a functional verb gives rise to a more defective structured vP than merging a lexical verb.

Assuming this hypothesis means that we do no longer need a cartography of functional projections which is filled in when building a sentence. However, we are left with the question how to account for the hierarchical facts. Why is it impossible to merge modals or auxiliaries on top of *schijnen*? In a truly dynamic syntactic approach, we would need to specify that the combinations that are ruled out are not meaningful as is done for example for adverb-ordering in Nilsen (2003). That is, a semantic feature should determine that *schijnen* cannot occur in the scope of modals and auxiliaries. We seem to have a candidate for the relevant semantic property in speaker-indexicality. As has been shown in section 3.2.1, the main distinguishing property between *schijnen* and *lijken* is speaker-indexicality, which *schijnen* has, but *lijken* hasn't. As such, *schijnen* is externally inscrutable and cannot interact with operators such as negation, questions or tense. In section 3.2.2 we have seen that also distributional properties of *schijnen* can be attributed to speaker-indexicality. As *schijnen* is restricted in its interpretation to the here and now of the speaker, it is incompatible with operators introducing possible worlds. However, this leads to the question as to how speaker-indexicality is encoded to make it legible for the Inference system. I do not want to claim that the concept of speaker-indexicality is readable for the Inference system, but we do want the Inference system to be able to recognize speaker-indexicality in order to rule out strings that aren't meaningful as proposed for *schijnen*.

For now, I will assume that speaker-indexicality is encoded in the functional element the lexical entry is associated with in the lexicon. This bears both on the hypothesis that each concept is associated with a functional element in the lexicon, along the lines of Chomsky (2005) and on the hypothesis that this functional element is readable for Inference. This functional element determines the scope properties of the concept. For

[43] I will not discuss the properties Cardinaletti & Shlonsky (2004) show here, for an extensive discussion I refer the reader to Cardinaletti & Shlonsky (2004). What should be noted though is that in Cardinaletti & Shlonsky's analysis causative and perception verbs are associated with the least impoverished vP-shell. However, these verbs do project an external argument, which the relevant Dutch verbs do not.

verbs, the functional element is little v[44]. In our analysis, each verb is associated with a little v in one of its flavors as proposed in Folli & Harley (2005) [45]. Some verbs are underspecified for flavor of v, which derives that these verbs have different scope properties in different contexts.

(71) *Flavor-of-v hypothesis:*
Verbs are associated with little v in one of its flavors. In this flavor of v, semantic properties are encoded, legible for Inference, which determine scope properties of the elements.
The flavors of v we need at least to account for the data presented in this thesis are: $v^* > v_{def} > v_{Superdef} > v_{Superdef\text{-}index}$

The flavor of v also contains information about the argument structure of the verb (Folli & Harley 2005). That is, little v consists of features legible to the computational system about which arguments the verb projects. Hence I distinguish between features that are legible to CS and Inference and give orders for merge and features that are legible both to CS and the Inference system which do not contain merge orders, but do determine scope properties of elements at Inference. Finally, I will make the assumption that all verbs which cannot be associated with v* in any form, cannot be merged on top of a CP, but only on VP[46]. For the moment this can only be stipulated. I will leave it to future research to determine what property is responsible for this. That is, determine what the relation is between v* and a complement C.

Let's go back to table 1 from section 3.2, repeated here in 11, which consists of a characterization of semantic and syntactic properties of the relevant verbs. The proposal is that our hypotheses together with the assumptions made will account for these

[44] Horvath & Siloni (2003) argue against the presence of vP in syntactic structure, and especially against the proposal that v assigns the external θ-role, what they dubbed 'the little-v hypothesis'. Their arguments are mainly conceptual. They substantiate that the proposal is not compatible with minimalist thinking as adding v to the structure is motivated by linearity of constituents. Moreover, the little-v hypothesis claims to take care of the mapping problem: which argument is merged externally and which is merged internally. However, they argue that given little-v, the mapping problem still exists. In a framework as proposed by Reinhart (2003) on the other hand, in which the external θ-role is part of the verb's θ-grid, mapping principles determine whether an argument is merged externally or internally. Furthermore, for lexical operations such as reflexivization as proposed in Reinhart (2003) and Reinhart & Siloni (2005) it remains undetermined which verbs allow this operation and which do not if the external θ-role is not part of the θ-grid. Still, this thesis will adopt little-v as it accounts for ditransitive structures (Hornstein et al. 2005) as well as the subject-position in ECM-constructions. Even more, the different types of verbs, thus the v they are associated with, places different restrictions on (the semantics of) the arguments (Folli & Harley 2007). This would be left unaccounted for if we do away with the little-v hypothesis. Whether little-v is only necessary to create positions, or whether we need v to give an element its verbal nature as in theories like Borer (2005), will be left open to future research.

[45] Folli en Harley (2005), (2007) argue for the existence of different flavors of v which can account for the difference between causative and agentive verbs. They claim that lexical items select for a particular syntactic frame, e.g. flavor of v which poses restrictions on the arguments.

[46] Passives can take a CP under this assumption in their complement, as they are derived from a lexical verb which projects full argument structure and is thus associated with v*.

properties. So, lexical verbs are associated with v* in the lexicon[47]. These verbs project full argument structure and as such v* is the only non-defective flavor of v and v*P defines a phase. *Lijken* is associated with v_{def} which contains the information that the verb cannot project an external argument. As *lijken* is associated with v_{def}, it cannot be merged on top of CP and thus its syntactic complement can rather be VP. That *lijken* triggers restructuring follows from this as its complement does not define a CP-phase and hence transparency effects can obtain. A final assumption made is that v_{def} has a preference for a complement that does not carry the feature [+future]. Root modals are in this analysis associated with $v_{Superdef}$, which defines that the verb cannot project any arguments. As this v is not v*, its complement is again VP and not CP and thus root modals trigger restructuring. Furthermore, I stipulate that $v_{Superdef}$ prefers a complement with the feature [+dynamic].

Finally, epistemic modals and *schijnen* are associated with $v_{Superdef\text{-}index}$. This is associated with verbs that cannot project arguments either and furthermore bear an index on v which is valued on merger of Tense in the computational system. If this index is valued by present tense and the interpretation of the verb is thus restricted to the actual here and now of the speaker, combination with possible worlds introducing operators or operators such as question and negation will not give rise to a meaningful string on Inference. However, if an element is able to value the index of v on its own, merger of this element does lead to an interpretable result on Inference. This is the case for modal *zou* 'would' which as we saw in section 3.2.2 can be merged on top of *schijnen*. Elements that have the ability to value v's index might differ from language to language[48]. In this way, the flavor of v is responsible for distributional restrictions of *schijnen* and epistemic modals. Furthermore, interpretation of the verb is dependent on the value of T and therefore there is no transparent distinction between present and past tense forms. The final assumption is that $v_{Superdef\text{-}index}$ has a preference for a complement with the feature [+stative].

[47] Folli & Harley (2005), (2007) propose that different v*'s can be distinguished. These different v's pose selectional retrictions on the semantics of their arguments.

[48] The possibility for language variation could also explain the Norwegian data that Eide (2005) discusses. She shows that in Norwegian an epistemic modal is able to follow an aspectual head as in (i). This would mean that in Norwegian, an aspectual head is able to value the index of $v_{Superdef\text{-}index}$.

(i) Han har matta arbeidd med det I heile natt
He has mustPERF workPERF on it all night
'He must have worked on it all night'
(Eide 2005: 120)

	Root Modals	Epistemic Modals	Schijnen	Lijken	Lexical V
External Argument	-	-	-	-	+
Internal Argument	-	-	-	+	+
Restructuring	+	+	+	+	-
Inflection person	+/-	+/-	+	+	+
Complement (syntax)	VP	VP	VP	VP	CP
Transparent pres-past	+	-	-	+	+
Infinitive form	+	-	+/-	+	+
Speaker-indexical	-	+	+	-	-
Embedding aux	+	-	-	+	+
Embedding modals	+	-	-	+	+
Embedding operators	+	-	-	+	+
Complement (semantics)	+dynamic	+stative	+stative	-future	both

Table 11: Properties of verbal elements. +/- indicates that the particular form exists, but not in every context.

Now the differences in properties between *schijnen* and *lijken* have been accounted for. They are said to follow from the specification of a different flavor of v in the lexicon. This flavor of v encodes semantic properties in order to make them legible for CS and the Inference system. It is these features which determine on Inference which strings are interpretable and which are not and on CS what arguments the verb projects. Hence, the influence of the concept on its merge properties is only an indirect relation. Furthermore, I have assumed along the lines of Folli & Harley (2005), (2007) that the flavor of v has preferences for the semantic features of its complement.

Besides an account for the data we find in adult Dutch, it also follows from this analysis that children acquire *schijnen* just as late as *lijken*. *Schijnen* is not assumed to be a functional head, inserted in a functional projection. It rather is merged, just like any other verb; however, it is a defective verb in that the functional structure it projects is defective. Hence, both *schijnen* and *lijken* project a defective vP phase which makes these verbs difficult to interpret for children.

An advantage of the current analysis is that it accounts for semantic and syntactic properties of functional verbs without having to stipulate a fixed range of functional projections. That is, we no longer have to assume the existence of a number of functional projections and even more that all functional projections are present in every sentence we produce. The structure of a sentence and hence the number of projections is determined by the elements present in the numeration. Related to this, it has been proposed that ordering restrictions do not follow from syntax, but rather indirectly from semantic properties of the lexical items in the numeration. That is, the syntactic operation to combine elements (merge) is blind (that is not to say that merge does not receive orders from the interface with the lexicon). Particular strings are ruled out because they do not deliver a meaningful string on Inference. How the semantics determines what is meaningful and what is not is still a point of future research. For now the hypothesis is posed that the semantic property of speaker-indexicality is encoded on the flavor of v

associated with the verb. This feature is legible for the Inference system as to rule out strings that aren't meaningful.

In addition, within this account the difference between root and epistemic modals can be accounted for without having to assume modals to be ambiguous between a root and an epistemic reading (as in Palmer 1990 and Coates 1983). This makes the current analysis compatible with attempts to maximally limit the lexicon (Folli & Harley 2005, 2007). Modals must be assumed to be underspecified for the flavor of v and can hence be merged with $v_{Superdef}$ as well as $v_{Superdef\text{-}index}$. Modals will receive a different interpretation on association with v in a different flavor.

Another benefit of the current analysis is that it enables us to further define the definition of defective phases as discussed in chapter 2. In chapter 2 defective phases have been defined, along with TP alone, as weak verbal configurations. Weak verbal configurations can now be said to be configurations that have been created by merging a verb which is associated with v in another flavor than v* in the lexicon as in (72).

(72) *Definition of defective vPs:*
All verbal configurations that are derived from merger of a V which is associated with v in any other flavor than v* in the lexicon

We just saw that with the flavor of v hypothesis in (71) we can account for argument structure, restructuring, complement type, interaction with operators and distributional properties of *lijken* and *schijnen*. However, there are also questions left for which we do not have an answer at this point and that require further research.

First of all, according to Cinque's hierarchy, *schijnen* and epistemic modals are ordered mutually. However, at this point I do not have an analysis which tells us which modals have a purely evidential meaning and which have a purely epistemic meaning. For example, De Haan (2005) argues that Dutch modal *moeten* 'must' can have both an evidential and an epistemic meaning. If we embed *moeten* under *schijnen*, both a root reading and an epistemic reading are possible (although not in exactly the same sentence), see (73). For the moment I do not have an example in which *moeten* used as evidential can be embedded under *schijnen*. The question arises whether there is a distinct flavor of v associated with epistemic as opposed to evidential readings of modals. Even more, as epistemic modals are speaker-indexical (Papafragou to appear), it is not clear at which point flavor of v associated with epistemic readings differs from the one associated with evidential readings. Future research should provide an answer to the question what discriminates epistemic v from evidential v and what the consequences are for the Inference system.

(73) a. Jan schijnt te moeten schaatsen
John seems to must skate
Root: It seems that John is obliged to skate
Non-root: It seems that I infer that John is skating

b. Jan schijnt aan het schaatsen te moeten zijn
John seems skating to must be
#Root: It seems that John has the obligation to be skating
Epistemic: speaker has heard that there is a high degree of certainty that John is skating

Moreover, the current analysis only focuses on *schijnen*, *lijken*, epistemic modals and root modals, but there are much more functional heads in Cinque's functional hierarchy. It should be investigated whether these heads can be associated each with a little v in a particular flavor. Furthermore, future research should attempt to determine which and how semantic properties of the different verbs are encoded on v and what the consequences are for the Inference system.

Furthermore, an interesting problem with the current account is that *lijken*, when it selects an experiencer, is speaker-indexical in that it can no longer be challenged, see example (74). Additionally, *lijken* with experiencer cannot be embedded under factive predicates as in (75). If this is true, we would have to propose a flavor of v which both carries an index and carries features for the projection of an internal argument, which comes down to the assumption that an index can be a property of different flavors of v. However, we might also speculate that speaker-indexicality can be achieved in two ways. That is, it can be encoded on little v and it can be introduced with an experiencer argument.[49]

(74) A: Jan lijkt mij een aardige jongen te zijn
John seems to-me a nice boy to be
B: Nee dat is niet waar
No that is not true
(i) It is not the case that John is a nice boy
(ii) #It is not the case that the A infers that John is a nice boy

(75) ??Het is verassend dat Superman me jaloers lijkt te zijn
It is surprising that superman to-me jealous seems to be

Another point of future research is why root and epistemic modals that *can* inflect for person are not always obliged to. There does not seem to be a correlation between flavor of v and inflection for person as both *schijnen* and *lijken* always inflect for person, whereas modals do not. Nevertheless, inflection for person might not be associated with flavor of v, but rather depend on other properties. For example, we could make an attempt for an analysis along the lines of Zwart (2003), (2006). He claims that subject agreement is a sisterhood relation. Hence, there is no direct relation between the verbal element and the subject. The morphological reflex on the verb is the spell-out of the

[49] This gives rise to the idea that speaker-indexicality is always introduced with an experiencer argument, either explicit as for *lijken* or implicit which is then hypothesized to be the case for *schijnen*. This means that the need to encode speaker-indexicality on little v no longer exits; it rather is an implicit experiencer argument, available at least in the semantic representation, which restricts the interpretation of *schijnen* to the here and now of the speaker. It is interesting to explore this idea in future research. One of the issues that needs to be taken up is whether this implicit argument is active in syntactic processes as well. Furthermore, the consequences this hypothesis has for our representation of modals should be examined.

agreement relation between the subject and its sister (Zwart 2003, 2006). This means that modals for morpho-phonological reasons cannot or are not always obliged to serve as an element for spell-out of agreement. Future research along these lines might be fruitful.

Finally, in this analysis, an answer is to be found as to why modals are acquired earlier than raising-verbs (Papafragou 1998), although they do project a defective vP. The answer might be that the English raising-verb *seem* shares a property with lexical verbs which is that it can take a CP complement if it is used in the unraised form see (76). In contrast, modals can in no case take a CP complement, see the ungrammaticality of (77). This makes an interesting prediction with respect to Dutch where modals can take a CP complement as in (78). Hence under this hypothesis, modals should be acquired as late as *schijnen* and *lijken* by Dutch children. I know of no results on acquisition of modals in Dutch. Future research should be carried out to see if the prediction that Dutch modals are acquired late is borne out.

(76) It seems [$_{CP}$ that John is driving a car]
(77) *It must [$_{CP}$ that John is driving a car]
(78) Het kan [$_{CP}$ dat Jan aan het fietsen is]
It can [$_{CP}$ that John cycling+progressive is
'It can be the case that John is cycling'

To conclude, the analysis proposed in this section to account for the child and adult language data with respect to *schijnen* and *lijken* is a bottom-up analysis. The hypothesis is that every structure is different, depending on the elements present in the numeration. There is no rigid tree structure with positions that are filled in while building a sentence. Hence, syntactic subcategorization is not hypothesized to be in our minimal set of tools. That means that the difference between lexical and functional elements can no longer be explained to follow from insertion of the elements in a different projection. This thesis rather argues that functional verbs differ from lexical verbs in the amount of functional structure they project. That is, vP of functional verbs is more impoverished than vP of lexical verbs.

Furthermore, the current analysis proposes that distributional restrictions are not the result of restrictions on merge. They are rather the result of semantic properties of the concepts that determine that particular strings are not interpretable for the Inference system. Each verb is associated with little v in a particular flavor in the lexicon. This little v encodes particular semantic properties of the concepts to make it legible for the Inference system. These features determine on Inference what is meaningful and what is not.

Finally, this analysis is based on a study of both theory and language acquisition. The interaction between the two fields provides an interesting source of information. Acquisition data have given us insight in the possible syntactic structure of Dutch subject-raising verbs and have proven to be enlightening in the discussion of building structure.

CHAPTER 4: CONCLUSION

This thesis started out with a discussion of an interesting set of phenomena in language acquisition that have been connected recently: delayed acquisition of passives, unaccusatives and raising. Wexler (2004) argues that adopting UPR explains the relevant data. UPR is based on the idea that language is biologically determined and that principles of language develop as the brain matures. With respect to UPR the claim is that the immature brain cannot handle defective phases, which leads to problems in interpretation of the structures mentioned above. The prediction that follows is that universally, children will acquire constructions which involve extraction of an element out of the complement of a defective phase around the same age. Therefore, one goal of this thesis is to evaluate UPR on the basis of Dutch data. The focus of this thesis is on raising-structures as Dutch raising-verbs show properties not observed for English raising-verbs. From our acquisition experiment, the first conclusion that can be drawn is that acquisition of Dutch *lijken* is as predicted by UPR. Children up till the age of 8 have been shown to have problems comprehending sentences with *lijken*.

However, as just mentioned, the reason to study raising-structures in Dutch is that similar raising-verbs, e.g. *schijnen* and *lijken* which both translate to English *seem*, can be shown to differ on particular semantic and syntactic properties. This work contributes in that it provides an extensive comparison between *schijnen*, *lijken*, and modals. The main finding of the semantic study is that whereas *schijnen* is restricted in its interpretation to the here and now of the speaker, *lijken* is not. This distinguishing property leads to a different behavior of *schijnen* and *lijken* in a number of contexts as demonstrated in section 3.2.1. On the syntactic side it has been pointed out that *lijken* and *schijnen* differ in argument structure and ordering restrictions. Finally it was said that *schijnen* is more functional and *lijken* is more lexical. The question addressed in this thesis is whether these differences are attributable to a different underlying structure as proposed in theories as Cinque (2000) or to something else.

The current work attempted to formulate an answer on the basis of a combination of theoretical and experimental data. A comparison of acquisition of *schijnen* and *lijken* was taken to provide information about the syntactic structure of the former verb. Results have shown that, in spite of the semantic and syntactic differences shown, acquisition of both verbs is very similar which is taken to support the assumption that *schijnen* projects a defective vP as well. In this way, our experiment has proven to be helpful in determining which analysis of the structure of functional verbs is correct. At least an analysis along the lines of Cinque (2000) cannot be maintained regarding the data.

However, now there is still no proposal about the structure of functional verbs or for the ordering restrictions observed for *schijnen*. This issue is taken up in section 3.4. It is claimed that lexical verbs differ from functional verbs in the amount of functional structure, e.g. vP, where functional verbs are impoverished in the functional structure they project. Furthermore, distributional restrictions have been argued to follow from semantics along the lines of the minimalist program. The analysis is that semantic

properties of verbs are encoded on the little v they are associated with. That is, little v of *schijnen* encodes speaker-indexicality. As this feature is legible for Inference, strings that are not interpretable due to speaker-indexicality can be ruled out. Hence, no restrictions on merge have to be assumed, distribution rather follows from semantics. As has been shown, many questions are still open to research, but the idea as proposed in this thesis provides an interesting tool for future research.

To conclude, this thesis has proven that the interaction between linguistic theory and language acquisition is enlightening in our understanding of language. This thesis has contributed to the goal of defining the architecture of language by providing an analysis of functional verbs. Furthermore, it has found support for the hypothesis that defective phases are acquired extraordinarily late also in Dutch. Hence, this combination of theory and acquisition provides a tool to unravel the connection between language structure and brain structure.

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APPENDIX 1

Raising Schijnen			
Child's Name:	DOB: DT:	Age	
Scenario	Sentence	Answer	T/F
Test			
eten OVR PL8	De krokodil schijnen de dinosaurussen op te eten		1
	en de aap schijnen ze aan te wijzen		
	'The dinosaurs seem to eat the crocodile and they seem to point at the monkey'		
eten ON PL7	De dinosaurus zijn de krokodillen aan het opeten		0
	en de slang zijn ze aan het likken		
	'The crocodiles are eating the dinosaur and they are licking the snake'		
wassen HO PL12	Ik heb gehoord dat de de jongens Margie aan het wassen zijn		0
	'I've heard that the boys are washing Marge'		
bekijken ON PL1	De muizen is de kat aan het achterna zitten		1
	en de honden is ie aan het bekijken		
	'The cat is chasing the mice and he is watching the dogs'		
beschieten SVR PL17	De tijgers schijnen de wolf te beschieten		0
	'The tigers seem to shoot the wolf'		
redden HO PL14	Ik heb gehoord dat het konijn de varkens aan het redden is		1
	Í've heard that the rabbit is saving the pigs'		
schilderen HO PL10	Ik heb gehoord dat het nijlpaard de giraffen aan het schilderen is		0
	'I've heard that the hippopotamus is painting the giraffes'		
bekijken OVR PL3	De hond schijnen de katten te bekijken		0
	en de ezel schijnen ze te schoppen		
	'The cats seem to watch the dog and they seem to kick the donkey'		
eten SVR PL6	De krokodillen schijnen de dinosaurus op te eten		1
	'The crocodiles seem to eat the dinosaur'		
beschieten OVR PL15	De wolven schijnt de tijger te beschieten		1
	en de olifanten schijnt ie te begroeten		
	'The tiger seems to shoot the wolves and he seems to greet the elephants'		
wassen ON PL11	Margie zijn de jongens aan het wassen		1
	en Lisa zijn ze aan het optillen		
	'The boys are washing Marge and they are lifting Lisa'		
bekijken HO PL2	Ik heb gehoord dat de hond de katten aan het bekijken is		0
	'I've heard that the dog is watching the cats'		
redden OVR PL13	De varkens schijnt het konijn te redden		0
	en de pinguins schijnt ie op te tillen		
	'The rabbit seems to save the pigs and he seems to lift the pinguins'		
schilderen ON PL10	De giraffen is het nijlpaard aan het schilderen		0
	en de kikkers is ie aan het stompen		

	'The hippo is painting the giraffes and he is punching the frogs'		
beschieten HO PL18	Ik heb gehoord dat de wolven de tijger aan het beschieten zijn		1
	'I've heard that the wolves are shooting the tiger'		
wassen OVR PL11	Margie schijnen de jongens te wassen		1
	en Lisa schijnen ze op te tillen		
	'The boys seem to wash Marge and they seem to lift Lisa'		
eten HO PL5	Ik heb gehoord dat de dinosaurussen de krokodil aan het opeten zijn		0
	'I've heard that the dinosaurs are eating the crocodile'		
schilderen OVR PL9	De giraffe schijnen de nijlpaarden te schilderen		0
	en de kikker schijnen ze te stompen		
	'The hippos seem to paint the giraffe and they seem to punch the frog'		
wassen SVR PL12	De jongens schijnen Margie te wassen		0
	'The boys seem to wash Marge'		
beschieten ON PL16	De wolf zijn de tijgers aan het beschieten		1
	en de olifant zijn ze aan het begroeten		
	'The tigers are shooting the wolve and they are greeting the elephant'		
bekijken ON PL3	De hond zijn de katten aan het bekijken		0
	en de ezel zijn ze aan het schoppen		
	'The cats are watching the dog and they are kicking the donkey'		

APPENDIX 2

Raising Lijken			
Child's Name:	DOB: DT:	Age:	
Scenario	Sentence	Answer	T/F
Test			
eten OVR PL8	De krokodil lijken de dinosaurussen op te eten		1
	en de aap lijken ze aan te wijzen		
	'The dinosaurs seem toe at the crocodile and they seem to point at the monkey'		
eten ON PL7	De dinosaurus zijn de krokodillen aan het opeten		0
	en de slang zijn ze aan het likken		
	'The crocodiles are eating the dinosaur and they are licking the snake'		
wassen HO PL12	Ik heb gehoord dat de de jongens Margie aan het wassen zijn		0
	'I've heard that the boys are washing Marge'		
bekijken ON PL1	De muizen is de kat aan het achterna zitten		1
	en de honden is ie aan het bekijken		
	'The cat is chasing the mice and he is watching the dogs'		
beschieten SVR PL17	De tijgers lijken de wolf te beschieten		0
	'The tigers seem to shoot the wolf'		

redden HO PL14	Ik heb gehoord dat het konijn de varkens aan het redden is		1
	'I've heard that the rabbit is saving the pigs'		
schilderen HO PL10	Ik heb gehoord dat het nijlpaard de giraffen aan het schilderen is		0
	'I've heard that the hippo is painting the giraffes'		
bekijken OVR PL3	De hond lijken de katten te bekijken		0
	en de ezel lijken ze te schoppen		
	'The cats are watching the dogs and they are kicking the donkey'		
eten SVR PL6	De krokodillen lijken de dinosaurus op te eten		1
	'The crocodiles seem to eat the dinosaur'		
beschieten OVR PL15	De wolven lijkt de tijger te beschieten		1
	en de olifanten lijkt ie te begroeten		
	'The tiger seems to shoot the wolves and he seems to greet the elephants'		
wassen ON PL11	Margie zijn de jongens aan het wassen		1
	en Lisa zijn ze aan het optillen		
	'The boys are washing Marge and they are lifting Lisa'		
bekijken HO PL2	Ik heb gehoord dat de hond de katten aan het bekijken is		0
	'I've heard that the dog is watching the cats'		
redden OVR PL13	De varkens lijkt het konijn te redden		0
	en de pinguins lijkt ie op te tillen		
	'The rabbit seems to save the pigs and he seems to lift the pinguins'		
schilderen ON PL10	De giraffen is het nijlpaard aan het schilderen		0
	en de kikkers is ie aan het stompen		
	'The hippo is painting the giraffes and he is punching the frog'		
beschieten HO PL18	Ik heb gehoord dat de wolven de tijger aan het beschieten zijn		1
	'I've heard that the wolves are shooting the tiger'		
wassen OVR PL11	Margie lijken de jongens te wassen		1
	en Lisa lijken ze op te tillen		
	'The boys seem to wash Marge and they seem to lift Lisa'		
eten HO PL5	Ik heb gehoord dat de dinosaurussen de krokodil aan het opeten zijn		0
	'*I've heard that the dinosaurs are eating the crocodile'*		
schilderen OVR PL9	De giraffe lijken de nijlpaarden te schilderen		0
	en de kikker lijken ze te stompen		
	'The hippos seem to paint the giraffe and they seem to punch the frog'		
wassen SVR PL12	De jongens lijken Margie te wassen		0
	'The boys seem to wash Marge'		
beschieten ON PL16	De wolf zijn de tijgers aan het beschieten		1
	en de olifant zijn ze aan het begroeten		
	'The tigers are shooting the wolf and they are greeting the elephant'		
bekijken ON PL3	De hond zijn de katten aan het bekijken		0
	en de ezel zijn ze aan het schoppen		
	'The cats are watching the dog and they are kicking the donkey'		