The acquisition of finite complement clauses in English: A corpus-based analysis*

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Abstract

This article examines the development of finite complement clauses in the speech of seven English-speaking children aged 1;2 to 5;2. It shows that in most of children's complex utterances that seem to include a finite complement clause, the main clause does not express a full proposition; rather, it functions as an epistemic marker, attention getter, or marker of illocutionary force. The whole construction thus contains only a single proposition expressed by the apparent complement clause. As children grow older, some of the "main clauses" become more substantial and new complement-taking verbs emerge that occur with truly embedded complement clauses. However, since the use of these constructions is limited to only a few verbs, we argue that they are not yet licensed by a general schema or rule; rather, they are "constructional islands" organized around individual verbs.

Keywords: *complement clause; performative speech act; grammaticalization; construction; cognitive grammar.*

1. Introduction

At some point during their third year of life, English-speaking children begin to produce utterances such as *I think Daddy's sleeping* or *See if Mommy's there*. These utterances have been analyzed as complex sentence constructions composed of two clauses: a main clause (i.e., *I think* or *See*) and a subordinate clause (i.e., *Daddy's sleeping* or *if Mommy's there*) functioning as a sentential complement of the main-clause verb (see Pinker 1984; Bloom et al. 1991). In this article we argue that most of the constructions that seem to include a finite complement clause in early child speech are simple utterances in which the apparent main clauses do not express a full proposition; rather, they function as some sort of clausal

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operator guiding the hearer's interpretation of the associated (complement) clause: they serve as epistemic markers, attention getters, or markers of the illocutionary force of an utterance. All of these uses are also frequently found in adult conversational English. For instance, Thompson and Mulac (1991) have shown that in spoken discourse *I think* and *I guess* are commonly used as parenthetical epistemic markers rather than as independent assertions. Our study shows, based on natural child data, that the nonassertive use of these constructions emerges long before children begin to use complex utterances in which a finite complement clause is embedded in a full-fledged main clause.

The most comprehensive study of the development of finite complement clauses in natural child speech is Bloom, Rispoli, Gartner, and Hafitz (1991). Their investigation is based on data from four English-speaking children between 2;0 and 3;2 years of age. It concentrates on the analysis of four verbs that children frequently use with a finite complement clause: *think*, *know*, *look*, and *see*. What is interesting in the context of the current investigation is that Bloom and colleagues already noticed the nonassertive use of these four verbs. According to their analysis, children use *think* and *know* "in order to qualify the degree of certainty–uncertainty of the complement proposition". Similarly, *look* and *see* primarily function to express the speaker's assessment of the information provided by the complement clause: While *look* suggests "an attitude of definiteness", *see* signals the speaker's lack of certainty, notably when it occurs with an *if*-complement clause (Bloom et al. 1991: 330–331). However, since Bloom and colleagues restricted their analysis to just four verbs, it is unclear how general their findings are. Is the nonassertive use of the main clause limited to *think*, *know*, *look*, and *see*, or does it also occur with other complement-taking verbs? Moreover, the analysis that Bloom and co-authors propose appears to be somewhat inconsistent. Although they argue that children's use of *think*, *know*, *look*, and *see* is nonassertive (i.e., nonreferential), they suggest in other places that the main clauses contain full propositions and that the composite structure is really a complex utterance comprised of two full-fledged clauses (i.e., a main clause and a complement clause).

That the early use of complement-taking verbs is not always assertive (or referential) was also noted by Limber (1973), who examined the development of various types of complex sentence constructions in the speech of twelve children aged 1;6 to 3;0. Specifically, Limber argued that children use *I think* parenthetically as a holistic formula without knowledge of its literal meaning. (Limber 1973: 185). However, like Bloom, Rispoli, Gartner, and Hafitz, Limber did not indicate how general the parenthetical use was in his data; in fact, his analysis suggests that

the parenthetical use is restricted to *(I) think* and perhaps a few other mental verbs.

In accordance with Limber, Shatz, Wellman, and Silber (1983: 301) observed that *think* and other mental verbs are not used for "mental reference" when they emerge in children's speech; rather, the earliest uses serve various "conversational functions": they may modulate an assertion, express the speaker's desire, or direct the interaction (see also Wellman 1990; Bartsch and Wellman 1995). The results of Shatz's investigation are consistent with our empirical findings. However, since Shatz and colleagues are primarily concerned with the cognitive development of children (as indicated by their use of mental verbs), they do not consider the implications of their findings for grammatical development; in fact, the grammatical context plays only a minor role in their study, which considers children's use of mental verbs across a wide variety of constructions (i.e., not just in complex sentences including finite complement clauses).

Apart from these few corpus-based analyses, there have been a number of experimental studies testing children's comprehension of complement clauses (see Phinney 1981; de Villiers et al. 1990; Roeper and de Villiers 1994; Vainikka and Roeper 1995; de Villiers 1995, 1999; de Villiers and de Villiers 1999). However, most of these studies are not specifically concerned with the acquisition of finite complement clauses; rather, they use complement clauses in order to investigate the development of general grammatical principles. For instance, in one series of experiments complement clauses were used to study the development of *wh*-movement, as in (1):

(1) What did the girl say she bought?

Although such sentences are extremely rare in the speech of young children, they can provide crucial insights into the child's comprehension of complement clauses. For instance, de Villiers (1999) points out that when children under four years of age are asked to answer the question in (1), they usually name the thing that the girl actually bought rather than what she said she bought, which might be different. In other words, young children do not understand that "the question concerns the joint effect of two verbs: both saying and buying" (de Villiers 1999: 103); instead, they concentrate on the verb in the complement clause, which according to de Villiers suggests that they have not yet fully mastered the syntax and meaning of sentential complements (see also de Villiers et al. 1990; Roeper and de Villiers 1994). Though this conclusion is open to various interpretations, it is in any case compatible with the analysis we propose: children might ignore the main clause predicate in sentences like (1),

because the main clause does not usually express a full proposition in early child language.

In what follows we will examine the development of finite complement clauses based on observational data from seven English-speaking children between 1;2 and 5;2 years of age. Before presenting our results, we will consider the use of complement clauses in adult English, providing the background for our investigation of children's early use of complement clauses in spontaneous speech.

2. Complement clauses

Complement clauses (henceforth abbreviated as COMP-clauses) are commonly defined as subordinate clauses functioning as an argument of a predicate (Noonan 1985: 42);[1] they may serve as subject or object of the superordinate clause:

(2) That Bill wasn't in class annoyed the teacher.
(3) The teacher noticed that Bill wasn't in class.

The COMP-clause in (2) functions as subject of the verb *annoyed*; it could easily be replaced by a subject noun phrase (such as *Bill's absence from class annoyed the teacher*).[2] Such subject COMP-clauses do not occur in our child language data (see also Limber 1973: 175). The COMP-clause in (3) serves as the direct object of the verb *noticed*; it could also be replaced by a simple noun phrase (compare *The teacher noticed Bill's absence from class*).[3] Unlike subject COMP-clauses, object COMP-clauses are very common in early child speech (see Limber 1973; Bloom et al. 1991). They may include a finite or nonfinite verb. Nonfinite COMP-clauses comprise infinitival and participial constructions (see Quirk et al. 1985: 1185–1208); however, nonfinite COMP-clauses will not be considered in this work. Finite COMP-clauses can be divided into three types:

1. S-complements marked by *that* or by zero;
2. *if*-complements marked by *if* (or *whether*);
3. *wh*-complements introduced by a *wh*-pronoun or *wh*-adverb.

Examples of each type are given in examples (4) to (6).

(4) Sally thought that he was crazy.
(5) Peter asked Bill if that was true.
(6) Mary didn't understand what Bill was saying.

S-complements either include a *that*-complementizer or they are morphologically unmarked (having the form of a simple main clause). *If*-complements are introduced by the complementizers *if* (or *whether*),

which in contrast to *that* qualify the meaning of the COMP-clause. Unlike S-complements, *if*-complements have a hypothetical meaning. Finally, *wh*-complements have a specific syntactic structure setting them apart from both S-complements and *if*-complements: They are introduced by a *wh*-word serving as an argument or adjunct in the embedded clause; that is, while the complementizers of S- and *if*-complement clauses are grammatical operators, the *wh*-pronouns/adverbs of *wh*-complements serve a semantic role within the embedded clause.

The three types of COMP-clauses occur with a limited number of complement-taking verbs. Some of them are compatible with all three types of complement clauses, while others take only one or two of them. For instance, while *see* may occur with S-, *if*-, and *wh*-complements, *think* only occurs with S-complements and *ask* is restricted to *if*- and *wh*-complement clauses. The co-occurrence restrictions are largely motivated by the meaning of the complement-taking verbs (see Quirk et al. 1985: chapter 16), which can be divided into various semantic classes: utterance verbs (e.g., *say*, *tell*, *ask*), mental state verbs (e.g., *think*, *believe*, *assume*), perception verbs (e.g., *see*, *hear*, *notice*), desiderative verbs (e.g., *wish*, *desire*, *hope*), and several others (see Noonan 1985: 110–133). While these verbs are commonly used to *denote* a mental or verbal activity, this is by no means their only usage. We will distinguish between two major uses of complement-taking verbs (abbreviated henceforth as CTV): (1) the *assertive* use and (2) the *performative* use. These uses differ both with regard to their pragmatic functions and with regard to the conceptual relationships that they evoke between a CTV-clause and a COMP-clause.[4] Before discussing the properties of these two uses, we have to specify some theoretical assumptions that underlie the analysis that we propose.

Following Langacker (1987, 1991), we assume that linguistic elements are symbolic units that consist of a specific form paired with a specific meaning. This holds not only for lexical items (as Saussure already suggested) but also for grammatical constructions, which can be seen as complex symbolic units. More precisely, we define the notion of construction as a form–function pairing that comprises at least two smaller symbolic units.[5]

Complex sentences including finite COMP-clauses can be seen as grammatical constructions in which a specific combination of clauses is paired with a specific meaning. The whole construction comprises two propositions expressed by the CTV-clause and the COMP-clause. For the purpose of this study, we define the term proposition as the meaning or content of a clausal construction denoting some state of affairs (e.g., a state, an event, or an activity).

Based on these assumptions we can characterize the assertive and performative uses as follows. In the assertive use, a CTV-clause expresses the main proposition of the composite structure. Consider the following examples:

(7) Peter remembered clearly that he had seen this guy before.
(8) Peter told Mary that he would not come to the party.
(9) Peter saw that Mary was coming.

Each utterance in (7) to (9) contain two propositions expressed by a CTV-clause and a COMP-clause; the complement proposition, however, serves as a conceptual element of the CTV-clause proposition. The meaning of the composite structure is therefore determined by the meaning of the CTV-clause: example (7) basically describes a cognitive activity (i.e., remembering), (8) refers to a communicative act (i.e., telling), and (9) denotes the perception of an activity (i.e., seeing). Thus, the central state of affairs is expressed in the proposition of the CTV-clause. The COMP-clause proposition is only of secondary interest: it is not considered as an independent object of thought; rather, it presents background information that is only relevant in that it plays a certain role within the proposition expressed in the CTV-clause. Thus, the COMP-clause is conceptually embedded in the CTV-clause.

In the performative use, the relationship between the CTV-clause and the COMP-clause is different. A performative CTV-clause does not express the main proposition of the whole utterance; rather, it addresses a specific aspect of the interaction between the interlocutors. As a starting point, let us consider Austin's (1962) analysis of "explicit performative utterances". Noticing that utterances are not only used to *describe* some state of affairs but also to *perform* an action, Austin introduced the well-known distinction between *meaning* and *(illocutionary) force*. The meaning of an utterance is its propositional content (i.e., the description or denotation of some state of affairs), whereas the illocutionary force is what speakers *do* with an utterance (e.g., make a promise, apologize, express regrets, etc.). What is interesting in the context of the current investigation is that Austin used complex sentences including COMP-clauses in order to illustrate aspects of his analysis. Specifically, he argued that the illocutionary force of a speech act can always be expressed in an "explicit performative utterance", which is basically a complex sentence construction in which the CTV-clause includes a speech-act verb in "the first person singular present indicative active" (Austin 1962: 61–62).[6] Some typical examples are given in (10) to (13).

(10) I promise that I will help you with this work.
(11) I (want to) ask you if you could do me a favor.
(12) I maintain that your hypothesis is invalid.
(13) I suggest that we leave before it begins to rain.

While Austin was not interested in the analysis of complex sentence constructions, his discussion of explicit performative utterances reveals an interesting aspect of the relationship between CTV-clause and COMP-clause. Specifically, it shows that the two clauses of this construction are at different speech-act levels if they constitute an explicit performative utterance: while the COMP-clause describes some state of affairs, the CTV-clause basically serves to indicate the illocutionary force of the utterance. Since CTV-clause and COMP-clause concern different speech-act levels they are conceptually less tightly integrated in the performative use than in the assertive use (in which both clauses serve together to describe a complex state of affairs). This is easily demonstrated by the fact that a performative CTV-clause can always be omitted if the illocutionary force of the utterance is sufficiently determined by the discourse context (or by other means such as modals, adverbs, or discourse particles). In fact, it is probably much more common to express the speech acts in examples (10) to (13) without the associated CTV-clauses, as in the following examples:

(10′) I will (definitely) help you with this work.
(11′) Would you do me a favor?
(12′) Your hypothesis is invalid.
(13′) We better leave before it begins to rain.

In contrast to the performative use, the assertive use of a CTV-clause involves information that cannot be so easily omitted. If we consider for instance examples (7) to (9), it appears to be impossible to express the meaning of the whole utterance without the CTV-clause given that the COMP-clause is conceptually an element of the CTV-clause proposition. Unlike the performative use, the assertive use (of a CTV-clause) contributes crucially to the expression of the propositional content, which—in contrast to the illocutionary force—is not so easily inferable from the discourse context.[7]

While Austin analyzed the performative use of speech-act verbs in great detail, he did not consider the use of other verbs that may occur in a CTV-clause. In our view, there are many other complement-taking verbs, notably mental and perception verbs, that can similarly be used as performative speech-act verbs. While most of them do not (immediately) indicate the illocutionary force of an utterance, they are generally

concerned with the interaction between the interlocutors: they may express the speaker's mental stance (i.e., the "propositional attitude"; see Searle 1979) regarding the COMP-clause proposition; they may indicate the source of knowledge for the information expressed in the COMP-clause; or they may in various other ways instruct the hearer how to interpret the COMP-proposition. Like performative speech-act verbs, these complement-taking verbs are immediately concerned with the interaction between the interlocutors and thus are subsumed under the performative use.

Two major subtypes of performative CTV-clauses can be distinguished on formal grounds. First, CTV-clauses in the first-person singular present indicative active. This type subsumes both the performative use of speech-act verbs and many other verbs that may occur in this construction:

(14) I believe that this is a mistake.
(15) I find that these conditions are unfair.
(16) I (can) hear that Paul is coming; he just closed the front door (making a noise).
(17) I see that Jack is leaving (he just went out of the building).

While the CTV-clauses in these examples do not include a speech-act verb indicating the illocutionary force, they address other aspects of the interaction: the CTV-clauses in examples (14) and (15) express the speaker's propositional attitude, and the ones in examples (16) and (17) indicate the knowledge source for the information expressed in the COMP-clause. In all four examples, the CTV-clauses denote a mental state or an act of perception, i.e., they describe some state of affairs, as in the assertive use. However, this is not their sole function; rather, they also serve to instruct the hearer as to how to interpret the utterance. In fact, we maintain that the expression of the propositional content is secondary in these CTV-clauses: their primary function is to guide the hearer in his/her interpretation of the COMP-clause proposition. This is suggested by the fact that the core of the propositional content can be expressed without the CTV-clause:

(14′) This is probably a mistake.
(15′) These conditions are unfair.
(16′) Paul is coming; he just closed the front door (making a noise).
(17′) Jack is leaving (looking out of the window the speaker observes that Jack is leaving).

While the constructions in examples (14′) to (17′) are not as explicit as their counterparts in (14) to (17) they basically convey the same meaning, assuming that the speaker's cognitive activities (as expressed in

the CTV-clauses in examples [14] to [17]) are inferable from the discourse context. Thus, as in the case of an explicit performative utterance, the central state of affairs is expressed in the COMP-clause rather than by the CTV-clause proposition. What distinguishes the CTV-clauses in examples (14) to (17) from performative speech-act verbs is that they concern the propositional attitude or knowledge source for the complement proposition rather than the illocutionary force. That is, they do not indicate what the speaker *does* with the utterance; rather, they signal how the propositional content of the COMP-clause is to be understood.[8]

The other performative use of a CTV-clause involves direct questions, imperatives, and hortatives. While the verbs of these constructions also occur in the present indicative active (as in all other performative uses), they involve different subjects: the subject of a performative question is the second-person pronoun *you*, the hortative involves the first-person plural accusative pronoun *us*, and the imperative usually occurs with no overt subject. The following examples illustrate the performative use of these constructions:

(18) What do you think happened last Friday?
(19) Show me what you got from Peter.
(20) Let us assume that this is right ...

Like performative CTV-clauses including a first-person subject, the ones in these examples concern the interactive dimension of the utterance: the CTV-clause in (18) indicates that the hearer should answer the question based on his/her beliefs (which might not be true); the one in (19) induces the hearer to demonstrate an action; and in example (20) the CTV-clause opens a mental space for the subsequent proposition(s). Again, the CTV-clauses do not primarily serve to *denote* some state of affairs; rather, their primary function is to coordinate the interaction between the interlocutors. Since the interactive dimension of an utterance is usually sufficiently determined by the discourse context, the CTV-clauses can easily be omitted, as in all previous examples of the performative use:

(18′) What happened last Friday?
(19′) What did you get from Peter?
(20′) If this is right ...?

To summarize the discussion thus far, we have seen that a CTV-clause can be used in two ways: either it expresses the main proposition of a complex state of affairs, or it addresses a specific aspect of the interaction between the interlocutors. We have called these two uses the assertive and performative uses respectively. In the assertive use, the CTV-clause and COMP-clause together denote some complex state of affairs; the main

proposition is expressed by the CTV-clause, within which the COMP-proposition is conceptually embedded. In the performative use, the CTV-clause and the COMP-clause concern different dimensions of the utterance. While the COMP-clause expresses the core of the propositional content, the CTV-clause serves primarily to coordinate the interaction between the interlocutors: it may indicate the illocutionary force, the speaker's propositional attitude, the knowledge source for the COMP-proposition, or some other aspect that is relevant to the interpretation of the COMP-clause. Since the CTV-clause and the COMP-clause concern different speech-act levels, they are less tightly integrated in the performative use than in the assertive use. In fact, we maintain that in the performative use the COMP-clause is not conceptually embedded in the CTV-clause: rather than being viewed as a conceptual element of the CTV-clause proposition (as in the assertive use), the COMP-clause expresses the main proposition, which the hearer interprets with the help of the CTV-clause.[9]

While the assertive use and the performative use can be seen as the two major uses of a CTV-clause, there is yet another way in which a CTV-clause can be employed. We will call this third usage the *formulaic use* of a CTV-clause. It is historically related to the performative use, from which it developed through grammaticalization. The following examples illustrate the formulaic use of a CTV-clause:

(21) *Suppose* we do it this way.
(22) You're right, *I guess.*
(23) She left *I think.*
(24) *I bet* you missed the bus, didn't you?
(25) *You know*, we've been here before.

While examples (21) to (25) include both a CTV-clause and a COMP-clause, they are not really bi-clausal. Unlike the CTV-clause in the assertive and performative uses, the CTV-clause of the formulaic use is not a full-fledged (main) clause. Rather, it is a holistic formula functioning as an epistemic marker or attention getter that is only loosely adjoined to the COMP-clause, which is really an independent utterance. In other words, the examples in (21) to (25) are monoclausal constructions in which the CTV-clause has been demoted to some kind of clausal operator.[10] This is evidenced by a number of features that characterize the formulaic use (see Hooper 1975; Hooper and Thompson 1973; Thompson and Mulac 1991);

i. The CTV-clauses are always short and formulaic (suggesting that they are stored as holistic expressions).

ii. The subject of the CTV clause is either not overtly expressed or it is a first- or second-person pronoun.
iii. The complement-taking verb itself occurs in the present indicative active.
iv. There are no auxiliaries, modals, adverbs, or prepositional phrases in the CTV-clause.
v. The COMP-clause tends be much longer and more diverse.
vi. Since the COMP-clause is non-embedded (both formally and conceptually) it does not include a *that*-complementizer.
vii. The order of CTV-clause and COMP-clause is variable: the CTV clause may precede or follow the COMP-clause or may even be inserted into it.

Note that some of the features in (i) to (vii) are also characteristic of the performative use: Like formulaic CTVs, performative CTVs occur in the present indicative active and take either a first- or second-person pronoun as subject (unless they occur in the imperative). The performative use shares these features with the formulaic use because the two uses are historical related. As pointed out above, the formulaic use of a CTV-clause is commonly derived from the performative use through grammaticalization. In fact, in many cases the development is not yet completed so that it is often difficult to distinguish the two uses. However, some formulaic CTV-clauses are easily identified (the historical source is indicated in square brackets):

(26) She's a doctor *y'know*, [>(did/do) you know]
(27) *Y'mean* you won't come tomorrow? [>(did/do) you mean]
(28) *Guess* you are right. [>I guess]
(29) *Remember* you promised to help me. [>do you remember]
(30) *Suppose* we do it this way. [>let us suppose]
(31) *Say* we leave at eight o'clock, ... [>let us say]

Since the CTV-clauses in examples (26) to (31) are formally distinguished from their historical sources (i.e., the performative CTV-clauses in square brackets), they can only be interpreted as epistemic markers or attention getters (i.e., as formulaic CTV-clauses). However, there are many utterances in which the CTV-clause is equivocal between the performative use and the formulaic use. In fact, there is no clear-cut borderline between these two uses: one can think of the formulaic use as a performative CTV-clause, in which the propositional content has been bleached or demoted. Since this is a continuous process, the distinction between the performative use and the formulaic use is necessarily fluid. In the extreme case, the propositional content of the CTV-clause is

entirely empty, as in the examples in (26) to (31); however, very often the CTV-clause still seems to have some propositional content despite the fact that it basically functions as some kind of clausal operator. We assume therefore that the performative use and the formulaic use form a continuum with many intermediate cases.

In what follows we summarize the previous discussion, highlighting three important aspects of the assertive, performative, and formulaic uses: (i) the function of the CTV-clause, (ii) the function of the COMP-clause, and (iii) the relationship between the CTV-clause and the COMP-clause.

i. Function of the CTV-clause
   (a) In the assertive use, the CTV-clause expresses the main proposition of the whole utterance.
   (b) In the performative use, the CTV-clause has some (propositional) meaning; however, its primary function is to coordinate the interaction between the interlocutors.
   (c) In the formulaic use, the CTV-clause serves as some kind of clausal operator (e.g., epistemic marker, attention getter).

ii. Function of the COMP-clause
   (a) In the assertive use, the COMP-clause expresses a proposition that is conceptually an integral part of the CTV-clause proposition.
   (b) In the performative use, the COMP-clause expresses the core of the proposition content for the whole utterance.
   (c) In the formulaic use, the COMP-clause expresses the only proposition; the CTV-clause is propositionally empty.

iii. Relationship between CTV-clause and COMP-clause
   (a) In the assertive use, the COMP-clause is both formally and conceptually embedded in the CTV-clause.
   (b) In the performative use, the COMP-clause is formally subordinated but conceptually nonembedded in the CTV-clause.
   (c) In the formulaic use, the COMP clause is neither formally nor conceptually embedded in the CTV-clause.

We are now in a position to state our hypothesis regarding children's acquisition of COMP-clauses more precisely: the earliest and most frequent COMP-clauses that English-speaking children learn occur in utterances in which the CTV-clause is formulaic; that is, the earliest CTV-clauses are propositionally empty and the associated COMP-clauses are not embedded (neither formally nor conceptually). As the children grow older, they begin to use performative and assertive CTV-clauses; however, since the occurrence of the performative and assertive uses is restricted to a few complement-taking verbs, we argue that these

constructions are not yet subsumed under a schema or rule; rather, they are constructional islands organized around specific complement-taking verbs.

3. Data

Our study is based on natural data from seven English-speaking children. All data are taken from the CHILDES database (see MacWhinney and Snow 1990). The seven children are between 1;2 and 5;2 years of age. As can be seen in Table 1, there is considerable variation as to the amount of data available for each child. The most comprehensive corpora exist for Adam and Abe: they include 789 and 968 finite COMP-clauses respectively. The corpora for Sarah, Peter, and Nina are significantly smaller: they consist of a few hundred COMP-clauses each. Finally, the corpora for Naomi and Eve are rather small, including around 50 COMP-clauses each.

If we add up the data from all seven children our corpus comprises a total of 2807 utterances including a finite COMP-clause. We collected these data in two steps: in the first step we searched the transcripts from all seven children for utterances including at least two clauses defined by the occurrence of two verbs (disregarding auxiliaries and modals). In the second step we classified and coded these utterances using the traditional criteria for complement, relative, adverbial, and coordinate clauses. We also indicated whether the subordinate clause was finite or nonfinite and whether main and subordinate clause included the same or two different subjects. Note that we did not distinguish between the three different uses of CTV-clauses at this stage of our analysis. Our sample includes therefore all utterances in which a finite clause seems to function as a complement of the verb in a superordinate clause even though the latter might turn out to be some kind of clausal operator.

Table 1. *Age of children and number of COMP-clauses*

	Age range	Number of COMP-clauses
Naomi	1;2–4;9	49
Eve	1;6–2;3	53
Nina	1;11–3;3	213
Peter	1;9–3;2	263
Sarah	2;3–5;1	472
Adam	2;3–5;2	789
Abe	2;4–5;0	968
Total	1;2–5;2	2807

All finite COMP-clauses included in our sample have been coded for the following features:

1. the subject of the CTV-clause (e.g., 1SG.PRO, lexical NP, etc.);
2. the tense features of the complement-taking verb (e.g., present, past, future);
3. the occurrence of modals and negation markers in the CTV-clause (e.g., *would*, *can*, *don't*);
4. the occurrence of complementizers and *wh*-pronouns/adverbs in the COMP-clause (e.g., *that*, *if*, *what*);
5. the order in which CTV-clause and COMP-clause occur.

Table 2 presents a list of all complement-taking verbs that we have found in the data. There are 29 complement-taking verbs in the entire corpus, but only seven of them occur in the transcripts of all seven children: *see*, *look*, *think*, *know*, *guess*, *say*, and *tell*. All other complement-taking verbs are only found in the speech of some of the children.

4. Results

4.1. *S-complements*

The earliest COMP-clauses in our data are S-complements; they emerge shortly after the second birthday. The entire corpus includes a total of 1811 S-complement clauses, which occur with 20 different complement-taking verbs. However, some of the complement-taking verbs have just a few tokens; they will not be considered in the following analysis, which concentrates on the most frequent complement-taking verbs. Table 3 shows the number and percentage of those verbs that occur at least ten times in our sample; the verbs that occur less frequently (i.e., less than ten times summed across all children) are listed at the bottom of the table.

Table 2. *Complement-taking verbs*

7 children	6 children	5 children	4 children	3 children	2 children	1 child
see	*show*	*watch*	*hope*	*hear*	*forget*	*care*
look	*pretend*	*wonder*	*find*	*ask*	*happen*	*understand*
think		*remember*		*wish*	*read*	*write*
know		*mean*		*sing*		*pray*
guess		*bet*				*like*
say						
tell						

Table 3. *Complement-taking verbs of S-complements*[a]

	Nina	Peter	Naomi	Eve	Sarah	Adam	Abe	Total	Percentage
think	20	48	11	12	88	186	193	558	30.8
say	30	17	7	3	45	35	176	313	17.3
see	34	27	2	15	81	63	53	275	15.2
know	6	3	3	1	29	36	57	135	7.5
look	30	13	2	3	10	36	31	125	6.9
pretend	19	3	1	1	2	9	32	67	3.7
mean	2	2	–	–	20	14	25	63	3.5
bet	3	1	–	–	14	18	19	55	3.0
guess	1	7	–	1	12	13	15	49	2.7
tell	5	4	1	2	6	5	23	42	2.3
wish	–	–	–	–	5	28	4	37	2.0
hope	–	1	–	–	6	10	14	31	1.6
remember	1	–	–	4	5	3	5	18	1.0

[a]Others: *Hear, sing, show, forget, find, pray.*

We divided the complement-taking verbs in Table 3 into four classes based on their pragmatic function. The following four sections examine these classes in turn.

4.1.1. *Epistemic markers:* Think, guess, bet, mean, *and* know

There are five verbs in our data that are commonly used as parenthetical epistemic markers: *think*, *guess*, *bet*, *mean*, and *know*. Nearly 50 percent of all utterances including a S-complement clause occur with one of these five verbs in our sample. The following examples show the first fifteen utterances that Sarah produced with the complement-taking verb *think*.

(32) [Sarah's first fifteen utterances including *think* plus S-complement]

a.	*I think* I'm go in here.	3;1
b.	And *I think* (pause) we need dishes.	3;2
c.	*Think* some toys over here too.	3;3
d.	*I think* I play jingle bells ... with the record player.	3;5
e.	*I think* he's gone.	3;5
f.	Oh (pause) *I think* it's a ball.	3;5
g.	It's a crazy bone (pause) *I think*.	3;5
h.	*I think* it's in here.	3;5
i.	*I think* it's in here ... Mommy.	3;5
j.	*Think* it's in there.	3;5
k.	*I think* I don't know that one.	3;6
l.	I'm get my carriage (pause) *I think*.	3;6
m.	*Think* it's in this.	3;6

n. *I think* that your hands are dirty. 3;6
o. *I think* my daddy took it. 3;7

At first glance, the utterances in (32) seem to contain two propositions expressed by a CTV-clause and a COMP-clause; however, there is good evidence that the CTV-clauses are propositionally empty. In all fifteen examples, the CTV-clause is short and formulaic; there is hardly any variation: *think* always occurs in the present, indicative, active, taking the first-person singular pronoun *I* as subject. Note that in three examples *I* is omitted, yielding a CTV-clause with no overt subject. Apart from the pronominal subject, there is no other element that co-occurs with *think* in the CTV-clauses: *think* is never accompanied by an auxiliary or modal and never modified by an adverb or prepositional phrase. The COMP-clauses are longer and much more diverse; some of them include an auxiliary, a negative marker, a prepositional phrase, or a verb in the past tense. None of the COMP-clauses in (32) is marked by a *that*-complementizer and, with one exception, there are also no complementizers in Sarah's later COMP-clauses of *think*. Finally, although the COMP-clauses usually follow the CTV-clause, there are two examples (in 32) in which *think* occurs at the end of the utterance. All this suggests that the CTV-clauses of these examples are prefabricated formulas: they serve as parenthetical epistemic markers that indicate the speaker's degree of certainty towards the associated proposition, somewhat similar to an epistemic adverb such as *maybe* (see Chafe and Nichols 1986; Thompson and Mulac 1991).

As Sarah grows older, a few other patterns emerge. At the age of 3;7 she uses *think* for the first time in an interrogative clause with a second-person pronoun as subject (example [33]), which from then on occurs quite frequently. Five months later, there is an utterance in which *think* is used in the past tense (example [34]), and at the age of 4;3 she uses *think* with the pronoun *they* as subject (example [35]); this is the only third-person subject of *think* in Sarah's entire corpus, which includes 87 tokens of the complement-taking verb *think*.

(33) *You think* it does? 3;7
(34) *(I) thought* it was in the house. 4;0
(35) I will sing along with them ... then *they think* I ... will ... have ... 4;3

While the parenthetical *I think* remains the dominant type of CTV-clause in Sarah's data, the examples in (33) to (35) show that some of her later uses of *think* are more substantial: they actually refer to some mental state of affairs. The same developmental pattern is found in the data of some of the other children. Consider the examples in Table 4, which show all the

Table 4. *CTV-clauses of S-complements including* think *at different ages*

Age	Sarah	Adam	Abe
>2;11		*I think* [2;11] (2)	*I think* [2;8] (4) *I thought* [2;9] (2)
3;0–3;11	*I think* [3;1] (26) *(Do) you think* [3;7] (2)	*I think* (7) *Do you think* [3;3] (4)	*I think* (71) *I thought* (23)
		Does he think [3;3] (3) *You don't think* [3;5] (1) *What do you think* [3;5] (1) *I don't think* [3;8] (2)	*I don't think* [3;1] (7) *They think* [3;3] (2) *He thought I think* [3;3] (1) *Don't you think* [3;4] (1) *Why do you think* [3;10] (1) *What do you think* [3;5] (1) *Where do you think* [3;6] (1) *You thought* [3;8] (2) *The people thought* [3;8] (1) *Do you think* [3;11] (2)
4;0–5;0	*I think* (42) *Do you think* (3) *I thought* [4;1] (7) *I'm thinking* [4;2] (1) *They think* [4;3] (1) *What do you think* [4;4] (2) *I don't think* [4;8] (2) *I'll think* [4;10] (1)	*I think* (99) *Do you think* (5) *I don't think* (2) *Why do you think* (2) *Why do you think* (1) *One think* [4;6] (1) *Paul think* [4;10] (1)	*I think* (22) *I thought* (14) *Do you think* (10) *I don't think* (1) *She thinks* [4;0] (1) *I was thinking* [4;8] (1) *How do you think* [4;8] (1) *Why do you think* [4;9] (1) *He wants everyone to think* [4;9] (1) *We would think* [4;11] (1) *You thought* [4;11] (1)

CTV-clauses (i.e., all types) that Sarah, Adam, and Abe produced with *think* and an S-complement clause.[11] We divided their data into three time periods: *think*-CTV-clauses produced (1) up to the third birthday, (2) between three and four, and (3) between four and five. The first occurrence of a *think*-CTV-clause is underlined; the exact date is indicated in square brackets. The figures in parenthesis show the number of tokens with which each clause type occured during a certain time period.

As can be seen in Table 4, all three children use *think* initially in the parenthetical formula *I think*, which is by far the most frequent type of CTV-clause including *think* in our data. However, as Sarah, Adam, and Abe grow older they begin to use *think* in other types of CTV-clauses, in which *think* occurs in different tense and aspect forms, with auxiliaries

and negation markers, and with other subjects: Especially in questions, *think* is commonly used with the second-person pronoun *you* in subject function. There are also a few examples in which *think* occurs with a third-person subject, notably in Abe's data, but they are significantly less frequent than second-person pronouns and especially first-person pronouns. In our view these data suggest that the use of *think* becomes more substantial with increasing age. All three children begin with the formulaic use of *think* as a parenthetical epistemic marker. The formulaic use is later supplemented by the two other uses of CTV-clauses, notably the performative use in questions. The assertive use remains extremely rare throughout the entire time period of our study. There are only a few later examples, primarily in Abe's data, in which a CTV-clause including a third-person subject seems to denote the main proposition of a complex utterance.

Like *think*, the four other complement-taking verbs of this class are primarily used as parenthetical epistemic markers. The examples in (36) and (37) illustrate the use of *guess* and *bet*; they show Sarah's first ten utterances in which these two verbs occur with an S-complement clause.

(36) [Sarah's first ten utterances including *guess* plus S-complement]

a.	*I guess* I better come ...	3;5
b.	*Guess* I'll write some more white.	3;9
c.	*Guess* I lay it down.	3;10
d.	*I guess* saw me break them.	3;10
e.	*I guess* I have one more.	4;4
f.	That goes right here but it don't fit ... *I guess.*	4;4
g.	Now ... *I guess* that goes right there ... doesn't it?	4;4
h.	Because it have both lines ... *I guess.*	4;5
i.	*I guess* this is a hill ... like this.	4;9
j.	*I guess* this is ...	5;0

(37) [Sarah's first ten utterances including *bet* plus S-complement]

a.	*Bet* can't ... it.	3;4
b.	*I bet* I can't do that.	3;4
c.	That will be me *bet you* ...	3;6
d.	*I bet* the other one's Shaggy.	3;8
e.	*I bet* I can.	3;9
f.	*I bet* I can try with a spoon.	4;1
g.	*I bet* you he'll eat one of the birds up.	4;1
h.	*I bet* you can' make a ...	4;3
i.	*I bet* you don't know this.	4;4
j.	*I bet* I can win this time.	4;6

The utterances in examples (36) and (37) have basically the same structure as the constructions including *think:* the complement-taking verbs always occur in the present indicative active, they are never accompanied by an auxiliary, modal, or adverb, and their subject is always the first person singular pronoun *I*. The COMP-clauses are longer and more diverse, they are never introduced by a *that*-complementizer, and in some examples they precede the CTV-clause. Thus, like *I think*, *I guess* and *I bet* can be seen as parenthetical CTV-clauses adjoined to a S-complement, which is formally really an independent clause; the composite structure is thus monoclausal. However, while the use of *think* is later extended to other types of CTV-clauses, *guess* and *bet* always occur in the same construction; there is no evidence for development in our data. With the exception of one example, the occurrence of *guess* and *bet* remains restricted to the parenthetical formulas *(I) guess* and *(I) bet*.

The examples in (38) show the first ten utterances that Adam produced with *mean*.

(38) [Adam's first ten utterances including *mean* plus S-complement]

a.	Does lion crawl (pause) *I mean*.	3;5
b.	*I mean* (pause) make another airplane	3;6
c.	*You mean* dat's on there?	3;11
d.	*You mean* Paul says that?	3;11
e.	*I mean* I'm a police driver.	4;1
f.	*What do you mean* (pause) I'm not afraid?	4;3
g.	*What do you mean* about play with it?	4;3
h.	*What do you mean* (pause) that's all?	4;7
i.	*What do you mean* (pause) they'll last a long time?	4;9
j.	*What do you mean* (pause) it's going to be one?	5;2

Adam uses *mean* either in the CTV-clause *I mean* or in CTV-clause questions where it occurs with a second-person pronoun as subject. Both uses are formulaic: *I mean* serves as a parenthetical epistemic marker, while the interrogative clauses function as question formulas: *You mean ...?* is used to ask for confirmation that the speaker understood the hearer correctly, and *what do you mean (pause)...?* signals that the speaker disagrees with the hearer's previous utterance unless s/he can provide some reasons to explain it. Both CTV-clause questions can be seen as some sort of speech-act marker.

While Adam uses *mean* only with either a first- or a second-person pronoun as subject, some of the children also use *mean* with third-person subjects. In fact, the use of *mean* with third-persons pronouns is quite frequent in the data, as shown in Table 5.

Table 5. *Subjects of* think, guess, bet, mean, *and* know

	1.SG.PRO	2.SG.PRO	3.SG.PRO	PL.PRO	LEX.N	IMP	Total
think	467	75	8	5	3	–	558
guess	48	–	–	1	–	–	49
bet	55	–	–	–	–	–	55
mean	29	14	19	1	–	–	63
know	50	79	2	–	4	–	135
Total	649 (75%)	168 (20%)	29 (3%)	7 (1.0%)	7 (1.0%)	– (0%)	860

As can be seen in Table 5, the complement-taking verbs of this class occur primarily with first-person pronouns or second-person pronouns as subjects (the latter almost always occur in questions). *Mean* is the only verb of this class that occurs with a significant number of third-person subjects: There are nineteen examples (in the entire corpus) in which a CTV-clause includes *mean* and either *it* or *that* as its subject. However, that does not mean that these CTV-clauses are assertive. While *it means* and *that means* do not function as epistemic markers, they do not serve to denote some state of affairs; rather, they indicate a specific link between two utterances (similar to a conjunctional adverb such as *therefore* or a linking phrase such as *in other words*). Thus, *it means* and *that means* are also propositionally empty and can be seen as formulaic CTV-clauses.

Finally, (39) shows Adam's first ten utterances including *know* and an S-complement clause.

(39) [Adam's first ten utterances including *know* plus S-complement]

a.	*I know* this piece go.	2;6
b.	*I know* (pause) soldier marching.	2;8
c.	*How do you know* it going eat supper?	3;0
d.	*How do you know* dat a duck?	3;0
e.	*How do you know* dat convertible?	3;0
f.	*How do you know* (pause) I saw ducks	3;0
g.	*How do you know* (pause) put my cup up?	3;0
h.	*How do you know* (pause) doesn't hurt me?	3;1
i.	Mommy (pause) *how do you know* dat's Harvard Square bus?	3;1
j.	*Do you know* de lights went off?	3;2

Like *mean*, *know* occurs in two types of CTV-clauses: in the expression *I know* and in questions. *I know* is similar to other CTV-clauses such as *I think* or *I guess*: it can be seen as an epistemic marker. However, compared to *I think* and *I guess*, *I know* is less grammaticalized. Although

I know basically serves as an epistemic marker, it always precedes the COMP-clause and is often negated (like performative and assertive CTV-clauses). Adam's early use of *know* in questions also has very little substance. It is largely restricted to the interrogative formula, *How do you know ...?*, which functions to elicit an explanation.

Like *think*, *know* appears in a wider variety of CTV-clauses as the children of our study grow older. Table 6 presents a complete list of CTV-clauses (i.e., a list of all types) in which *know* occurs with a S-complement in Sarah, Adam, and Abe's transcripts.[12]

As can be seen in Table 6, all three children begin to use *know* in formulaic CTV-clauses: Sarah and Adam start with *I know* while Abe uses the often contracted formula *y'know* before he employs *know* in any other CTV-clause. With growing age, the use of *know* becomes somewhat more substantial. *Know* is especially common in interrogative CTV-clauses, which are often ambiguous between the formulaic and performative uses. However, the assertive use of *know* is extremely rare: There is one relatively early example in which Sarah uses *know* with a third-person subject and less than half a dozen later examples that might include an assertive CTV-clause.

Table 6. *CTV-clauses of S-complements including* know *at different ages*

Age	Sarah	Adam	Abe
> 2;11		*I know* [2;6] (1)	*(You) know* [2;11] (1)
3;0–3;6	*I know* [3;2] (2)	*I know* (3)	*You know* (5)
	I didn't know [3;7] (1)	*How do you know* [3;0] (8)	*I didn't know* [3;1] (5)
	She knows [3;7] (1)	*Do you know* [3;2] (2)	*I don't know* [3;2] (5)
		I want to know [3;6] (1)	*Did you know* [3;3] (8)
		You know [3;7] (1)	*You didn't know* [3;3] (1)
		How did you know [3;8] (1)	*I know* [3;5] (4)
			Do you know [3;9] (1)
4;0–5;0	*I know* (2)	*I know* (8)	*You know* (3)
	I didn't know (2)	*You know* (3)	*Did you know* (6)
	Do you know [4;0] (2)	*How do you know* (1)	*I don't know* (3)
	Did he know [4;1] (1)	*Do you know* (1)	*I don't know* (1)
	You know [4;2] (13)	*I didn't know* [4;5] (3)	*I know* (3)
	How do you know [4;6] (1)	*Mommy don't know* [5;2] (1)	*Do you know* (1)
	You won't even know [4;8] (1)		*I knew* [4;6] (3)
	I knew [4;10] (1)		*Don't you know* [4;6] (1)
	You knew [4;11] (1)		*I just want to know* [4;8] (1)

4.1.2. *Deontic modality markers:* Wish *and* hope

We turn now to two other CTVs, *wish* and *hope*, which are only used by three of the seven children that we examined: Sarah, Adam, and Abe (there is also one isolated example including *hope* in Peter's transcripts). The following examples are the first utterances that Adam produced with *wish* and *hope* in CTV-clauses.

(40) [Adam's first ten utterances including *wish* plus S-complement]

a.	*I wish* I could play with dis [a Christmas present].	3;5
b.	*I wish* I can keep it (pause) for writing on.	3;5
c.	*I wish* I can keep dat so I can tick (pause) tick it.	3;5
d.	*I wish* we can eat ...	3;8
e.	*I wish* we could eat that.	3;8
f.	*I wish* I could have a tractor to drive in them.	3;8
g.	*I wish* (pause) could (pause) make some more just like dat.	3;8
h.	*I wish* you could color all dese.	3;9
i.	*I wish* I could have a picnic.	3;11
j.	Mommy (pause) *I wish* I could come back here.	3;11

(41) [Adam's first nine utterances including *hope* plus S-complement]

a.	*Hope* he tipped again.	3;6
b.	*I hope* he won't bother you.	4;0
c.	*I hope* my cat friends are alright.	4;4
d.	*I hope* dey alright.	4;4
e.	*I hope* I can knock dese pretty bowling balls down with only one strike.	4;9
f.	*I hope* de house won't be on fire.	4;9
g.	*I hope* dat kitty's not getting into trouble.	4;9
h.	*I hope* I put my sponge in here.	4;9
i.	*I hope* they are not in my group.	4;10

The examples in (40) and (41) are very similar to some of the utterances that we have seen before. *Wish* and *hope* occur exclusively in the present indicative active, they are never accompanied by an auxiliary or modal, they are never negated, and their subject is almost always the first person pronoun *I*. Table 7 shows that that there are only four utterances in the entire corpus in which *wish* and *hope* occur with a different subject.

Since the CTV-clauses in which *wish* and *hope* occur are highly formulaic, it is reasonable to assume that their use is nonreferential: They do not *denote* the speaker's desire; rather, they can be seen as deontic modality markers, serving basically the same function as a modal adverb such as *hopefully*. Additional support for this hypothesis comes from the fact that some of the children use *I hope* after the associated proposition

Table 7. *Subjects of* wish *and* hope *in CTV-clauses*

	1.SG.PRO	2.SG.PRO	3.SG.PRO	PL.PRO	LEX.N	IMP	Total
wish	36	–	–	–	1	–	37
hope	28	3	–	–	–	–	31
Total	64 (94%)	3 (4.5%)	– (0%)	– (0%)	1 (1.5%)	– (0%)	68

(i.e., after the COMP-clause) and that the COMP-clauses accompanying *wish* do not always occur in the subjunctive as in adult speech (e.g., *I wish I can keep dat ...*). If *I wish* was a full main clause, one would expect it to generally trigger the use of a subjunctive verb form in the dependent clauses. The occasional occurrence of the subjunctive in modals (e.g., *could*) does not contradict this hypothesis; children might simply repeat these forms from the "input" without knowing that they are using the subjunctive. Crucial is that they do not always use the subjunctive in COMP-clauses where it is required; this seems to suggest that the COMP-clause is treated as an independent utterance whose verb form is not determined by the complement-taking verb *wish*.

Unlike *think* and *know*, which show at least some developmental changes (see earlier), *wish* and *hope* occur in the same formulaic CTV-clauses throughout the time period of our study. While it is conceivable that children recognize (as they grow older) that *I wish* and *I hope* can literally denote the speaker's desire, this is not evident from our data. Their use of *wish* and *hope* remains formulaic and there are no signs of development giving rise to the performative, let alone the assertive uses.

4.1.3. *Discourse directives:* See, look *and* remember

There are three other verbs in our sample that are commonly used as parentheticals: *see*, *look*, and *remember*. Table 8 shows that 90 percent of these verbs occur with no overt subject. *See* is either used in the imperative or in an intonational question, *look* always appears in the imperative, and *remember* occurs in reduced questions. The following examples illustrate the early uses of *see* and *look*; (42) shows Sarah's first ten utterances in which *see* occurs in a CTV-clause, and (43) shows Adam's first ten uses of *look*.

(42) [Eve's first ten utterances including *see* plus S-complement]

a.	*See* I have a teeth.	2;0
b.	*See* I write a lady finger already.	2;1
c.	*See* it will work.	2;2

Table 8. *Subjects of* see, look, *and* remember *in CTV-clauses*

	1.SG.PRO	2.SG.PRO	3.SG.PRO	PL.PRO	LEX.N	IMP	Total
see	24	4	1	6	1	239	275
look	1	–	1	–	–	123	125
remember	1	1	–	–	–	16	18
Total	26 (6.2%)	5 (1.2%)	2 (0.5%)	6 (1.5%)	1 (0.2%)	378 (90.5%)	418

d. *See* ... this stool can work on a other ... a little stool. 2;2
e. *See* ... it can work on a little stool. 2;2
f. *See* ... it works on here. 2;2
g. Please make a picture *see* ... I'm making you something. 2;2
h. *See* ... I writing you talk, talk ... like this ... *see*? 2;3
i. *See* this is Eve ... 2;3
j. She wants to have an eggnog, *see it*? 2;3

(43) [Adam's first ten utterances including *look* plus S-complement]
a. *Look* birdie fly. 2;5
b. *Look* (pause) Mommy (pause) cowboy reach. 2;6
c. *Look* (pause) Daddy put it on a wall. 2;8
d. Fell down (pause) *look*. 2;9
e. *Look* (pause) dat man doing. 2;10
f. *Look* (pause) see new wheel. 2;10
g. *Look* (pause) dat me talking. 2;11
h. We (pause) all (pause) *look* (pause) mail come out. 2;11
i. *Look* I did to mailbox. 3;0
j. It's got something ... *look*. 3;0

See and *look* are common perception verbs, but in our data they serve a discourse pragmatic function. *See* has two distinct uses that are sometimes difficult to distinguish: it serves either as an attention getter (e.g., *See Daddy is over there*) or as some kind of question marker (e.g., *See, it works?*). The two uses are intonationally distinguished and derived from different historical sources. The attention getter is based on the imperative, while the question marker developed from an interrogative CTV-clause (i.e., [*do*] *you see ...?*). *Look* is always used as an attention getter based on the imperative. Note that *look* often follows the associated proposition, which indicates that *look* is used parenthetically in these examples; that is, it does not serve as an imperative CTV-clause.

While the use of *look* does not change in our data, *see* also occurs in other types of CTV-clauses as the children grow older; notably the use of *I see* is quite common:

(44) *I see* you bought some babies too. [Adam 4;4]
(45) *I see* you have bought new toys. [Adam 4;6]
(46) *I see* you carried the book with you. [Adam 4;9]

While *I see* is more substantial than the earlier uses of *see* in imperative and interrogative CTV-clauses, it is not clear whether *I see* is a performative CTV-clause: in most examples *I see* is ambiguous between an interpretation as parenthetical epistemic marker and perception/cognition verb (see Johnson 1999). While *I see* and a few other CTV-clauses can be seen as performative uses, the assertive use of *see* is almost entirely absent from our data; there are only a few later examples from Abe in which *see* might (literally) *denote* an act of perception.

The early use of *remember* is illustrated in (47) with examples from Adam and Abe.

(47) [Adam and Abe's first nine utterances including *remember* plus S-complement]
a. *Remember* uh ...uh ...um ... I had a book Tippy and Sue got me ... 3;0
b. I said "after we do this one ... do this one next"... *remember*? 3;2
c. *Remember* you reading de puzzle ... I put in there? 3;2
d. *You remember* I broke my window. 4;0
e. You have to put it in the barn ... *remember*? 4;1
f. I think you're going to win and *remember* Dad ... no wrecking the wall. 4;3
g. Daddy ... *remember* that time we were running up and running down ... 4;6
h. I'm writing a flat Dad ... *remember* you can't come in until I say okay. 4;10
i. And *remember* it's the touch the ball wrestle. 4;11

Remember denotes a cognitive activity in its most common meaning. However, in our data it functions to qualify the information expressed in the associated clause. As pointed out above, *remember* occurs in reduced questions (*do you remember* [*that*]...*?*> *remember*...*?*). In this usage it indicates that the associated proposition conveys information that is familiar to the interlocutors due to shared experience. Like *see* and *look*, *remember* basically serves a discourse pragmatic function.

4.1.4. Say, tell, *and* pretend

Finally, there are three other complement-taking verbs that we need to consider: *say*, *tell*, and *pretend*. These three verbs have more semantic weight and a less abstract meaning than all other CTVs in our sample. *Say* and *tell* refer to a verbal activity, an act of speaking, and they are always used in this sense in our data. *Pretend* seems to have a more abstract meaning. In adult language, *pretend* is commonly used to indicate a distinctive mental state. However, children use *pretend* in a more concrete sense, denoting a game in which somebody adopts the role or character of somebody else. In their use, *pretend* means something like "acting" or "staging" and thus is not a cognition verb as in adult language (Perner 1991).[13] Although *say*, *tell*, and *pretend* are semantically more concrete than mental verbs, they occur several months after *think*, *know*, and *see* in CTV-clauses.

(48) [Nina's first ten utterances including *say* plus S-complement]

a.	*The cowboy say* (pause) "I'm angry at you".	2;9
b.	*He sayed* he has something to play with for me.	2;9
c.	That means *peoples say* "put the kitty down".	2;10
d.	*She gonna say* I have a pretty dress on.	2;10
e.	*The kitty says* he wants to come in.	2;10
f.	*He say* the alligator's gonna bite him up.	2;10
g.	You make a rabbit and a bear *I said.*	2;10
h.	*He said* yes he will give you a cow.	2;11
i.	*She said* she is gonna give me a pillow ...	2;11
j.	*Dolly said* "yes she (pause) she's a witch".	2;11

(49) [Nina and Abe's first ten utterances including *tell* plus S-complement]

a.	*You don't tell Daddy* I'm making.	2;10
b.	*We should've told him* you put bananas on the floor ...	2;10
c.	*I told um* ... uh ...um ...uh ... mommy zebra had a baby zebra.	2;11
d.	*I'm gon to tell her* I brushed my teeth.	3;1
e.	Yeah see *I told you* nothing will be wrong.	3;1
f.	*She telled me* she forget the doll carriage for me.	2;10
g.	*He telled me* ... me don't scream again.	3;0
h.	*Tell me*... I would like to come to your house again.	3;0
i.	*I'm gonna tell him* I wanna go to his house.	3;3
j.	*I tell her* ... "no ... no... baby that's my stuff".	3;3

(50) [Abe's first ten utterances including *pretend* plus S-complement]

	I want to pretend this is a brush ...	2;10

I'm pretending this a gun and killing ... 2;10
I'm pretending you're fish and ... and pretending this is a gun. 2;10
I'm just pretending I'm going. 3;2
I'm just pretending it's a napkin. 3;3
Yeah *I pretended* this was a gun and ... 3;3
I pretend this is a mmm and I throw it. 3;3
I'm gon to pretend they are napkins 3;3
I'm just pretending it's a napkin. 3;3
No *we just pretended* you could play that and I could too ... 3;4

The utterances in examples (48) to (50) are rather different from those that we have seen before. The complement-taking verbs occur in different tenses and are frequently accompanied by a modal or an adverb: fifty percent of all CTV-clauses including *say*, *tell*, or *pretend* occur in the past tense and fifteen percent include either a modal or an adverb. By contrast, only seven percent of all other complement-taking verbs occur in the past and fewer than two percent are accompanied by a modal or an adverb. Furthermore, while the complement-taking verbs that we have seen in the previous sections are almost exclusively used with a first- or second-person pronoun as subject, the use of *say*, *tell*, and *pretend* is much more flexible in this regard. Table 9 shows that they occur with a wide variety of subjects including third-person pronouns and lexical NPs, which are extremely rare with most other complement-taking verbs in our data.

Finally, *say*, *tell*, and *pretend* are much more likely to occur with a *that*-complementizer than all other complement-taking verbs in our corpus (see Diessel and Tomasello 1999). The vast majority of S-complements does not include a complementizer; there are only 45 COMP-clauses in the entire data that are marked by *that* (i.e., 2.5 percent). However, more than half of them (24 tokens) occur with *say*, *tell*, or *pretend*, although these verbs only account for 22 percent of all complement-taking verbs of S-complements in our corpus. It is thus three-and-a-half times more likely that a *that*-COMP-clause occurs with *say*, *tell*, or *pretend* than with other complement-taking verbs in our data.

Table 9. *Subjects of* say, tell, *and* pretend *in CTV-clauses*

	1.SG.PRO	2.SG.PRO	3.SG.PRO	PL.PRO	LEX.N	IMP	Total
see	102	34	55	17	85	20	313
tell	18	7	7	1	2	7	42
pretend	31	2	1	19	–	14	67
Total	151 (36%)	43 (10%)	63 (15%)	37 (8.8%)	87 (20.6%)	41 (9.7%)	422

Table 10. *The average number of tokens per clause type including a specific complement-taking verb*

	Average number of tokens per clause type	Overall number of tokens per complement-taking verb	Overall number of clause types per complement-taking verb
bet	55	55	1
guess	49	49	1
look	41.7	125	3
think	18.6	558	30
see	18.3	275	15
wish	12.3	37	3
hope	7.8	31	4
know	6.4	135	21
remember	6.0	18	3
mean	5.7	63	11
pretend	2.8	67	24
say	2.4	313	128
tell	1.2	42	36

Unlike the complement-taking verbs that we have seen in previous sections, *say*, *tell*, and *pretend* do not occur in parenthetical formulas; rather, they are embedded in full propositions which are much more complex and diverse than most other CTV-clauses. This is demonstrated in Table 10, which shows the average number of tokens with which a specific CTV occurs in a specific type of CTV-clause, where "type of CTV-clause" is defined as a structure having at least one formal feature (e.g., a specific tense form) that distinguishes it from all other CTV-clauses with the same verb. For instance, the verb *remember* has 18 tokens (in the entire corpus) distributed over three different types of CTV-clauses (*remember...?*; *I remember...*; and *Do you remember...?*), which yields an average of six tokens of the complement-taking verb *remember* for each type of CTV-clause.

What Table 10 shows is that the CTV-clauses including *say*, *tell*, and *pretend* have by far the lowest token frequency (*pretend* 2.8; *say* 2.4; *tell* 1.2), which indicates that they are much more diverse than most other CTV-clauses in our sample. The greater degree of diversity suggests that these CTV-clauses are not parenthetical formulas but rather full propositions. Specifically, *say* and *tell* are commonly used in assertive CTV-clauses, as suggested by the high percentage of third-person subjects and past tense forms, whereas *pretend* is primarily used in performative CTV-clauses; it mainly occurs in three constructions: (1) with first-person singular subjects (e.g., *I'm just pretending it's a napkin*), (2) in imperative

clauses (e.g., *Pretend you're a dog*), and (3) in hortatives (e.g., *Let's pretend it's raining*).

Although *say*, *tell*, and *pretend* occur in full-fledged CTV-clauses, it is unlikely that the children of our study have acquired a general COMP-clause or rule on the basis of these three verbs. There are two arguments that contradict such an assumption. First, the fact that *say*, *tell*, and *pretend* are the only complement-taking verbs that commonly occur with an embedded COMP-clause in our data; as already shown, all other complement-taking verbs are primarily used as parenthetical formulas that are adjoined to an independent utterance. Second, the CTV-clauses in which *say*, *tell*, and *pretend* occur are so diverse that it is questionable that children conceive of them as instances of the same grammatical construction. The CTV-clauses differ both formally and with regard to their meaning: while *say* and *tell* denote an act of speaking, *pretend* refers to an activity in a game. The semantic difference correlates with several structural differences. Unlike *say* and *tell*, *pretend* is frequently used in the progressive tense and accompanied by modal adverbs; moreover, while *say* and *tell* primarily occur in declarative CTV-clauses, *pretend* is also commonly found in imperatives and hortatives. If we compare the use of *say* and *tell* we find that although both denote an act of speaking, they take different types of COMP-clauses. While *say* is commonly used with a direct quote, *tell* takes COMP-clauses that paraphrase the content of a previous utterance. Furthermore, while *say* usually occurs with a simple S-complement, *tell* takes in addition an indirect object denoting the addressee (e.g., *I am gonna tell Mommy I want paper*). Given that *say*, *tell*, and *pretend* occur in rather different constructions and that the early use of performative and assertive CTV-clauses is largely restricted to these three verbs, it appears to be unlikely that children have formed a general COMP-clause schema (or rule) at this stage. Rather, what they seem to have learned are "constructional islands" (Tomasello 2000) organized around specific complement-taking verbs. We will come back to this point in the discussion.

4.2. If-*complements and* wh-*complements*

We turn now to *if-* and *wh*-complement clauses, which require a co-occurring CTV-clause to form a complete utterance: That distinguishes *if-* and *wh*-complements from S-complements. The latter are formally indistinguishable from independent utterances unless they are marked by a *that*-complementizer, as are only a small minority of S-complements in our sample. Since *if-* and *wh*-complements are structurally incomplete without the associated CTV-clause, they cannot be interpreted as

parentheticals. However, that does not mean that the composite structure is necessarily biclausal. This section shows that the CTV-clauses of *if*- and *wh*-complements basically serve the same pragmatic functions as the CTV-clauses of S-complements: they may function as epistemic markers, attention getters, or markers of the illocutionary force of an utterance. However, while the CTV-clauses of S-complements are parentheticals, the CTV-clauses of *if*- and *wh*-complements function as an integral part of a lexically specific utterance frame that is associated with a particular pragmatic function.

4.2.1. If-*complements*

Our data include seven complement-taking verbs that occur with an *if*-complement clause: *see*, *tell*, *wonder*, *ask*, *care*, *know*, and *happen*. Almost all of them have just a few tokens. The only verb that is frequently used with an *if*-complement clause is *see*: of the 98 *if*-complements, 69 occur with *see* in our data (i.e., 70.5 percent). Apart from *see*, *tell* is the only other complement-taking verb that has more than ten tokens; however, since 13 of the 14 utterances including *tell* and an *if*-complement clause are produced in a single session by the same child, we will limit our discussion to *see* in this section. The examples in (51) show the earliest utterances including *see* and an *if*-complement clause in Nina's and Sarah's transcripts.

(51) [Nina and Sarah's first ten utterances including *see* plus *if*-complement]

a.	... and *see* if I'm tall.	2;10
b.	Now *let's see* if it fits on this little boy.	3;1
c.	*Let me see* if there's something else in her bag.	3;3
d.	*I want to see* if you...	3;8
e.	*Let me see* if I can touch you.	4;2
f.	*See* if I can make a kite.	4;8
g.	*See* if I can make you wink.	4;9
h.	*See* if I can pour it like this.	4;9
i.	*See* if it smells.	4;11
h.	*Let me see* if you get anymore.	5;1

While *see* does not only occur in one specific formula, its occurrence is restricted to a few types of CTV-clauses. Table 11 shows all CTV-clauses (i.e., all types) that Sarah, Adam, and Abe produced with *see* and an *if*-complement clause. As can be seen in Table 11, none of the three children uses *see* with an *if*-complement clause before the third birthday. This holds for all complement-taking verbs that Sarah, Adam, and Abe

Table 11. *CTV-clauses of* if-*complements including* see *at different ages*

	Sarah	Adam	Abe
> 2;11			
3;0–3;11	*I want to see* [3;8] (1)	[3;7] *See* (1)	*See* [3;3] (11) *I will see* [3;4] (1) *I'm gonna see* [3;5] (1) *Let me see* [3;8] (4) *I want to see* [3;9] (3)
4;0–5;0	*Let me see* [4;2] (2) *See* [4;8] (4)	*See* (12) *Let me see* [4;1] (7) *Let's see* [4;6] (2) *I want to see* [4;6] (1)	*See* (3)

used with an *if*-complement clause (there are however a few earlier examples in Peter's and Eve's transcripts). If we look at the data in Table 11 more closely we find only six clause types in which *see* serves as the complement-taking verb of an *if*-complement clause as in Table 11a.

In more than half of the utterances in which *see* occurs with an *if*-complement, the CTV-clause consists solely of *see* (i.e., 31 tokens in the data from Sarah, Adam, and Abe). In such a case, *see* does not denote an act of perception; rather, it serves together with *if* as a directive, drawing the interlocutors attention to an unknown (or not yet realized) state of affairs whose status (or truth) will be revealed in the immediate future. Some typical examples are given in (52):

(52) [Adam (imperative *see* plus *if*-complement)]

a.	*See* if I can push it.	4;1
b.	*See* if your car is stuck.	4;3
c.	*See* if I can do something else.	4;10
d.	*See* if the flowers would like to watch me.	4;10

Although the other CTV-clauses with *see* appear to be somewhat more substantial, they basically serve the same function as the simple *See if*...: they also draw the interlocutors attention to the COMP-clause proposition. While some of these clauses might be considered performative (rather than formulaic), it must be emphasized that there are no assertive CTV-clauses of *if*-complements with *see* in our data. In fact, none of the complement-taking verbs that take *if*-complements are assertive. They generally occur in the present indicative active and take either a first-person pronoun as subject or occur in imperative or hortative clauses. Thus, there is good evidence that the use of *if*-complement clauses is restricted to the formulaic and performative uses.

Table 11a. *Clause types in which* see *serves as the complement-taking verb of an* if-*complement clause*

Types	Tokens
See	31
Let me see	13
I want to see	5
Let's see	2
I will see	1
I'm gonna to see	1

4.2.2. Wh-*complements*

Table 12 shows the complement-taking verbs that occur at least ten times (across all children) with a *wh*-complement clause. As can be seen in Table 12, most of the complement-taking verbs that occur with *wh*-complements are also used with S-complements. The following examples illustrate the use of *see*, *look*, and *watch* (note that the latter only occurs with *wh*-complements):

(53) [Nina's first ten utterances including *see* plus *wh*-complement]

a.	*See* where my monkey is.	2;4
b.	*See* what he doed?	2;9
c.	*See* what this is.	2;9
d.	I just opened that thing and *see* what was in there.	2;10
e.	*See* how I eat it.	2;10
f.	*See* what ... what the babies are?	2;10
g.	No *let me see* who is that.	2;10
h.	Let's close the door and *see* what happens.	2;11
i.	*Let's see* what's in here.	3;1
j.	*I wanna see* what else is ...	3;1

(54) [Sarah's first ten utterances including *look* plus *wh*-complement]

a.	Oh ... *look* what I did.	3;2
b.	Look ... *look* ... what's that look like.	3;6
c.	*Look* what he doing.	3;8
d.	*Look* what I made.	3;9
e.	*Look* what I made.	3;9
f.	*Look* what I found.	3;9
g.	*Look* what I have.	3;10
h.	See *look* what I made.	4;0
i.	*Look* ... which one ... this is ... here.	4;4
j.	*Look* how size I have	4;10

Table 12. *Complement-taking verbs of* wh-*complements*[a]

	Nina	Peter	Naomi	Eve	Sarah	Adam	Abe	Total	Percentage
know	22	82	12	1	78	102	112	409	44.9
see	13	13	6	5	24	66	46	173	19.0
look	13	5	–	–	10	33	49	110	12.0
wonder	6	1	–	–	4	50	7	68	7.5
show	1	7	1	–	1	6	22	38	4.2
tell	1	–	1	–	3	11	15	31	3.4
guess	–	1	1	–	6	6	9	23	2.5
watch	2	–	–	–	1	2	5	10	1.1

[a]Others: *remember, find, hear, ask, forget, mean, understand, say, write, like, care.*

(55) [Nina and Abe (all utterances including *watch* plus *wh*-complement)]

a. *Watch* how I put him in the box. 3;0
b. *Watch* which chalk I talked away. 3;1
c. *Watch* how I slide down. 3;2
d. *Watch* how we play cards ok? 3;4
e. *Watch* how this snake is gon to be catched. 3;8
f. Ok *watch* how fast I could run this time ... 3;8

In these examples, *see*, *look*, and *watch* have basically the same function as in the combination with S-complement clauses: they function as discourse directives rather than as perception verbs. The only difference is that the COMP-clauses of these examples are formally marked as embedded clauses, so that *see*, *look*, and *watch* cannot be analyzed as parentheticals; rather, they function as an integral part of a specific utterance frame.

The examples in (56) illustrate the use of *wonder* plus a *wh*-complement; the examples show Adam's first ten utterances of this construction.

(56) [Adam's first ten utterance including *wonder* plus *wh*-complement]

a. *I wonder* what a whale fish is. 3;8
b. *I wonder* what skinned means. 3;8
c. *I wonder* what dat is. 3;8
d. *I wonder* what dat noise is. 3;8
e. *I wonder* what it is. 3;8
f. Mommy ... *I wonder* what dat is. 3;8
g. *I wonder* what dey are. 3;8
h. *I wonder* what dis is. 3;8
i. *I wonder* where the door is. 3;8
j. *I wonder* where the rest of it is. 3;8

All ten examples include the same type of CTV-clause, consisting of the first-person singular pronoun *I* and the complement-taking verb *wonder* in

the present indicative active. The formulaic character of these expressions strongly suggests that the CTV-clauses are non-referential. Specifically, *I wonder wh-...* serves to introduce an indirect question; it can be seen as a formal marker of the illocutionary force of an utterance. A similar analysis applies to *guess* plus *wh*-complement:

(57) [Sarah and Adam's first ten utterance including *guess* plus *wh*-complement]

a.	*Guess* what it is?	3;5
b.	*Guess* who we spun?	4;1
c.	*Guess* what that is?	4;5
d.	*Guess* what I can make still?	4;6
e.	*Guess* what that is?	4;6
f.	*Guess* what this is?	4;10
g.	*Guess* what it is?	4;10
h.	*Guess* what dis is?	4;11
i.	*Guess* what dis is going to be, Mommy?	5;2
j.	*Guess* how old I am?	5;2

In all ten examples, *guess* occurs with no other element in an imperative CTV-clause. In fact, there is only one example in which *guess* occurs in a different type of CTV-clause (*You guess what we got you*; Abe 3;5); all other examples have the same structure as in example (57). Like *I wonder wh-...*, *Guess wh-...* signals the illocutionary force of a speech act; specifically, it marks the first utterance of an adjacency pair in which the speaker asks the hearer to surmise what has happened in a particular situation before revealing the answer.

The most frequent complement-taking verb of *wh*-complements is *know*, which occurs in 409 utterances. The examples in (58) show the first ten utterances that Nina produced with *know* and a *wh*-complement clause.

(58) [Nina's first ten utterances including *know* plus *wh*-complement]

a.	*You know* what these things are called?	2;3
b.	*Know* what happened?	2;3
c.	*You know* what these things are called?	2;3
d.	*Know* what my making?	2;3
e.	Uh ... *you know* what my make?	2;4
f.	*Know* what my eating ... Mommy?	2;4
g.	*Know* what's happening?	2;4
h.	*Know* where my monkey is?	2;4
i.	*Know* what it is now?	2;5
j.	*Know* what these is?	2;5

In all ten utterances *know* serves as the complement-taking verb of a polar question which may or may not include a second-person pronoun as a subject. *(Do you) know* is by far the most frequent clause type; it occurs in more than half of all utterances in which *know* takes a *wh*-complement clause. In most of these constructions, *(do you) know* is semantically redundant. If somebody asks, for instance, *Do you know what time is?* the speaker usually is not interested in the hearer's knowledge (i.e., whether or not s/he knows the time); rather, what the speaker would like to know is the specific time at the point of the utterance. The hearer is therefore expected to provide an answer in response to the COMP-clause proposition rather than the CTV-clause; the latter is just a polite formula to introduce a directive speech act.

Apart from *(do you) know*, there are two other types of CTV-clauses in which *know* frequently occurs: *I know*, which has 54 tokens, and *I don't/didn't know*, which occurs in 97 utterances. Although both types are short and formulaic, they cannot generally be classified as epistemic markers. In particular, when they are used contrastively they function as performative CTV-clauses denoting the speaker's mental state (see Wellman 1990; Bartsch and Wellman 1995). However, not all uses of *I know* and *I don't/didn't know* are contrastive; the noncontrastive uses are generally less substantial and often equivocal between an interpretation as epistemic marker and an interpretation as performative CTV-clause.

As the children grow older, they begin to use *know* in a wider variety of CTV-clauses. Some of them can only be interpreted as assertive uses, as in examples (59) to (63):

(59) *He doesn't know* where he's driving. [Adam 4;0]
(60) Do you think *they'll know* who wrote the letter then? [Abe 4;1]
(61) *Paul knows* where it is, doesn't he? [Adam 4;3]
(62) *This airplane doesn't know* where it's going. [Adam 4;4]
(63) *She didn't know* where it was. [Shrah 5;0]

In these examples, the subject of the CTV-clause is either a third-person pronoun or a lexical NP referring to a non-speech-act participant. Note also that *know* occurs in different tenses (present, future, and past) and that in three cases the CTP-clause is negated. These features suggests that the COMP-clauses are embedded (both formally and conceptually) in an assertive CTV-clause. In other words, the utterances in examples (59) to (63) document the gradual development of complex sentence constructions including *know* plus a *wh*-complement in our data.

Finally, there are two complement-taking verbs *tell* and *show*, that occur from the very beginning in a wide variety of CTV-clauses with *wh*-complements.

(64) [Adam's first ten utterances including *tell* plus *wh*-complement]

a.	*Tell me* where you going.	2;10
b.	*Why you told him* what you gonna do?	3;2
c.	*You tell me* what it is.	3;4
d.	*Will you tell me* what it is.	3;8
e.	*Tell you* how vegetables grow.	3;11
f.	*He's trying to tell you, Paul*, what're you trying to do?	3;11
g.	*Tell me* what all of dese are?	4;7
h.	*Mommy you tell me* what de directions do, ok?	4;10
i.	*Mommy, tell me* what de directions are.	4;10
j.	*Tell me* what they taste like.	4;10

(65) [Peter and Adam (all utterances including *show* plus *wh*-complement)]

a.	Yeah ... *show them* how it works...	2;8
b.	*I'm gonna show you* where the horses feet is.	2;8
c.	*I'll show you* where it is.	2;8
d.	Oh ... *let me show you* how I do it ...	3;1
e.	*Show me* how it works.	3;4
f.	*I show you* what I put on wrong.	3;6
g.	*Show me* what color you want.	4;3
h.	*I show you* what I made.	4;7
i.	Now... *show me* what de directions are.	4;10
j.	*Show me* how I'm gonna make a kite.	4;10

The CTV-clauses in (64) and (65) are more complex and more diverse than most other CTV-clauses. They are declarative, interrogative, or imperative clauses, including various subjects, indirect objects, verbs in different tenses, and in one case *tell* serves as the infinitival complement of the verb *try*. The diversity of these constructions suggests that they do not function as clausal operators; rather, they serve as full-fledged (main) clauses. While most of them are performative CTV-clauses (e.g., *Tell me where...*), a few represent assertive uses (e.g., *He's trying to tell you, Paul, what ...*).

5. Discussion

In this article we have shown that the vast majority of children's early COMP-clauses are accompanied by formulaic CTV-clauses. The composite structure contains thus only a single proposition expressed by the COMP-clause. The CTV-clauses are propositionally empty: rather than denoting some state of affairs, they function as epistemic markers, attention getters, or markers of the illocutionary force. From a formal perspective, two types of formulaic CTV-clauses can be

distinguished: (1) CTV-clauses that function as parentheticals of S-complements, and (2) CTV-clauses that function as an integral part of a specific utterance frame including *if-* or *wh*-complements. Since formulaic CTV-clauses are not full-fledged (main) clauses, the associated COMP-clauses are non-embedded.

As children grow older, some of the early formulaic CTV-clauses become more substantial. For instance, while the earliest uses of *think* are restricted to the parenthetical formula *I think*, there are some later examples in which *think* occurs in other types of CTV clause; some of the latter represent performative or assertive CTV-clauses. However, while the number of performative and assertive uses increase with growing age, the formulaic use remains by far the most frequent usage. Moreover, the performative use tends to emerge before the assertive use. This holds for both the class of complement-taking verbs as a whole and for individual verbs. Specifically, if the earliest use of an individual verb is formulaic (as in the case of most complement-taking verbs in our data), it is very likely that the use of this verb is first extended to performative CTV-clauses before it is used assertively. There is thus a developmental trend leading from CTV-clauses via the performative use to assertive CTV-clauses. However, it must be emphasized that not every complement-taking verb passes through all three stages. In particular, the formulaic use is limited to a rather small number of verbs, despite the fact that this use is dominant in early child speech. In our data there are only four (common) verbs that never occur in formulaic CTV-clauses: *say*, *tell*, *pretend*, and *show*. These four verbs (which emerge several months after the first formulaic complement-taking verbs) occur from early on in performative and assertive CTV-clauses. They can be seen as the first real "main clause verbs" taking an embedded COMP-clause.

However, this does not mean that the acquisition of COMP-clauses is completed when these four verbs emerge. As we have seen above, children's early use of sentences including *say*, *tell*, *pretend*, and *show* is item-specific; the sentences are organized around individual verbs and not yet licensed by a general CTV/COMP-clause schema (or rule). Such a schema emerges only later through generalization across a large number of item-specific CTV/COMP-clauses. In general, what children eventually learn is a network of interrelated constructions. Following Langacker (1988, 2000), we assume that such a network represents constructions at different levels of abstraction, ranging from concrete utterances (or parts of concrete utterances) that are stored as prefabricated processing units to highly abstract schemas. The constructions are related through specific links; two types of links are distinguished: (1) *instantiation* links, which indicate a relationship between a schematic construction and a more

concrete construction that elaborates the former by more specific elements; and (2) *extension* links, which also indicate a relationship between a schematic construction and a more concrete construction; however, in this case there is some conflict in value: the more concrete construction is not fully compatible with the more abstract construction, so that the former is not simply an instance of the latter despite the fact it shares most of its features. Figure 1 shows how the various CTV/COMP-clause constructions may be linked in a partial network of adult grammatical knowledge.

In Figure 1, the vertical dimension of the network indicates the degree of abstractness or schematicity: constructions at the top of the network are in general more schematic than constructions at the bottom. In fact, the lowest level of the network shows CTV/COMP-clause constructions that include concrete lexical items. These items represent formulaic CTV-clauses, stored as prefabricated elements that combine with specific types of COMP-clauses. They can be seen as extensions (rather than instantiations) of the central performative and assertive uses of CTV/COMP-clauses. The latter comprise constructions of various degrees of abstractness: At the lowest level (above the level of the CTV/COMP-clauses), the CTV/COMP-clause constructions are item specific; that is, they are organized around individual complement-taking verbs. The item-specific constructions are instantiations of more abstract constructions that become increasingly more schematic towards the top of the network.

What the children of our study have learned at the end of the time period we examined (i.e., at around age five) are isolated CTV/COMP-clause constructions at the bottom of the network. Most of these constructions are formulaic CTV/COMP-clauses. The performative and assertive uses are basically restricted to *say*, *tell*, *pretend*, and *show*, and a few other complement-taking verbs whose use has become more substantial with increasing age (e.g., *think*, *know*, see). Since the performative and assertive uses are limited to a few verbs, it is unlikely that the children of our study have formed a more schematic CTV/COMP-clause construction at this stage. If that was the case one would expect that they used this schema productively beyond the scope of individual verbs. However, there is no evidence in our data that children extend the performative-assertive use of CTV/COMP-clauses to novel verbs; they only use them with *say*, *tell*, *pretend*, and *show* (and possibly a few other verbs). It is therefore reasonable to assume that the more schematic constructions of the network in Figure 1 emerge only later as children learn more types of CTV/COMP-clauses.

Note that children's acquisition of finite COMP-clauses starts with constructions that are extensions of the central types of CTV/COMP-clauses (i.e., the performative and assertive uses of these constructions).

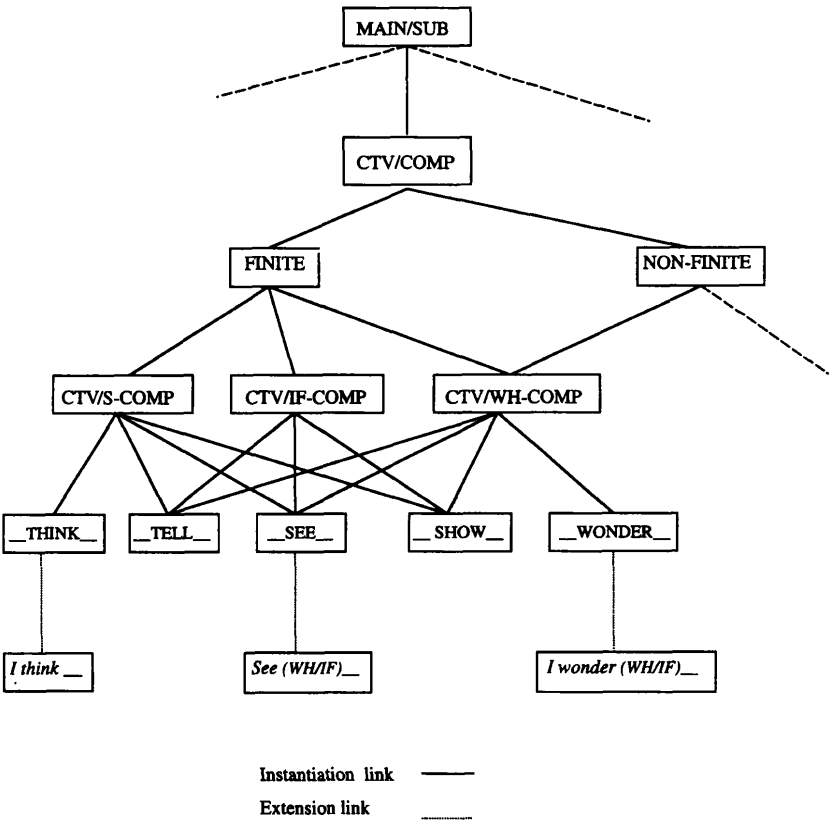

Figure 1. *Network of finite CTV/COMP-clause constructions in English*

In other words, children learn the noncentral use of CTV/COMP-clauses (i.e., the formulaic use) before they acquire the central or prototypical uses (i.e., the performative and assertive uses). Moreover, the formulaic CTV-clauses are not only noncentral, they also come later historically. Ontogenetic and diachronic development proceed in opposite directions in this case, challenging a common assumption according to which ontogeny and diachrony are parallel developments (see Ziegler 1997).

Let us finally ask what motivates the described development? Why do children learn the formulaic use of CTV/COMP-clauses before they learn the performative and assertive uses? We briefly consider three possible factors that may explain (or contribute to) the described development.

1. *The ambient language.* Although we did not systematically examine the parents' use of CTV/COMP-clauses, it is immediately obvious that the formulaic use of CTV/COMP-clauses is very frequent in the parents' data; it outnumbers the two other uses by several times.[14] Moreover, the parents' use of performative and assertive CTV/COMP-clauses involves the same complement-taking verbs as are found in the speech of their children: *say*, *tell*, *pretend*, and *show* are by far the most frequent performative and assertive complement-taking verbs in their data. The early and frequent use of formulaic CTV/COMP-clauses in the speech of young children is thus to be expected if one considers the language to which they are exposed.
2. *Processing complexity.* Unlike the performative and assertive uses, the formulaic use involves just a single proposition. Thus, although the composite structures are formally complex, they do not require the children to hold two propositions in short-term memory, which might exceed their processing capacity. It is thus conceivable that children's early use of parenthetical formulas such as *I think* is made possible by the fact that the utterances in which they occur are relatively easy to process compared to performative and assertive CTV/COMP-clauses which contain two propositions. Indirect support for this hypothesis comes from a recent study by Diessel and Tomasello (2000) in which we show that relative clauses, like COMP-clauses, first emerge in constructions that contain only a single proposition. Thus, children's early use of complex sentence constructions might in general include just a single proposition because utterances that are propositionally more complex would exceed their processing capacity.
3. *Cognitive development.* Finally, it is conceivable that the formulaic use of mental verbs such as *think*, *know*, and *remember* appears before they are used in performative and assertive CTV-clauses because the latter uses presuppose certain cognitive abilities that emerge only gradually during the preschool years. Specifically, the child must be able to understand that reality and mental representations do not always match and that different people might have different beliefs about the same state of affairs in order to use mental state verbs in performative and assertive CTV-clauses. Recent work by Bartsch and Wellman (1995) has shown that although children as young as three-and-a-half years of age are able to make these distinctions, they are still often confused in false-belief tasks until after the fourth birthday. This suggests, according to Bartsch and Wellman, that children under four years of age do not have a fully developed theory of mind (see also Perner 1991; Astington and Jenkins 1999). If this

is correct, one could argue that the formulaic use of mental verbs in early child speech is due to the fact that children do not have the cognitive prerequisites for the performative and assertive uses. Furthermore, it might explain why the earliest performative and assertive CTV-clauses involve verbs such as *say*, *tell*, *pretend*, and *show* rather than mental verbs, which at first only occur in formulaic CTV-clauses: Mental verbs such as *think*, *know*, and *remember* occur in the same syntactic environment as *say*, *tell*, *pretend*, and *show*, but their referential use presupposes a theory of mind that children do not have when they begin to use performative or assertive CTV/COMP-clauses (at around the third birthday).[15]

There are thus several factors that might explain why the formulaic use of CTV/COMP-clauses is so dominant in early child speech and why the performative and assertive uses are initially restricted to a few nonmental verbs. However, if and to what extent these factors contribute to the described development needs to be tested in experiments.

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Notes

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1. The predicate is usually a verb; however, it can also be an adjective or a noun (see Noonan 1985). The two latter will not be considered in this paper.
2. This is sometimes used as a test demonstrating the subjecthood of the subordinate clause.
3. Note that example (3) can be passivized (*That Bill wasn't in class was noticed by the teacher*), providing additional support for the assumption that the COMP-clause functions as object.
4. We use the term *CTV-clause* in lieu of the traditional notion of *main clause*, which we find misleading for reasons that will become apparent.
5. There is some variation as to the use of the notion of construction in the literature. While some authors call all symbolic units constructions (see Goldberg 1995), others reserve the term of construction for morphological and syntactic assemblies that comprise at least two symbolic elements (see Langacker 1987). In this study we follow the latter convention.
6. In addition to these features, the word *hereby* may serve as a "useful criterion that the utterance is performative" (Austin 1962: 57) (e.g., *I hereby promise that I will come*).
7. That does not mean that the propositional content is always entirely explicit; in fact, implicatures, entailments, and presuppositions concern the implicit expression of meaning (i.e., the propositional content). However, we would contend that the

illocutionary force of an utterance is more directly determined by the discourse context than its propositional content. One piece of evidence supporting this hypothesis comes from the study of language acquisition: As Bruner (1983), Tomasello (1992), and others have shown, children are able to comprehend the speaker's intention for an utterance (i.e., its illocutionary force) long before they understand its meaning (i.e., its propositional content) as expressed by the words it includes.

8. This is, of course, an idealized description of their functions. The expression of the propositional content and the indication of the illocutionary force are not independent of each other: the way in which speakers denote a state of affairs has an effect on the illocutionary force, and conversely the expression of the illocutionary force contributes to the propositional content contained in an utterance. However, that does not mean that it is in principle impossible to distinguish elements that are primarily used to indicate the illocutionary force from elements whose primary function is to modify the propositional content. Hence, what we suggest is that, in the performative use, some CTV-clauses primarily serve to indicate the illocutionary force (notably performative speech act verbs), while others primarily serve to qualify the propositional content (notably cognition and perception verbs).
9. A similar analysis has been suggested by Verhagen (to appear: 16): "In a sense, we have thus turned the traditional notion of 'dependent clause' upside down, by showing that it is the matrix clause that is actually conceptually dependent on a subordinate one [i.e., a COMP-clause]". However, since Verhagen does not distinguish the performative use from the assertive use, he seems to overgeneralize his conclusion.
10. Although a formulaic CTV-clause is not really a clause, we will use the term *CTV-clause* for this usage in order to indicate its relationship to the CTV-clauses in the performative and assertive uses.
11. The data from Naomi, Nina, Peter, and Eve are not shown in Table 4, because they are either limited to a rather short time period (in the case of Nina and Peter) or are too thin to show significant developmental changes (in the case of Naomi and Eve).
12. Again, since the data from Naomi, Nina, Peter, and Eve are insufficient to enable the observation of significant development changes, they have not been included.
13. Indirect support for this analysis of *pretend* comes from a recent study by Custer (1996), who found that three-year-olds respond correctly in a picture choice task when the test scenario involves a complex sentence including the complement-taking verb *pretend* (e.g., *He is pretending that his puppy is outside*) while they fail to provide the correct answer when the test sentence includes the complement-taking verb *think* (e.g., *He thinks that his puppy is outside*). We take this as additional evidence for our hypothesis that *pretend* has a more concrete meaning in the speech of young children than in the speech of adults and that *pretend* must be distinguished from other cognition verbs such as *think* or *know* in early child speech (see also Lillard 1993).
14. In a recent paper, Thompson (2000) has shown that the assertive and performative uses are so rare (or perhaps even entirely absent) in adult conversational English that one might question whether embedded COMP-clauses are a grammatical category of spoken English.
15. An alternative explanation has been suggested by de Villiers (1995, 1999; see also de Villiers and de Villiers 1999). She argues that the relationship between cognitive development and language acquisition is not unidirectional: while the acquisition of CTV/COMP-clauses has certain cognitive prerequisites, the cognitive development is in turn facilitated by syntactic development. More precisely, de Villiers (1999: 95) argues that CTV/COMP-clauses provide a "representational medium" within which children can reach a better understanding of certain aspects of the mind, notably of false beliefs.

Her hypothesis is based on evidence from experiments with deaf and hearing children showing that the acquisition of COMP-clauses improves children's performance in false-belief tasks. While de Villiers' research sheds new light on the intricate relationship between language acquisition and the child's emerging theory-of-mind, we believe that much more empirical work needs to be done in order to resolve this issue.

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